

BY ILAN BIJAOU

Enhancing the Global and Local Economic Impact of Israeli Innovation



SERVICES FOR SCIENCE AND EDUCATION, UNITED KINGDOM



Ilan Bijaoui

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ABBREVIATIONS

AAC	Augmentative Alternative Communication
AAPC	Ammonia Adsorption Plasma Column
ACTD	Advanced Concept Technology Demonstration
ADAS	Advanced Driver Assistance Systems
AKT	Protein kinase B PKB, also known as AKT
AO	Alpha Omega
ASD	Autism Spectrum Disorder
AWS	Amazon Web Services
CASB	Cloud Access Security Broker
CBD	corticobasal degeneration
C-IED	Counter-Improvised Explosive Device
DO	Dissolved Oxygen
DOC	DiskOnChip
DSC	Dye Solar Cell
DSP	Digital Signal Processor
DRAM	Dynamic random-access memory
DSPC	Digital Signal Processor Communications.
DTCP	Deutsche Telekom Capital Partners
EaaS	Education-as-a-Service
EAE	encephalomyelitis
EDA	Electronic Design Automation
EEPROM	Electrically Erasable Programmable Read-Only Memory
EPFL	École Polytechnique Fédérale de Lausanne
EPROM	Erasable Programmable Read-Only Memory
EUV	Extreme Ultraviolet
FIE	Fault Injection Engine
FPI	Fluid Percussion Injury
FRIL	Drone Racing League

FTO Fluorine-doped Tin Oxide
GBAD Ground-BAsed air Defense
HAI Hospital Acquired Infections
HDI Heat Diffusion Imaging
HOPE Hematology Oncology Paediatric Excellence
HPC High Performance Computing
IBR Israeli Biotechnology Research
IFF International Flavors & Fragrances
ICH Intracranial Hemorrhage
IDE Israel Desalination Engineering
ITU International Telecommunication Union
IMod Ministry of Defense
JHL Joint Heavy Lift
MAC Miracle Alien Cookies
MCS Methylcellulose Culture System
MIT Massachusetts Institute of Technology
MED Multi-Effect Distillation
MNO Mobile Network Operator
NOTES Natural Orifice Translumenal Endoscopic Surgery
MSF Multi-Stage Flash
MVC Mechanical Vapour Compression
NROM Nitrate-Read-Only Memory
NVM Non-Volatile Memory
NVP Network Voice Protocol
NAI National Academy of Inventors
PCI Percutaneous Coronary Intervention
P.K. Pink Kush
Polydimethylsiloxane PDMS
POS Point-Of-Sale
PPACt Performance, Area, Cost and Time-to-Market

PRO Pressure Retarded Osmosis
PTSD Post-Traumatic Stress Disorder
RAM Random Access Memory
RDMA Remote Direct Memory Access
REG Recovered Energy Generation
RED Reverse Electrodialysis
RIN – Ripening Inhibitor
RO reverse osmosis
RoC Radar-On-Chip
SCS Spinal Cord Stimulation
SDIO Strategic Defense Initiative Organization
Sub-T Urban Warfare to Subterranean Operations
TBI Traumatic Brain Injury
TCO Transparent Conductive Oxide
THC Tetrahydrocannabinol
THEL Tactical High Energy Laser
TrueFFS True Flash Filing System
UAV Unmanned Aerial Vehicle
VFVC Vacuum Freezing Vapor Compression
VSAT Very Small Aperture Terminal
VoIP Voice over Internet Protocol

ABSTRACT

Israel's Innovation Policy: Export-Driven, Locally Limited. Israel's national innovation policy is heavily oriented toward promoting high-tech exports, with limited support for domestic commercialization of innovations. While this strategy has positioned Israel as a global leader in innovation, it has left significant gaps in the local deployment and societal impact of Israeli-developed technologies. Radical Innovations: Globally-Oriented Scientific Advances. Many radical innovations in Israel originate from foreign-born researchers and academic institutions. A total of 21 radical innovations were identified, primarily in: Mathematics, Healthcare, Chemistry. These innovations are largely export-focused, with only 7 also addressing local market needs. Discontinuous Innovations: Market-Driven Emergence. 94 discontinuous innovations have emerged in response to new customer demand trajectories, particularly in Agriculture, Energy, Healthcare, Telecommunications. These innovations are also predominantly targeted at international markets, with only 6 adapted for local use. Disruptive Innovations: Technological Breakthroughs for Mainstream Needs. 134 disruptive innovations introduce novel technologies that meet previously unmet needs, with applications in: Agriculture, Water Treatment, Healthcare, Hardware-Software Platforms, Digital Imaging, Education, Defense. Again, the vast majority are designed for international deployment, with only 6 also implemented locally. Inclusive Innovation: A Missing Pillar. Inclusive innovations, which aim to serve local, underserved populations, currently lack institutional support in Israel. With proper backing, these innovations have the potential to evolve into discontinuous or disruptive technologies, contributing not only to local well-being but also to global economic and technological advancement.

ISRAELI SCIENTISTS RADICAL INNOVATORS

Israeli radical innovators are deeply integrated into international research teams, while maintaining strong ties to Israeli academic institutions, where most are employed. These scientists—many of whom are foreign-born or dual nationals—contribute significantly to Israel’s global scientific standing. They originate from a diverse set of countries, including Israel, United States, Germany, Austria, Belarus, South Africa, Ukraine, Hungary, and France. Their areas of expertise span across: Mathematics, Chemistry, Life Sciences, Agricultural Sciences. Many of these individuals have received prestigious international awards recognizing their contributions to science and innovation.

Mathematics

Dr Bruria Kaufman, Mössbauer Emission of Gamma Rays from Solid Material, Spectroscopy

Bruria Kaufman was born in 1918 in New York City. During her childhood, her family immigrated to what was then British Mandate Palestine, first settling in Tel Aviv before moving to Jerusalem. She completed her undergraduate studies in mathematics at the Hebrew University of Jerusalem in 1938. Later, she returned to the United States to advance her education at Columbia University, where she earned her doctorate in mathematics in 1947.

Following her PhD, Kaufman became a research associate at Princeton University’s prestigious Institute for Advanced Study. Her research primarily involved addressing complex physics problems through mathematical methods. From 1947 to 1955, she collaborated with the renowned mathematician John von Neumann, a pioneer in game theory, computer science, and nuclear physics. Together, they studied the Mössbauer effect, which involves the emission of gamma rays from solid materials.

In 1950, Kaufman began working as Albert Einstein’s mathematical assistant, a position she held until his death in 1955. During this period, they co-authored a book and two papers focusing on the implications of relativity.

Kaufman made important contributions to Einstein’s Theory of General Relativity and the field of statistical physics, cementing her legacy as a significant figure in 20th-century physics and mathematics.

She sought to refine a famous paper on neutron absorption in crystals by Willis Lamb, who only realised the full significance of her suggestions after the discovery in 1958 of the Mossbauer effect, now a fundamental technique in modern spectroscopy. He received the Nobel Prize in Physics in 1955 ([nobelprize site](#)).

Due primarily to Harris' academic career, the couple left the kibbutz and relocated to the US in the 1980s when their sole kid grew up. After her husband passed away in 1992, Kaufman eventually relocated to the University of Arizona, where she taught as a visiting professor. The marriage did not endure, but four years later she wed Willis Lamb, a physicist and Nobel laureate who had worked with her at Columbia. She returned to Israel and became a professor at the Weizmann Institute of Science in Rehovot and Haifa University. Kaufman's final years were spent in a nursing home in Kiryat Tivon until she died in 2010 at age 92.

Prof. Robert Aumann, Acceptable Points in General Cooperative n -Person Games

Robert Aumann was born in Frankfurt am Main, Germany, in 1930, to an orthodox Jewish family (ma.huji site). Fleeing Nazi persecution and emigrated to the United States in 1938, settling in New York. Aumann attended Yeshiva elementary and high schools, got a bachelor's degree from the City College of New York in 1950, and a Ph.D. in mathematics from MIT in 1955.

Prof. Robert John Aumann is a mathematician, a member of the United States National Academy of Sciences, and a professor at the Center for the Study of Rationality at the Hebrew University of Jerusalem in Israel.

He joined the mathematics department at the Hebrew University of Jerusalem in 1956. In 1990, he was among the founders of the Center for Rationality at the Hebrew University, an interdisciplinary research center on Game Theory, with members from over a dozen different departments, including Business, Economics, Psychology, Computer Science, Law, Mathematics, Ecology, Philosophy, and others.

He has cooperated with Michael Maschler, Jacques Drèze, Mordecai Kurz, Sergiu Hart, Bezalel Peleg, Adam Brandenburger, Frank Anscombe, Abraham Neyman, Benjy Weiss, Micha Perles, Joe Kruskal, Roger Myerson. Aumann received the Nobel Memorial Prize in Economic Sciences in 2005. When the Prize was announced, the work of mine most prominently mentioned by the Committee was 1959 paper "Acceptable Points in General Cooperative n -Person. for having enhanced our understanding of conflict and cooperation through game-theory analysis." Aumann's specific contribution is in the field of non-cooperative game theory Games (nobel prize site).

Dr Elon Lindenstrauss, Jean Bourgain, Benjamin Weiss, Mikhail Gromov, Number Theory

Born Aug. 1, 1970, in Jerusalem, Lindenstrauss has a bachelor's degree in mathematics and physics and a master's degree and Ph.D. in mathematics at Hebrew University (Siegel-

Itzkovich and Hartman, 2010). After completing his doctorate, he did post-doctoral work at the Institute for Advanced Study at Princeton University and Stanford University in the US. Married and the father of three living in Jerusalem, he is a Hebrew University professor.

Lindenstrauss was cited by the Institute of Mathematics and its Applications (IMA) for his "far-reaching advances in ergodic theory," which studies the statistical behavior of dynamical systems. The ergodic theory deals with questions such as, how are a frog's landing spots distributed within the interiors of the squares and in particular, how close do they come to the squares' corners and edges? Lindenstrauss has advanced his understanding of a critical topic, the Littlewood conjecture, pertaining to the proximity of such frogs to landing on edges. He described his work in mathematical dynamics as having a system and describing how the process develops in quality and quantity. It is basic theoretical research, but there are many applications, as in the field of encryption. In Fall 2014, he was a Visiting Miller Professor at the University of California, Berkeley.

In a co-authored paper with Jean Bourgain, he made major progress on Peter Sarnak's Arithmetic Quantum Unique Ergodicity conjecture. Recently with Manfred Einsiedler, Philippe Michel, and Akshay Venkatesh, he studied distributions of torus periodic orbits in some arithmetic spaces, generalizing theorems by Hermann Minkowski and Yuri Linnik (Einsiedler et al, 2006).

Together with Benjamin Weiss he developed and studied systematically the invariant of mean dimension introduced in 1999 by Mikhail Gromov (Lindenstrauss and Weiss, 2000; Gromov, 1999). In related work, he introduced and studied the small boundary property and stated fundamental conjectures (Lindenstrauss, 2019). Number theory, which is the branch of mathematics relating to numbers and the rules governing them, is the mother of modern cryptography - the science of encrypting communication. Cryptography algorithms that guarantee data privacy, integrity, and authenticity derive their base from number theory, which is utilized to ensure data confidentiality and integrity during online transactions and the identification of digital users.

***Prof. Yoav Benjamini, Prof. Daniel Yekutieli, and Prof. Ruth Heller,
Screening of a Large Number of Experimental Results to Identify
Significant Discoveries***

Prof Yoav Benjamini is the Nathan and Lily Silver Professor of Applied Statistics at the Department of statistics and operations research at Tel Aviv University. He holds a B.Sc in physics and mathematics an M.Sc in mathematics from the Hebrew University, and Ph.D in Statistics from Princeton University.

He is a member of the Sagol School of Neuroscience, and of the Edmond Safra Bioinformatics Center, both at Tel Aviv University. His scientific work combines

theoretical research in statistical methodology with applied research that involves complex problems with massive data.

The concept of False Discovery Rate (FDR) was born from a need in medical research, specifically, studies examining large numbers of success parameters to evaluate new treatments. FDR techniques are used in many different domains, including neuroscience, where studies examine tens of thousands of genetic indicators for specific disorders, and genomics, where researchers look for parts of the brain activated by specific tasks, such as face recognition; and also, agriculture, economics, behavioral sciences and astronomy.

Benjamini, together with his former students Prof. Daniel Yekutieli, and Prof. Ruth Heller, has refined and expanded the original Benjamini-Hochberg (BH) procedure beyond medical research to cover genomics, neuroscience, and other fields. They win the 2024 Rousseeuw Prize for Statistics.

Chemistry

Prof. Dan Shechtman, Quasicrystalline Materials

Daniel Shechtman is born January 24, 1941, in Tel Aviv–Yafo, Israel (britannica site). In 1966, Shechtman graduated from the Technion–Israel Institute of Technology in Haifa with a bachelor's degree in mechanical engineering. After that, he graduated from Technion with a master's degree in materials engineering in 1968 and a doctorate in the same field in 1972.

He worked as a postdoctoral fellow at Wright-Patterson Air Force Base's Aerospace Research Laboratories in Dayton, Ohio, from 1972 to 1975. He began working at Technion in 1977 and eventually rose to the rank of professor in 1984. He began teaching materials science and engineering at Iowa State University, Ames, in 2004.

Dan Shechtman, Frank Biancaniello, Denis Gratias, John Cahn, Leonid Bendersky, and Robert Schaefer at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, USA, discovered quasicrystals in 1984 (britannica site). Their study of the metallurgical characteristics of aluminum-iron and aluminum-manganese alloys was funded by the US Air Force.

Shechtman and his colleagues heated the mixture until it melted after combining manganese and aluminum in a roughly six-to-one ratio. The liquid was then dropped onto a cold spinning wheel, a technique called melt spinning, which quickly cooled the combination back into the solid condition. A new structure was discovered when the solidified alloy was viewed under an electron microscope. It displayed long-range order, which is absent from amorphous materials, and fivefold symmetry, which is prohibited in crystals. Thus, its arrangement was neither crystalline nor amorphous. Since then, numerous additional alloys with similar characteristics have been created.

Between the exact pattern of crystals and the amorphous solids of glasses (particular types of metals and other minerals, as well as ordinary glass), quasicrystalline materials are generated atomically. Although quasicrystals have an organized structure similar to that of crystals, the patterns are not as obvious or recur at exactly regular intervals. Instead, quasicrystals seem to be comprised of two distinct structures put together in a nonrepeating array. This is the three-dimensional counterpart of a tile floor composed of two different tile shapes, which have no repetition but an orientational order.

Quasicrystals differ from regular crystalline metals in both their elastic and electrical behavior. The speed at which sound waves travel through metal can be used to study elastic response.

Quasicrystals have weak electrical conductivity in contrast to their constituent elements, which typically have strong electrical conductivity.

On April 8, 1982, The Nobel Committee at the Royal Swedish Academy of Sciences said that "his discovery was extremely controversial," but that his work "eventually forced scientists to reconsider their conception of the very nature of matter." (Lanine, 2011).

Through Shechtman's discovery, several other groups were able to form similar quasicrystals by 1987, finding these materials to have low thermal and electrical conductivity while possessing high structural stability (Day, 2001).

Quasicrystalline materials could be utilized in a large number of applications, incorporating the formation of durable steel used for fine instrumentation, and non-stick insulation for electrical wires and cooking equipment applications (Van Noorden, 2011).

The practical applications of Shechtman's findings are for reinforced metal. As such, it has impacted the construction of tougher surgical tools and can be found in products as diverse as diesel engines, LEDs, and materials used to conduct electricity.

Prof. Michael Levitt, Arie Warshel, and Martin Karplus, Development of Multiscale Models for Complex Chemicals

Born on 9 May 1947 to a Jewish family from Lithuania in Pretoria, South Africa Michael Levitt, studied first at the University of Pretoria and later at King's College, London (cap.stanford.edu site). Levitt completed his postgraduate studies in the Laboratory of Molecular Biology in Cambridge, England, following a stint at the Weizmann Institute of Science in Rehovot, Israel. He remained employed there until 1980. He has been employed at Stanford University since 1987. The theoretical, computer-aided examination of the basic protein, DNA, and RNA components that underpin life is the main emphasis of Prof. Levitt's work.

Arie Warshel is born on 20 November 1940, in Kibbutz Sde-Nahum, Israel. He studied first at Technion in Haifa and received his Ph.D. from the Weizmann Institute of Science

in Rehovot in 1969 (nobelprize site). Warshel worked at Cambridge, England's Weizmann Institute of Science and the Laboratory of Molecular Biology after attending Harvard University in Cambridge, Massachusetts, in the United States.

Since 1976, he has been employed at the University of Southern California in Los Angeles. He is a trailblazer in the field of computer research on biological molecules' functional characteristics.

Martin Karplus was born on March 15, 1930, in Austria. He was the director of the Biophysical Chemistry Laboratory, a joint laboratory between the French National Center for Scientific Research and the University of Strasbourg, France.

In the 1970s, Michael Levitt, Martin Karplus, and Arieh Warshel successfully developed methods that combined quantum and classical mechanics to calculate the courses of chemical reactions using computers (Van Noorden, 2013).

They pioneered key approaches for simulating the functions of biological molecules, including introducing molecular dynamics in biology, developing the quantum mechanical/molecular-mechanical (QM/MM) approach, introducing simulations of enzymatic reactions, pioneering microscopic simulations of electron transfer and proton transfer processes in solutions and in proteins, pioneering microscopic modeling of electrostatic effects in macromolecules and introducing simulations of protein folding.

They received the 2013 Nobel Prize in Chemistry, for the development of multiscale models for complex chemicals. They brought computer modelling into chemistry and used it to undertake multi-scale modelling for the development of complex chemical systems.

Ernest David Bergmann, Aromatic Compounds and Reactive Aliphatics from Petroleum, Nuclear Bomb

Ernest David Bergmann (1903-1975) was an Israeli organic chemist and is often considered the father of the Israeli nuclear program (ahf.nuclearmuseum site).

He was born in Karlsruhe, Germany in 1903. In 1927 he received a Ph.D. and earned a degree in organic chemistry from the University of Berlin, where he focused on "The Addition of Sodium to Carbon-Carbon Double Bonds" for his dissertation.

In 1934, Bergmann followed biochemist Chaim Weizmann to Israel, where he became the scientific director of the newly created Daniel Sieff Research Institute (later renamed the Weizmann Institute).

Bergmann was appointed director of research for the Division of Research and Infrastructure (EMET; later RAFAEL) and established the Israel Atomic Energy Commission in 1952.

Bergmann's scientific endeavors had a noteworthy influence in Israel, including his studies on aromaticity and cancer at Hebrew University; his early 1950s research supervision at the Technion in Haifa; and during the 1950s and 1960s, his investigations into organofluorine chemistry at the University of Tel Aviv (encyclopedia site).

Prof. Chaim Weizmann, Acetone Butanol-Ethanol (ABE) Fermentation Process and Aromatic Hydrocarbons

Chaim Weizmann was born in 1874 to a traditional Jewish family in the small town of Motol in White Russia (Belarus) (wis-wander.weizmann site). After graduating with honors from the Real-Gymnasium in Pinsk, he chose to study chemistry in Germany and Switzerland. He received his doctorate in organic chemistry from the University of Fribourg in Switzerland in 1899.

He started his career at the University of Manchester in England as a scientist. In 1915, Chaim Weizmann invented a fermentation process that converted starch — a poly-sugar readily available from corn and potatoes — into acetone and butyl alcohol, facilitated by a bacteria, *Clostridium acetobutylicum*, that Dr. Weizmann had previously isolated (The Curiosity Review, 2022).

Weizmann is regarded as the "father" of industrial fermentation and a scientist. He created the acetone–butanol–ethanol fermentation process, which uses bacterial fermentation to produce acetone, n-butanol, and ethanol.

Acetone was a key component in the production of the smokeless gunpowder (cordite) used by the Allies in World War I. Acetone had previously been made from calcium acetate imported from Germany, but since the Allies were at war with Germany, this was no longer possible, and the U.S. had a sparse supply.

Winston Churchill requested that the “Weizmann process” be used to mass produce acetone in England, Canada, and the U.S.

The molecules that form the foundation of contemporary petrochemical industries might be produced by the same fermentation process, Dr. Weizmann predicted, knowing that it produced chemical compounds with three and four carbon atoms.

He frequently expressed the necessity for nations, particularly those with limited natural oil supplies, to switch from a petroleum-based chemical industry to one that relies on fermentation. Weizmann's technology provides the basis for the acetonebutanol-ethanol (ABE) fermentation method that is currently experiencing an industrial rebirth.

Following the founding of the Daniel Sieff Institute in 1934 (it was renamed the Weizmann Institute in 1949), Dr. Weizmann concentrated on research areas that were especially pertinent to the future Jewish state's then-emerging economy, specifically the commercial synthesis of organic compounds from petroleum or agricultural products. Of particular

technical significance was the discovery of a process that converts petroleum or petroleum fractions into a range of aromatic hydrocarbons as solvents, as well as in the synthesis of drugs, dyes, and plastics.

Pharmaceuticals, that had previously been reliant on coal tar, a resource virtually non-existent in Israel are now independent of coal as a raw material. Biobutanol is widely used as a solvent for paints, coatings, varnishes, resins, dyes, camphor, vegetable oils, fats, waxes, shellac, rubbers, and alkaloids due to its higher energy density, lower volatility, and lower hygroscopicity. It can be produced from different kinds of cellulosic biomass and can be used for further processing of advanced biofuels such as butyl levulinate as well (Kraemer et al, 2011). Many items rely on products made by the aromatics industry, from aspirin and refrigerators to clothes, cars, and DVDs (aromaticsonline site).

Healthcare

Prof. Aaron Ciechanover, Prof. Avram Hershko, Discovery of Ubiquitin-Mediated Protein Degradation

Aaron Ciechanover was born in Haifa, Israel in 1947. He received his M.Sc. (1971) and M.D. (1973) from the Hebrew University in Jerusalem. He obtained a doctorate in biological sciences in the Faculty of Medicine in the Technion (D.Sc.; 1982).

There, as a graduate student with Dr. Avram Hershko and in collaboration with Dr. Irwin A. Rose from the Fox Chase Cancer Center in Philadelphia, USA, ubiquitin's covalent bond with a target protein instructs it to be degraded. He continued his research on the ubiquitin system while working as a post-doctoral fellow with Dr. Harvey Lodish at the M.I.T. and generated more significant findings. Ubiquitin-mediated proteolysis plays a major role in numerous cellular processes. The system has become an important platform for drug development.

Avram Hershko was born on December 31, 1937, in Karcag, Hungary, 150 kilometers east of Budapest (nobelprize site). The family emigrated to Israel in 1950, in Jerusalem. In 1956, Hershko started to study at the Hebrew University – Hadassah Medical School in Jerusalem, which was the only medical school in Israel at that time.

He earned his medical degree (cum laude) and doctorate (summa cum laude) at the Hebrew University in Jerusalem — Hadassah Medical School, the only medical school in Israel at the time (1967-69). He worked as a postdoc at the University of California Medical Center in San Francisco in the Department of Biochemistry and Biophysics.

In 1954, Irwin A. "Ernie" Rose began working at Yale University in the Department of Pharmacology. In 1963, he transferred to the Fox Chase Cancer Center's Institute for Cancer Research.

Hershko and Rose first met at a Fogarty Foundation meeting in 1977 where they discovered their mutual interests in ATP-dependent proteolysis. Rose asked Hershko to work in his lab at the Institute for Cancer Research in Philadelphia for a sabbatical. The partnership lasted for ten years, during which Rose hosted the Israeli group each summer.

Irwin A. Rose, Avram Hershko, and Aaron Ciechanover made the startling discovery that energy-dependent intracellular proteolysis was significantly more complex than the previously recognized models in two publications they published in PNAS at the beginning of 1980 (Wilkinson, 2005).

Aaron Ciechanover and Avram Hershko contributed to the understanding of how cells respond to cancer. Their contribution to the field impacted the way cancer is treated today. They shared the 2004 Nobel Prize in Chemistry with the late Professor Irwin Rose of the University of California, Irvine, for finding and defining ubiquitin-mediated protein degradation.

Prof. Ada E. Yonath, the Structure of Ribosomes, New Antibiotics

Ada E. Yonath is an Israeli crystallographer and Nobel laureate in Chemistry, best known for her pioneering work on the structure of ribosomes (en.wikipedia).

She currently serves as the director of the Weizmann Institute of Science's Helen and Milton A. Kimmelman Center for Biomolecular Structure and Assembly. Ada Lifshitz (later Yonath) was born on 22 June 1939 in the Geula quarter of Jerusalem. Her parents, Hillel and Esther Lifshitz immigrated to Israel from Zduńska Wola, Poland in 1933. In 1969 she was a Post Doctoral Fellow, at Mellon Inst. Pittsburgh, Pa., USA, and in 1970 a Post Doctoral Fellow, Dept. of Chemistry, MIT, Cambridge, MA, USA.

Yonath focuses on the mechanisms underlying protein biosynthesis, by ribosomal crystallography, a research line she pioneered over twenty years ago despite considerable skepticism of the international scientific community (nobelprize 2009 site).

According to Venki Ramakrishnan, Thomas Steitz, and Ada Yonath, we must first be able to picture the ribosome to comprehend it. Using X-ray crystallography, an imaging technique in which the diffraction patterns formed by X-rays passing through a crystal of a substance are used to piece together that crystal's atomic structure, they independently set out to 'solve' the structure of the ribosome. The Nobel Prize in Chemistry 2009 was awarded to them for their studies of the structure and function of the ribosome.

In 1980 Ada Yonath worked with the ribosomes of heat-loving bacteria that she thought might be especially robust and succeeded in preparing the first useful crystals of the larger of the ribosome's two subunits. The publishing of high-resolution structures for both subunits in 2000 was the culmination of twenty years of intense activity that saw the

acquisition of ever-better crystals and pictures as well as the resolution of many technological obstacles.

The bacterial ribosome is a structure of significant therapeutic value, being the target of half of all known antibiotics. Given the rise in antibiotic resistance, it is hoped that a better knowledge of the specific interactions between antibiotics and the ribosome would enable the development of novel medicines that can combat bacteria that are resistant to drugs. To aid direct structure-based drug design of novel antibiotics, Ramakrishnan, Steitz, and Yonath have all visualized the molecular interactions between ribosomes and antibiotics.

Antibiotics frequently target ribosomes because they convert RNA into protein and because their structures change somewhat in bacteria compared to eukaryotic cells like human cells. She identified the ubiquitous symmetrical area that provides the framework and guides the polypeptide polymerization process within the otherwise asymmetric ribosome in 2000 and 2001. She also determined the whole high-resolution structures of both ribosomal subunits. She therefore demonstrated that the ribosome is a ribozyme that positions its substrates in stereochemistry appropriate for substrate-mediated catalysis and peptide bond synthesis.

Yonath clarified the mechanisms of action of more than 20 distinct antibiotics that target the ribosome, shed light on drug resistance and synergism mechanisms, unraveled the structural basis for antibiotic selectivity, and demonstrated how it is crucial to clinical utility and therapeutic efficacy, thereby opening the door for.

To enable ribosomal crystallography Yonath introduced a novel technique, cryo bio-crystallography, which became routine in structural biology and allowed intricate projects otherwise considered formidable (Hope et al, 1989).

Prof. Carmit Levy, Prof. Yaron Carmi, and PhD Student Avishai Maliah, Modified Protein to Stimulate the Immune System to Fight Cancer Cells

Prof. Carmit Levy performed her PhD at the Hebrew University of Jerusalem and her postdoctoral training at the Harvard Medical School and Broad Institute (carmitlevy site). She completed his PhD studies at the Ben-Gurion University of the Negev and won the Pratt Award for Excellence PhD students. She completed her postdoctoral training at the Department of Immunology at Stanford University.

Prof. Carmit Levy, Prof. Yaron Carmi, and PhD student Avishai Maliah Medical researchers at Tel Aviv University (TAU) have discovered a way to help the body fight cancerous tumors that are even resistant to prevailing forms of immunotherapy (Maliah et al, 2024).

They found that reversing a mechanism preventing the immune system from attacking tumors can stimulate the immune system to fight the cancer cells. While in most cases, cancer researchers worldwide focus on the tumor and look for mechanisms by which cancer

inhibits the immune system, here they proposed a different approach: investigating how UV exposure suppresses the immune system and applying our findings to cancer.

A protein that stops the body's immune system from combating cancers has been discovered. Scientists have been able to alter the protein's function since its discovery, which has helped them boost the immune system's ability to combat cancer cells. They succeeded in eliminating it, restoring the immune system's functionality. The discovery may result in novel cancer therapies, including ones that may not respond to immunotherapy.

Prof. Ephraim Katchalsky–Katzir, Deciphering the Genetic Code, the Production of Synthetic Antigens, and the Clarification of the Various Steps of Immune Responses

Prof. Ephraim Katzir was born in Kiev, then in Tsarist Russian Ukraine (The Guardian site). He grew up in Jerusalem having arrived in 1922 with his family. He studied biology at the Hebrew University of Jerusalem in 1932, received his PhD degree there in 1941, and later carried out postgraduate research at Harvard and Columbia Universities. In 1949, Katzir founded and became head of the department of biophysics and professor at the Weizmann Institute of Science in Rehovot. He deepened understanding of the genetic code and immune responses and helped develop Copaxone, a drug that combats multiple sclerosis. His initial research centered on polyamino acids – synthetic models that facilitate the study of proteins (wis-wander site). Katzir created a technique for attaching enzymes—which accelerate several chemical reactions—to different molecules and surfaces. The technique established the groundwork for the current field of enzyme engineering, which is crucial to the food and pharmaceutical sectors. For instance, semi-synthetic penicillins and fructose-enriched corn syrup are made with it.

Prof. Michel Revel, Interferon

Miche Revel was born on August 20, 1938, in Strasbourg, France. In 1959 B.Sc. - Biology, University of Strasbourg, France 1963 M.D. - Medical School University of Strasbourg, France 1963 Ph.D. - Biochemistry, University of Strasbourg, France

In 1957 Alick Isaacs and Jean Lindenmann discovered why infection with one virus could prevent disease when a second virus attacked soon after (pubmed.ncbi.nlm.nih site). The two scientists demonstrated that the cells (in this case, chicken embryos) create a material in response to viral invasion that has a long-lasting effect, which was previously thought to be the case. This molecule, which inhibits viral activity, was named interferon.

After working on elements that regulate the commencement of protein synthesis at the Pasteur Institute in Paris, Prof. Revel joined the Weizmann Institute in 1968, accompanied by his wife Claire and four small children.

The Weizmann Institute of Science has played a prominent role in the interferon story (Wis-Wander, 2007). In 1970, Revel started working with two Argentine scientists, Ernesto and Rebecca Falcoff, who were conducting interferon research in Paris. They show that viruses such as the polio virus, which carry their genetic information in the form of RNA (rather than DNA), interferon steps in and controls protein synthesis at the phase where the lengthy chains of amino acids that comprise the viral proteins are translated from the instructions contained in the viral RNA. The components that explain how interferon regulates the translation step of protein synthesis were extracted by Prof. Adi Kimchi, who was a postdoctoral associate with Revel at the time.

Dr. Judith Chebath identified a group of genes that increase their activity when exposed to interferon and showed they code for enzymes involved in interferon's anti-viral actions in cells.

Revel uncovered the gene encoding the receptor and learned that interferon interacts with cells through a cell wall receptor in 1975 while he was a visiting scientist at Yale. Interferon beta was the type of interferon that the group had chosen to work on by the end of the 1970s. Though other groups in the world were working on interferon alpha, which is made in white blood cells, Revel felt that the beta form, made in most of the body's cells, might have a special role.

After two years, Amichai Schattner, an MD who had joined Revel's team, co-authored a study with Revel that demonstrated how injected interferon beta leaves traces of its effects in the genes it activates. The study of interferon beta was not only preserved but it was also left available for investigation by researchers from the Weizmann Institute. The group chose to use easily accessible young human tissue—the foreskins of circumcised infants—to obtain a sufficient amount of interferon. The foreskins, which are typically buried, were initially denied to the scientists by the Jewish ritual circumcisers. However, a group member, Dr. Dalia Gurari, was the niece of the Lubavitcher Rebbe, the leader of a sizable Hassidic sect, and soon the lab had a consistent supply to work with. The use of foreskin cell cultures proved crucial in the Look for the gene for interferon beta. The competition to purify interferon was underway at this period.

In a record ten months, Prof. Menachem Rubinstein and his mentor Sid Peska at Roche were able to purify interferon. He and his co-researcher Sid Pestka received one dollar for the process's patent under the terms of their agreement with Roche. Rubinstein got several job offers in the United States, but he chose to return to the Weizmann Institute, where he had a position in the Organic Chemistry Department waiting for him. In 1979, he finally agreed to Revel's request to work in the Institute's Virology Department. Revel was certain that there might be medical applications for interferon beta, and his group had made

significant strides in developing a production process. Revel's demand that the production facility be constructed in Israel was accepted by the Swiss pharmaceutical company Serono. The establishment of Interpharm, which initially manufactured the foreskin-derived interferon-beta under the brand Frone©, marked the beginning of a successful collaboration.

Around this time, Revel and Prof. David Wallach of the Department of Biological Chemistry, whose primary focus is on other, related biological molecules, made a significant contribution to the study of interferons. They demonstrated that the third type of interferon, known as interferon-gamma, affects the immune system differently than the alpha and beta interferons. As they subsequently discovered, interferon beta inhibits the effects of interferon-gamma, which lessens the autoimmune process in multiple sclerosis.

After identifying the human gene that codes for interferon beta in 1980, Revel's team looked for a productive way to make the protein in large quantities. Another breakthrough resulted from this. During that period, bioengineered bacteria or yeast were used to produce complex proteins for medications. However, these microbes are unable to accumulate certain sugar complexes, which appear to serve as cues to the immune system that identify the proteins as "self" rather than foreign invaders. Revel and his colleagues devised a technique to produce interferon beta in Chinese hamster ovary cells to generate a more useful product. The animal cells were genetically modified to have 100 copies of the interferon beta gene each, and this effectively produced human-like interferon beta with sugar complexes. Since then, the biotech industry has evolved to rely heavily on this technique. After Serono conducted rigorous clinical trials, Rebif©, an interferon beta-based therapy for multiple sclerosis, was released into the market in 1998.

Revel's team found in 1995 that topical interferon treatment for genital herpes effectively prevents symptom recurrence, and they are still investigating this use. Furthermore, in certain Asian cultures, interferon beta proved to be a highly successful treatment for hepatitis C. Drugs based on interferon are used to treat viral illnesses such as multiple sclerosis, hepatitis, and certain types of cancer.

Professor Raphael Mechoulam, Medical Cannabis, Weizman Institute and Hebrew University

Raphael Mechoulam was born on Nov. 5, 1930, into a Jewish family in Sofia, Bulgaria. His father was a prominent Austrian-born physician, and his mother had studied in Berlin and encouraged a broad education in many languages (Williams, 2023).

His father was sent to a concentration camp in 1944 but survived. In 1949, the family emigrated to Israel, where Professor Mechoulam studied at the Hebrew University, earning a master's degree in biochemistry.

After taking an academic post at the Weizmann Institute in the early 1960s, he began to read about the pharmacology of cannabis.

Professor Mechoulam's groundbreaking work with cannabis began in the early 1960s, just before the use of marijuana and other drugs exploded in countries around the world.

He and his team at the Weizmann Institute began to break down the chemical structures of Tetrahydrocannabinol (THC), the psychoactive compound in marijuana, to assess how it did what it did — namely, make users high. He continued this research for decades at the Hebrew University of Jerusalem.

In his research at the Hebrew University, Professor Mechoulam synthesized many cannabinoid compounds that helped other scientists discover cannabinoid receptors in the brain. He also did groundbreaking research on the body's natural endocannabinoid system — including the discovery of anandamide, one of the main endocannabinoids. Endocannabinoids, chemicals similar to those found in marijuana, help regulate a wide range of bodily functions, including learning and memory, sleep, immune responses and appetite.

Agriculture and Water Treatment

Prof. Ora Kedem, Biomembrane Processes for the Treatment of Water and Wastewater

Born in Vienna in 1924, Kedem arrived in Israel as an "illegal" immigrant on the doomed Patria immigration ship in 1940 (Jewish virtual library site). In 1953, she obtained her doctorate from the Weizmann Institute after graduating from the Hebrew University. She started describing the energy conversion in active transport and muscle action by analyzing biomembrane processes in terms of nonequilibrium thermodynamics with Professor Aharon Katzir.

She helped to comprehend and create membrane techniques for desalination as well as other separation technologies, like a novel, eco-friendly water softening technique. Her "cake filtering" method removes calcium minerals from the environment without releasing any contaminants.

A new business called EcoSoft, located in the Kiryat Weizmann Industrial Park next to the school has produced innovative water-softening equipment based on this method. This apparatus is made to soften water without adding salt to subterranean aquifers. EcoSoft, which was founded by Israeli paint maker Tambour Ltd. and Dutch company Crecor B.V., uses the cutting-edge "cake" filtration technique to soften water.

To lessen the need for detergents and stop pipes and heating elements from scaling, many businesses, laundromats, hotels, municipal waterworks, and private homes soften their

water by eliminating calcium salts. Ion exchange, which involves extracting calcium in purifying columns that are regenerated for later use with the aid of salty water, is now the most widely used technique for doing so. However, tons of sodium-rich wastewater are dumped into the aquifers, causing undetectable contamination from an ostensibly clean operation. As a result, there is growing global pressure to outlaw the ion exchange technique. The traditional method of softening hard water by adding lime to it to produce calcium carbonate to precipitate was replaced by ion exchange. However, because it takes around 24 hours, produces massive pools of sludge, and necessitates large ponds to allow the precipitate to settle, lime softening is rarely employed nowadays. Similar chemistry underlies the new cake filtration technique, which involves adding caustic soda solution to hard water to cause calcium carbonate to precipitate. But when the calcium carbonate-supersaturated alkaline water passes through a filter cake, full precipitation occurs in a matter of seconds. The installations needed for lime softening are ten times larger than those needed for lime softening.

In 2018, the German company "Benckiser Wasser Technik" purchased EcoSoft and merged it into the "BWT" group. In 1823, Johann Adam Benckiser established a tiny chemical plant in Germany under his family name, which is where BWT got its start. Then, in 1990, as part of a management buy-out, Andreas Weißenbacher set the groundwork for the current BWT. Although BWT's original headquarters were in Hallein, Austria, the fledgling business moved to Mondsee, Austria, two years later.

Dr. Eli Putievsky, Plant Geneticist, Agricultural Research Organization (ARO), Newe Ya'ar Experiment Station

On October 28, 1942, Eli Putievsky was born in Tel Aviv. He earned his doctorate in biology from Hebrew University in Jerusalem in 1972.

He started a unit for the study and production of fresh and medicinal herbs when he joined the staff of the Agricultural Research Station of Newe Ya'ar in 1973.

His work at the Newe Ya'ar Experiment Station, ARO, in collaboration with Moshe Shimoni, Uri Ravid, and Reuven Reuveni, expanded Israel's fresh herb cultivation industry.

He elucidated the cytogenetic relationships between clover species and *Glycine* (family Fabaceae), *Emex* (Polygonaceae), and *Ocimum* (Lamiaceae) as part of his plant genetics research.

His research on this topic helped to advance genetic breeding procedures and the transfer of advantageous traits from wild plants to domesticated plant kinds. The creation of the new clover varieties "Achziv" and "Sefi" was one result of this effort.

Oregano, hyssop, sage, basil, and curly parsley are the main herbal crops that have been developed and are today at the forefront of Israeli and global agriculture. With funding,

especially from the Rothschild Foundation, he established the Israel Gene Bank as a division of the International Plant Genetic Resources Institute (IPGRI).

Dr Elisabeth and Dr Hugo Boyko, Use of Salt Water for Irrigation

Together with her husband, Hugo Boyko, who was born in Vienna in October 1892, Elisabeth Boyko, an Austrian-Israeli botanist, was born in Vienna on September 24, 1892. She is credited with being the first person in Israel to use salt water to irrigate desert plants.

One of the largest concerns facing farmers and plant scientists, whose primary focus is on finding answers, has been and continues to be the use of seawater for agricultural crop irrigation (Ventura et al, 2014).

Early in the 1960s, geophysicist Hugo Boyko and plant-ecologist Elisabeth Boyko, motivated by the need to increase the use of natural resources, showed that it was possible to grow crops using full-strength seawater. This opened the door for the first studies on seawater agriculture (Boyko and Boyko, 1964). They postulated that the utilization of surplus amounts of seawater, together with sandy soils' high water permeability and superior drainage capabilities, might be the fundamental elements enabling the growth of this agricultural sector. *Agropyrum junceum* and *Juncus arabicus*, two plant species with radically different ecological requirements, were successfully grown for fiber production on dunes irrigated with different seawater dilutions over a period of approximately 1.5 years, as demonstrated by these scientists in a small-scale experiment (Boyko and Boyko, 1959). Subsequent studies showed that using seawater to irrigate specific local barley strains allowed them to complete their life cycle. According to Boyko and Boyko (1964), it contains up to 4.2% salt. The ability of two types of grass, *Agropyron elongatum* and *Puccinellia capillaris*, for ground cover and grazing when cultivated on saline wastelands was proved almost simultaneously when comparable hypotheses were tested (Rogers and Bailey, 1963; Malcolm, 1969).

Haim D. Rabinowitch and Nahum Kedar, RIN (Ripening Inhibitor)

Vienna is where Prof. Nahum Kedar was born in 1920 (plantscience site). He graduated from the Hebrew University with a Ph.D. in plant physiology and genetics in 1958.

Before being hired as a staff member at the Hebrew University of Jerusalem, he held postdoctoral positions as a scientist at the Wageningen Agricultural University (Holland) and the John Innes Institute (Norwich, England).

His area of study was tomato breeding and genetics, with a focus on disease resistance, flavor, and shelf life.

According to PlantScience, Prof. Haim D. Rabinowitch was born in Israel in 1940. The Hebrew University of Jerusalem is where he received his academic training in plant physiology and genetics. Before being hired as a staff member at the Hebrew University of Jerusalem, he held postdoctoral positions as a scientist at the Wageningen Agricultural University (Holland) and the John Innes Institute (Norwich, England).

He worked in the biochemistry department of Duke University Medical Center for three sabbaticals. Haim was chosen Head of the Department of Field and Vegetable Crops, Head of the Faculty Research Committee, Faculty Dean, and University Rector in addition to conducting research, teaching, and supervising.

His areas of interest include fundamental genetics and physiology studies of tomatoes' spontaneous mutations of ripening inhibitor genes and the application of that information to create long-lasting tomatoes, which revolutionized the fresh market sector.

AGRICULTURE

European immigrants brought with them established consumer habits and practices that significantly influenced the development of agriculture in Israel. Today, most agricultural innovators work within research centers, collaborating closely with farmers and agribusinesses to turn ideas into practical solutions. Innovation in Israeli agriculture follows two broad categories: Product Improvement Trends for fruits and vegetables, focusing on: Smaller size for convenience, Sweeter taste, Longer shelf life, Seedless varieties, Enhanced nutritional value, Easier handling, such as simpler peeling, Technological Inputs and Process Innovations, primarily targeting: Seed genetics to improve crop traits; Water and nutrient management, including advanced irrigation techniques and fertilizers; Biological plant protection methods to reduce reliance on chemical pesticides; These innovations help increase productivity, improve consumer appeal, and promote sustainability in Israeli agriculture.

Hanka Lazarson, Beith Alpha kibbutz member which was founded in 1922 by immigrants from Poland, was engaged in vegetable breeding; including: cucumber, onion, garlic, aubergine, and cauliflower. Between 1931 and 1936 she developed a breed of cucumbers that came to be known as the "Beit Alpha Cucumber" (Klein Leichman, 2017). The breed became highly popular worldwide due to its excellent taste and high yield. The mother seeds were delivered to the "Hazera" company for reproduction and distribution in the country and outside the country.

In the 1950s Ananas Yoqne'am was bred and cultivated by Nathan Rabinowitz, a Romanian-born resident of 'Yokneam' that had formal agricultural training in France (Paris et al, 2012).

Ha'ogen melon was bred in the kibbutz "Ha'ogen", founded in 1939 by immigrants from Czechoslovakia. Although there is no concrete evidence, it is believed to have started in Hungary. Good yields of almost 1-2 kg of flavorful green meat, lovely and highly fragrant.

Fruits and Vegetables

Nahum Kedar, Haim D. Rabinowitch, Tomaccio Cherry Tomato, Hazera Genetics

Most of the tomatoes on the market were large-sized. While diminutive cherry tomatoes (which, as mentioned, probably originated in Central America) were available, they were relatively rare (chubeza site).

In the 1970s the British chain Marks and Spencer approached Bernard Sparks, a farmer who grew tomatoes for them, with the request to develop more successful cherry tomatoes, with a good old-fashioned taste. Mr. Sparks' numerous attempts to create cherry tomato

hybrids eventually reached satisfactory results. In the 1980s, Marks and Spencer began to market the first of their cherry tomatoes in many European countries and overseas as well.

Simultaneous to this development, a top Marks and Spencer executive, food technologist Nathan Goldenberg – a British Zionist Jew who kept close tabs on agricultural developments in Israel Nachum Kedar and Chaim Rabinowitz to led to the creation of tomatoes which ripened slower on the plant, reaching the ultimate sugar level at ripening and top durability in shipping. Goldenberg suggested that they apply these developments to cherry tomato varieties as well. Their combined efforts resulted in the development of Tomaccio, a highly successful species that reached the markets in the 1990s.

Aliza Vardi, Prof. Daniel Zohari, Prof. Pinchas Spiegel, Orri clementine, “Flamingo” – Red Pomelo “Hanna”, White Pomelo “Einat” – Pink Grapefruit

One of Israel's most significant agricultural emblems and economic pillars from almost the inception of Zionism has been the citrus sector. For instance, citrus products, primarily oranges and grapefruits, accounted for over 75% of Israel's exports in the 1930s (Nevo, 2017). Economic and social shifts throughout time caused the splendor to fade, and the citrus industry had a severe crisis in the 1970s.

Over the years, economic and social changes led to the citrus industry's diminished glory, which found itself in a deep crisis in the 1970s. One of those responsible for its revitalization was geneticist Aliza Vardi.

Born in 1935, Aliza Vardi grew up in Rishon LeZion. She decided to pursue her love of science as a biology student at the Hebrew University. She specialized in genetics and her doctorate, under the supervision of Prof. Daniel Zohari who pursued a doctoral degree at the University of California. He was among the pioneers of research into the evolution of landraces around the world.

Vardi continued her specialisation at Cambridge University in the UK and returned to Israel in 1972 to work at the Volcani Center, today's Agricultural Research Organization.

She was in charge of developing new citrus cultivars. One of the challenges researchers faced then was developing varieties of seedless fruit, which were popular in Europe.

Vardi and her predecessor, Professor Pinchas Spiegel, led the research team, concentrating mostly on creating mandarin and clementine cultivars. This led, among other things, to the development of “Or” (Orri) clementine, which was characterized by sweet, tasty, easy-to-peel fruit with almost no seeds, which notably ripens later than other varieties.

Orri Clementine:

The development of seedless fruit types, which were popular in Europe, was one of the difficulties addressed by researchers.

The extensive research led by leading citrus breeders and botanists managed to develop an exceptional lineup of mandarin cultivars that hit their objectives (orrijaffa site). Aliza Vardi, Pinchas Spiegel-Roy, Avraham Elchanati, Ahuva Frydman-Shani, and Hana Neumann are the inventors of the unique citrus reticulata hybrid variety of the mandarin tree that is the subject of the current innovation. In 1988-1994 in Bet Dagan, Israel from a selection of plants grown from irradiated bud wood of the cultivar 'Orah'.

The new variety named 'Orri' is desirable to the consumer because it typically has zero or few seeds (0-6 seeds per fruit) and to the grower because of a long ripening period. The fruit has a typical flavor with low to moderate acidity (patents.google site).

Orri stands for distinctive fruity flavor, tender juicy bites, and easy-to-peel quality with zero to few seeds. In markets including France, the United Kingdom, Holland, Germany, Russia, Canada, and the United States, as well as more recently, China and Japan, Orri's popularity has been increasing significantly in recent years. Although Israel is still the biggest supplier of Orri Mandarins, there are now authorized growers in the US, South Africa, Spain, and South America.

Grapefruit Varieties:

A cross between a Shamouti orange and a clementine, the "Flamingo" red pomelo is a variation of the "Chandler" pomelo. This pomelo variety ripens in the period from October to December and unlike other varieties it maintains its red color when the temperature drops (Spiro, 2015; birds.songs site). The pomelo's distinctive trait is the presence of lycopene, a red pigment said to have exceptional health benefits like preventing cancer. It is sweet (14% sugar) and seedless.

The "Hanna" White Pomelo is a cross between the Chandler and Tahitian varieties. This pomelo-type ripens from October to December and has a white inside. It is seedless and has a very sweet flavor due to its 12.6% sugar content.

"Einat," or pink grapefruit, is a non-sour cross of a pomelo and Hudson Tetrafluoride. This type of grapefruit ripens between October and January and retains its lycopene, or interior pink hue, throughout the growing season. Its segments are seedless, and its sugar content is 11.5%. The absence of sourness is what distinguishes this grapefruit.

"Aliza" The grapefruit is a cross between the easily peelable "Ora" fruit and the "Chandler" pomelo. Both the inside and the outside of this grapefruit type turn orange as it ripens, which happens between November and February. It is seedless and has 16% sugar. The fruit's popularity can be attributed to its high sugar content and sweet flavor, which also

helped it score highly in tasting tests. There is a chance that the Aliza grapefruit may take over the world market.

Eyal Vardi, Itay Gal, Nano Watermelon, Origene Seeds

Dr Eyal Vardi CEO of Origen Seeds, worked in Hazera Genetics for 22 years and was the head of R&D for 11 years (1992-2004). He has a PhD in genetics (1989-1993) from the Hebrew University of Jerusalem and an MBA from the College of Management Academic Studies (2004-2005). Itay Gal a farmer from Moshav Ein Yahav, raised the first ones as tested the winter watermelon and deemed it ready for market.

Pure, organic watermelon isn't resistant to diseases from the ground. Therefore, the watermelon is grafted on pumpkin rootstocks, which is resistant to many soil-born diseases (Baruch, 2021). The tasty fruit is produced by the watermelon scion thanks to the resilient pumpkin root. Nano watermelon is sweeter than the original, a slightly different color, and no heavier than three kilograms (6.6 pounds) is a recent new product resulting from three years of development by Origene Seeds.

Origene Seeds was established in 2004, specializing in research, plant breeding, seeds production and processing, sales, and marketing of hybrid vegetable varieties, mainly Cucurbits (origeneseeds site). After four years of intensive breeding, the company started semi-commercial trials in the target areas around the world, following commercial sales.

As a pioneer in seedless watermelon breeding, Origene Seeds has introduced intermediate resistance to powdery mildew, a patented accomplishment.

This initiative, which is the source of the natural genes governing the resistance from exotic wild watermelons, is a breakthrough. Drought-tolerant seedless watermelon genotypes that require 25–30% less water are another example. A large variety of watermelon sizes, shapes, and colors are also available from Origene Seeds. The company is still working on pollenizers to finish the watermelon product line. Origene pollenizers have a relatively large number of male flowers that have an extended period of flowering, in parallel to the flowering of the seedless varieties being pollinated.

Zvi Karchi, Anneke Govers, Galia Melon, Volcani Institute

Breeders Zvi Karchi Division of Vegetables Crop ARO, Vulcani Institute, and Anneke Govers introduced the Galia melon to the market in 1974, and it quickly became a multimillion-dollar global sensation (Leichman, 2017). Galia, a descendant of Ha'Ogen, has achieved success due to its pleasing appearance, flavor, and aroma.

Light golden-tan netting covers the yellow-to-orange skin of the Galia melon. Pale green in color, its flesh has a juicy texture and a distinctively spicy, sweet flavor with tropical and fragrant aromas.

The Galia melon is now produced in large quantities in Morocco, Turkey, and Spain. Costa Rica, Greece, Egypt, Panama, Portugal, Brazil, Honduras, Guatemala, and Israel are among the other places where they can be found growing. Europe, the United States, and northern regions of the United States import Galia melons.

Dani Zamir, Yaakov Tadmor, Miniaturization of Fruits, Superfruiter, Pikamelon

Dani Zamir was born in 1950 in Jerusalem and studied Agronomy at the Faculty of Agriculture at the Hebrew University of Jerusalem (nasonline site). After graduating in 1977 he continued his studies at the University of California at Davis where he obtained his MSc in Vegetable Crops (1978) and his PhD in Genetics (1981). The thesis dealt with developing haploid selection approaches to improve low-temperature tolerance in tomatoes. While working as a teaching assistant to Prof. Charles Rick he was introduced to his rich tomato germplasm collection and the value of wild species for crop improvement. In 1981 he returned to Israel to the Faculty of Agriculture of the Hebrew University where his work has focused on developing methods to enhance the rate of transfer of traits from wild species to the tomato crop. His research focuses on the genetics and breeding of tomato, lisianthus, and fragrant roses. Through the use of mapped exotic genetic resources, marker-assisted selection, and positional cloning his university-based lab explores genomic-assisted methods to improve crop breeding.

Dr. Yaakov Tadmor, from the Volcani Institute, Israel's Agricultural Research Organization (and HUJI alum) has successfully developed miniature-sized melons based on a single gene mutation. More than 15 years ago (1999), Dr. Yaakov Tadmor learned about his buddy Prof. Dani Zamir's tomato mutation library (Epstein, 2024).

Each of the families in Zamir's mutation library contained distinct gene alterations and resulted from the self-pollination of a single mutagenized seed. Tadmor decided to try to achieve the same result with melons, using the mutation library as a tool to find the genes and as a resource for novel melon variations. Without any particular goal in mind, he mutagenized thousands of seeds and classified the different visible changes that transpired in the offspring of each treated seed into a mutant family. However, one of the mutant families led to a notable fall in fruit size along with a notable rise in fruit production. This marked the beginning of the development of SuperFruiter.

Superfruiter company was established in 2021 following a revolutionary technological breakthrough developed at the "Volcani Center", Israel's National R&D powerhouse

(superfruiter site). This innovation, based on years of trials, allows for the miniaturization of fruits from the Cucurbit family, all governed by a single gene.

Genetic analyses done by the team of researchers revealed that a single gene governs this trait and they named the gene: “Superfruiter”. The mutant gene was cloned and identified, its function and mechanism of action were documented and the gene and its effect have been worldwide patented. Furthermore, crosses of this mutant gene with various melon types showed similar effects in all tested fruit types.

The single mutation changes the melon in several different ways. In addition to making each fruit around the size of a hand's palm and weighing only about 800 grams, it also greatly increases the number of fruits per plant from four at most to 20, and even potentially 100.

Superfruiter has successfully raised \$5 million in funding to accelerate its growth and expand its product offerings (leadsontrees site). In addition to supporting ongoing initiatives, the recently raised capital will assist the business to expand its global reach and pursue its goal of transforming the way melons are consumed.

The superfruiter is a recessive gene that developed as a result of a chemically induced mutation in melons (Baruch, 2021). Fruits produced by a melon line with this gene are typically three times smaller and five times greater in number.

Funding for the project comes from COPIA, an Israeli impact fund that works to fund projects in sustainable agriculture. The ultimate breeding is then carried out by the Israeli vegetable breeding platform BreedX. The Pikamelon is all about premium quality, meeting the high expectations of top retailers, food service, gourmet restaurants, and luxury hotels—to the consumer. Our goal is to source and deliver the best small melons that fit perfectly into the busy lives of individuals and families today.

Pikamelon” weighs 200-700 grams with no genetic modification The result is a fruit with empty seeds that will revolutionize the exotic fruit experience.

The Israeli company is implementing its production process in Spain to offer Europe two seedless mini melons weighing less than 800 grams and a cherry melon with edible skin (Agriculture Ingo Agro, 2024).

Ephraim Slor, Abba Stein, Anna Apple

The Anna apple — was developed by Volcani horticulturist Ephraim Slor and named after his daughter (Leichman, 2017). *Malus domestica*, the botanical name for Anna apples, is a member of the Rosaceae family, which also includes all other apple types, apricots, plums, cherries, peaches, nectarines, and almonds.

They are an Israeli hybrid that’s a cross between Red Hadassiya and Golden Delicious (specialityproduce site).

Abba Stein, an apple breeder and grower in Israel during the 1950s, aimed to cultivate apple varieties suitable for the warm, Middle Eastern climate. Through careful cross-breeding between local varieties and European imports, he successfully developed the Ein Shemer Apple Tree, along with the Anna Apple Tree.

Gil Ronen, Kobi Baruch, Semi-dried Cherry Tomatoes NRGene, Supree®

Gil Ronen has a Ph.D in genetics (1994 - 2000) from The Hebrew University of Jerusalem. He founded in 2012 NRGene which delivers top-quality agricultural products to everyone anywhere at any time while reducing supply chain losses significantly.

Kobi Baruch, the CTO of the company owned a Ph.D. in molecular genetics, Bioinformatics 2005 – 2011 from The Hebrew University of Jerusalem.

With unparalleled speed, NRGene uses genomic data to identify the optimal results for a sustainable future. Its expertise and AI innovations ensure efficiency, certainty, and focus across the entire agrigenomics process. Supree® product category develops innovative fruit and vegetable varieties designed to be naturally dried and preserve a high content of vitamins and nutrients, ensuring great taste and extended shelf life such as Semi-dried cherry tomatoes (Ronen, 2012, NRGene site).

The Supree semi-dried cherry tomatoes offer precisely that – a burst of rich flavor, vibrant color, and 5 times more antioxidants that elevate any salad, pasta dish, or even a cold-cut platter. Naturally dried and conveniently stored frozen, they are always at your fingertips to upgrade your meal quality.

NRGene signed a strategic collaboration agreement with Top Seeds International, a subsidiary of the Japanese corporation Mitsui & co., Ltd. on November 17, 2021.

Aliza Benzioni , Jojoba Oil, JD Jojoba Hatzerim

Aliza Benzioni from Ben-Gurion University of the Negev, Beersheba, Israel. December 1964- November 2005. Researcher plant physiology, Department of Life Sciences is the main contributor to the development of Jojoba in Israel.

The jojoba plant, which originates in the deserts of Mexico and Arizona and grows there naturally, was forgotten for several hundred years and returned to the pages of history in the 1980s when an article appeared in a financial newspaper in the USA about the jojoba plant, which is described there as the “next thing” in the world and promises great wealth to those who grow it him (Benzioni, 2010).

The article led to a large wave of plantings in the US deserts, but what the article did not tell is that the jojoba plant is a stubborn plant that is not at all easy to grow and also the process of extracting the oil from it is complex. Everyone who planted jojoba plantations

found this out the hard way and most of the plantations were abandoned and uprooted, simply because they were unable to get what they wanted from the plant.

In the 1980s, the Israeli “Dalek” company made the jojoba plant “Alia” to Israel in order to extract the oil as an additive to fuels. Even at the Delek company, like the American growers, there was a failure in cultivation and the plantations were sold to Kibbutz Hatzerim in the Negev, at a nominal price.

The first plantations were planted in the Kibbutz Hatzerim in 1990 and a small factory was established to extract the oil. A lot of agricultural and agrotechnical knowledge has been accumulated in Kibbutz Hatzerim where the “Netafim” company has been operating since 1965 and in the kibbutz. The combination of the desert climate that suits the plant like a glove and the extensive agricultural knowledge accumulated in the kibbutz helped acclimatize the jojoba plants and extract oil from them.

Since then, the Jojoba Hatzerim branch has been a leader in the global jojoba field with a series of breakthroughs in the discovery of new varieties, maximizing the plant’s capabilities through a sophisticated irrigation and fertilization system, a mechanical collection system that does not require much manpower, and a state-of-the-art factory for extracting the oil in a special process adapted to the specific jojoba seeds. Thanks to these things, Kibbutz Hatzerim is a major player in the global cosmetics market and the oil is sold in many countries around the world.

JD Jojoba Golden Oil is a light oil with golden highlights and a delicate, yet distinctive natural scent. JD Organic Golden Jojoba Oil is produced from organic certified seeds grown in our organic certified farms. All Jojoba Desert oils have the same special properties and are naturally hypoallergenic.

Inputs and Equipment

Simcha Blass, Drip Irrigation, Netafim

Simcha Blass was born in Warsaw, Poland to an Orthodox Jewish family. He was active in the Jewish self-defense units organized in Warsaw to defend Jews during the end of World War I (Blass, 1973). After years of experimenting, Simcha and his son, Yeshayahu, developed the first experimental system of modern drip irrigation in 1959 and created Netafim in 1965 as a joint venture between him and Kibbutz Hatzerim – an Israeli community agricultural settlement located close to Beer Sheva (netafim site). It produced the world’s first drip irrigation system in 1966.

Water and fertilizers are delivered by pipes known as "dripperlines" with smaller units known as "drippers" in drip irrigation. The ideal amount of nutrients will be sent to the plant's roots by each dripper, which will deliver water and fertilizer straight to them.

Every plant in the field undergoes this procedure until they are all receiving the ideal amount of nutrients—neither too much nor too little.

In terms of efficiency, drip irrigation has an efficiency of 95-100% when it comes to water use, which is phenomenal when compared to other methods (such as sprinkling) which reach 85% efficiency at best.

In 1967, Netafim from kibbutz Hatzerim began supplying drip irrigation equipment for vegetable growing in Israel's Arava desert. The initiative was a huge success, allowing the farmers to grow eggplants, tomatoes, peppers, and melons in a desert region, opening up a new market: agriculture in the desert, despite the region's unfavorable growth circumstances and little yearly rainfall (as little as 20mm). Beginning in 1975, Netafim provided cotton farmers in the Negev desert, northern Galilee, and Israel's Jordan Valley with drip irrigation systems. After that, it began exporting to China and India as well as to important cotton-growing countries in the West, such as the US, Spain, Greece, and Australia. On February 7, 2018 – Mexichem, from Mexico, announced that it had completed the acquisition of an 80% stake in Netafim.

Mexichem is a world leader in plastic piping, one of the most cost-efficient PVC producers, and one of the world's largest chemical and petrochemical companies. By providing a wide range of goods to high-growth industries like housing, datacom, infrastructure, water management, and more, Mexichem aids in the advancement of the world. With operations in over 30 countries, Mexichem has more than 18,000 employees, as well as 120 plants, two fluorite mines, 15 R&D laboratories, and eight training academies.

Mexchem belongs to Orbia group (orbia site), a publicly traded Mexican multinational corporation active in the fields of precision agriculture, building and infrastructure, fluorinated solutions, polymer solutions, and data communications.

Orbia works in the following industries: Fluorinated Solutions (Koura), Precision Agriculture (Netafim), Building and Infrastructure (Wavin), and Polymer Solutions (Vestolit and Alphagary).

Prof. Uri Shani, N Drip

Professor Uri Shani, Israel's former Water Commissioner and one of the world's top Water Experts with 40 years of experience with water and irrigation, has developed a ground-breaking Gravity Micro Irrigation System (ndrip site).

The N-Drip technology is revolutionary for farmers, governments, water utilities, and industry, among others, as water resources become more scarce.

A line of water reservoirs is filled with water by a pipe passing through each. Each reservoir, 1.5 meters from the soil transfers water through gravitational force for energy to a pipe with drippers to water the plants.

Farmers who switch from flood irrigation to N-Drip routinely achieve water savings of 50%, yield increases of up to 33%, fertilizer reduction of 50%, and a drop in greenhouse gases like carbon and methane from 50% to 85%.

N-Drip with nearly 100 employees, currently does business in 17 countries, with a special emphasis on the US, India, and Australia.

N-Drip has created N-Drip Connect, a sensor-based decision-support tool with exceptional accuracy, as part of the on-field solution. This tool enables farmers and other interested parties to continuously monitor a particular field. The sensor offers yet another way to optimize water and nutrient use by making real-time recommendations about fertilizer and irrigation applications. Additionally, up to six weeks before the planned harvest, the system can anticipate the size of a harvest with remarkable accuracy. The sensor functions effectively with any type of irrigation, even though it is typically offered with N-Drip irrigation equipment.

Natural Ventures closed a \$44 million C round on June 23, 2023, and announced an investment in N-Drip ([natural.venture site](https://natural.venture.site)).

Natural Ventures, which has its headquarters in the United Arab Emirates and has extensive experience working in the Middle East and Asia, has a wide network of partners for manufacturing, distribution, and providing the regions with attractive solutions. In addition to investors from earlier rounds, the Liechtenstein Group, Hamilton Lane, Bridges Israel, Kibbutz Ein Harod Ihud, and a group of US-based investors are co-investors. Dr. Ariel Halperin, Prof. Uri Shani, and Ran Ben-Or are investors and co-founders.

Among its other primary investment areas, the Liechtenstein Group is a global investor in intelligent, sustainable agriculture. The Foundation Prince Liechtenstein is the owner of the Liechtenstein Group, a strategic holding corporation. It owns RiceTec, one of the biggest manufacturers of hybrid rice seeds worldwide, among many other assets.

N-Drip and RiceTec have signed a strategic partnership agreement as part of the latest investment round to promote N-Drip's innovations in rice fields in the US, India, and other countries. In this transaction, Deutsche Bank served as N-Drip's only placement agent.

Uzi Teshuva and Avner Shohet, Hydroponic System, TAPKIT

Uzi Teshuva and Avner Shohet | are the Co-Founder of TAPKIT

TAPKIT was developed by [TAP Ltd.](#) (established 1958) to make hydroponic production of fresh herbs and leafy green vegetables feasible for small to medium growers, micro-farmers and family farms, as well as for community/urban farming organizations, schools and other institutions. The TAPKIT is the first affordable commercial hydroponics system, changing the way leafy vegetables (and in the future, micro-leaves) are grown and distributed.

Small and medium growers are able to enter the market with low initial investment costs and a ready-made solution.

Moti Rebhun, PhD, Fermentation Facility, YDLabs

Dr. Moti Rebhun is a leading expert in fermentation process development, with over 30 years of experience in scale-up, separation, and purification of fermentation-based proteins, enzymes, and small molecules. He has held key leadership roles, serving as the Head of Hadassah's Fermentation Unit and as CTO of renowned companies such as Fermentek and Bio-Dalia. As the founder of Israel's Fermentation Society, Moti has been instrumental in advancing the field and fostering industry collaboration.

Launched in April 2022, YDLabs is the FIRST fermentation pilot facility dedicated to Foodtech and Agritech sectors in Israel. We are fermentation enthusiasts, specializing in process development and optimization from an idea level to 1,000L scale-up. Our technical team has over 70 years of accumulated fermentation experience, specifically in the Foodtech sector, which allows us to handle the trickiest projects in a broad range of methods to the best outcome. (yd-labs site).

This focus is what makes us so good at what we do and allows us to provide both a comprehensive range of services as well as the highest quality.

Isaac Mazor, Autonomous Harvesting, Nanovel

Founded in 2018 by Isaac Mazor, a serial entrepreneur in the field of semiconductors, Nanovel LTD aims to modernize the fruit farming industry by introducing autonomous harvesting (nanovel site).

Isaac Mazor holds a M.Sc. in Electrical, Electronic and Communications Engineering Technology from the Technion.

The system is constructed with an independent platform with several autonomous robotic arms. Each arm is equipped with advanced AI and a patented Grip & Trim™ unit, ensuring the delicate and precise picking of fruit in accordance with rigorous fresh market standards.

The robotic system operates entirely on electric power generated by the towing tractor. With a six-arm configuration, the robot is designed to pick approximately one bin of oranges, weighing 400 kilograms, per hour.

It is optimised for continuous operation, both day and night, and can pick up to 20 bins per full workday. "This solution provides growers facing shortage of farm labour with much higher predictability and reliability when it comes to harvest scheduling", Mazor emphasises. The current model, tailored for harvesting fresh-market oranges, is equipped with six robotic arms. In addition to the robotic arms, the system features a conveying

system and bin replacement mechanism, ensuring gentle handling of the harvested fruit from the tree to the bin.

The robot can currently harvest fruit at a height of up to up to 3 metres, with potential for future models to extend this range. Furthermore, the AI-driven system incorporates selective picking based on both size and colour.

Plant Health and Control

Prof. Dani Zamir, Ilan Levin, and Moshe Lapidot, Tomato Brown Rugose Fruit Virus (TBRFV)

An expert in tomato genetics and breeding, Dani Zamir is a professor of plant genetics and breeding at the Hebrew University of Jerusalem's Faculty of Agriculture. He founded ABSeeds (acq. Monsanto), Phenome Networks LTD, and served as a consultant to De Ruiter Seeds (Netherlands) from 1992 to 2008. given the EMET Prize in Agriculture (2015) (newbreed site) and the Hebrew University's Kaye Innovation Prize.

Research on cultivars resistant to the tomato brown rugose fruit virus (TBRFV), which is rapidly spreading throughout the world, is creating industry buzz thanks to the work of Ilan Levin and fellow Volcani scientist Moshe Lapidot (afhu site).

Although TBRFV does not affect human health, it reduces yield by 50% and makes infected tomatoes unsightly. They are figuring out the gene that governs TBRFV resistance in addition to finding a new source of resistance.

Experts in agriculture are always searching for ways to minimize the need for chemical sprays while keeping insects and diseases away from crops. Breeding cultivars that are resistant to specific diseases is one tactic.

Together with large-fruited resistant scions like NBK 20227, the team's resistant robust rootstock "YOGEV" can aid tomato growers in combating the virus. We are pleased to provide a "better together" #ToBRFV resistance that blends NewBreed rootstock and scions since this grafting combination has been evaluated by commercial growers in Israel over the previous three years.

Amir Avniel, miRNA, Genome Regulator in Plants, Rosetta Green

Amir Avniel obtained a Bachelor of Social Sciences and Humanities degree from Open University in Israel (app.boardroomalpha site) after studying computer technology at the Academic College of Tel Aviv - Jaffa, Israel. Between 2006 and 2009, Mr. Avniel was the President and CEO of Rosetta Genomics. From 2010 to 2013, he was the CEO of Rosetta Green Ltd. In addition to being the President since June 2017 and the Chief Business

Officer of Beyond Air since July 2022, he has been a member of our Board of Directors since January 2017. He has been a manager in the biotechnology sector for almost a decade.

Beyon Air's LungFit® PH eliminates the need for iNO source sources like cylinders or cassettes by using its patented Plasma Pulse Technology™ to create inhaled nitric oxide (iNO) from the room's ambient air (beyondair site).

Using special genes known as microRNAs, Rosetta Green, a 2010 offshoot of Rosetta Genomics' agro-biotechnology business, creates enhanced plant features for the agricultural and biofuel sectors (Agro pages, 2013).

To address these two issues, Rosetta Green has been creating microRNA (miRNA) genes. Researchers found that miRNA functions as a "master genome regulator" in both plants and animals in the 1990s.

Scientists at Rosetta Green have created more resilient varieties of corn, soybeans, cotton, and other crops by modifying miRNA. In 2013, Monsanto paid \$35 million to acquire Apollo Green Ltd., which shut down in 2016 (ivc-online site).

Prof.Sammy Boussiba, Haematococcus Pluvialis Alge, Cyanobacteria for Mosquito Biocontrol of Pest Diseases, BioSan

Sammy Boussiba was born into a Jewish household in Fez, Morocco. He moved to Israel in 1956 along with his parents and two brothers. He started his academic career in 1969 and graduated from BGU with a bachelor's degree and the Hebrew University of Jerusalem with a master's degree. Under the guidance of Professor Amos Richmond, he proceeded to his doctoral studies at BGU, where he concentrated on the function of the biliprotein picocyanin C and the impact of environmental conditions on its metabolism. With funding from the Fulbright and Rothschild foundations, he pursued postdoctoral research at Cornell University after earning his PhD in 1981. He investigated how cyanobacteria absorb and use ammonia while he was at Cornell.

Boussiba returned to Israel in 1984 after finishing his postdoctoral studies and joined the Microalgal Biotechnology Laboratory (MBL) at the Jacob Blaustein Institutes for Desert Research BIDR, BGU. The French Associates Institute for Agriculture and Biotechnology of Drylands of the Jacob Blaustein Institutes for Desert Research at Ben-Gurion University's Sde Boker Campus was directed by Prof. Boussiba from 2009 to 2015.

The use of microalgae for environmental and human health protection is a current area of interest for Prof. Boussiba. Among his achievements are the unique development of biotechnology for the production of astaxanthin-rich *Haematococcus* biomass, and the successful expression of BTI toxin genes into nitrogen-fixing cyanobacteria for combating tropical diseases. As an outcome of this research, commercial enterprises have been set up, one of which is a plant located in the Arava, for the production of the valuable carotenoid

astaxanthin produced from the green alga *Haematococcus pluvialis*, and the second - is the establishment of a start-up company “BioSan” involved in the commercialization of engineered cyanobacteria for mosquito biocontrol of pest diseases.

Lior Hessel, Hydroponic Systems Organic Bio-ammonia Fertilizer, AlgaeNite, and Growponics

Lior Hessel is an agriculture engineer from the Technion and has an M.Sc. in Science from NYU Polytechnic School of Engineering (Growponics, 2022). He is the founder of OrganiTech, AlgaeNite, and Growponics.

OrganiTech Ltd. was a pioneer in the globe and a top producer of hydroponic growing factories for the agricultural and biological sciences sectors. Its devices made it possible for green leafy plants to flourish in a hygienic, automated, and cost-effective setting. The business was engaged in the construction of factories utilizing GrowTech technology for its global clientele.

Based on Prof. Boussiba's current research concerning the utilization of microalgae for human health and environmental protection, he developed a novel solution called AlgaeNite, to turn nitrogen from the air into fertilizer with the help of cyanobacteria, which are half bacteria, half green-blue algae.

Lior Hessel founded AlgaeNite company in 2018 to provide a sustainable alternative to today's chemical and organic fertilizers. While organic fertilizers are costly and frequently contain hormone and pharmaceutical residues that wind up in food, chemical fertilizers have a significant carbon footprint and are derived from fossil fuels.

In southern Israel, AlgaeNite is constructing its first production facility. Next year, it plans to expand to the US and Europe. Eretz-Noshevet's investment would make it possible to scale up to full commercial size.

AlgaeNite has developed a patented process to produce Bio-fertilizer using nitrogen-fixing Cyanobacteria to produce Bio Ammonia from the air using sunlight and replace the massive use of Synthetic Ammonia harmful to the environment.

Avishay Morag, Pollination Insight Platform (PIP), BeeHero

Yuval Regev has a Bachelor of Science (BSc), Electrical and Electronics 2007 - 2011 from Tel Aviv University and a Master of Engineering (MEng), Systems Engineering 2014 - 2016 from the Technion.

To make sure that farmers, beekeepers, and the environment all benefit, a group of seasoned beekeepers, serial entrepreneurs, famous biologists, and data scientists launched BeeHero. Bees are essential to 70% of crops worldwide.

BeeHero has nine different sensors inside our small units that go inside the hives. It can identify if the queen is failing if the hive is going through a starvation situation, and if there are mite problems, and so on.

For instance, to support the development of the bees and incubate the eggs laid by the queen, the hive must maintain a specific temperature.

The sounds in a hive can tell us a lot about what is happening, so for example, you can tell when the bees are foraging. When you aggregate this data with environmental parameters and so on, you know whether you're getting good or bad pollination. They hydrate the nectar to make honey at night when there is no foraging activity, and the amount of energy they use on hydrating at that time the nectar [in the hive] helps us to get a good understanding of how much nectar they collect.

PIP empowers growers with real-time insights to optimize production and support a healthy, sustainable food system. From almonds and berries to apples, canola, avocados, and more BeeHero helps growers worldwide achieve better results while promoting environmental stewardship.

Its precision pollination technologies offer previously unheard-of transparency into commercial pollination by utilizing machine learning, artificial intelligence, and advanced analytics. BeeHero's low-cost IoT sensors in beehives and fields gather real-time data to improve pollinator health and crop yield.

Avishay Morag, Kenaf Plant, Kenaf Ventures

Avishay Morag has done senior management studies in agriculture 1983-1985, Ruppin Academic Institution and marketing and management studies 1982-1984, College of Management. He founded in 2018 Kenaf Ventures with Aviv Spiner, Asaf Ofer, Ido HersHKovits, and Gideon Suzan (Levanon, 2025).

Grown in the fields around Kibbutz Kfar Aza, kenaf is used to make sustainable products for the plastics and construction industries. Photo courtesy of Kenaf Ventures

Originating in Africa, kenaf is versatile and can be grown in different soil types and climate conditions. Heavy metals, CO₂, and even heavy oils like tar are absorbed by kenaf. The plant yields fibers that resemble jute and can be used to make building materials, textiles, absorbents, packaging products, and oil. The company employs kenaf to replace petroleum-based plastics like polypropylene in the plastics sector, creating a bioplastic compound that contains a sizable amount of organic materials.

Kenaf Ventures is developing a technology based on the Kenaf plant for reducing global greenhouse gas emissions and says it is now more determined than ever to complete the launch of commercial production at its recently inaugurated factory (Globes, 2023). The

specialty of Kenaf Ventures is converting the Kenaf plant (*Hibiscus cannabinus*), which is well-known for its capacity to absorb carbon dioxide, into biomaterials that are suitable for use by a range of businesses. This lowers CO₂ emissions and the amount of polluting raw materials used in sectors including plastics, insulation, and buildings (Barak, 2023).

The company concentrates on two of the most difficult environmental issues: lowering the usage of harmful raw materials and fixing and absorbing carbon dioxide. Utilizing the kenaf plant (*Hibiscus cannabinus*), the company has created innovative proprietary technologies that allow carbon dioxide to be naturally absorbed and transformed into biomaterials.

By combining the plant with conventional raw materials such as plastic, wood, and cement, it's possible to reduce the amount of polluting materials and improve the properties of the final product, making it of higher quality, stronger, more insulating, and more durable.

The company employs kenaf to replace petroleum-based polymers like polypropylene in the plastics sector. This results in a bioplastic compound with a high amount of organic matter that has the same or, in some cases, better material qualities than the original plastic.

In a similar vein, the business is creating carbon-negative, sustainable solutions for the building sector that have better qualities in terms of strength, weight, fire resistance, simplicity of use, cost, and thermal and acoustic insulation.

Products from the company depend on its ability to blend large amounts of natural fibers with other raw materials like cement, plastic, and wood while using fewer of those components, enhancing the end product's qualities, and keeping costs competitive. Kenaf focuses on three major industries: plastics (bioplastic), construction (bio-block, bio-plaster), and insulation (substitute for styrofoam and rock wool).

Simcha Shore, Platform Monitors Crop Development in Real-time, AgroScout

Simcha Shore is a Political Science and Government Associate of Science - AS Sep 1997 - Sep 2000 from The Hebrew University of Science and has a Master's degree, in Asian Studies/Civilization Master's degree, 2010 – Jerusalem Associate 2012 University of Haifa.

AgroScout was founded in 2017 (agro-scout site). The headquarters are located in northern Israel in a converted vintage dairy farm in the heart of a multi-generational farming community of Kibbutz Yir'on. To more precisely organize processing and manufacturing processes across regions, crops, and growers, the AgroScout software tracks crop development in real-time.

Dor Oppenheim, LyOr Rabonowiz, Cultivating Complex & Diverse Microbiomes, ReGen

Dor Oppenheim is an entrepreneur with a decade of on-farm agtech R&D in startups and academia (regensoil site).

LyOr Rabonowiz has 20 years of microbial composting, regenerative agriculture and holistic farm design.

The overuse of agrochemicals damages these complex interactions, depleting vital natural elements from the soil and trapping farmers in a costly cycle.

Microbial Fertilization is the result of the interactions between plants and microbes unlock nutrients from soil particles, nourishing crops exactly when they need it.

ReGen is developing technologies for cultivating complex & diverse microbiomes for various crops.

As a first step of regeneration, ReGen coats the microbiome onto seeds. The delivery system ensures a successful symbiosis, fertilizing and protecting plants from germination. More biologicals are in development to accelerate soil and plant health regeneration throughout the growing season.

The symbiosis between crops and the introduced microbiome builds back better soil structure, recycles nutrients and sequesters carbon & water, providing farmers with backup to challenging seasons.

Ishay Hadash, Cooling Device, CO2 Liquid, Nofcooling

With a career that spans across multiple industries in companies large and small, Ishay is focused on developing, managing and expanding the business direction of NOF. He holds an MSc degree in Applied Economics from the University of Minnesota, and serves as the CEO for NOF (nof cooling site).

Natural Offset Farming NOFcooling is a patented cooling device that utilizes CO2 in its liquid state to produce cooling energy, providing a unique and energy-efficient way to cool any medium in precision agriculture (Air, Water, Surfaces, etc).

Prof' Jiftah Ben Ashe, Croptune, Agriot Group

Prof' Jiftah Ben Asher has gained experience in characterizing plant response to water and nutrients deficiency. His unique approach is based on the relationship between reflected and emitted radiation from plants under environmental and cultivation stresses. Throughout his 30 years of academic activity he published more than 100 scientific papers in soil physics and micrometeorology. The PhD dissertation of Prof' Ben-Asher was the

world first scientific paper that was published on drip irrigation. Later, this irrigation method has become the international flagship of advanced agriculture.

Revolutionary Nitrogen Detection with BIO-Optic Sensor Technology (croptune site)

Croptune is revolutionizing agriculture with a first-of-its-kind nitrogen meter in the palm of your hand. The app provides precise, real-time nitrogen analysis to help farmers optimize fertilization, save costs, and boost yields. Designed for open fields, greenhouses, and orchards, Croptune empowers farmers with data-driven decisions that improve efficiency and sustainability. Trusted by leading growers and food producers, we're turning technology into better crops and a brighter agricultural future.

Yoav Banitt, Customized Robotics Robotic Perception

Dr. Yoav Banitt received his PhD in computational neuroscience from the Hebrew University, Jerusalem in 2010 (roboticperception site). His research involved detailed neural network models of the visual cortex in mammals, as well as in the neocortical column model of the Blue Brain project, under the supervision of Prof. Idan Segev in the same institution, and Prof. Kevan Martin from ETH, Zurich. After completing his PhD, he was co-founder and CTO in two startups, until in 2019 he founded Robotic Perception, where he is now CEO. Robotic Perception was awarded Horizon 2020 funding for developing an autonomous electric vehicle for vineyards.

Robotic Perception was founded in Israel with the goal of improving the agriculture industry through the use of robotics. We specialize in creating customized robotics solutions for tasks such as spraying, pruning, mowing, detection, and navigation. Our team is dedicated to delivering high-quality products and ensuring customer satisfaction. We take pride in our innovative and effective solutions that make farm management easier and more efficient.

Robotic Perception dreams of a world where farms & vineyards work with you.

Our autonomous electric vehicle, sprayer, and mower take the hard work off your hands. Through simplified crop detection, irrigation requirement analyses, virus stress detection, and single plant detection, we are building the future of agriculture today.

Autonomous robotics corresponds with using electric vehicles, and then fossil fuels and carbon emissions can also be reduced, supporting efforts to reduce global warming.

Robotic Perception has developed an autonomous electric vehicle that provides precision spraying and mowing, under the agROBOfood project. The project is called Farmer JoeBot. 15 sensors and cameras are mounted on the vehicle, along with AI detection capabilities in real-time for both crop monitoring and for the autonomous operations of the vehicle.

The collected data is sent to the cloud and displayed on a webapp for crop management purposes. The app shows single-tree resolution heatmaps of the fields with crop yields, irrigation requirements, virus stress detection data and has sharing options for consultation with agronomists.

The vehicle is designed to provide spraying and mowing services, that typically account for >50% of the annual vineyard treatments. A robotic sprayer was developed with capability to reduce the use of chemical pesticides, that sprayer is now in patent pending status.

The combination of the autonomous capabilities of the vehicle that account of >50% of vineyard operations, together with the webapp that allows single-tree analysis of crop yields and irrigation requirements, and together with the capability of remote control of a fleet of such vehicles from a tablet, in fact allow to manage vineyards semi-autonomously.

Animal Genetic

Nashaat Haj-Mohammed and Yael Alter, Genomically Male Chicks to Grow Ovaries Soos Technology

Soos Technology was founded in 2017 by Nashaat Haj-Mohammed and Yael Alter with funding from Takwin, a VC supporting Arab-Jewish Israeli startups (Klein Leichman, 2023).

In the layer chicken industry, male chicks are useless because they cannot produce eggs and aren't the right breed for meat. This indicates that roughly 7 billion male hatchlings are culled annually by workers known as "sexers" and killed by gassing, suffocating, electrocuting, or live shredding.

Nashat Haj Mohamed from Kaokab Abu-Alhija, an Arab village in northern Israel, found in his family's chicken coop that certain sound vibrations could alter embryos from males to females.

Yael Alter has a BA and MBA in Economics from Ben-Gurion University of the Negev.

The first six days of embryonic development are spent exposing eggs incubated in Soos Technology's Smart Tray to particular sonic vibrations.

Surprisingly, the sound waves induce genomically male chicks to develop ovaries and hatch as female chicks capable of laying eggs after the customary 21 days. Genetically female chicks are unaffected by the sounds.

The procedure does not entail any kind of hormonal or genetic alteration, is safe for the embryos, and does not interfere with the eggs.

The company controls the environmental conditions in the incubator during embryonic development by applying sound vibration in a patented combination of frequencies and volumes and by affecting the humidity and temperatures within the incubator. These parameters are tracked and monitored in real-time for data collection and technical malfunctions detection (soos site).

The technology increases the production of female layers while using the same resources. The company does it without harming hatchability while maintaining chicks' livelihood and health and ensuring that females that have undergone the Soos treatment produce the same number of eggs at the same quality as any standard egg-laying hen. SOOS eggs are non-GMO and exempt from novel food regulations (verified by an FDA-compliant lab).

Hatching efficiency and productivity are improved and allow egg producers to operate with substantially higher profit margins while reducing their carbon footprint. A typical hatchery can save up to 300 MWh per million eggs incubated every hatching cycle, and the proportion of females produced changes from 50% to 80%.

Sensors in the Smart Tray monitor nearly every egg and provide critical data to Soos to improve the technology to the point where 100 percent of genomic males will hatch as females. Most of the competitors, such as European companies InOvotive and Seleggt, use detection technologies that analyze what is inside the egg. Sex reversal is not being used by anyone to boost productivity.

Prof. Daniel Offen, Yehuda Elram, Gene-editing Tool CRISPR, eggxyt

Prof. Daniel Offen earned his PhD in Molecular Biology at the Weizmann Institute of Science and did his post-doctoral studies at the Albert Einstein College of Medicine in N.Y. He heads the Neurology Laboratory at Tel Aviv University in the Department of Human Genetics and Biochemistry. He is co-founder of several biotechnology companies developing gene and cell therapies for neurological disorders including eggxyt. Yehuda Elram holds an LL.B. degree from the Hebrew University of Jerusalem and an M.A. degree in education and Jewish leadership from the Jewish Theological Seminary in 2002.

The company uses the gene-editing tool CRISPR to edit the genes of chickens so that any male eggs they lay will light up when checked by an ultrasound device (eggxyt site).

The technology enables sex detection of chick embryos immediately after the eggs are laid and before they enter the 21-day incubation process.

These male eggs are removed so that no resources go into incubating them. They could be sold to non-food industries such as pharma or cosmetics.

The technology is unique because it can perform sexing on day zero as the eggs are being laid, which is as early as possible. This makes our technology the most efficient and implies

that we meet the highest bar of ethics and efficiency because we can sex eggs before an embryo has formed.

Dr. Yuval Cinnamon, Molecular Biology Technology, NextHen

Dr. Yuval Cinnamon, PhD is the principal investigator and research group leader at the Agricultural Research Organization, The Volcani Institute. Expert in embryology, molecular biology, genetics, and poultry (nexthen site).

Using cutting-edge genome and engineering technologies, NextHen (previously NRS Poultry) is a science-based business that provides a platform of fully integrated, complementary solutions intended to address significant issues in the poultry sector.

NextHen explores and produces scientific innovations to address enduring global issues in agriculture, food production, and health. Scientists and researchers at NextHen collaborate with world-class centers of excellence, including through a joint venture with the State of Israel's Ministry of Agriculture's Agriculture Research Organization (ARO).

NRS Poultry Sustainability and Transformation Ltd., a division of IMPACT NRS, created Poultry by Huminn.

Molecular biology technology licensed from the Volcani Institute Agricultural Research Organization of the Israeli government forms the basis of Poultry by Huminn. It was created by Yuval Cinnamon, an animal science researcher, in collaboration with Compassion in World Farming, a UK organization.

NextHen uses technology to alter solely the female paternal Z chromosome, causing it to segregate exclusively into male embryos. This alteration will never affect female layers because of chromosomal segregation. Layers only hatch in females.

Male eggs will cease development at a very early stage of embryonic development due to the maternal Z chromosome. Non-GMO female embryos, receiving only wild-type W chromosomes, will normally hatch and develop without containing GMO.

Non-GMO female chickens will create poultry products for household use. Male eggs that do not hatch will contain traces of GMO and can be used for alternative uses (e.g. animal feed), depending on local regulation.

WATER TREATMENT AND SUPPLY

Water scarcity has long been—and continues to be—a major bottleneck threatening the welfare and sustainability of Israel. Water demand spans multiple essential sectors, including: Drinking water for the population, Agricultural irrigation, Industrial processes, Healthcare services, Recreational and leisure activities. To address this fundamental challenge, innovative solutions such as desalination and water extraction from air have been developed. These technologies help secure a reliable water supply not only for Israel's growing population but also for neighboring countries, contributing to regional stability. By providing sustainable water resources, these solutions help mitigate potential conflicts, particularly with the Palestinians and Jordan, fostering cooperation and peace in a water-scarce region.

Desalination

Alexander Zarchin, Vacuum Freezing Vapor Compression (VFVC), IDE

Alexander Zarchin (1897-1988) was a Ukrainian-born Israeli engineer. After emigrating from Russia to Israel in 1947, he became one of the pioneers of seawater desalination in Israel and was also the inventor of VFVC (ide-tech, 2019).

VFVC process was based on straightforward physical principles: When saltwater is boiled – the produced vapor consists of pure water, while salt is concentrated in the remaining brine. Individual ice crystals made of pure water are covered in a small layer of salt water as they freeze, which sticks to their surface and must be cleaned.

In 1961, the Israeli government formed the "Desalination Plants Ltd." Company in partnership with Zarchin and the US-based Fairbanks Whitney Corporation. A modest research and development company that changed its name to "Israel Desalination Engineering Ltd." and, in 1965, to IDE Technologies Ltd.

The first freeze desalination technology demonstration facility in Eilat went into service in 1963. However, the plant's lifespan was brief, and it was closed in 1967. The results of Zarchin's innovations established the groundwork for more sophisticated desalination systems, but his freeze desalination miracle was judged too costly. Soon after, the town's grid started receiving water from an imported dual-purpose MSF (Multi-Stage Flash) desalination plant.

MSF was first established in the 1950s. This technique is based on thermal distillation, which consists of multi-stage chambers where every chamber acquires a pressure lower than the previous one using a steam ejector. Following heating in a "brine heater," the feedwater moves into the first stage, or chamber, where the decreased pressure causes the hot feedwater to evaporate.

IDE Technologies continues to use Zarchin's freeze method for a variety of applications, including ski resorts, thermal energy storage (TES), and effective ice production for mine cooling.

Alfa Water Partners, a partnership established by Mr. Avshalom Felber and Mr. Amir Lang, is the sole owner of IDE (ide-tech site).

Mr. Felber has held the position of Executive Chairman of IDE Technologies since 2018, after founding Alfa Water Partners LLP, a partnership that acquired the IDE Group in 2017. Before joining IDE, Mr. Felber served as the Israeli Ministry of Finance's Deputy Director of the Budget Division.

Sidney Loeb and Srinivasa Sourirajan, Reverse Osmosis (RO)

Loeb was born in Kansas City, Missouri in 1917. He studied chemical engineering at the University of Illinois, Chicago (Cohen and Glater, 2010). Sidney Loeb received his B.S. in chemical engineering from the University of Illinois in 1941. Before joining UCLA as a graduate student, he worked in the Los Angeles area in the fields of petrochemicals, rocket engines, and nuclear reactors.

He received his M.S. and Ph.D. degrees from UCLA in 1959 and 1964, respectively. It was in the course of his M.Sc. thesis research that the Loeb-Sourirajan membrane breakthrough was achieved (patents.google site).

The Loeb-Sourirajan membrane, created in 1959 at UCLA by Sidney Loeb and Srinivasa Sourirajan, separates the salt, withstands pressure, and permits enough water to pass through. Due to this innovation, reverse osmosis (RO) desalination became feasible. Then, in Coalinga, California, Dr. Loeb constructed the first RO desalination plant in history.

Born in 1923, Sourirajan hailed from rural Tamil Nadu and was among the first generation of Indians to receive a PhD, in chemistry (Saastra, 2024). His research credentials earned him a passage to Yale University, where he received a second doctorate – in chemical engineering. After joining UCLA's Department of Engineering, Sourirajan was directed to start studying the Gibbs Adsorption Equation, which uses surface tension data to estimate the amount of adsorption at a liquid surface. Loeb and Sourirajan worked together on research on commercial ultrafiltration membranes during their time at UCLA, which ultimately resulted in their patent.

Today A well-established method for turning seawater and brackish inland water into drinkable water is reverse osmosis (RO) membrane desalination. Nowadays, RO membranes are also frequently utilized as a component of the entire wastewater treatment process for reclamation and reuse in industrial, groundwater replenishment, and irrigation applications. In regions of the world where freshwater water supplies are limited, RO desalination technology has enabled the development of new drinkable water sources.

Compared with the traditional distillation method, reverse osmosis technology has the advantages of low energy consumption, easy operation, and high water production rate, so it is widely used in desalination plants and other water treatment fields.

Professor Avi Efraty, Closed-circuit Desalination (CCD) Technology, Desalitech

Professor Avi Efraty, an American-born chemist who moved his family to Israel in the mid-1970s is the inventor of closed-circuit desalination (CCD) technology (Globes, 2019). Before his work on CCD technology, he served for nearly 20 years as a Professor of Physical Chemistry at the Universities of Waterloo, Georgia, Rutgers, and the Weizmann Institute.

Desalitech was founded in Israel in 2008 by Nadav Efraty the son of Avi Efraty. The startup moved to Massachusetts in 2013.

A closed circuit reverse osmosis (CCRO) technique created by Desalitech can lower the price of water reuse and purification. The company's ReFlex reverse osmosis systems offer maximum recovery and feature Desalitechs patented CCD process.

ReFlex reverse osmosis systems CCD process is capable of extracting purified water from challenging sources and adjusting to highly variable water conditions, making them suitable for industrial water and effluent treatment and inland brackish desalination. Desalitech systems offer up to 98% recovery, up to 35% energy reduction, and reduction of operational and maintenance expenses.

US chemicals maker DuPont signed an accord to buy Israel-founded water purification startup Desalitech Ltd in December 2019 for an undisclosed amount of money.

Water-from-air

Prof. David Broday and Prof. Eran Friedler, Water Extraction from the Air Even in Dry and Desert Areas

The developing world is not the only place experiencing a water issue. For instance, rivers in Europe are getting more and more contaminated, and almost 60% of the drinking water in Los Angeles is imported. With a better solution in terms of cost, environmental impact, and health, H2OLL plans to capitalize on the \$363 billion bottled water business that is already in existence.

Prof. David Broday received a D.Sc. from the Faculty of Mechanical Engineering, Technion, in 1996. He then did one year of postdoctoral research at the Levich Institute, CCNY, CUNY, New York, working on biophysics at the cellular level and 3 years of postdoctoral fellowship in the Computational Chemodynamics Laboratory,

David Broday is a professor in the Faculty of Civil & Environmental Engineering at the Technion's Department of Environmental, Water, and Agricultural Engineering.

His research interests include atmospheric and aerosol physics, air pollution, exposure modeling and assessment, applications of GIS for environmental health, dosimetry of inhalable pollutants, and enviroinformatics.

Professor Friedler leads the Stephen and Nancy Grand Water Research Institute and the Technion's Water Forum Project. He holds the Henry Goldberg Academic Chair and is a senior research fellow.

Developing alternate water sources as part of sustainable urban management, large-scale wastewater treatment systems, and processes in sewer systems and those influencing water quality in catchment basins are among his research interests.

The water-from-air prototype was created by Professor David Broday and his collaborator, Professor Eran Friedler ([israel21c](http://israel21c.com) site). The technology enables water extraction from the air even in dry and desert areas, while completely blocking chemical and biological contaminants. It is based on adsorption, unlike most companies in the field that operate on direct cooling technology. The difference is striking: H2OLL's adsorption technique can generate water even when the air has half as much water vapor, or roughly 5 grams of water vapor per kilogram of air, whereas direct cooling requires at least 10 grams of water vapor per kilogram of air.

200 liters of water are produced daily by the initial prototype, which was constructed at the Technion more than four years ago.

H2OLL, under the direction of Joab Kirsch (CEO), Ilan Katz (CTO), and Oded Distel (VP of Business Development), enabled the conversion of the study into a workable system. Based on Technion research, the first full H2OLL system generates 1,000 liters of water daily at Wadi Attir, a Bedouin community project in the Negev in collaboration with International Sustainability Laboratory, a New York-based non-profit. (Technion, 2024).

Dr. Khaled Gommed from the Faculty of Mechanical Engineering was also instrumental in the development of the technology.

The system is operating under the auspices of the Wadi Attir project, and the International Sustainability Laboratory, a non-profit organization based in New York (sustainabilitylabs.org/wadi-attir site). Based on Bedouin culture and a range of technology, Wadi Attir is a Bedouin community effort in the Negev that integrates education (a school and a learning center), sustainable food production, and local and global innovation.

The objective is to construct a system that will generate roughly 10,000 liters of water per day, promote the brand, connect the technology to solar energy, and increase worldwide marketing efforts.

Sharon Dulberg, Atmospheric Water Generator, Water-gen

Mr. Dulberg has a vast experience in several R&D industrial companies both in practical and scientific fields. He has an M.Sc. in Electrical Systems Engineering and a B.Sc. in Mechanical Engineering.

Sharon Dulberg has filed for patents to protect the following inventions (patents.justia site):

Atmospheric water generator and dehumidifier for vehicles and Method and system for producing drinking water from air (2024). Method and system for dehumidifying an enclosure (2023)

The market for atmospheric drinking water devices (AWGs), which are devices that produce drinking water from the air, is led by the innovative Israeli business Watergen.

To extract water from the air, Watergen's technology allows the air to enter the proprietary Genius system quickly, resulting in increased efficiency and lower energy use. Watergen is the owner, manufacturer, and patent holder of GENuis.

Water-gen machines can produce from the air enough clean drinking water for a whole day for a hospital, and some machines can provide daily water consumption for a village or even an entire city. The price of one liter of water ranges from 7 to 15 cents, depending on the cost of electricity in the area.

Watergen can provide enough high-quality drinking water for individual residences or workplaces, or it can be scaled down to offer fresh, clean drinking water to a whole town or hamlet.

ENERGY

Recent advancements in energy source technologies encompass a range of cutting-edge innovations, including: Waste heat recovery systems that capture and reuse thermal energy for improved efficiency; Smart electronic management systems that optimize the performance of solar chips; Wireless charging technologies integrated into surfaces for convenient, cable-free power delivery; Lightweight, flexible solar panels that enable versatile installation on various surfaces; Organic photovoltaic cells, offering cost-effective and environmentally friendly solar energy solutions; Advanced batteries featuring 3D current collectors for enhanced energy storage capacity and performance; Nanotechnological coatings designed to provide passive cooling, reducing energy consumption for temperature regulation. These innovations collectively contribute to more efficient, sustainable, and adaptable energy systems.

Heat and Solar Energy

Lucien Yehuda Bronicki, Geothermal, Waste Heat Recovery, Ormat

Lucien Yehuda Bronicki was born in a region of Poland that is now part of Ukraine. There, as a young teen, he survived the Holocaust.

He holds a Bachelor of Science in Mechanical Engineering and a Master of Science in Physics from the University of Paris. He received a postgraduate degree in nuclear engineering from the Conservatoire National des Arts et Métiers (CNAM) in Paris.

He is the Co-Founder, Chairman, and Chief Technology Officer for Ormat Technologies (bpb site). Ormat has constructed 1,300 MW of geothermal and recovered energy generation plants in the United States and in twelve other countries, of which Ormat owns and operates 540 MW.

Ormat was established in 1965 by Lucien Y. Bronicki and his wife, Dita, building upon Lucien's patents and research conducted at the National Laboratory under the guidance of Harry Z. Tabor (bpb site, ormat site).

The goal was to carry on with the small solar turbine's development, production, and marketing after the laboratory project was abandoned due to financial limitations.

Through creative waste heat recovery projects, Ormat, which has more than 50 years of experience and is present in more than 30 countries, is setting the standard for renewable energy. The Ormat Recovered Energy Generation (REG) unit is based on Organic Rankin Cycle (ORC) technology to take waste heat from industrial processes and convert it to power that can be consumed on-site or sold to the grid. Ormat's power plants provide clean baseload power in resource-constrained countries from Iceland to New Zealand, and Hawaii to Japan.

The ORC can help several industrial operations (biomass, waste heat recovery) meet their carbon footprint reduction goals. In thermodynamic cycles based on Rankine architecture, the ORC makes it possible to use low, medium, and high enthalpy flows from renewable sources (solar, geothermal, etc.).

Orix acquired its stake in an acquisition from a large fund and the founder family in 2017 (thinkgeoenergy site). ORIX Group is a Japanese corporate group active around the world in financing and investment, life insurance, banking, asset management, real estate, concession, environment and energy, automobile-related services, industrial/ICT equipment, ships, and aircraft (orix site).

With the increase from an initial holding of 8.3% in Ormat Technologies as of April 2022, to now 12.5% it makes BlackRock the second largest shareholder in Ormat after Japanese company ORIX which holds a 19.7% stake in Ormat (thinkgeoenergy site).

BlackRock is a global investment manager, operating in Israel since 2016 which offers a range of solutions for institutions, financial professionals, and individuals across Israel (blackrock site). For eight years, BlackRock in Israel has assisted individuals in taking charge of their financial security, from shop clerks in neighborhood businesses to national organizations and non-profits.

Today, Ormat Technologies, Inc. is a global business with its headquarters located in Reno, Nevada, in the United States. Ormat provides geothermal energy technology that is renewable and alternative. The company has installed more than 3,200 MW and constructed more than 190 power plants.

Guy Sella, Lior Handelsman, Yoav Galin, Meir Adest, and Amir Fishelov, a Smart Electronic System, Solaredge

Guy Sella was born and grew up in Haifa (Magen, 2019). He studied engineering at the Technion-Israel Institute of Technology in Haifa and later received an offer from the Intelligence Corps technology unit. SolarEdge was founded in 2006. After leaving the IDF, Sella worked in the Star Ventures venture capital fund, where four of his former soldiers—Lior Handelsman, Galin, Meir Adest, and Amir Fishelov—came.

SolarEdge's technology is a smart electronic system based on chips that manage solar energy production, convert energy into a more efficient form, produce more energy, and facilitate remote control and monitoring through the Internet. The initial development was a chip placed next to each solar panel.

Power harvesting and management in solar photovoltaic (PV) systems have been transformed by SolarEdge's intelligent inverter technology. The SolarEdge DC-optimized inverter system maximizes power generation at the individual PV module level while lowering the cost of energy produced by the solar PV system.

Since beginning commercial shipments in 2010, SolarEdge has shipped over 54.5 Gigawatt (“GW”) of its DC-optimized inverter systems and its products have been installed in solar PV systems in 140 countries.

SolarEdge was able to secure funding from Israeli fund Genesis Partners as well as two US venture capital funds, Walden International and Opus Capital Ventures. In March 2015, SolarEdge held its IPO on Nasdaq at a \$620 million valuation.

The next development in the company came when it was decided to use the converter's technology in areas other than solar energy. This was accomplished through a series of acquisitions. "The global solar energy market is about \$7 billion, which theoretically leaves us, as holders of a 60% market share, with \$3-4 billion.

In 2018 and 2019, SolarEdge acquired the activity of Gamatronic Electronic Industries, which manufactures uninterrupted power supply systems, for NIS 40 million; South Korean lithium batteries company Kokam for \$88 million; and Italian company SMRE, which developed an electric car propulsion unit, for \$77 million.

Dr. Jonathan Goldstein, Barry N. Breen Dr Michael Schwartz, Dye Solar Cell (DSC) Technology, 3G Solar

3G Solar pioneered a low-cost alternative to silicon that generates significantly more electricity than leading silicon-based PV solar modules at a lower cost per kilowatt hour (eilateilot site).

The core of our third-generation photovoltaics development is dye solar cell (DSC) technology. Recent research indicates that these two characteristics can be replaced by other substances, including perovskites, therefore the term "hybrid solar cells" is increasingly fitting. An anode and a cathode make up the electrochemical device known as a DSC. These two electrodes are usually constructed from a particular type of glass that has a thin layer of fluorine-doped tin oxide (FTO) and a Transparent Conductive Oxide (TCO) coating on one side. While the conductive surface gathers charges, sunlight can enter the cell due to the substrate's transparency.

Brian O'Regan and Professor Michael Graetzel of the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, created DSC. DSC is derived from nature itself, replicating the natural process of photosynthesis using a sandwich of electrolyte, titanium oxide, and dye to create an electric current. DSC production is based on screen printing equipment rather than vacuum systems and does not require silicon.

Israeli company 3G Solar has developed the first commercial-size solar energy system that uses coloured dyes rather than the more costly silicon, and remarkably also functions in sunless conditions (Gods Direct Contact). Similar to the natural process of photosynthesis this third-generation solar technology utilizes simple organic dyes much like the way

nature uses the green pigment in plants and algae to absorb light and convert sunlight into energy.

The manufacturing costs are very low, about a fifth of conventional silicon or thin-film production for first or second-generation solar power technology because the manufacture of 3G Solar does not involve the use of a vacuum room and other expensive semiconductor equipment. It utilizes a unique and simple technique with printing machines, much like printing a shirt. Furthermore, the manufacturing process can be set up locally and is ideal for areas in developing countries where there is no electricity. Herewith the team (ortra.com)

Barry N. Breen CEO: Thin film process development expert; 16 years in senior positions at AVX; Four years at GE. Recognized for outstanding achievement in product and business development. B.Sc. in Nuclear Engineering from MIT. President and creator Dr. Jonathan Goldstein is an electrochemist who has 41 patents and specializes in solar energy, batteries, fuel cells, and materials. PhD in Chemistry from City University, London.

Dr Michael Schwartz CTO: Materials Chemist with over 20 years of industrial and academic experience developing electroactive materials; holder of 14 patents. Ph.D. in Chemistry from the University of North Carolina, Chapel Hill.

3G Solar belongs to NokiaPartners - Open Communities is an open co-creation environment originally initiated by Nokia. Our goal is to bring together the most ambitious companies and brightest individuals to help them innovate and grow their businesses bigger, better, and faster.

The start-up 3GSolar Photovoltaics Ltd., based in Jerusalem, has received a \$2.5 million investment from the Chinese industrial and real estate conglomerate HuaXiang Group.

Eran Maimon, Oded Rozenberg, Lightweight Flexible Solar Panels, Apollo-Power

Eran Maimon holds an M.Sc. in Mechanical Engineering from the solar energy laboratory at Tel Aviv University (apollo-power site)power paper. He described the characteristics of coatings based on nanotechnology for application in solar energy receivers in his thesis. Mr. Maimon also holds a B.Sc. in Physics and International Relations from the Hebrew University.

Oded Rozenberg was previously a senior flight instructor at the Israel Aerospace Industries (IAI). He holds an MBA in Finance from IDC Herzliya and a BA in Economics from Haifa University. Founded in 2014 Apollo has developed technology for the manufacturing of flexible, lightweight, durable, and high-efficiency solar films that it says can turn any sun-kissed surfaces into energy-producing surfaces that generate electricity (Wrobel, 2023).

The solar panels are designed for surfaces that cannot sustain the weight of glass solar panels, such as those found on vehicles, trucks, rooftops, and airplanes. The basic solar film unit is 12 square meters in size and weighs 3 kilos per square meter. Amazon, Volkswagen, and Audi are among several companies deploying the company's technology for use on cars, roofs, and aircraft (Wrobel, 2023).

Traded on the Tel Aviv Stock Exchange since 2017, Apollo says its floating solar panels produce electricity on water surfaces, and are durable to waves, making them suitable for a variety of marine vehicles and sails.

Prof Nir Tessler, Organic Photovoltaic Cells

Prof Nir Tessler is the director of the Wolfson Microelectronic Center and of the Sarah and Moshe Zisapel Nanoelectronics Center at the Technion (Rbni.technion, 2016).

Researchers at the Technion-Israel Institute of Technology have developed a patentable invention that increases organic photovoltaic cells' efficiency by 50%.

Their ability to be installed on lightweight, flexible, and easily replaceable sheets that may be applied to buildings and roofs like wallpaper and convert solar energy into electrical current is one of their advantages over "conventional" silicon solar cells.

An electric current inside the cell has been improved from 10% (a level considered to be "high efficiency") to 15% (the level at which industry experts say organic solar cells will be cost-effective) and adding 0.2 volts to the cell's voltage. By altering the electrodes' fixed position inside the system, the development aims to increase the energy gap between them.

One of the limiting factors in organic solar cells is the reduced built-in potential due to the effective pinning of the electrodes relative to the energy gap at the bulk of the device (Tessler, 2015). Having identified this as a problem Prof Tessler suggests a device structure that can enhance the open circuit voltage. The detailed modeling shows that such a structure can enhance the open circuit voltage as well as the short circuit current leading to above 40% improvement in power conversion efficiency of state-of-the-art organic solar cells.

Energy Storage Solutions

Avi Brenmiller, Scalable Thermal Energy Storage Solutions, Brenmiller Energy

Avi Brenmiller has a Bsc, Mechanical eng. 1976 - 1978 from Ohio State University. He was the CEO of Solel Solar Systems Solel Jan 1997 - Nov 2009 and CEO of Siemens STE Nov 2009 - Dec 2011. From Jan 2013 he is Brenmiller Energy CEO.

Brenmiller Energy delivers scalable thermal energy storage solutions and services that allow customers to cost-effectively decarbonize their operations. Its patented bGen thermal storage technology enables the use of renewable energy resources, as well as waste heat, to heat crushed rocks to very high temperatures. Like electric batteries, the storage material is heated to 650°C using grid electricity or renewable energy.

To give the client stable condition steam up to 530°C, heat is stored for hours or days until the discharge begins, at which point water is cycled in carbon-steel pipes in direct contact with the hot storage media. Steam is then produced and sent to the stabilization tank.

With bGen, businesses can use electricity, biomass, and waste heat to create the steam, hot water, and hot air they require for several uses, such as molding plastic, processing food and drink, making paper, making chemicals and medications, or powering steam turbines without using fossil fuels.

The bGen™ system is made up of several identical prefabricated components known as bCubes™. bCubes™ are put together on-site, connected to the plant, and insulated to reduce heat loss. There are multiple designs to lessen footprint restrictions.

Recent agreements highlight the strides the company is making in recurring revenue projects, including:

- Partner in Pet Food (PPF), Hungary: A 30 MWh bGen system designed to reduce gas usage by 25-30%, while also providing low-carbon steam and grid balancing services.
- Tempo Beverages, Israel: It is estimated that a 32 MWh installation will save carbon emissions by 6,200 tons per year and save \$7.5 million over 15 years.
- Wolfson Hospital, Israel: With the help of a \$450,000 grant, this \$3.55 million project is anticipated to save \$1.3 million annually and cut emissions by 3,900 tons.

Moshiel Biton, Vladimir Yufit, and Farid Tariq, Batteries 3D Current Collector Manufacturing, Addionics

Founded in 2017 by Ph.D. Moshiel Biton, Ph.D. Vladimir Yufit, and Ph.D. Farid Tariq, Addionics has production facilities in the U.S. and Israel, along with sites in the UK and Germany (addionics site).

Moshe Biton has a PhD in Materials Science 2013 – 2016 from the Imperial College London on Materials Science.

Vladimir Yufit works as a postdoctoral research associate at Imperial College London's Department of Earth Science and Engineering. He led groundbreaking research on the

creation of three-dimensional thin-film lithium-ion micro-batteries while earning his PhD from Tel Aviv University in Israel.

1969 saw the birth of Tariq Farid in Sahiwal, Pakistan. When Tariq Farid was eleven years old in 1981, he and his family moved to the United States. At the age of 17, the family purchased and started running a flower store in East Haven, Connecticut, in 1986. While working in the family business, which expanded to additional locations, Tariq developed a computerized point-of-sale system for floral shops.

Addionics has redesigned the architecture of rechargeable batteries to provide specialized, better batteries. The patent-protected scalable 3D Current Collector manufacturing enhances capacity, safety, charging time, lifetime, and the cost of batteries.

The unique 3D structured foil increases the coating surface area, strengthens the bond with the active material, and creates a highly porous structure for better performance.

This design minimizes degradation, improves capacity, and shortens charging time, enhancing efficiency and battery life. Our scalable production procedures provide premium, reasonably priced 3D structured foils for a range of energy storage uses.

Addionics' novel 3D structure minimizes internal resistance and improves mechanical longevity, thermal stability, and other fundamental limitations and degradation factors in standard batteries.

Addionics uses an innovative, patented, scalable, economical, and accurate production techniques to design and produce cutting-edge 3D Current Collectors for the EV battery market.

In central Tel Aviv, Addionics is now opening a state-of-the-art production line that it claims is the first of its type globally.

The company plans to use its chemistry-agnostic Smart 3D Electrodes technology for the electric vehicle (EV) battery industry - one of the world's fastest-growing industries. The new plant, inaugurated in January 2023, covers over 1,500 square meters and will serve as the company's headquarters. Addionics also has offices in London (UK), the US, and Germany (Globes, 2023).

A \$39 million funding round in Israeli startup Addionics, which is creating technology to enhance vehicle battery performance, was co-led by GM (General Motors) Ventures. Along with truck and bus manufacturer Scania, Union Tech Ventures, Delek Motors, and others, Deep Insight co-led the funding round.

Addionics plans to build a \$400 million U.S. factory to make copper anodes for electric vehicle batteries starting in 2027 to eventually supply enough for about 1 million EVs a year, it said on Monday (Carey, 2024). The plant will be built in three phases. The company is undergoing due diligence for up to \$50 million in U.S. and \$120 million in funds from the Inflation Reduction Act for the first phase.

Yaron Ben Nun, IceBrick , Nostromo Energy

Nostromo Energy was founded in 2017 by Yaron Ben-Nun, ORT Electrician 1985-1988. At Lightapp Technology (formerly ZIRA), an industrial analytics software provider for operational excellence in energy management, Yaron previously held the position of Head of Innovation. Additionally, Yaron worked in marketing for Phoebus Energy, a cleantech heat pump technology firm. Yaron flew an A4 Skyhawk in the Israeli Air Force earlier in his career as a combat pilot.

The IceBrick ESS is an energy storage device created by Nostromo Energy that does not require any rare earth or hazardous chemicals. Nostromo's IceBrick system stores cold thermal energy in the form of ice using excess electric power during times of excess. This ice is then used for cooling during peak hours when the electrical grid is most stressed.

Commercial and industrial buildings may now become sustainable energy storage assets and lower their energy expenses and carbon emissions thanks to Nostromo Energy's ice-based energy storage technology. When electricity costs are low and renewable energy is plentiful, Nostromo's IceBrick® system uses ice to store energy, which is then released to prevent the need to buy costly and carbon-intensive electricity. Nostromo provides building owners with a safe, clean, and cost-effective energy storage solution while also accelerating the renewable revolution and paving the road for an electric grid free of carbon. Compact, modular, and non-flammable, the IceBrick® is simple to adapt to already-existing commercial and industrial structures.

Project IceBrick, a virtual power plant (VPP) that would install up to 193 cold thermal energy storage devices in commercial buildings around California, has received a \$305 million loan guarantee from the US Department of Energy (Prabhat Ranjan Mishra, 2024).

The project could give hotels, offices, data centers, and other commercial facilities the equivalent of about 170 MW (450 MWh) of behind-the-meter storage capacity. Because IceBrick thermal storage cells are small and modular, they may be installed in a number of different kinds of buildings as well as in different parts of a building, like a basement or a roof. Installed at the famous Beverly Hilton, Nostromo's meticulously executed project entailed converting the 69-year-old structure into a cutting-edge Grid Interactive Asset, where 300,000 pounds of IceBrick cells were used. Supporting hydraulic and electric equipment were brought in through a 3-foot corridor and installed in a refurbished old boiler room. The IceBrick system provides the Beverly Hilton with a solution that shifts energy consumption for cooling to off-peak hours, when solar energy is most prevalent, alleviating grid strain (Whitlock, 2024). It reduces the building's energy consumption during peak hours, when solar energy is no longer used, by freezing 150,000 pounds of encapsulated water into ice during off-peak hours. The ice then cools the air conditioning's circulating water during peak hours, eliminating the need for energy-intensive chillers to function at that time, and thus reducing strain on the grid. The system's use of off-peak

energy reduces the hotel's annual energy cooling costs by 50 percent and CO2 emissions by 150-200 metric tons annually.

Zvi Nitzan, Paper-thin Energy Cells, Power Paper

Zvi Nitzan is the founder of Power Paper Ltd (founded in 1997). He held the title of Chief Technology Officer.

Mr. Nitzan's former job was as a Division Manager at Israel Aerospace Industries Ltd. Mr. Nitzan received his undergraduate degree from Technion-Israel Institute of Technology.

Power Paper produces paper-thin energy cells that are printed on silk-screen printing presses, can be adapted to fit the size and shape of almost any product, and are safer for the environment than conventional batteries (Israel21c, 2003).

The cell, which boasts a shelf life of two and a half years, can be printed, pasted, or laminated onto paper, plastic, or other media, becoming part of the end product itself.

Professor Avner Rothschild, a New Technique for Testing the Efficiency of Hematite and other Semiconductor Materials

Both photovoltaic and photoelectrochemical cells are used in solar panels, and photoelectrochemical cells can only produce electricity when there is sunshine.

In collaboration with scientists from Ben-Gurion University of the Negev and Helmholtz-Zentrum Berlin, researchers led by Professor Avner Rothschild of Technion's Department of Materials Science and Engineering have advanced our knowledge of how semiconductors function. (Jerusalem Post, 2021). Semiconductors enable light energy to split water molecules into oxygen and hydrogen, which are then stored as a separate fuel source for later. The most widely used semiconductor material, hematite, has low efficiency, resulting in a significant loss of potential energy. To test the effectiveness of hematite and other semiconductor materials, Rothschild's team created a new method that should eventually enable the development of more efficient solar panels.

Pressure Retarded Osmosis (PRO) Producing Power

Sidney Loeb, Pressure Retarded Osmosis (PRO) Producing Power by a Reverse Electrodialysis Heat Engine (RED)

Sidney Loeb received his M.S. and Ph.D. degrees from UCLA in 1959 and 1964, respectively. It was in the course of his M.Sc. thesis research that the Loeb-Sourirajan membrane breakthrough was achieved (patents.google site).

Loeb immigrated to Israel in 1967 and started teaching RO technology at the Negev Institute, later incorporated into Ben-Gurion University of the Negev (BGU), and conducted a great deal of research over the next 15 years, teaching generations of new engineers about membrane and desalination processes. At BGU, Loeb developed a novel technique for generating electricity using a reverse electrodialysis heat engine (RED) and Pressure Retarded Osmosis (PRO).

Pressure-resisting osmosis (PRO) is a renewable energy source that can be used to capture the energy released when freshwater and saltwater mix.

Water from a low-salinity solution enters a pressured, high-salinity solution through a membrane in PRO; the permeate is depressurized using a hydroturbine to generate power. The first prototype installation of PRO opened in Norway in late 2009. The freshwater inflow into the saltwater stream raises its pressure, which powers a turbine to produce electricity. PRO, which is used by companies like SaltPower, is predominantly based on osmosis, which is the movement of a solvent (i.e. from a less concentrated solution to a more concentrated one) over a semi-permeable membrane (something that can dissolve other substances).

Water serves as the solvent in the PRO process. A water-permeable membrane—one that permits water to pass through but not salt—is placed between a stream of fresh water and a stream of saltwater in order to use osmosis to produce energy. Osmosis allows the freshwater to enter the seawater stream through the membrane since the seawater stream is more concentrated due to its significantly higher salt content.

SaltPower is the World's first commercial energy production technology based on osmotic energy (saltpower site).

Nobian has started a pilot project with SaltPower™ and Dansk Salt at SaltPower's salt mining field in Hvornum, Denmark (nobian site). The plant, the first of its kind in the world with a capacity of 100 kW, started operating in 2023.

By reintroducing diluted salt water into the cavern, SaltPower can lower the energy consumption of the solution mining operation. SaltPower technology can thus take the role of the high-pressure pump typically employed in solution mining.

The osmotic pressure differential between fresh water and salt brine is used by SaltPower to generate energy. The concentrated brine draws fresh water through a semi-permeable membrane, causing an increase in pressure. The high-pressure diluted brine can then be used to produce electricity in a turbine or directly as hydraulic energy.

The salt concentration in brine is about eight times higher than in seawater. As a result, the economics of the process are much better compared to the case where seawater is used to create the osmotic pressure to produce electricity.

Laser Beams

Joseph Schwartz, and Meyer Wechsler, Laser Beams have Yielded the Solid-state Laser, Weitzman Institute

The Weitzman Institute of Science has conducted the most intense research on lasers, and nowhere is Israeli ingenuity more evident than in laser technology. Research aimed at utilizing solar radiation to produce laser beams has yielded the solid-state laser, developed by Professor Joseph Schwartz, of the Weitzman Institute's Department of Chemical Physics, and Dr. Meyer Wechsler, a visiting scientist from El-Op Ltd., a Rehoboth-based electro-optics and engineering firm (Israel High Tech and Investment Report, October 2012).

Experimentation with the most powerful solar-pumped laser operated anywhere in the world has yielded a record 100 watts of frequency-pure infrared laser light--double the power ever previously extracted from any type of sun-powered laser. The long-term goal is to design communication and industrial devices.

Solar-pumped lasers are promising for photochemistry, free space optical communication, and wireless power transmission in space. Developing solar-pumped lasers with great potential for satellite communications, building solar-heated gas turbines to generate electricity, producing hydrogen from water for use as a clean fuel, gathering sunlight in bright, arid regions and piping it as energy-rich gas to energy-consuming regions, and creating advanced solar cells are all examples of ambitious projects.

Wireless Power Solutions

Ran Poliakine, Powermat

Ran Poliakine was born in Haifa, Israel. He attended Jerusalem's Bezalel Academy of Arts and Design.

In 2007, Poliakine founded Powermat, a wireless charging startup (Globes, 2024). Wireless charging on surfaces was created by the firm.

Up until 2014, Poliakine served as the company's CEO. Due in part to a distribution agreement with Starbucks, the business generated \$200 million in revenue annually at its height and was valued at \$1.3 billion. Despite various challenges in recent years, the company is still regarded as the market pioneer for wireless charging.

In October 2012, Powermat and Starbucks announced a pilot program to install Powermat charging surfaces in store tabletops in 17 Boston-area locations (Gilbert, 2012). The technology is consistent with Starbucks' environmentally friendly guidelines. Powermat Technology was adopted by General Motors, Procter & Gamble, Duracell, General Motors, Starbucks, Flextronics, and AT&T.

Powermat Technologies provides advanced Qi-certified and proprietary wireless power solutions for IoT, telecom (5G), automotive, robotics, consumer electronics, medical devices, and industrial applications (powermat site). Powermat wireless power solutions and IP licensing programs enable global businesses to incorporate advanced wireless power into their products and customize solutions for unique use cases. Powermat wireless power solutions have been used by major players in the global market, including Samsung, General Motors, Flex, Harman International, Pivotal Commware, and Kyocera. Powermat solutions are found in more than 800 million smartphones, 40 million embedded accessories, and 8 million automobiles globally.

Uses the low-power, long-range RF technology and engineering/productization skills of Powercast and the high-power, short-range SmartInductive technology of Powermat to create a single location for everything related to wireless power. On June 13, 2023, two of the world's pioneers of wireless power technology, Powercast with its long-range over-the-air RF (radio-frequency) technology, and Powermat with its SmartInductive™ hybrid inductive/resonance technology, are partnering to create one team that can implement both short and long-range wireless power designs optimized for each customer's application (powercast site). PowerNovelties division focuses on creating toys, games, gifts, stationery, and promotional items using flat power cells. Companies such as Hallmark and Marks & Spencer are already selling products around the flat cells. Toy manufacturer Hasbro Inc., which counts among its brands Playskool, Tonka, Milton Bradley, Parker Brothers, and Tiger Toys, recently agreed with Power Paper as well and plans to start marketing toys with Power Paper cells next year.

The company's PowerID division develops smart tags that can track products from anywhere, store data, and transmit it over extended communication ranges. Unlike 'passive' labels that must be manually scanned or registered, Power Paper's tags actively transmit information for just a few cents per label. They can also track environmental factors, so you can track whether a temperature-sensitive product, like meat, or blood being sent for a transfusion, stays above a certain temperature for too long.

Green Hydrogen

Hen Dotan, Gideon Grader, and Avner Rothschild. E-TAC, H2Pro

H2PRO was founded in 2019 by leading hydrogen experts from the Technion, Dr. Hen Dotan, Prof. Gideon Grader, and Prof. Avner Rothschild in collaboration with the team that founded Viber, Juno, and iMesh (H2Pro site).

Similar to electrolysis, Electrochemical, Thermally Activated Chemical (E-TAC) uses electricity to split water into hydrogen and oxygen. Hydrogen and oxygen are produced independently in two distinct processes, an electrochemical (E) step, and a thermally-

activated chemical (TAC) step, in contrast to traditional electrolysis. Membrane-free electrolytic reactors from E-TAC are appropriate for both economical scaling and high-pressure hydrogen production. This disruptive process enables the production of green hydrogen in a way that retains high energy efficiency (98.7%HHV) inside the cells (see Nature article) and a 95% system efficiency. The company's E-TAC method for producing green hydrogen by splitting water is over 95% efficient, safe, and cost-competitive compared to fossil-fuel hydrogen (Star up Nation Central, 2023).

The Nano-technological Coating that Cools

Yaron Shenhav, SolCold

Yaron Shenhav has a BSc in Electronic Engineering from Tel Aviv University Oct '01 - May '06 and an MBA Tel Aviv University Apr '11 - Mar '13.

SolCold was established in 2016 and is a global leader in the study and creation of outdoor cooling coatings. Our goal is to offer solar-powered, eco-friendly cooling systems. In the not-too-distant future, we see sustainable cities and other sectors implementing our coatings as normal practice, hence decreasing reliance on power for outdoor cooling.

Everything is cooled by a patented nanotechnology layer created by SolCold. The material works best when it is extremely hot and the sun is at its fiercest because it uses the sky and sunlight to cool. The coating can be used to cool cars, buildings, containers, apparel, airplanes, etc., and is anticipated to drastically cut greenhouse gas emissions and result in enormous savings on cooling and air conditioning costs.

After 3.5 years in the lab, in 2022, SolCold did 25 (all paid) pilots with major companies, such as Volkswagen, Hyundai, Elbit Systems, and the Tel Aviv municipality. Large sales deals are being negotiated, and the first results are very encouraging.

Herewith some of the projects:

IPS The Israel Prison Service, Buses, and Passengers area Up to 11 °C lower than uncoated vehicle

Volkswagen, private car, Up to 11 °C lower than uncoated vehicle

AbnBev World's largest brewer, Electric Trucks, Up to 7 °C lower interior than uncoated vehicle

Innoviz, a Global leader in LiDAR technology, Defense, and comm boxes, is 12 °C lower compared to a white-colored box

Tefron World's top man. of seamless intimates and activewear, Textiles, sport shirts, and coated shirt areas 12 °C cooler

Elbit Defense, Camera, about 4 °C on the internal hot electronic component

HEALTHCARE

Healthcare innovation in Israel spans a diverse array of fields, including: Diagnostic and therapeutic equipment and devices; Drug therapies and pharmaceutical advancements; Laser surgery technologies; 3D bioprinting for tissue engineering and regenerative medicine; Robotics applied in surgery and patient care; Healthy food and Natural cosmetics with therapeutic properties. These innovations predominantly originate from academic institutions and their affiliated research centers, as well as from researchers linked to these institutions, reflecting a strong connection between academia and healthcare technology development.

Diagnostic Equipment and Devices

Avraham Suhami, Nuclear Physics Medical Imaging Solutions, Elscint and Elscint Tomography

Dr. Avraham Suhami was born in Izmir. He immigrated by himself to Israel when he was 14 years old. Before enlisting in the Israeli army, Suhami worked in the textile industry after spending two years on a kibbutz. Following three years of military service, Suhami attended Hebrew University in Jerusalem in 1956 and graduated with degrees in mathematics and physics. In 1960, he switched to the Technion. Where he completed a doctorate in nuclear physics and was appointed as a Nuclear Physics professor at the Technion to the faculty. A group of graduates led by Avraham Suhami established Elscint, in 1969 with the goal of applying nuclear physics. Elscint is a contraction of the words "electronic" and "science." research to develop and market products (webarchive).

Elscint developed, manufactured, and sold medical imaging solutions, including Nuclear medicine, computed tomography magnetic resonance imaging, and X-ray scanners.

The VDP1 is a gamma scanner used to monitor radioactive isotopes in the body. The Elscint's first commercial success was this VDP1. A North American exclusive distribution contract was struck between Elscint and General Electric.

In 1990 Elbit Computers Ltd, a sister company of Elscint, and a subsidiary of Elron, acquired a majority share in Elscint. In 1999, sold all its holdings in Elbit Medical Imaging to Europe Israel Ltd controlled by real estate developer Mordechai (Moti) Zisser. Zisser reorganized Elbit Medical Imaging as a holding company with an emphasis on real estate, hotel development, and shopping and entertainment malls, integrating his previous real estate endeavors into the business.

In 2005, Elscint was delisted and became a wholly owned subsidiary of Elbit Medical Imaging. GE Healthcare and Philips Medical Systems purchased the majority of Elscint's operations.

Breast imaging medical diagnostic equipment is developed by Elscint Tomography. Dr. Avraham Suhami's invention of Linear Velocity Imaging Tomography served as the foundation for the company's technology.

Thanks to this exclusive technology, doctors' offices and medical facilities around the globe can provide women of all ages with more efficient breast scans without exposing them to dangerous X-ray radiation or compressing their breasts. Even with imaging of the pendant breast up to the rib cage. The technology allows for breast scans even at a young age or during pregnancy without fear of the cumulative effects of ionizing radiation.

The 3D imaging can be performed in approximately one minute and offers a clearer image than X-ray imaging due to higher contrast. In the event of suspected malignancy, the technology also provides an opportunity to delay surgery by measuring the growth rate of the tumor to assess its aggressiveness and/or attempting in situ growth elimination by cryotherapy, radiation, and/or chemotherapy. The principles of Linear Velocity Imaging Tomography have been confirmed in clinical measurements performed at Rambam M.C. in Israel under an IRB-approved Helsinki protocol and submitted for publication.

Things are different with Suhami's breast cancer diagnosis method. Senior officials at Rambam Health Care Campus, led by hospital director Dr. Rafi Beyar Weinberg (2016), heard Suhami's presentation of the proposal.

He connected Suhami with Prof. Marsha Javitt, one of the top female oncologists in the world. Javitt immigrated to Israel shortly before that and was appointed manager of the Rambam imaging department. She examined the idea and confirmed that it was indeed interesting and appeared practical.

Javitt became a fervent supporter of Elscint Mammography, despite the fact that she now holds no formal position within the business, which Suhami and his son Shmuel run.

Mammography is controversial now, specifically in the 40-49 age bracket, and one out of every six women with breast cancer is in this age bracket. Ultrasound is also not sensitive enough, while MRI is expensive, and the effect of the contrast medium is also unclear. Women with dense breast tissue are at high risk of getting the disease, and it's especially hard to diagnose it with them. Even if you use two diagnostic methods on top of each other today, you miss 30-50% of the cancer cases.

Radiation from our device is very safe. It's the same radiation as from a cellular device, which has been examined for years to see if daily use for hours is hazardous. As of now, they haven't found a risk, other than people who don't listen to each other. We use this radiation for a fraction of a second, compared with the ionizing radiation in mammography, which is known to be hazardous.

The technology is very accurate on the one hand and very quick on the other. In imaging, we usually sacrifice either rapidity or accuracy.

Suhami presented Javitt with the prototype. The machine is expected to also tell us the type of tumor - whether it is malignant or benign. That can eliminate the need for a biopsy.

Gideon Barak, Detect and Classify Cancer Early, HT BioImaging

From 1980 to 1983, Gideon Barak earned a Bachelor of Arts in Economics from Tel Aviv University. Gideon then pursued their Master's in Business Administration (MBA) with a focus on finance and marketing at Tel Aviv University from 1984 to 1986.

Gideon Barak is a distinguished entrepreneur and business leader with extensive experience in technology and innovation. As Co-Founder and Chairman of HT BioImaging, Gideon has led initiatives in early cancer detection through Heat Diffusion Imaging and AI. Chairmanships at Idesia, Advasense, IXI Mobile, and Envara, with an emphasis on wireless communications, biometric solutions, and image sensor technologies, are examples of prior leadership positions.

Barak also served as Chairman of the Board at Advasense Image Sensors from 2004 to 2011, contributing to the development of innovative CMOS Image Sensor products for cameraphones.

For early cancer detection, HT BioImaging, a medical imaging business, has created a novel medical imaging modality that is precise, instantaneous, and completely safe. With HT Vista, HTVet, a division of HT Bioimaging, introduces the technology to the veterinary sector. The first non-invasive medical tool that enables veterinarians to immediately rule out cancer in the clinic is called HT Vista.

Gavriel Iddan, PillCam SB Capsule, Given Imaging

Born in October 1941 in Haifa Israel, Gavriel Iddan is an Israeli electro-optical engineer and the inventor of wireless capsule endoscopy (dpedia site). Initially at RAFAEL Armament Development Authority working on guided missile technology, Iddan got the idea for an endoscopic capsule while on sabbatical in Boston from a neighbour, an Israeli gastroenterologist suffering from undiagnosed stomach pain.

As the field of endoscopy developed in the twentieth century, easy and accurate visualization of the small bowel remained elusive (epo site). Medical professionals were able to examine the top 1.2 m and bottom 1.8 m of the human digestive tract with the use of gastroscopes and colonoscopes, but it was still more challenging to reach the middle 6 m, which is the small intestine.

Direct visual access to the small intestine was not possible with conventional diagnostic techniques like X-rays and ultrasounds. For small bowel diagnostics, doctors were occasionally required to do exploratory surgery, which is a dangerous and extremely

unpleasant procedure for patients. These restrictions reduced the likelihood that gastrointestinal disorders might be successfully detected early.

Gavriel Iddan introduced the concept of wireless capsule endoscopy in the mid-1990s, which revolutionized the area of gastroenterology.

In the realm of gastrointestinal diagnostics, Gavriel Iddan's invention of a pill-sized camera for wireless capsule endoscopy created a plethora of new opportunities. For the detection of gastrointestinal disorders, the PillCam video capsule provides an alternative to less patient-friendly or more invasive methods.

In 1998, Mr. Iddan co-founded Given Imaging to market his new prototype. In 2001, his work was formally unveiled.

The PillCam SB capsule, which weighs 3.7 grams and measures 11 mm by 26 mm, has a radio transmitter, two silver-oxide batteries, six LEDs, and an image chip video camera. After being swallowed by the patient in need of diagnostics, the capsule passes through the patient's digestive tract as intended and is normally eliminated.

The transmitter in the PillCam SB capsule communicates with the patient's wearable sensors. Additionally, a pager-sized device worn by the patient records all of the data, which is sent at a pace of two photos per second, for a total of about 50,000 images. The patient is free to move around as usual for the duration of the 8.5-hour capsule exploration.

Sales of PillCam SB have brought Given Imaging considerable financial success. Gavriel Iddan sold the company to Irish medical device maker Covidien for \$860 million in 2013 (Globes, 2013). Covidien was acquired by Medtronic in 2016 and is now the provider of Pillcam.

Hossam Haick, Nano-artificial Nose, SniffPhone

Israeli chemical engineer Hossam Haick is the inventor of a 'nano-artificial nose' that can detect cancer and kidney disease (Israel21c, 2017).

Haick, who was born and reared in the Christian Arab community of Nazareth, is not the only non-Jewish graduate of the Technion in Haifa (2002) and Ben-Gurion University of the Negev (1998).

His first role model was his father, a mechanical engineer and lecturer at ORT Braude College in Karmiel. At an early age, Hossam began browsing his father's bookcase, and by eighth grade, he was certain that the sciences were the path he wanted to take.

His mother, who has a college degree in history, chose to be a full-time mother to Hossam and his four siblings.

He returned to the Technion, from which he'd earned his PhD, as an assistant professor in 2006.

Haick lives in Haifa with his wife, Rana, a chemist and food engineer at the Israeli Ministry of Health, and their three-year-old son. He reads literature in English, Hebrew, and Arabic, and walks six to eight kilometers (four to five miles) before starting his day in the lab.

Haick developed an inexpensive “nano-artificial nose” (NA-NOSE) that detects the symptomatic odour caused by some cancerous tumours, Parkinson's dementia, multiple sclerosis, and many more diseases. Its accuracy range is between 86 and 93 percent. (Trip to Culture, 2021).

In the last two years, the device has proven effective in distinguishing between lung, prostate, breast, and colorectal cancer, and we can distinguish between head and neck cancers and lung cancers, without blood tests or biopsies.

Raffi Rembrand Maayan Shahar, Early Detection of Autism, SensPD

Rembrand is the father of a child with autism who has devoted his life to studying this field. His son was only diagnosed when he was 4 years old. Rembrand is an engineer who specializes in signal processing and that is also the technology used.

Our interaction with the world consists of three stages. The first stage is signal registration – signals that are registered and received via the five senses. The second stage is sensory perception. The information received via our senses undergoes a process of enhancement and filtering and reaches the brain stem. During the third stage, the information moves from the brain stem to the cortex for processing and decoding. Research has revealed and proved that in people with autism, the first stage works properly. In other words, the problem for autistic people starts in the second stage – the sensory perception stage – due to some disorder in the filtering process that is expressed in what we define as autism i.e., communication and behavioral problems.

Early intervention, changes the lives of those with autism. The problem is that the diagnostic process of autism is behavior-based and is therefore only possible at a later age. SensPD measures the source, the sensory perception mechanism, which causes the impaired functioning associated with autism.

The simple, short, and non-invasive test is conducted with a device called OAE (Otoacoustic Emission) and is similar to the deafness test used worldwide on babies after birth. It requires minimal cooperation on the part of the patient, is performed without anesthesia, and tests the sensory perception mechanism that is developed already after birth. In practice, SensPD has taken this device a step further by making several IP-protected technological alterations in order to measure the sensory perception system performance and thereby identify autism.

The study is being conducted together with the Shaare Zedek Medical Center and is headed by Dr. Adi Aran, a leader in the study of biomarkers for autism. The results of the study, which encompasses children between the ages of 1.5-13 years, will help us advance to a prospective study with newborn babies.

The Vision: An Autism Diagnosis for Every Newborn Baby

Similar to the current deafness test, SensPD hopes to integrate its technology into postnatal screening testing.

David Groberman, Home Pregnancy Monitor, HeraMED

David Groberman, the Co-Founder of HeraMED, is an engineer, visionary, and the mind behind home-based, connected maternity care.

David and his wife Odelia witnessed firsthand in 2011 the crippling worry and anguish that too many expectant couples endure when worries about their unborn child grow.

David was both thankful for their baby's well-being and furious at the procedure after a night of worry, tension, and an ER visit. That evening, David had the idea for our first commercial product, HeraBEAT™, a smart, networked fetal heartbeat monitor for the home.

HeraMED is creating home-use-connected pregnancy monitoring devices. Fetal health and parental confidence are the main goals of HeraMED's hardware and software products.

The company is a medically accurate and scientifically optimized smartphone-based fetal heartbeat monitor for home use. With HeraBEAT, pregnant women may effortlessly share fetal vital sign data with medical specialists and keep an eye on the fetus' heartbeat from anywhere at any time.

Ofer Peleg, a Non-invasive and Real-time Biomarker of Cancer, Infiniplex

Ofer Peleg has a Ph.D in Bioinformatics, Microbiology, and Molecular Biology from 2007 Veterinary school of the Hebrew University of Jerusalem and was a postdoctoral fellowship in Professor Shimon Harush lab at the Veterinary School of the Hebrew University of Jerusalem in collaboration with Genaphora Ltd (infiniplex site).

Ofer Peleg, identified dozens of mutations in various cancer types, Infiniplex.

The product utilizes DNA that freely circulates in the bloodstream (cell-free DNA, cfDNA) as a non-invasive and real-time biomarker of cancer. In a single test, it may detect dozens of mutations in different forms of cancer by using a multiplexing technique.

Shmulik Bezalel, Miniature 3D Replicas of Human Brains, Itay&Beyond

The platform decode brain activity, predict drug efficacy, improve lives (itayandbeyond site).

Itay&Beyond was founded by Shmulik Bezalel and inspired by his son Itay, who has Autism Spectrum Disorder (ASD). Animal models, particularly mice, often do not predict human outcomes accurately. Miniature 3D replicas of human brains grown from patient cells, provides a more accurate model than traditional animal testing.

The platform decodes brain activity and predict drug efficacy. Bezalel joined forces with Mr. Boaz Goldman, Prof. Ariel Tenenbaum and Dr. Nisim Perets to establish the company.

Boaz Goldman is a seasoned entrepreneur and investor with a track record of nurturing groundbreaking technologies. Prof. Ariel Tenenbaum is the Head of Children's Neurological Dept., Hadassah hospital. Dr. Nisim Perets is a neuroscientist with high-impact publications and innovative research in drug development.

The capabilities of the platform are:

Detection of abnormalities in organoids for precise analysis.

Drug testing and predictive modeling for effectiveness in correcting identified abnormalities.

Versatile platform adaptable to a broad spectrum of neuropsychiatric and neurological disorders.

The data presents a visualization of brain organoids through three-dimensional reconstruction. It enables the detection of morphological and size abnormalities in patients with autism spectrum disorders compared to the control brain organoids.

Arik Ben Ishay, Israel Sarussi, Blood Pressure Monitoring, Biobeat

Biobeat's 24 hour monitoring measures blood pressure uses cuff-less, wireless, non-invasive, medical grade and FDA cleared chest patch.^[1]

Arik Ben Ishay has vast experience in management of advanced technological projects. During 2005-2011, he served as the Director of Startups and the Director of Technology Incubator in the Rocket and Space Department of the Israeli Ministry of Defense. From 2012-2016, he was the Director of the Hardware and Software Division at Symcotech LTD, developing and managing information systems requirements of the division.

During 1990-1995, Israel Sarussi worked in the Israeli Ministry of Defense on the development of advanced RADAR technologies. In 1995-1997, he was working on sophisticated control systems for agriculture and from 1997-2010, he served as the CTO of SPO Inc.

Drugs and Therapeutic Equipment

Dvora Teitelbaum, Michael Sela, and Ruth Arnon, Copaxone, for Multiple Sclerosis (MS), Teva

Dvora Savitsky was born in Tel Aviv in 1941 to parents who immigrated from Poland in the 1930s (Weizman Wonder Wander, 1997; tevapharm site). She was raised in Tel Aviv and developed a fascination with science in high school, focusing on biology. She married Chaim Teitelbaum in 1962 after meeting him while serving in the military. Teitelbaum went on to become a prominent IDF officer.

Dvora Teitelbaum earned her master's degree in biology from Tel Aviv University in 1966. After that, she relocated to the Weizmann Institute, where she started her doctoral studies in the Department of Immunology under the guidance of Professor Ruth Arnon.

Born in Poland in 1924, Prof. Michael Sela immigrated to British Mandate-controlled Palestine in 1941 (weizmann site). After studying chemistry at the Hebrew University of Jerusalem, he earned a PhD in protein chemistry from the Hebrew University in 1954 for work at the Weizmann Institute.

Born in 1933 in Israel, Ruth Arnon studied chemistry at the Hebrew University of Jerusalem, where she graduated in 1955 with an M.Sc. (wolffund site). Under Michael Sela's supervision, she began her doctoral studies at the Weizmann Institute of Science in 1960.

The concepts of immunogen and immunogenicity were initially introduced into immunological research by Professors Michael Sela and Ruth Arnon. They were also the first to use synthetic polypeptides. They paved the way for the creation of peptide vaccinations and considered synthetic vaccines to be merely a medication design concept. Their groundbreaking discoveries made it possible to create tailored peptides to treat autoimmune disorders and safe, long-lasting vaccinations against infectious diseases.

Copaxone inhibits the progression of multiple sclerosis and has been marketed in dozens of countries worldwide, earning billions of dollars for Teva Pharmaceutical Industries, which held exclusive rights to it for many years. In 1996, the FDA approved the drug for marketing, based on a patent recorded more than two decades earlier by three scientists from the Weizmann Institute. Two senior scientists, Prof. Michael Sela and Prof. Ruth Arnon are well-known for winning awards such as the Israel Prize, the Wolf Prize, and the Rothschild Prize.

However, the third party, Dvora Teitelbaum, remained in the shadows, not sharing the glory and limelight of the other two.

In addition to researching immune responses, the team was looking for methods to cause experimental autoimmune encephalomyelitis (EAE), a multiple sclerosis model in which

the immune system assaults myelin, in lab animals. Nerve fibers are covered with a lipid covering called myelin, which enables electrical signals to flow through them.

Teitelbaum was in charge of the development of these proteins-like polymers to induce EAE in laboratory animals. She spent almost a year testing various materials to determine how they bonded to lipids, but all of her research was in vain because the sickness was not brought on by the injected chemicals. As a result, she and her advisors came up with an additional idea: if these synthetic proteins do not cause illness, they could be able to rival the proteins that do.

This strategy turned out to be far more successful. They quickly discovered a collection of small proteins known as copolymers, which were beneficial against EAE. One of these compounds, copolymer-1, was likewise highly successful in both avoiding the disease if administered prior to the introduction of the causal protein and reducing the disease if administered to an animal that was already exhibiting symptoms. Teva later bought this substance, which was dubbed Copaxone.

The researchers were able to patent the material evenly among Sela, Arnon, and Teitelbaum by the time Teitelbaum finished her doctorate in 1974.

Teitelbaum remained in the Department of Immunology at the Weizmann Institute, where he continued to work on Copaxone as a research fellow. As a consultant to Teva, she helped the business organize and carry out research and trials when they started developing Copaxone as a medication.

Prof. David (Dedi) Meiri, Medical Plants, Cannabis, IMC

IMC has been doing groundbreaking progress to improve the quality of its different strains and the active ingredients in medical plants (imcannabis site).

Alien SinMint Cookies is an Indica-Dominant Hybrid which produces large frosty buds with strong minty overtones, and an earthy, flowery sweetness. The strain is a cross of Alien OG and SinMint Cookies. Peanut Butter Miracle Alien Cookies (MAC) is an exotic indica dominant hybrid strain, with a distinct earthy-nutty aroma. The strain is a cross of MAC and Peanut Butter Breath.

Roma is an elegant, powerful strain that is known for its strong impact and influence. The high Tetrahydrocannabinol (THC) concentration, its earthy taste, and its strength tell us of an indica dominance. Roma helps relieve pain, treat nausea, and encourage sleep, which makes it more suitable for nighttime treatments.

Tel Aviv: this sativa-dominated strain was named after the vibrant city of Tel-Aviv, because both are known for uplifting the spirit and enhancing creativity. Its sweet, exotic flavor helps increase patients' appetite and treat eating disorders, while providing a lively, energetic feeling.

London: as a distinct indica with high THC concentration levels, London stands out thanks to its flavor, which combines sweet spiciness with a deep earthy scent. Its strong influence enables patients to ease insomnia and makes this strain a good fit mainly for nighttime usage. IMC is an international cannabis company that provides premium cannabis products to medical patients in Israel and Germany (imcannabis site).

The IMC ecosystem operates in Israel through a commercial relationship with Focus Medical Herbs Ltd., which imports and distributes cannabis to medical patients, leveraging years of proprietary data and patient insights. In Germany, the IMC ecosystem operates through Adjupharm GmbH, where they distribute cannabis to pharmacies for medical cannabis patients. Until recently, the Company also actively operated in Canada through Trichome Financial Corp and its wholly owned subsidiaries, where it cultivated, processed, packaged, and sold premium and ultra-premium cannabis at its own facilities under the WAGNERS and Highland Grow brands for the adult-use market in Canada.

IMC founded a start-up platform called IMC Venture, which is a co-partnership with Prof. David (Dedi) Meiri of the Laboratory of Cancer Biology and Cannabinoid Research at the Technion's Faculty of Biology.

Prof. Yitzhak Ashkenazi, Cannabis, Tikun Olam, Cannbit Pharmaceuticals

Prof. Yitzhak Ashkenazi is a doctor and international expert on management and leadership in crisis situations, communal resilience, epidemiology, and mass casualty incidents, with extensive professional and academic experience (richardsilverstein site).

Cannbit pharmaceuticals, a public company, acquired Israeli medical cannabis pioneer, Tikun Olam in 2019 (canbit site). Tikun Olam-Cannbit LTD. is a leading supplier on the local market. Since its establishment, the company has treated more than 30,000 patients in Israel from childhood through to old age with a variety of illnesses, and has the most experience worldwide in the treatment of patients and in alleviating their suffering through medical cannabis.

The company has 15 years of experience in clinical research and more than 35 clinical and pre-clinical research studies which have been published in the world's foremost scientific journals. Cannbit has production facility in the north of Israel and cultivation farm at the Dead Sea were received the EU-GMP certification.

Yohai Golan Gild, Medical Plants, Cannabis, Better

Yohai Golan Gild, Better founder, and CTO moved to Israel from California due to its supportive cannabis research laws, and today Better has treated over 12,000 patients more accessible arena to study the drug.

Better is a global player in the production of medical cannabis at the world's highest standards in various countries, led by Israel and Australia. In Israel, Better has full ownership of its farm in Kokhav Michael and is a partner in the farm in Kfar Ahim.

The company's wide array of strains and products have been tailored for use for different indications and have a proven record of improving the health of patients. They have further gained recognition from researchers and professionals in the field.

Herewith two other plant specialisations.

Indica Pink Kush (P.K) Oil: Better has been nurturing and cultivating the P.K. strain for more than a decade, during which it has refined and stabilized the strain's genetic qualities, which provides an effective solution to thousands of patients suffering from insufferable pains, post traumatic conditions and oncological and neurological indications. This strain is also effective as an appetite stimulant induces a sense of tranquility and enables continuous and quality sleep.

Cure E.P: Cure E.P is special inflorescence rich in Corticobasal Degeneration (CBD) that is produced from the PhD strain that has been grown and cultivated by Better since 2009. A significant concentration of CBD helps strengthen the immune system, reduces inflammation, reduces anxiety levels and contributes to significant physical and mental improvement.

Shulamit Levenberg, 3-D Bio-Printing

The Center for 3D Bioprinting and the Rina & Avner Schneur Center for Diabetes Research are both directed by Shulamit Levenberg, a professor and former dean of the Technion Faculty of Biomedical Engineering. Her position at the site is the Stanley and Sylvia Shirvan Chair in Cancer and Life Sciences.

Born in 1969 and raised in Israel, she did in 1992 her BSc Magna Cum Laude, in Biology, Faculty of Life Sciences, Hebrew University, Jerusalem, her PhD in 1999 in Molecular Cell Biology, cell adhesion at the Weizmann Institute her post-doctorate research (1999-2002) on tissue engineering with Prof. Robert Langer at MIT.

Prof. Levenberg conducts interdisciplinary research on stem cells and tissue engineering, with implications for regenerative medicine and sustainable food production (bme.technion site). According to her research, complex tissues, including blood vessels, may be produced in a lab and, when transplanted, these designed tissue constructs can blend in with their host. Dina Safina, Ph.D., Galia Ben David, Lab Engineer, and her team Science writer & Research Lab Manager, Inbal Michael, Ph.D., Lab Manager, Orit Bar-Am, Lab Manager and Janette Zavin Technician recently developed a unique stem-cell engineered tissue constructs that induce the regeneration and repair of injured spinal cords and genetically engineered muscle tissue for treating type 2 diabetes(levenberglab site).

She is the creator and CSO of two start-up businesses, one of which is Aleph Farms, which is transforming the food sector by using cow cells to produce authentic meat without endangering the environment or animals.

As tissues in the body fail or need replacing, a growing number of scientists are creating tissues in their labs that can help with ailments and even save lives when they are added to the body (bsf site).

Tissue engineering allows researchers and scientists to cultivate three-dimensional tissue samples in a laboratory. They do this by taking cells and growing them on 3-D scaffolds. The idea is for the cells to attach to the scaffold, then grow, differentiate, and assemble into the tissue. Then, these pieces of tissue can be used for implementation into the body in order to repair or restore damaged tissues in the body.

The process is complex, and the possibilities are far-reaching. Projects at Levenberg's lab alone have included facial reconstruction, spinal cord injury regeneration, bone tissue healing, and even creating a type of cell-grown meat that would the taste buds of meat lovers without sacrificing the lives of animals.

Isaac Kaplan, Uzi Sharon, Laser Surgery

Isaac (Yitzhak) Kaplan was born in the small town of Kroonstad and was only 11 years old when Zeev Jabotinsky came to Johannesburg (Dromi, 2012).

Kaplan volunteered for the South African army during World War II and became an interpreter in the communications corps because of his fluency in Italian (Photonics, 2012). As a demobilized soldier, he was accepted to medical school at Witwatersrand University in Johannesburg but cut short his fourth year of studies in March 1948 to assist in the escape of some pre-state underground members who were sent to Kenya by the British.

Kaplan arrived in Israel in 1952 and was employed by the Rambam Medical Center in Haifa. He trained under Sir Harold Gillies, the founder of British plastic surgery, in England after completing his fellowship in plastic surgery at Hadassah University Hospital in 1954.

Professor Isaac Kaplan is a pioneer in the creation of the first carbon dioxide laser for general surgery and founder of the International Society for Laser Surgery and Medicine.

Kaplan was the former chair of plastic surgery at Tel Aviv University and an emeritus professor of surgery. At Beilinson Hospital (now Rabin Medical Center), he founded and oversaw the Department of Plastic and Reconstructive and Maxillofacial Surgery.

According to the obituary, he established Israel's first burn unit in 1967. In the midst of the Vietnam War, he was dispatched to Saigon a year later to set up a sizable hospital. Later,

he trained over 600 surgeons worldwide on how to do a variety of procedures using the CO2 laser.

In 1972, Kaplan created the Sharplan Laser, an instrument with precision and versatility not before possible in laser technology, with engineering assistance from his colleague, Uzi Sharon.

In addition to trying to create a device that would be human-friendly, they planned to study the use of CO2 lasers in surgery generally. Engineered and designed especially for clinical surgery, bearing in mind the physical conditions and requirements of the average operating room and the idiosyncrasies of the average surgeon.

An articulated arm, with mirrors, was necessary in order to bring across the beam, which was maneuverable. The apparatus ended in a handpiece, which was sterilizable, easy to handle, and small enough to handle properly.

Laser Industries, Sharon and Kaplan company was the world's leading producer of a broad range of carbon dioxide surgical lasers. In 1997 Laser Industries merged with ESC Medical (Ginsburg, 1997).

Eli Hurvitz, Teva, Dr David G Poplack, Hematology Oncology Paediatric Excellence (HOPE) generic drugs for Sub Saharan Africa

Eli Hurvitz was Born in 1932 in Jerusalem. Eli Hurvitz joined Teva in 1953 and served the company for 58 years. He retired in 2002 after 25 years as CEO and served as Chairman of the Board until 2010.

In 1964, Eli led the merger of Assia with Zori, one of many small pharmaceutical manufacturers in Israel, and in 1969 acquired a controlling interest in the publically traded Teva. In 1976, the three firms merged to become Teva Pharmaceutical Industries Ltd.

He was one of the first to realize the huge potential of the generic drug market for developed and developing countries.

Most of the medicines Teva makes are generic medicines that contain the same active, or key, ingredient(s) as the original medicine brand. Due to the relatively lower cost of production, generic medications are usually offered at a significantly lower price than their branded counterparts. Generic medicines cost, on average, 80–85% less than brand-name medicines.

Teva has the largest supply chain of any pharmaceutical company and its network of 37,000 employees and 53 global manufacturing sites work around the clock to make sure our medicines reach patients across six continents and more than 60 countries. More than 800 generic medications are presently being developed by Teva scientists.

There is a massive childhood cancer challenge in Africa (Teva pharm, 2023). To put it in perspective; in the U.S. Approximately 80% of the 15,000 children cancer cases that occur each year are successful. Every year, 100,000 children in Sub-Saharan Africa are diagnosed with cancer, and 90% of them pass away.

Dr David G Poplack, Director of Global Hematology Oncology Paediatric Excellence (HOPE) is internationally recognized as a leader in the field of pediatric oncology who launched Global HOPE in 2016 from Texas Children's Hospital, the largest children's hospital in the US.

When Dr. Poplack learned that Teva supplies 70% of the medications required to support children with cancer, the Teva collaboration was born. A meeting at the UN General Assembly on NCDs in 2018 was effective in starting the relationship. To date, Teva has supplied approximately 25 different medicine types to the regions, including chemotherapy support and antibiotics. The Teva partnership also has the potential to help with medicine management, which is a vital skill in programs like this.

Judith and Kobi Richter, Stent, Medinol

The history of percutaneous coronary intervention (PCI) is marked by rapid technological advancements that have taken place over the past 40 years (Schmidt and Abbott, 2018). The mainstay of PCI was balloon-expandable metal alloy stents following a phase of balloon angioplasty, which was characterized by the danger of abrupt artery closure and vascular recoil. The current PCI period was brought about by the development of drug-eluting stents (DES), which addressed in-stent restenosis, a prevalent cause of stent failure. The field has progressed since the initial generation of DES thanks to developments in stent design and polymer research. The current generation of DES features exceptional safety and efficacy profiles, thin struts, biocompatible or absorbable polymers, and good deliverability.

Dr. Kobi Richter graduated from Tel Aviv University with a Ph.D. in Physiology and Pharmacology. He is currently a member of the Center for Brains, Minds, and Machines (CBMM) Advisory Board and the Columbia University Medical Center Cardiac Council. in the McGovern Institute for Brain Research at MIT's Department of Brain and Cognitive Sciences.

He was a faculty member for over 10 years at Tel-Aviv University's Graduate School of Business, where she specialized in corporate strategy and decision-making under uncertainty. In addition, Dr. Richter was chief of research and development for the Israeli Air Force and a post-doctoral and research fellow at the Massachusetts Institute of Technology (MIT)'s Artificial Intelligence Laboratory and Brain Research Department.

One of the most renowned business executives in the Israeli industry, Dr. Judith Richter is a successful businesswoman.

The NIR stent was first introduced in 1996 and revolutionized interventional cardiology (medinol site).

The first stent to offer both flexibility and sturdy scaffolding, Medinol's NIR stent allowed for the treatment of lengthier lesions in more intricate anatomy.

This discovery significantly increased the number of patients who could benefit from stenting and established stenting as the preferred course of treatment versus riskier, more involved, and costlier surgical procedures.

Among the most clinically researched bare metal stents ever created are NIR stents. More than 5000 patients have participated in more than 25 clinical investigations that have investigated NIR and its successors since 1995.

Medinol Received FDA Approval for Next Generation EluNIR-PERL™ Drug-Eluting Coronary Stent System, Oct. 24, 2023 ((cosohealth 2024 site)

EluNIR-PERL builds upon the proven performance and clinical data of the EluNIR™ DES system. EluNIR-PERL, the most recent development in the EluNIR DES family, has a hybrid polymer-metal radiopaque catheter tip and four radiopaque markers—two at each end of the stent. These unique features allow outstanding visualization during PCI procedures whether navigating through complex anatomies or precise placement of the stent.

EluNIR-PERL™ is exclusively available in the United States through CoSo Health, an innovative healthcare supply and logistics company changing the way medical devices are distributed and sold.

***Shimon Eckhouse, Intense Pulsed Light (IPL), Elos Technology
Shapeshifting Capsule, ESC Lumenis, Syneron, Venter Technologies, and
Epitomee***

Born in 1945 Shimon Eckhouse holds a BSc in physics from the Technion – Israeli Institute of Technology and a Ph.D. from the University of California, Irvine, with a degree in physics. He is the inventor of IPL technology which he brought to market in 1994 in ESC and is the most popular non-invasive energy-based technology for a broad range of non-invasive medical aesthetic applications.

From 1992 until 1999, Shimon served as the founder, chairman, and chief executive officer of Lumenis (formerly ESC). In 1996, he listed the business on the Nasdaq, raising over \$250 million through three IPOs. The company eventually attained a valuation of over \$1 billion, giving investors a return of more than X120 on their investment.

He is also a co-founder of Syneron and co-developer of the proprietary elos technology on which Syneron's aesthetic medical devices are based. Elos technology is a special blend of radio frequency (RF) and intense pulsed light (IPL). Shimon co-founded Syneron Medical Ltd. (Nasdaq ELOS) in 2001, and until its acquisition by APAX partners in July 2017, he served as its chairman.

Located in Netanya, Israel, Vantor Technologies is a privately held business that was established in 2004. As part of its commitment to creating less invasive replacement aortic valves, Vantor has created the transapically implantable Vantor Embracer™,* which is undergoing clinical testing in Europe. When a non-femoral approach is preferred due to considerations such as peripheral artery dysfunction, the transapical approach offers a useful alternative and is especially well-suited to the minimally invasive skills of cardiac surgeons. Medtronic paid \$325 million to acquire Vantor Technologies in 2009.

A publicly traded firm, Epitomee Medical is creating and marketing ingestible medicinal devices to address some of the most common chronic illnesses of our day in a more self-managed, secure, system-friendly, and manageable manner.

The innovative platform technology developed by Epitomee is based on self-expanding hydro-gel scaffolds made of food additives, biocompatible excipients, and components that come into touch with food. These scaffolds fold into a typical pharmaceutical capsule.

A shapeshifting capsule that imitates solid food, activating key pathways involved in the regulation of food intake both in the brain and the stomach.

Easily swallowable, the capsule reaches, the stomach; Expanding into a semi-rigid. Triangular shape as a reaction to the stomach's pH levels; Interacting with the stomach's Mechanical sensors; inducing early satiety; modified gastric emptying. The device travels to the intestine after spending several hours in the stomach and breaks down in a matter of minutes.

ESC Medical Systems Ltd., to be renamed Lumenis Ltd., and WaveLight Laser Technologie AG, of Erlangen, Germany, have signed an agreement granting ESC Medical exclusive worldwide distribution rights for WaveLight's refractive laser products in most major markets, including the United States and Japan (Photonics Spectra, 2024).

This new arrangement expands the distribution of the Allegretto Wave LASIK laser system to the United States and Japan, amending the prior agreement between WaveLight and Coherent Medical Group, which was purchased by ESC Medical in April. WaveLight refractive devices are currently marketed by ESC Medical across the majority of Asian, European, Latin American, and Middle Eastern markets as a result of the prior arrangement. The contract excludes rights in several countries where WaveLight has pre-existing agreements in effect.

Ron Nagar, Non-invasive Glucose Monitoring Devices VIVI Cap, TempraMed

TempraMed's current president and CEO is Ron Nagar. He served as President, CEO, and Co-Founder of Glucon in the past. Ron Nagar was a student at the Israel Institute of Technology (Technion).

Ron Nagar contributes expertise from prior positions at Glucon, InsuLine Medical, Norbitek, and Glucon Medical. Ron Nagar holds a Technion - Israel Institute of Technology. Ron Nagar has 3 emails on RocketReach.

TempraMed develops non-invasive glucose monitoring devices for diabetes patients conditioned at the right temperature to keep patients healthy and safe 24/7 365 days a year.

We found that people take their prescriptions for granted after working with insulin injectors for years and witnessing the never-ending battles they face to control their diseases.

The patient's prescription drugs are not protected at the last mile by a temperature control system. That is why in order to protect medications and assist patients in taking better control and remaining safe without adding any hassle, TempraMed uses space-grade technology and smart heat absorbency to protect medications from temperature damage.

Injectable pharmaceuticals have strict temperature storage indications. Only until it reaches the pharmacy is the temperature rigorously regulated, even though the manufacturer must maintain it until the end of use. When medications are stored improperly, their effectiveness is diminished, patients are put at risk, and even lives are lost. In 2018, the FDA registered 50% of new medication items that are temperature sensitive.

VIVI Cap uses the same technology that was initially created for aviation and spaceships to maintain your insulin in the Safe Zone. Space-grade thermal insulation, self-regenerating heat-absorbing material, and monitoring electronics are all combined in TempraMed's proprietary technology to create the first hassle-free, long-lasting pharmaceutical storage solution.

Advanced space-grade insulation finds use in cryotherapy, avionics, spacecraft, and other high-stress applications. The heat-absorbing action will certainly continue to function daily for years to come without any human assistance. The medication's temperature is intuitively indicated by the monitoring electronics. No battery or charging is required. The only pen cap gadget that can store and monitor temperature is the VIVI Cap.

By only pressing and releasing the sensor button, the integrated insulin temperature indicator can determine the current temperature. To display the insulin temperature state, the temperature sensor indicator will briefly turn on: Green indicates that insulin has been maintained at the proper temperature.

Tal Dvir Print a 3D Heart Using Human Tissue

Tal Dvir is a Professor at Tel Aviv University, Israel. He obtained his B.Sc. (2003) and Ph.D. (2008) degrees from the faculty of Engineering at the Ben-Gurion University of the Negev in Israel. His Ph.D. Research, under the supervision of Prof. Smadar Cohen, focused on cardiac tissue engineering and regeneration. Tal carried on with his postdoctoral research with Prof. Robert Langer in the Department of Chemical Engineering at MIT. His postdoc research focused on advanced materials for tissue engineering and regeneration.

In October 2011, Tal was recruited by the Department of Biotechnology and the Center for Nanotechnology at Tel Aviv University to establish the Laboratory for Tissue Engineering and Regenerative Medicine. Tal is also affiliated with the Department of Biomedical Engineering in the Faculty of Engineering and the Sagol Center for Neuroscience (dvirlab site). Professor Tal Dvir led the project 3D-printed heart using human tissue. His team at Israel's Tel Aviv University Research for the study was conducted jointly by Prof. Dvir, Nadav Moor, a PhD candidate in Prof. Dvir's laboratory, and Dr. Assaf Shapira of TAU's Faculty of Life Sciences.

They developed a uniquely formulated media used to support the printing of extracellular matrix-based biomaterials (Shapira et al, 2020). The hybrid material, comprised of calcium-alginate nanoparticles and xanthan gum, presents superb qualities that enable printing at a high resolution of down to 10 microns, allowing the fabrication of complex constructs and cellular structures. Additionally, this hybrid offers a unique blend of favorable qualities such as excellent transparency, stability throughout a broad temperature range, biocompatibility, and suitability for delicate extraction techniques.

Using a patient's cells and biological components, researchers at Tel Aviv University have "printed" the first 3D vascularized synthetic heart in history, marking a significant advancement in medicine. On April 15, research in Advanced Science reported their findings (Bloom, 2019).

An entire heart, complete with cells, blood arteries, ventricles, and chambers, has never before been successfully created and printed by anyone, anywhere.

Human cells and biological elements unique to each patient make up this heart. These ingredients are used in the process as bioinks, which are proteins and sugars that may be used to 3D print intricate tissue models.

Igal Kushnir, Alon Kushnir, in Vitro Blood Clots from a Patient's Whole Blood, RedDress®

Dr. Kushnir is a pediatrician with a medical degree and a cum laude degree from Tel Aviv University.

Dr. Kushnir is the owner of multiple patents for medical devices. He previously created a body thermoregulation device while serving as the founder and CEO of MTRE Advanced Technologies for five years.

He served as the main physician and medical manager of a hospital for patients with chronic illnesses for ten years.

RedDress®'s chief executive officer is Alon Kushnir. Alon oversaw medical affairs and regulatory quality assurance for nine years at Deep Breeze Ltd. and seven years at Circ MedTech (the RedDress website) before co-founding RedDress®. Alon graduated from Bar Ilan University with a B.Sc.

Healthcare professionals can create in vitro blood clots from a patient's entire blood in real time with the ActiGraft® wound care product.

Once applied, the blood clot acts as the body's natural wound healing process by acting as a protective layer, biologic fibrin scaffold, and wound microenvironment. ActiGraft is an FDA-approved regenerative wound care product that is based on RedDress' exclusive patented technology. ActiGraftPro provides a unique, individualized approach to healing by utilizing the body's inherent resources. With the capacity to treat up to 56cm square inches, in a single application. Its adjustable size guarantees a personalized fit for each wound. The activated blood clot can be used with patients: On blood thinners and with exposed bone and tendon.

ActiGraft^{Pro} is an inclusive solution for religiously or culturally sensitive patients, as it has no bovine, porcine, placental, or any other 3rd party products.

Bernard Bar-Natan, Pressure Bandage

A child of Holocaust survivors from Poland who grew up in New York, Bernard Bar-Natan made aliya in 1979 (Horwitz, 2011). While also doing immigrants' "Phase Two" IDF service and subsequent reserve duty. Despite his lack of medical experience, he was given the chance to become a combat medic two days before his IDF basic training ended in 1984. When he was conscripted, he had observed that the "personal bandage" that was provided to him and all other recruits—a simple field dressing wrapped in a tiny, rectangular green cloth—had the year 1942 on it.

In pre-hospital emergency settings, the pressure bandage is a specially made first-aid tool used to halt bleeding from hemorrhagic wounds caused by traumatic traumas. First used for saving lives during a NATO peacekeeping operation in Bosnia and Herzegovina, the bandage was successfully used during operations Enduring Freedom and Iraqi Freedom. Before the Israeli emergency bandage was invented in 1998, wounded soldiers were told to find a rock and wrap it on top of hemorrhaging wounds in order to hold direct

pressure. The company that first brought the bandage to the US military, PerSys Medical Inc. in Houston, Texas, purchased Bar-Natan's business.

Dr. Madeleine Mumcuoglu, Against the Avian Flu Virus, H5N1, Sambucol

Dr. Madeleine Mumcuoglu works and conducts research at the Hebrew University Hadassah Medical Center in Jerusalem (Blackburn, 2006).

Mumcuoglu was born in Algeria and immigrated to Israel in 1974. She holds a Doctorate in Virology and studied bird flu during her Ph.D. In the 1980s, Mumcuoglu began studying the natural healing elements of the elderberry from the black elder tree (*Sambucus nigra*). Since the plant had been used for millennia in medicine, she became interested in it. Hippocrates, Dioscurides, and Plinius all included it in their texts, and it was originally mentioned as a cure in the fifth century BC.

Retroscreen Virology, a leading British medical research institute associated with Queen Mary College, University of London, announced that Sambucol was at least 99% effective against the avian flu virus, H5N1, and in cell cultures significantly neutralized the infectivity of the virus.

The patented, organically balanced elderberry juice and extraction method utilized in the published scientific studies is also used by Sambucol. This unique production process ensures that every serving of berries has consistent, immune-supporting qualities by preserving and maximizing their naturally existing health benefits.

Sambucol's natural Black Elderberries, from which the juice is extracted directly, are grown and harvested in accordance with GAP (Good Agricultural Practices), guaranteeing complete process traceability. Crucially, the Black Elderberry harvest season typically lasts from mid-August to mid-September. Close cooperation and partnerships between the farms, scientists, and manufacturers have been put into place over the course of the year to guarantee the continuation of the distinctive process used to make Black Elderberry juice.

In Austria and Hungary, Sambucol Black Elderberries are harvested in August and September when they are ripe, mature, big enough, and have turned a characteristic purplish-black color. They use only the Haschberg variety of premium cultivar elderberries, handpicked from trees grown in dedicated orchards, devoted to Black Elderberries. Even though they belong to the same genus (*Sambucus nigra* L. (Europa)), Haschberg Black Elderberries can have up to twice the anthocyanin level of wild elderberries.

Sambucol is a reputable brand that complies with the stringent European Fruit Juice Laws and employs hundreds of tons of elderberries annually. Although the same type may be used by other producers, Sambucol's special qualities come from a proprietary production method that maintains the benefits of the entire fruit.

The berries are handpicked once per year, milled, and cold pressed by using state-of-the-art technology. The highest concentrations of phytonutrients are maintained and included in the juice thanks to further microfiltration. The juice is kept in an entirely aseptic system that is devoid of alcohol and solvents.

Each batch is meticulously transported to our production facilities in Europe when it is ready for manufacturing, where Sambucol final products are made in accordance with strict GAP/GMP (Good Manufacturing Practice) guidelines.

Black elderberry juice has long been a priceless treatment, and elderberry wine has long been used to treat influenza and the negative symptoms of the cold. The elder is frequently referred to as the country people's "medicine chest."

Mumcuoglu recognized the main active component in elderberries during her investigation, and she tested them against the flu virus and found that they worked. Mumcuoglu continued her studies after arriving in Israel and joining the Hebrew University Hadassah Medical Center in Jerusalem.

The outcome was Sambucol, a patented natural combination that includes three flavonoids, which are naturally occurring plant antioxidants, and AntiVirin, a strong antiviral ingredient that was extracted from black elderberries. Mumcuoglu established Razei Bar Industries in 1992 after deciding to market her elderberry supplement.

Laboratory tests conducted at Hadassah in 1995 demonstrated the efficacy of Sambucol against strains of avian, swine, and human influenza.

Doron Besser, a Feeding Tube Placement System, ENvizion

Doron Besser co-founded ENvizion with Shay Tsuker in 2017 (envizionmed.com site). He graduated from Ludwig-Maximilians University in Munich with a doctorate in medicine.

Doron guided the company through its infancy stages, which included complicated animal and human trials, to FDA clearance, CE approval, and initial market penetration in Europe and the US. At superDimension, a pioneer in minimally invasive pulmonology devices, Doron also held the positions of VP of Clinical and Marketing and VP of Business Development. Doron was a member of the core team that found prospects in the pulmonology sector, helping to lead superDimension from the beginning. Covidien paid over \$300 million to purchase superDimension in 2012.

Doron is a seasoned businessman who focuses on finding innovative technology and advancing it through all stages of product development, including global marketing and sales initiatives.

Feeding tubes are inserted into the stomachs of patients who cannot eat or drink normally for reasons such as surgery, intubation, unconsciousness, or premature birth (Blum, 2022).

However, two to five percent of the 30 million feeding tubes that are implanted each year—9 million in the US—end up in the tracheobronchial tree, which delivers air into the lungs), resulting in a 30% chance of a collapsed lung or death. That’s close to 1.5 million patients worldwide. 187 accidentally entered the lungs, according to a survey of almost 10,000 insertions. Five patients died as a result.

The development Envue is a feeding tube placement system with advanced methods of navigation, integrated sensors, and body mapping, for accurate enteral tube placement, by the Israeli company ENvizion Medical, used in Hospitals and Medical centers in the US.

ENvizion has an agreement with a network of 100 US hospitals to provide feeding tube placement navigation devices (Globes, 2020).

The typical installation procedure time can be halved with ENvizion's "ENVue" navigation system, which uses electromagnetic mapping to direct medical support personnel while they insert the nasal tube. Cavity down the esophagus, and through to the small intestine, the anatomical location where nutrients are absorbed by the body. To avoid placing the tube into the lungs and ensure the placement is executed correctly, the ENVue device guides through a number of technical mechanisms including patient body mapping, multi-faceted vision, and directional guidance.

Amit Goffer, ReWalk – a Battery-Packed ‘Exoskeleton’

Dr Amit Goffer received his B.Sc. from Technion-Israel Institute of Technology, his M.Sc. from Tel-Aviv University, and his Ph.D. from Drexel University in electrical and computer engineering.

After a tragic accident left him paralysed from the waist down, Dr. Amit Goffer spent years developing a way for paraplegics to be less dependent on. He pioneered the invention and development of the ReWalk Robotics wearable exoskeleton, enabling individuals with lower limb paralysis to walk again (Lifeward, 2015). Even though the technology does not currently enable Because of the severity of his injuries, Dr. Goffer was able to walk again. His perseverance in creating a wearable exoskeleton to help others walk cleared the path for the ReWalk Rehabilitation and Personal systems, which are being utilized by over 1,000 ReWalkers worldwide. He is regarded as a pioneer and expert in the emerging exoskeleton industry. Dr. Goffer served as ReWalk's CEO from 2001 until 2012 and has served as its President and Chief Technology Officer since 2012 and a member of its board of directors since 2001. The wheelchair from UPnRIDE Robotics enables quadriplegics to be completely mobile in both indoor and outdoor settings by transferring them from a seated to an upright position (Tress, 2020).

The FDA cleared a standing wheelchair produced by an Israeli robotics company for sale in the US in September.

Alan (Alon) Bodner, Oxygen from Water, Like-A-Fish

Alan (Alon) Bodner, is the founder of Like-A-Fish Technologies, a company that pioneers the breakthrough technology that extracts dissolved oxygen from ocean water and enables humans to breathe underwater (likefish site). Alan earned his B.S. degree in 1978 and his M.S. degree in 1986, both from the Technion–Israel Institute of Technology.

Alan's background includes Mechanical Engineering, Robotics, artificial vision, computer imaging analysis, electronic design, CAD/CAM, Fluid Dynamics, and Noise Analysis.

Fishes vary tremendously among the different species, one thing that they have in common is that they all need oxygen to survive.

By drawing air from the sea, Like-A-Fish's special air supply systems free up air tanks for professional and recreational scuba divers, submarines, and underwater habitats.

The company provides a wide range of underwater breathing solutions, including for individual divers, underwater habitats, underwater agriculture, and small to large submarines. The oxygen in the water is dissolved called Dissolved Oxygen (DO), and in the liquid phase. Fish get this oxygen from their membrane-covered gills. Research was done on extracting this oxygen for human consumption using membranes. This research has so far failed due to the membranes' extremely enormous size requirements as well as the fact that human bodies need oxygen in the gas phase.

The solution: utilizing a known law in Chemistry called 'Henry's Law', the company causes the dissolved oxygen to bubble out from the watery solution by lowering pressure on a body of water. People may be able to breathe air straight from the sea thanks to this low-energy method. Patents are accepted in America and Europe. The first product supplies air for the crew of the DeepSeaker Submersible. In 2015, Like-a-Fish partnered with Italian company Inova, whose new hydrofoil submarine The Atlantis is hailed as a futuristic, multipurpose over and underwater travel vehicle.

From the Inova press release: "The Atlantis is the first submarine to be equipped with the 'Like-a-Fish' patented technology, a new system which can extract breathable air directly from the water during travel.

Zvi Nitzan, Micro-electronic Enhancers of Cosmetic Creams, Power Paper

An Israeli company which is a leading provider of thin and flexible micro-power source technology and devices, has developed two new revolutionary product lines which they expect will radically improve cosmetic skincare (Israel21c, 2003).

The goal of Power Paper's micro-electronic enhancers for cosmetic creams and gels is to improve the topical application of cosmetic formulations and raise their overall effectiveness by a factor of many.

The main breakthrough in both PowerCosmetics product lines lies in the application of proprietary ultra-thin micro-electronic components that are integrated into a simple cosmetic patch.

The company's products can be used to treat a number of cosmetic concerns, including skin aging and wrinkles, dark spots or discoloration, skin lightening and whitening, firming and lifting, moisturizing, slimming, and cellulite reduction.

The techniques used – micro-electric currents and micro-stimulation – have well-known cosmetic benefits.

Power Paper, a start-up in Kibbutz Einat outside Petah Tikva, has completed agreements with three of the world's leading cosmetics groups, and its first products are expected to reach the shelves in the third quarter of 2003.

Power Paper has enlisted a number of leading world experts in dermapharmacology and cosmetology, as well as top executives from the cosmetics industry to its PowerCosmetics Steering Committee.

Moshe Shoham, Mazor Robotics' Spine

Moshe Shoham is a worldwide acclaimed authority in the field of robotics. He is the Head of the Robotics Lab and a Professor of Mechanical Engineering at the Technion-Israel Institute of Technology.

Professor Shoham is the creator of the Microbot ViRob, an Autonomous Advancing Micro Robot - less than 1 mm in diameter - which has the ability to crawl within cavities and lumens, giving doctors the ability to precisely target a diseased spot.

Professor Shoham has received over a dozen honors, including the esteemed Thomas A. Nobel Prize, and has 50 patents. Edison Patent Award and election into the USA National Academy of Engineering.

His latest work includes a revolutionary swimming Micro Robot and the new Mazor Renaissance® Brain Surgery.

You can perform spinal surgery more effectively with the Mazor™ robotic guidance system, which integrates pre- and interoperative planning with surgical navigation.

Shoham's latest startup, Tamar Robotics, developed a surgical robot that aims to revolutionize brain surgery, finally giving doctors a safer, minimally invasive tool to remove tumors and blood clots and treat other life-threatening brain conditions that now require major surgery.

In 2018, Medtronic purchased Mazor Robotics, a surgical robotics business, for \$1.64 billion.

Tamar Robotics, situated in Kibbutz Yagur close to Haifa, is a participant in the expanding field of robotic surgery, which involves doing operations within the human body using microscopic instruments that are entered through tiny incisions. Often also guided by imaging and sensing technology. The technique allows for more accurate and less invasive procedures, reducing patient recovery time.

Tamar Robotics began when Dr. Hadas Ziso, its co-founder and Shoham's graduate student at the Technion, began examining ways to make brain surgery safer.

For five years, Ziso and Shoham worked on creating a small robot that could locate and remove brain masses, including tumors, while preserving healthy tissue. To commercialize the device, they established Tamar Robotics.

A tiny, moving robotic needle that emits water jets to kill brain tumors and blood clots is the technology, which is presently being tested on large animals like pigs. Surgeons make a tiny incision in the patient's head and insert the needle.

The needle is guided in real time by an integrated ultrasound that continuously scans. This is crucial because pre-operative images from MRIs and other scans are difficult to rely on because the brain moves a lot when tissue is removed during surgery.

Boaz Eitan, Avoset™ Infusion Pump

Dr. Boaz Eitan holds a B.Sc. in Mathematics and Physics (1976), an M.Sc. (1978), and a Ph.D. (1981) in Applied Physics, all from the Hebrew University of Jerusalem.

Dr. Boaz Eitan is the founder of Eitan Medical, a global provider of connected, intuitive drug delivery and infusion solutions (eitanmedical site). From pre-acute to hospital and home settings, the Sapphire line of infusion pumps is the preferred option for infusion therapy devices. Created with patient safety in mind from the start, and we continue to go above and above by creating gadgets that are meant to enhance patients' everyday lives.

With its small and straightforward design, the linked Avoset™ infusion pump revolutionizes specialty infusion while improving customer satisfaction. Remote visibility of infusion data and access to data analytics can help you monitor compliance and identify trends for better care planning. By making home infusion delivery safe, the approach may make it possible for more patients to receive therapy at home, hence improving quality of life and increasing patient access to home infusion.

Yedidya Ya'ari, Boaz Misholi, Portable and Foldable Oxygen Pressure Chamber, Bariks Health

Yedidya Ya'ari was the former CEO of Rafael Advanced Defense Systems, led the development of the Iron Dome, Chairman of Aeronautics Group, and former Commander of the Israeli Navy (barikshealth site).

Boaz Misholi was born and raised in Ramat Gan on November 11, 1951. He studied Computer Engineering at the Technion in Haifa, from which he graduated with honors. As a graduate student, he served as a teaching assistant at the Technion's Faculty of Electrical Engineering. He was a co-founder of Comverse, Verint Systems, Telemesser, DSP, Fundtech, Versamed, and others, companies that paved the way for the establishment of many other Israeli technology ventures.

Bariks is transforming hyperbaric oxygen therapy (HBOT) with a ground-breaking portable and foldable oxygen pressure chamber that can deliver treatment at up to 3 ATA working pressures. Currently, hyperbaric oxygen therapy (HBOT) chambers for treatments above 2 ATA are stationary and mostly found in hospitals, forcing patients to travel, making access time-consuming and inconvenient, especially for a full treatment course of 30-40 sessions. This lack of mobility limits athletes' ability to receive therapy because they are often on the go, and in an emergency when prompt access is essential, the chambers' limited availability and fixed nature prevent timely intervention, resulting in missed opportunities for treatment and saving lives.

Mahmoud Huleihel, Male Infertility

Mahmoud Huleihel has a B.Sc. and a M.Sc. 1978-1984, a Ph.D. 1984-1991 from Ben-Gurion University of the Negev and a postdoc from the Dept. of Obstetrics and Gynecology, Soroka Medical Center on "Involvement of cytokines in the regulation of male fertility" (fohs.bgu site).

His research is focused on evaluating the physiological and/or pathological role of cytokines in three reproductive processes: male infertility mechanisms of labor under physiological and pathological conditions, brain damage of the offspring, and the possibility of treatment with MgSO₄ and ovarian carcinoma.

He has a patent on methods of maturation of human spermatogonium comprising culturing the spermatogonium in a three-dimensional methylcellulose culture system (MCS) under conditions capable of differentiating said human spermatogonium into an elongated spermatid, thereby in vitro maturing the human spermatogonium.

Ali AbuMadighem, Sholom Shuchat, Mahmoud Huleihel, Creating Sperm in a Laboratory through a Microfluidic System using a Silicon Ship (Polydimethylsiloxane PDMS)

A research group led by the Ben-Gurion University of the Negev managed to produce an innovative microchip for creating sperm in culture by using a microfluidic system (BioPharma APAC, 2022).

The group included Prof. Emeritus Eitan Lunenfeld, from the Faculty of Health Sciences at Ben-Gurion University of the Negev and Soroka Medical Center, and Prof. Gilad Yossifon, from the Faculty of Mechanical Engineering at the Technion.

PhD students Sholom Shuchat from the Department of Mechanical Engineering at the Technion-Israel Institute of Technology and Ali AbuMadighem from the Shraga Segal Department of Microbiology, Immunology, and Genetics at Ben-Gurion University of the Negev led the study.

Children with cancer who receive aggressive chemotherapy may lose their future fertility. Many researchers worldwide are concerned with treating infertile males (caused by problems in their testicles) and preserving fertility in these youngsters. Recently, a team of researchers from Ben-Gurion University of the Negev and a team from the Technion-Israel Institute of Technology have developed a novel platform that enhances the process of producing sperm in a lab using a microfluidic system with a silicon chip (PDMS). A polymer that is frequently utilized for the creation and prototyping of microfluidic chips is polydimethylsiloxane, also known as dimethicone or PDMS. It belongs to the siloxane family of mineral-organic polymers, which is a structure made up of silicon and carbon. The name siloxane is derived from silicon, oxygen, and alkane.

Prof. Mahmoud Huleihel considered the need to find a method of producing sperm cells in the laboratory so that it bypasses limitations such as the potential return of cancer cells to the patient's body.

The development of sperm cells in the testicle is mimicked in young mice that are not yet producing sperm cells. It was feasible to create a method for cultivating testicular cells in a setting that was extremely similar to the natural environment in a lab setting (in terms of the shape of the sperm tubes and the cells that make them up). A full 3D system was constructed using a specialized chip made for the research, which has microfluidic channels that enable the injection of growth factors, testicular cells, or any other type of cell from the body's tissues.

The innovative system was successfully tested using young mice (which contain primary germ cells that develop to form sperm and supporting testicular cells). Seminiferous tube-like structures comprising advanced-stage cells (ROUND SPERMATID) in the process of sperm production were found after 5-7 weeks of testing a long-term culture. Now, the research group is preparing for the next phase of applying the experiment to cells from humans.

The procedure of producing sperm cells in a culture has new possibilities thanks to this study. It makes it possible to use microfluidic-based technologies in future treatments for infertile men and in preserving fertility in children receiving intensive radiation and chemotherapy treatments that could harm their fertility in puberty. In addition, this system

may also serve as an innovative platform for examining the effect of drugs and toxins on male fertility.

Mouna Maroun, Neurodegenerative Disorders of PTSD

With a PhD in psychobiology from the University of Haifa and a postdoc at Paris XI Orsay, France, Prof. Mouna Maroun is a neurobiologist. Prof. Maroun has been a faculty member at the University of Haifa for over 20 years (Press, 2015).

Maroun is the first woman from her hometown, the Druze village of Usfiya, to earn a PhD. She's also the first Arab woman in Israel to have a university academic position in neuroscience. In her laboratory at Haifa University, Maroun supervises a team of researchers studying the neurological basis of emotions.

Maroun grew up in a Maronite Christian family with four girls. She belongs to the Al-Maram Association, which advocates for education among Arabs, particularly among girls.

Mona Maroun studies the neurodegenerative disorders of Post-Traumatic Stress Disorder (PTSD), a chronic psychiatric disorder that occurs following exposure to traumatic events. According to recent research, PTSD may increase the likelihood of developing later neurological diseases including Parkinson's and Alzheimer's. In experiments on lab rats. In her research into the possibility of removing fear memories, she developed an injectable barrier. This barrier prevents activation of the AKT molecule (Protein kinase B PKB), also known as AKT), which is a critical component of memory formation. A one-time injection of the block in a specific time window can erase the memory of the specific fear and prevent re-emergence of the fear. This treatment enables millions of people around the world who suffer from post-traumatic stress disorder to be helped.

Mona Maroun has also worked on preclinical research to determine whether a particular substance has the ability to erase traumatic memories, hoping to eventually translate the findings to find a solution for patients with PTSD. The study found that injecting animals with this substance would cancel fear memory and that there were differences in development and in the mechanisms that regulate fear memory in puppies, compared to adult animals. This means that even in humans, different treatments may be required for children and adults.

Imad and Reem Younis, Deep Brain Stimulation (DBS) Procedure

Arab Christians Reem and Imad Younis started their own neurosurgery products business in Nazareth with Alpha Omega (AO) in 1993 (alphaomega site).

Imad Younis is a Nazarene business and social entrepreneur who has achieved his degree in Electrical engineering from the Technion.

According to recent research, PTSD may increase the likelihood of developing later neurological diseases including Parkinson's and Alzheimer's. Reem also co-founded Alpha-Cad Ltd., specializing in supplying complete CAD solutions for construction businesses and other entities.

The company began creating tools and solutions for neuroscience researchers and businesses. After that, it developed the infrastructure necessary for Alpha Omega to expand and thrive while fortifying its core competencies in the areas of brain recording and stimulation.

Today, the company provides systems and technology to meet the clinical demands in Deep Brain Stimulation (DBS) procedures, in addition to the ongoing growth and development in the scientific and research arena.

With the help of its Neuro Omega and Neuro Smart systems, HaGuide software, and other navigation tools, Alpha Omega is collaborating with electrophysiologists, neurosurgeons, and neurologists to make DBS easy, efficient, and reasonably priced. It also keeps coming up with new ways to help patients on their path to recovery.

More than 100 people work for Alpha Omega in all of its business divisions worldwide, including the headquarters in Israel, the United States, Germany, and China. Concentrating on meeting the demands of clients in every nation on the planet.

Brain electrophysiology was the main emphasis from the start. Both throughout the research phase and in clinical settings, prior to, during, and after Deep Brain Stimulation (DBS) procedures.

Every medical advancement starts with a concept, followed by lengthy hours of laboratory research, data gathering, analysis, and conclusions, and ultimately results in a medicine that improves the lives of patients. The field of brain electrophysiology is no exception. Alpha Omega creates software and hardware that address every phase of research. Over this lengthy journey, we have worked closely with academics and doctors, which has allowed us to gain a deeper grasp of their changing needs, challenges, and general knowledge of the area. By using advanced hardware and software for brain mapping and navigation, Alpha Omega is providing cutting-edge solutions for clinical applications that improve and streamline DBS therapy and procedure. This allows for more effective treatment of neurological and psychiatric disorders while the patient is awake or asleep, which improves patient outcomes.

Finding the ideal position in small, difficult-to-detect brain regions (STN, GPi, and Vim) is crucial to the success of the DBS surgery, which is used to treat essential tremor, dystonia, Parkinson's disease, and other neurological and psychiatric problems. For this initial crucial step in the process, Alpha Omega has created brain navigation devices that use microelectrode recording to insert DBS leads optimally.

Hundreds of hospitals and research facilities across six continents now use the company's equipment.

Hospitals, colleges, and research facilities all across the world employ their innovative products, which include a GPS-like system for brain surgeons.

Abd Al-Roof Higazi and Nuha Hijazi, Drug Therapy for Acute Bleeding Conditions, PamBio, Plas-Free

A husband-wife pair The co-founders of PamBio, a thriving biotech company in Nazareth that is creating medication therapy for severe bleeding disorders such as cerebral hemorrhage in the skull, are Abd Al-Roof Higazi and Nuha Hijazi.

With a PhD in neuroscience, Abd Al-Roof Higazi frequently appears in prestigious scientific journals. Higazi is a physician who leads the clinical biochemistry and laboratory departments at Hadassah Medical Center in Jerusalem and is a professor at the Hebrew University-Hadassah Medical School.

Holding a Ph.D. from the Hebrew University and a post-doctorate in Hematology from Hadassah Medical Center, Nuha is also a part of the Plas-Free team, that developing ClearPlasma™ device basic idea preclinical and clinical studies.

The couple lives in Neve Shalom/Wahat al-Salaam, a cooperative village jointly founded by Israeli Jews and Arabs between Jerusalem and Tel Aviv.

PamBio is an innovative biotechnology company developing drug therapy for Hemorrhagic stroke (intracranial hemorrhage ICH) and other acute bleeding conditions. PamBio is an NGT3 VC portfolio company, established in 2014 (ngt site).

“tPA Mutant in the Treatment of Acute Brain Injury and Neurodegenerative Disorders”- Inventors: Higazi Abd, Higazi Nuha.

“Plasminogen Activator Mutants as Anti-Fibrinolytic Agents” Inventors: Higazi Abd, Higazi Nuha.

The main cause of hemorrhagic stroke (intracranial hemorrhage, or ICH) is the rupture of tiny arteries in the brain, which allows blood to seep into the brain tissue. Ischemic stroke, the more prevalent type, happens when a blood clot stops the brain's blood supply from carrying oxygen and nutrients. There is no medication to treat ICH, however there is for ischemic stroke (Alteplase, tPA), which encourages clot lysis.

PamBio's biomolecule reduces bleeding in mice brains post Traumatic Brain Injury (TBI), with a good neurological outcome; piglets treated with the drug post-Fluid Percussion Injury (FPI) suffered less neurodegeneration; indicating that the medication effectively stops both systemic and general bleeding, cutting the amount of blood in rats (liver resection) and mice (tail bleeding) in half.

POC studies have shown that PamBio's biomolecule reduces bleeding in mice brains post Traumatic Brain Injury (TBI), with a good neurological outcome (figure 2); that piglets treated with the drug post-fluid Percussion Injury (FPI) suffered less neurodegeneration; and that the drug is effective in preventing general and systemic bleeding, reducing by half both bleeding time in mice (tail bleeding) and bleeding volume in rats (liver resection).

Plas-Free is a private medical device company founded in 2017, developing an advanced filtration technology for blood purification with the aim to save lives and reduce healthcare costs.

By eliminating Plasminogen and tPA from blood products, the ClearPlasma device—a sterile, non-pyrogenic, single-use tool—allows for a decrease in fibrinolysis, the breakdown of fibrin clots that occurs during severe bleeding. The device utilizes the chemical affinity of plasminogen to a specific ligand through its binding sites. When plasma runs through the resin bed, the plasminogen encounters the ligand that is covalently bound to the resin and specifically binds to it. The plasma, now depleted from plasminogen, continues to flow through the device and is collected in a new plasma bag ready for transfusion.

The Ammonia Adsorption Plasma Column (AAPC-300) from Plas-Free is a sterile, non-pyrogenic, single-use instrument used to extract ammonia from the blood. The AAPC-300 reduces ammonia levels during hepatic encephalopathy (HE) by efficiently and precisely extracting ammonia from plasma fractions. Since neurological damage cannot be reversed, time is of the essence when treating hyperammonemia. The AAPC-300 can reduce the levels of ammonia in less than 1.5 hours thereby preventing significant accumulated neurologic injury. The pharmacokinetics of medications, on the other hand, can take a few hours and then result in further brain damage.

Edward (Edu) Strul, Joshua Gur, Virtual Retinal Display (VRD) & Eye-Tracking, EyeJets

EyeJets was co-founded in 2017 by Edu Strul, B.Sc. & M.Sc. Aerospace Engineering from the Technion in Haifa, former head of the Israeli Air Force engineering and Dr. Joshua Gur, holds a BSc degree in Physics and Mathematics an MSc degree in Applied Physics from the Hebrew University, and a Ph.D. in Optics from the Rochester Institute of Optics in the US. Dr. Isaac Lipshitz, an ophthalmologist and, a pioneer in the field of refractive surgery, joined the team (eyejets.net site).

The company initially focused on VRD technology for military applications. EyeJets' innovative retinal projector casts images onto the center of the user's retina using premium reflection-based optics. Users can enjoy an unparalleled 100-degree field of view thanks to this innovative approach to augmented reality vision. In whatever task, peripheral vision is unaffected.

Use EyeJets' medical and diagnostic capabilities to improve patient care. Capture images seen through the smart glasses lenses and deliver AI-aided diagnoses. Instantly retrieve and update patient medical records, or follow live surgeries from anywhere worldwide.

Remotely diagnose & treat medical issues; Retrieve & update patient records, hands-free; Significantly reduce medical care costs.

Hanan Lepek, Male Mosquitos Sterilized Senecio Robotics

Hanan Lepek holds a BSc in Computer Engineering and an MBA, from Hebrew University, Israel. He is the founder of Senecio Robotics. He has more than 12 years of experience in aerospace technologies, with more than 20 pending patents as lead inventor. Managed programs in the fields of robotics, cyber aviation, software simulations, aerial experiments, and aircraft production line optimizations.

By using robotics and artificial intelligence to the subject of biocontrol, Senecio Robotics provides an innovative way to reduce the spread of dangerous diseases (including malaria and dengue fever) brought on by mosquito bites.

Because the female mosquitos – the only ones to bite – mate only once during their lifespan, it is assumed that if large numbers of male mosquitos are sterilized and released to seek and mate with wild females, it will be possible to dramatically reduce the numbers in subsequent generations of mosquitos. The use of sterilized mosquitos to reduce the local population is called SIT (Sterile Insect Technique).

This technique is already implemented around the world and has even proved itself in several projects of limited scale in countries such as the US, Singapore, China, Brazil, Australia, and others.

The process of sorting the male and female mosquitos can be performed relatively easily using a camera, but their flight makes identification difficult. Senecio Robotics developed a method for separating male and female mosquitoes with nearly 100% accuracy. The mechanism creates special conditions that cause the mosquitos to stand motionless while being photographed. Senecio Robotics created an entire process in which they grow the mosquitos and lead them to the photography point automatically – enabling us to operate like an industrial factory with unique adaptations so that the company has a kind of conveyor belt of mosquitos undergoing sorting, packaging, and storage. Reproducing this method enables the creation of sterile mosquitos at industrial levels of production and the Senecio Robotics' patent application for image-based mosquito sorting has received a positive. The connection to the manufacturing processes is with government as well as commercial entities in several countries such as the US, Brazil, Africa, Europe, and others where factories for sterile mosquito production can be established. Professor Nir Shvalb, Medical Robotics, Memic, Momentis Surgical, and W Endoluminal Robotics

Professor Nir Shvalb has a PhD from the Technion. - Mechanical Engineering (pniot.arel site). He is the Vice Dean of the Faculty of Engineering and the Vice Dean of Ariel University, Israel, as well as the head of the Robotics Research Laboratory and the founder of several robotics startup companies, including Momentis Surgical and W Endoluminal Robotics. His main research interests are medical robotics, global path planning, and theoretical foundations of robotics.

Based in Tel Aviv, Israel, Memic was founded in 2012 by Nir Shvalb and Ariel Tech Transfer Company in conjunction with Martal Consulting LLC (innovationisrael site). The robot is the first of its kind for gynecological NOTES (Natural Orifice Translumenal Endoscopic Surgery) and as of 2020 it is FDA-approved (ariel site). He also founded 'Innosing LTD.' which provides a system that will enable repeated analysis of radiologists and 'Asclapius AMT' which provides a novel endoscopic tool.

Additionally, he founded Momentis Surgical, the company that developed the Homins surgical system. Surgical operations that would normally be deemed impossible are made possible by the system. With 360 degrees of movement and a range of minimally invasive access configurations, the humanoid-shaped robotic arms replicate human dexterity and surpass human flexibility.

He co-invented an autonomous crawling micro-robot that can be controlled remotely or within the body. To stop tissue from growing into the catheter, the SCSTM device has an inbuilt robotic cleaning mechanism that is placed in the ventricular catheter's lumen.

***Yotam Hod, Dr. Sari Prutchi Sagiv, Haim Barsimantov, IntraVag©
Technology for Endometriosis, Gynica***

Yotam Hod is the co-founder of Asana Bio Group, a holding company specializing in scientific advancements in the field of cannabinoids. (gynica site) Former CEO of Lumir Lab, a world-renowned research and development facility that offers evidence-based marijuana R&D solutions to major industry players.

With more than 15 years of expertise, Dr. Prutchi-Sagiv has worked in preclinical and clinical research, regulatory affairs, and intellectual property, among other areas of pharmaceutical development. In the past decade, Dr. Prutchi-Sagiv has served as the head of scientific operations for several cannabis-based pharmaceutical firms, such as BOL Pharma, Talent Biotech, Kalytera, and Stero Biotech.

Haim Barsimantov is the former COO and CTO of Sol-Gel Technologies Ltd., a Nasdaq-traded pharmaceutical company. Haim has over 20 years of experience in process development, microencapsulation technologies, scale-up, and formulation and delivery system development.

Lenore Shoham is the former CEO of InPlant Technologies Ltd, a startup company that developed novel formulations for improved delivery of fertilizers and agrochemicals.

Gynica is a biotech business that aims to provide safe, effective, non-hormonal, intra-vaginal therapeutic alternatives to hundreds of millions of women with endometriosis globally. Through its proprietary IntraVag© technology—a non-invasive, self-administered drug delivery platform.

Endometriosis is a chronic and debilitating condition affecting at least 10%—more than 200 million—of women and girls of reproductive age worldwide, severely impacting their quality of life and overall well-being. Characterized by the abnormal growth of endometrial tissue outside the uterus, Endometriosis can cause a range of distressing symptoms, including intense pelvic pain, painful intercourse, menstrual irregularities, and infertility.

Increasing awareness, improved diagnostic techniques, and the prevalence of the condition have given rise to the growing demand for safe and effective therapies in an underserved market—with a potential global annual market worth \$180 billion.

Asana Bio Group, a holding company focused on advances in the life sciences, is the owner of Gynica.

Dr. Goffer and Oren Tamari, Wheelchair: It is the First and Only Wheeled Motorized Device, UPnRIDE Robotics

Dr. Amit Goffer Leaves a Lasting Legacy with Visionary Invention That Enables Individuals with Lower Limb Paralysis to Walk Again ([upnride site](#)).

Dr. Amit Goffer recognized the need for a solution for people paralyzed from the neck down after ReWalk proved successful in helping people paralyzed from the waist down stand and walk. He developed a novel mobility solution in response, enabling these people to move while standing. Oren Tamari and Dr. Goffer pioneered the development of UPnRIDE's revolutionary technology, forming UPnRIDE Robotics, after working for ReWalk for years and helping with its NASDAQ IPO.

Through the introduction of UPnRIDE, a sophisticated robotic mobility device, UPnRIDE Robotics hopes to transform the lives of millions of wheelchair users. Beyond just a wheelchair, UPnRIDE is much more: It is the first and only motorized wheeled gadget that allows wheelchair users to move around while standing. In practically any urban environment, both outdoors and indoors, and thus improves health, enhances self-esteem, and reduces medical and other disability costs.

The company's Robotic Standing Wheelchair was approved for marketing and use by the US FDA in February 2020, allowing wheelchair users and senior citizens to utilize it.

Prof. Marcelle Machluf, Mr. Yonatan Malca, Cell Membrane of Mesenchymal Stem Cells (MSCs), Nanogost

Prof. Marcelle Machluf is the founder (PhD) of nanogost a full professor and the former dean of the Faculty of Biotechnology and Food Engineering at the Technion-Israel Institute of Technology. His Postdoc is in drug delivery, gene therapy, and tissue engineering at Harvard Medical School (USA)

Mr. Yonatan Malca is Co-Founder & CEO (MA). He is also the founder of DNA Biomedical Solutions (TASE: DNA), a life sciences holding company.

Dr. Osnat Bohana Kashtan, VP R&D (PhD, MBA) has 15 years of pharma experience leading the development of small molecule, peptide, and cell-based therapies for immune disorders, cancer, and neurodegenerative diseases, from discovery to Phase 3 stage

He was the former Director of R&D at Cell Cure Neurosciences & Director of the Phase 3 Motixafortide project at BiolineRx. His postdoc in oncology is from The Johns Hopkins SOM (USA)

NanoGhost develops a highly selective first-in-class drug targeting platform (Nano-Ghosts/NGs) from the cell membrane of mesenchymal stem cells (MSCs), cells with known tropism to cancer and sites of inflammation.

NGs are nanovesicles equipped with inherent MSC targeting capabilities, and the ability to infiltrate inter and intra-cellular niches, with versatile loading capacity and broad therapeutic applicability.

The cell membranes of allogeneic mesenchymal stem cells (MSCs) are the source of NGs, which are nanovesicles.

The cell membrane of MSCs is separated and reduced to nanoparticles using the NanoGhost technology, maintaining the original structure and properties.

NGs can be loaded with a variety of therapies, including proteins, mRNA, and small-molecule medications.

Prof. Avi Domb, SRGel Platform for Cancer Treatment, Intragel

brings extensive experience in pharmaceutical development and innovation as the inventor of twelve authorized medications. Possesses undergraduate degrees in law, pharmaceuticals, and chemistry in addition to a PhD in chemistry (intragel site).

He was the head of the Pharmacy School at the Hebrew University of Jerusalem, and the Head of the Division of Identification and Forensic Sciences (DIFS), Israel police.

Intragel was created with the clever but straightforward idea of improving the distribution of currently available anticancer medications to make them safer and more effective.

The technology was inspired by Professor Avi Domb. In order to treat brain cancer (glioblastoma), Avi co-invented and developed the FDA-approved Gliadel® wafer, a revolutionary delivery method in which the wafer was infused with the medication and given during surgery, in the early 2000s.

Avi realized he might revolutionize cancer treatment by improving targeting accuracy and streamlining administration for tumors across the body. After fifteen years of study, Avi created a hydrophobic gel polymer that is easy to inject and works with ninety-five percent of anticancer medications.

By allowing local sustained release of anticancer medications at the tumor site, the SRGel platform is transforming the treatment of cancer by optimizing therapeutic efficacy while reducing systemic exposure and side effects. Its distinct hydrophobic, biocompatible, and biodegradable gel-based composition, which is based on safe and natural fatty acids, represents a significant advancement in drug administration.

SRGel is an injectable, pre-filled single syringe that is simple to use and ready to be inserted into any solid tumor, including those that are resistant to chemotherapy and radiation therapy or that cannot be surgically removed.

Easy-to-use. During a biopsy, a pre-filled, ready-to-use syringe can be injected straight into any solid tumor on any portion of the body.

Increased efficacy. High drug loading (up to 50%) is made possible by the composition's hydrophobic and solvent-free properties.

Prolonged release. Within 24 hours of delivery, biodegradable SRGel begins to release the medication, and this release continues for up to two months.

Safe and well tolerated. Preclinical and clinical data with the pipeline product, TumoCure, show tumor reduction with minimal to no systemic toxicity.

Localized action. For optimal effectiveness and little adverse effects, the drug is released locally at concentrations ten times higher than those achieved through systemic administration when it adheres to the tumor injection site.

Several types of cancer. Over 90% of currently available anticancer medications can be used with this special hydrophobic and inert gel.

Stability. Due to SRGel's extended shelf life of up to 24 months at room temperature, distributors and caregivers are not as constrained by shipping or storage requirements.

Prof Tal Dvir, Regenerative Medicine Platform, Matricelf

Tal Dvir teaches at Israel's Tel Aviv University. He graduated with a B.Sc. (2003) and a Ph.D. (2008) from the Ben-Gurion University of the Negev's engineering faculty in Israel.

Under the guidance of Professor Smadar Cohen, he conducted research for his Ph.D. that concentrated on cardiac tissue engineering and regeneration. Tal pursued his postdoctoral research in MIT in Department of Chemical Engineering in the lab of Professor Robert Langer. Advanced materials for tissue engineering and regeneration were the main focus of his postdoctoral studies. Tal was hired in October 2011 by Tel Aviv University's Center for Nanotechnology and Department of Biotechnology to create the Laboratory for Tissue Engineering and Regenerative Medicine. Tal is also connected to the Sagol Center for Neuroscience and the Faculty of Engineering's Department of Biomedical Engineering.

Matricelf is a pioneering biotechnology company that develops a platform for autologous tissue engineering, for a wide range of medical conditions (matricelf site). Professor Tal Dvir of Tel Aviv University's Laboratory of Tissue Engineering and Regenerative Medicine founded the business in 2019.

Every year, thousands of spinal cord injuries happen all around the world, mostly as a result of trauma from sports, falls, and auto accidents. In the U.S. alone, over 17,000 new SCI cases are reported each year. SCI patients usually suffer irreversible damage with further tissue degeneration. SCI patients are 2 to 5 times more likely to suffer premature death and bear tremendous healthcare costs ranging from \$350,000 to \$1 million in the first year alone. Patients with spinal cord injuries around the world now have hope for a productive and independent future thanks to Matricelf's regenerative medicine platform.

Racheli Gueta, Sharon Cohen Vered, Eran Blaugrund, Local Fat Reduction , Raziel Therapeutics

Raziel Therapeutics is a pharmaceutical company developing a proprietary drug for the treatment of local fat reduction (raziel-therapy site). Raziel offers a revolutionary solution for focal fat-reduction with its proprietary fat-dissolving injectable compound. This one-time, non-surgical treatment caters to both aesthetic and therapeutic needs. Raziel has already signed a commercial licensing agreement for the Chinese market with Fosun Pharma for its first application submental fat, commonly known as double-chin.

Racheli Gueta has a decade of experience in clinical and R&D activities in multi-disciplinary projects in the pharmaceutical and medical device industry. She holds a Ph.D. in structural biology from the Weizmann Institute of Science, Israel

Sharon Cohen Vered has over twenty-five years of experience leading drug development (CMC) teams in pharma, both in large multinationals and in startups. Prior roles includes VP CMC at NeuroDerm, CMC at Orasis Pharmaceuticals, and Head of Parenteral Dosage Forms at Teva innovative R&D. She holds a Ph.D. from Tel Aviv University.

Eran Blaugrund has twenty-five years of drug development experience. He headed the CNS/Pain project leadership group at Teva Pharmaceuticals with accountability for global development and post-approval project activities.

Eyal Sheetrit, Yaniv Barkana, Guy Tomer, Glucoma Drug, Eximore

Eximore is developing ophthalmic drug delivery products. The company's initial development is a non-invasive, novel sustained-release delivery system targeting glaucoma.

Eyal Sheetrit has a Master of Engineering , Biomedical/Medical Engineering 2005 – 2007 in Ophthalmology, Assaf Harofe Medical Center, Glaucoma Associated of New York, New York Eye and Ear Infirmary 2014-2015

Yaniv Barkana has a MD from the Hebrew University of Jerusalem Guy Tomer, has a PhD, Biochemistry 1994-1999 from the Weizmann Institute and a B. Pharm, Pharmacy B from the Hebrew University 1991-1993

EXP-LP is a non-degradable punctal plug that is placed in the punctum to provide a sustained release of latanoprost, a first-line and first-choice prostaglandin analogue that increases the outflow of aqueous fluid, for up to three months. At the end of this period, the doctor replaces the plug during an in-office visit. In order to satisfactorily address safety and retention, EXP-LP shape is based on currently marketed silicone and collagen punctal plugs which are used extensively in patients suffering from dry eye syndrome with an excellent safety record.

EXP-LP provides a steady micro-dose of latanoprost to the eye, avoiding the oscillations in drug level experienced with eye drops.

Niv Bachnoff, Moshik Cohen-Kutner, Dr. Niv Bachnoff Novel Antibiotic Agents, Omnix Medica

Founded in 2015, Omnix Medical is a clinical-stage biopharmaceutical company developing an arsenal of novel antibiotic agents for the treatment of infections involving drug-resistant bacteria.

Moshik Cohen-Kutner has a PhD on Biochemistry and Molecular Biology from The Hebrew University 2008-2013. Dr. Niv Bachnoff has a Ph.D on Molecular and Structural Biochemistry 2003-2013 from the Hebrew University.

Omnix Medical's agents are based on natural antimicrobial peptides, genetically engineered to be compatible for therapeutic use. Omnix peptides target severe Hospital

Acquired Infections (HAI) involving Multidrug Resistant (MDR) bacteria and are highly effective against a wide spectrum of bacteria species. Presently, Omnix is focusing on Priority Pathogens as designated by WHO/CDC, namely, the Gram-negative ESKAPE pathogens: *K. pneumoniae*, *A. baumannii*, *P. aeruginosa* and *Enterobacter* species.

Lior Shaltiel, Yoav Banitt, Nano Drugs, NurExone Biologic

Dr Lior Shaltiel is specializing in chemical engineering, molecular biology, electrophysiology, pharmacology and drug delivery systems (nurexone site). Lior has worked in several nano-drug delivery companies such as LipoCure and Ayana Pharma. Before joining NurExone, Lior was a VP and Partner at a boutique Chinese investment bank operating in Israel mapping the investment landscape and opportunities in the Israeli pharmaceutical industry. Lior is the initiator and head of the BioMed-MBA program at the Hebrew University. NurExone Biologic Inc. is a publicly-traded biopharmaceutical company, listed on the Toronto Stock Exchange (TSXV:NRX), the OTCQB Venture Market (OTCQB:NRXBF) and Frankfurt Stock Exchange (FSE:J90). Developing and commercializing the ExoTherapy platform for production of exosome-loaded nanodrugs. The Company operates according to two business lines: Using ExoTherapy platform to develop a first exosome-loaded nanodrug, ExoPTEN, for acute Spinal Cord Injuries (SCI) targeted at a global market projected at \$2.9 billion dollars.

Partnerships and licensing of the ExoTherapy platform to the global biopharmaceutical industry targeting other diseases and indications. In several preclinical studies, short cycles of NurExone's regenerative ExoPTEN therapy administered intranasally, led to significant motor improvement, sensory recovery, and faster urinary reflex. Functional recovery was accompanied by increased nerve regeneration, structural and electrophysiological improvements. Human trials expected to start in 2026.

Rachel Diamant, Ganit Yarden, Cellular Energy, Cellergy Bio

Rachel Diamant holds a BSc in biotech Engineering from the Technion and a MSc from the Weizmann Institute. She has 20 years experience as an entrepreneur in biotech (cellergy site).

Ganit Yarden holds a PhD from the Weizmann Institute in biochemistry. Held leadership roles at Teva, Merck and Compugen. Mitochondria transforms food fuel into cellular energy (ATP) which is critical to all cellular functions such as protein synthesis, DNA repair, muscle contraction, and waste removal.

A single human cell contains ~500-2500 mitochondria, depending on cell type. It is most abundant in tissues with high energy demand - muscles, brain and liver.

Degenerative diseases, and aging, often start with damage to mitochondria. Mutations in the mtDNA accumulate, the membrane lipids get oxidized. Once energy production is depleted, the cell starts to degenerate.

Mitochondria have their own small circular DNA coding for 13 proteins of the respiratory machinery; the rest of the mitochondrial proteins are encoded in the cell nucleus (~1200).

Health Food and Natural Cosmetics

Dr. Ori Cohavi, Animal-free Dairy, Remilk

Dr. Ori Cohavi started his academic journey with a Bachelor's degree in biology from Tel Aviv University, which he completed from October 2002 to June 2005.

He has a PhD in Biochemistry, Biophysics, and Molecular Biology between 2005 and 2011. Additionally, he pursued a Direct Ph.D program with the Feinberg Graduate School of the Weizmann Institute of Science, which lasted from 2005 to 2012.

Ori Cohavi the Co-Founder & CTO of Remilk, a position they have held since May 2019 (the org.com site). Before that, they worked as the Head of Discovery at Mitoconix Bio Ltd. from 2017 to 2019. Ori also served as a Project Manager at CollPlant from 2015 to 2017. Ori worked as a Senior Development Scientist at Beckman Coulter (Israel) Ltd. from January 2014 to September 2015. Before that, they were a Senior Researcher at Semorex Technologies from June 2012 to January 2014. Ori has also worked at the Weizmann Institute of Science, initially as a Ph.D. student from November 2005 to January 2012, and later as a Postdoctoral Researcher in 2012. Leading the way in the creation of dairy products without animal products is Remilk. The company was formed by CTO Ori Cohavi, PhD in Biochemistry, who has experience in research and development at many biotech companies, and CEO Aviv Wolff, an entrepreneur behind several business and social initiatives. Their mutual commitment to reimagining the dairy sector by eliminating cows from the milk-making process led them to start Remilk. For the first time in history, Remilk has eliminated the need for dairy cows in industrial-scale dairy production without sacrificing taste, functionality, or nutritional values. It does this by using precision fermentation to produce dairy-identical milk proteins and has developed a unique and patented approach to scalable manufacturing that uses a fraction of Earth's resources compared to traditional dairy. Real dairy without animals is called remilk.

Shoshana Arad, Ariel Kushmaro, Levi Gheber, and Nofar Yehuda, Natural Ingredient for Skin Protection, Alguard™, Frutarom

Shoshana Arad has a B.Sc.(1970) from The Hebrew University of Jerusalem, Department of Biology on Microbiology and Biochemistry M.Sc. (1973) from Ben-Gurion University,

Department of Biology and The Hebrew University of Jerusalem, and a Ph.D (1979) from Brooklyn College of the City University of New York, Department of Biology. Ph.D. Thesis: pH-induced aggregation in *Chlorella*.

Arel Kushmaro has a B.Sc (1990). Biology, Tel Aviv University, Israel, 1990 a M.Sc. (1992) in Microbiology, Department of Molecular Microbiology and Biotechnology, Tel Aviv University, 1992 and a Ph.D. (1999) Departments of Zoology and Microbiology, Tel Aviv University, Israel, 1999.

Levi Gheber has a B.Sc. Physics (1990), an M.Sc. (1990) in Physics, and a Ph. D. in physics of condensed matter from Ben-Gurion University of the Negev, Beer-Sheva, Israel.

Nofar Yehuda is a postdoctoral fellow at the Weizmann Institute of Science.

Even in extreme environmental conditions such as the world's ocean tidal zones, the porphyridium sp. or the red microalgae survives despite harsh temperatures, acidity, extreme UV radiation, salinity, and hydration (a-read site). The reason is a straightforward but effective biological product called Alguard™, a sulfated polysaccharide secreted by the algae that serves as an active shield around the cell structure to protect in addition to a physical barrier. Frutarom has developed a natural technology for obtaining Alguard™ for skin protection.

Beauty products with a natural component for skin protection can be made using the Alguard™ range. Similar to the algae's outer layer, our skin is frequently exposed to environmental factors that could degrade its inherent attractiveness. Therefore, using Alguard™ to its full potential will undoubtedly elevate skincare to a new level.

Frutarom begins the process of growth by growing the algae in conditions that are similar to those found in their natural habitat.

The algae are placed in sterile containers and are monitored carefully as they grow. They are then transferred to bioreactors outdoors to encourage the production of the polysaccharide that will provide the active shield ingredient.

The finished product has a silky smooth texture and unlike other products gathered from algae, it only has a small amount of odor. Keep in mind that this growth process and production of Alguard™ is 100% patented by Frutarom.

The polysaccharide has multiple uses and benefits for the skin. For instance, it can protect the skin against irritants and prevent it from oxidation. It protects the skin against the damaging rays of the sun and prevents the adhesion of microorganisms on the skin's surface. When it comes to beauty, it enhances the texture of the skin by reducing roughness seconds after application. It also reduces the visibility of wrinkles to promote a younger look and gives the skin surface a glossy appearance.

In summary, the ingredient can be used as a great component for products designed for anti-aging, sun protection, and total skin protection.

It is fit for products such as lotions, creams, and gels. As to properties, it is colorless, odorless, and has a silky smooth texture. This makes it an ideal ingredient for any skin care product. The development of Alguard™, which can now be organically processed to enable the creation of superior skin care products for consumers globally, has allowed red algae to survive in harsh environments.

Didier Toubia, Neta Lavon, Cellular Agriculture Technology, Aleph Farms

Toubia Didier, Didier, a qualified biologist and food engineer, is the founder of multiple medical device businesses. He founded Aleph Farms in 2017 in collaboration with The Kitchen FoodTech Hub and the Strauss Group in 2016.

Dr. Lavon is an authority on the biotechnological uses of stem cells. She established 25 new pluripotent stem cell lines while she was a researcher at Cedars-Sinai in Los Angeles.

Thanks to access to the Technion's laboratories and cooperation with Prof. Levenberg, Aleph Farms has taken the vascularization of stem cell-derived tissue constructs and adapted it to the food sector (aleph Farms site, Calcalist, 2020).

What characterizes Aleph Farms is the combination of 3 unique aspects. The first is the focus on growing a whole piece of meat, such as a steak rather than a hamburger. The second aspect is a unique source of cells that possess the capability to rapidly reproduce without genetic engineering. The third aspect is the infrastructure for large-scale production required in the world of food, alongside the many patents and knowledge we have developed.

Part of the development involves the complex issue of a growth medium providing the cell nutrients that will be both efficient and low-cost. In principle, the goal is to reconstruct the surroundings and nutrients that nurture the cells in the body, without any animal content i.e., only the cells themselves are animal-based.

In 2018 Aleph Farms was the first company to go public with a piece of steak grown outside a cow.

Morris Zelkha, Lycopene, Lycored Black Seed Oil (Nigella sativa), Trinutra

Prof. Morris Zelkha is the founder of Lycored (1995) producing lycopene-rich oil from extracts of locally grown tomatoes (afhu site). He has a B.S., in Chemical Engineering. He has worked in the fertilizer, chemical, and nutraceutical industries for more than 35 years.

These days, Lycored provides natural colorings and extracts made from tomatoes cultivated in Israel and California utilizing Israeli seeds for use in nutritional supplements and health purposes throughout North America, Europe, and Asia.

Zelkha is doing the same for black seed oil (*Nigella sativa*) (trinutra site). Just as he did for lycopene, Zelkha is teaching the market how to identify a high-quality black seed ingredient

Zelkha teamed up with scientists Itschak Lamensdorf, PhD, and Yoram Sela, PhD, who both had extensive backgrounds in the pharmaceutical sector, as soon as he left LycoRed in 2014. They co-founded TriNutra Ltd., a black seed company based in Ness Ziona, Israel. CogniBen, a cognitive-health product, was its initial offering.

Cogniben®

Ten participants (18–55 years old) with cognitive impairment symptoms participated in a recent single-blind, dose titration, outpatient study to assess Cogniben®'s effectiveness. By the conclusion of the second week, the subjects had been titrated from half a tablet of Cogniben® per day to the maximum permitted dosage of two pills per day. This dose was maintained for an additional 5 weeks. Subjects' symptoms, well-being, and improvements were assessed via questionnaires at baseline and subsequent visits. The average change in the total average symptom score from the baseline to the endpoint served as the main effectiveness objective.

B'utyQuin™

Native to South and West Asia, *Nigella sativa* is an annual blooming plant of the Ranunculaceae family. Its seeds and the oil derived from them are widely used as spices in Eastern cuisine and folk traditions for its skin and health benefits. Black cumin oil has been used in traditional medicine for more than two millennia.

TriNutra's® cold-pressed black cumin oil has fatty acids including linoleic, oleic, and palmitic acids, and is standardized to include 3% thymoquinone, a powerful active ingredient. The free fatty acid in it (FFA) level is kept very low (< 2%) to maintain high stability and quality.

ThymoQuin®

In many traditional Eastern and Ayurvedic medical systems, *nigella sativa* oil (NSO) is used extensively as a treatment for a wide range of illnesses and disorders. For the first time, thymoquinone, a crucial phytonutrient found in Black Seed Oil, has been naturally standardized by TriNutra®.

Main Benefits to Skin: Anti-aging and longevity Skin energizer Hydration and barrier repair Diminishing InflammAging Reducing oxidative stress Protecting Relief for seborrhoea, and dandruff.

Liki von Oppen-Bezalel, Protection Against Oxidative Damage and Sun Exposure, PhytoflORAL, Israeli Biotechnology Research (IBR)

Liki von Oppen-Bezalel, Ph.D. is a pioneer, trend- and tone-setter in the field of beauty from within/nutricosmetics. After earning a degree in microbiology and biotechnology from the Hebrew University of Jerusalem in Israel, von Oppen-Bezalel finished her doctoral studies at the FDA's National Center for Toxicological Research.

A patented component found in non-GMO tomatoes that are high in the colorless carotenoids phytoene and phytofluene makes up PhytoflORAL®. It is offered as an all-natural, free-flowing powder that can be utilized in a variety of products, such as pre-mix sachets, chewable tablets, beverages, and capsules.

PhytoflORAL is a pure tomato powder-derived ingredient ready to be put in capsules, chewable tablets, drinks, or pre-mix sachets meant to improve skin health and tone.

The patented cosmeceutical product was developed at Israeli Biotechnology Research (IBR), a company acquired by Frutarom (patents.justia.com)

Liki von Oppen-Bezalel holds several patents such as carotenoid compositions useful for whitening skin, carotenoid compositions having antiviral activities and uses thereof (patents.justia site)

According to clinical research, dietary carotenoids build up in the skin, protecting against sun exposure and oxidative damage while also brightening and balancing the complexion, preventing the formation of age spots, and lowering inflammation and DNA damage.

On May 7, 2018, International Flavors & Fragrances and Frutarom (TASE:FRUT) announced that they have entered into a definitive agreement under which IFF will acquire Frutarom in a cash and stock transaction valued at approximately \$7.1 billion, including the assumption of Frutarom's net debt (ir.iff site).

International Flavors & Fragrances Inc. ("IFF") is an American company that produces goods in the areas of nutrition, taste, texture, aroma, enzymes, cultures, soy proteins, and probiotics that it sells all over the world. It is headquartered in New York City and has creative, sales, and manufacturing facilities in 44 countries.

On December 15, 2019, DuPont de Nemours, Inc. ("DuPont") and International Flavors & Fragrances Inc. ("IFF") declared a final deal for the merger of IFF with DuPont's Nutrition & Biosciences ("N&B") businesses.

Michael Gordon, Yossi Sefi, Didier Toubia, Reduced Content of Sugar, Blue Tree Technologies Ltd

Blue Tree Technologies Ltd has developed a technology applicable to any high sugar natural liquids (bluetree-tech site). BlueTree enables the global production of healthier,

great-tasting natural beverages with reduced sugar content. The patented technology combines different separation techniques to selectively eliminate sugar molecules from juices and milk products.

Michael Gordon has an MBA and an M.Sc. in Water and Soil Sciences and a proven track record in the beverage and foodtech markets.

Yossi Sefi has a B.Sc. in Biotechnology Engineering and an M.Sc. In Industrial Engineering

Didier Toubia has over 20 years of experience in Pharma and foodtech entrepreneurship.

Kelly Thompson, Dr David Tsivion Sugar Reduction Solution, Incredio

Kelly Thompson brings decades of international business expertise and a proven track record in innovation and business development to Incredio (incredio site). With senior roles at Continental Mills, Dean Foods, and Kraft Foods, Kelly has led remarkable achievements.

David Tsivion, Ph.D., is specialised in nanomaterials synthesis from the Weizmann Institute of Science.

Incredio® Sugar is a sugar reduction solution that provides anywhere between 30%-50% reduction of sugar in food and snacks such as cakes, cookies, chocolate, candy and more, with no compromise to the taste or the level of sweetness.

The Incredio Sugar technology involves loading sugar molecules onto a large surface mineral to form clusters. These clusters carry the sugar more efficiently and swiftly, enhancing its delivery to the sweet taste receptors and resulting in an increased perception of sweetness.

The Incredio Sugar G2 technology blends and dries sugar and protein to form unique sugar clusters that, when combined with traditional sugar, dissolve quicker in the saliva. This rapid dissolution increases the concentration of sucrose around the sweet taste receptors, resulting in an increased perception of sweetness.

Yossi Peled, Yoni Twito Vegan Protein, NextFerm - Protevin™

Vegan protein NextFerm - Protevin™ is the first highly digestible, non-GMO, whole protein that can replace animal derived protein without compromising on nutrition, taste & performance. Its nutritional value enables a faster muscle mass regeneration with minimal protein intake compared to other vegan solutions.

Yossi Peled, over the past twenty years, was CEO of Galam - a natural raw materials refining company. Served as Chairman of Euro-sweet, Lehavot and Enzymotec, and has

held various executive positions at his Kibbutz, Maanit. Yossi studied Business Administration at the Ruppin Academic Centre and an Executive MBA at Tel Aviv University.

Six powerful natural ingredients, Vitamin D3, C, Zinc, Astaxanthin Astasferm, curcumin, Elderberry, to support healthy immune function and response, with mechanisms for covering both phases of the immune system.

Yoav Weinstein, Eran Sinbar, Packaging Analytical Monitoring (PAM), YORAN Imaging

Yoran Imaging was founded in 2016 by Yoav Weinstein and Eran Sinbar, who have worked together for more than two decades. Both have extensive research and development expertise centering on thermal imaging-driven analysis, inspection, and process improvements. Amir Vetzler joined the company in 2021.

Packaging Analytical Monitoring (PAM) is a nonintrusive inline inspection system for heat-sealed packages that does not result in production slowdown (yoran-imaging site). Combining thermal imaging technology with advanced real-time algorithms, PAM can be used for containers, blisters, canisters, pouches, sachets, and tubes.

Dr. Ilan Samish, Shmuel Marko, Novel Proteins, Amai Proteins

Dr. Ilan Samish is a leading multidisciplinary entrepreneur and expert in computational protein design, genetics, biochemistry, and computational biology who has worked in top-notch multidisciplinary teams. He has a Ph.D. from Weizmann, a postdoc from the University of Pennsylvania, and an academic career at Weizmann, Hebrew U., and Braude.

Shmuel Marko was the CTO of Materna and food CTO of SodaStream, which, during his tenure, grew from a \$6M company to over \$3B.

Amai Proteins developed Sweelin, a hyper-sweet protein from the serendipity berry that cuts added sugar in food and drinks by 40-70% without sacrificing taste, health, cost, or sustainability. The AI Computational Protein Design (AI-CPD) technology, precision fermentation production and food technology flavor-house capabilities enable to deliver healthy, great-tasting, sustainable, and affordable protein products to meet consumers' needs and industry requirements.

B.Z. Goldberg, Yair Yosefi and Omer Ben-Gal, Natural, Flavor Solutions, the Mediterranean Food (MFL) Lab

MFL was founded by three cooks B.Z. Goldberg, Yair Yosefi and Omer Ben-Gal and a filmmaker in 2019, brought together by their interest for natural flavor solutions. At their

bistro, “Brut,” inspired by French and Northern Italian cooking, they served hearty, meat-centered dishes.

The co-founders set out to recreate the same richness using fermentation of plant-based, natural foods to unlock the depth of flavor found in meat. After almost two years of study, the team discovered the power of Solid-State Fermentation.

The Mediterranean Food Lab develops a fermentation-based approach to produce natural flavor solutions made from real food – simple ag-commodities and food side streams. The solutions are designed to bring satisfying, meaty, multi-layered flavor profiles to a wide range of dishes traditionally flavored with animal protein.

Gofna Liss-Rubin, Plant-based Food Products Alfred's

Food innovator at heart, Gofna joined alfred's FoodTech because she believes it has what it takes to make a global impact - and soon: delicious and nutritious products, a huge market opportunity, simple and scalable technology and a dedicated team.

She has over 20 years of experience, most of them at Nestle. She holds a degree in Food Engineering and an MBA from the Technion.

Alfred's is a pioneering production platform for crafting 100% plant-based food products on a large scale. The solution revolves around their technology's capability to eliminate off-tastes in plant protein and infuse high protein content into each tailor-made product. Alfred's Patented Plant-Power Protein Platform delivers new Plant-based Products for our partners in the food industry.

Max White, Plant-based Food Technology, AKA Foods

Max White brings experience from previous roles at Redefine Meat, Wonderland Healing Center, Kanabo and Spinnovate holdings. Max White holds a 2006 - 2008 Bachelor of Laws (LL.B).

AKA foods specializes in AI-powered new product development (NPD) for the food industry. Their platform utilizes deep learning and graph neural networks to digitize plant-based food technology, mapping the molecular structure of ingredients to create products with authentic taste and texture, and facilitating the mainstream adoption of plant-based alternatives. Under one roof, AKA brings together a diverse, multidisciplinary team of vegan entrepreneurs, data scientists, and experienced food technologists.

A global food Consumer packaged goods (CPGs)' plant-based cheese development plateaued after 12 months of conventional NPD. AKA's STIR algorithm outperformed customer prototypes in preference and similarity, revitalizing NPD efforts and significantly accelerating product launch.

Shelly Lotan, Roni Shapira, Sustainable Protein Purification, Medium Well

Shelly Lotan has a Master of Laws (LL.M.) from Tel Aviv University and a Master of Laws (LLM), International Law and Legal Studies from Northwestern University Pritzker School of Law.

Dr. Roni Shapira is retired from The Robert H. Smith, Faculty of Agriculture, Food and Environment, Hebrew University, Jerusalem. Medium Well is developing a cost-effective and sustainable protein purification and molecular separation solution. The technology can also be used for medium recycling for cultivated meat production, by removing inhibitors and toxicants and even salvage valuable compounds out of waste streams.

With 10–20x the cost-efficiency of traditional synthetic resins and superior performance compared to conventional filtration solutions, BioResin and BioBags are a game-changer for downstream processes.

Golan and his Brothers Ido and Matan, Protein from Microalgae, Brevel

Founded in 2017 by Golan and his brothers Ido and Matan, Brevel combines light with sugar fermentation in indoor bioreactors. Traditional fermentation – limited to dark environments – produces microalgae at high yields and affordable costs, but poor in light-dependant nutrients, functionalities and overall commercial value, according to the company.

Brevel's fully automated, industrial scale indoor reactors unlock the full potential of microalgae by producing the highest quality natural ingredients at accessible costs.

Brevel develops a neutral-flavored and sustainable alternative protein from microalgae, suitable for animal-free products such as dairy, egg, meat, and seafood alternatives. The protein is high-quality, with a complete amino acid profile and significant nutritional value.

Danny Weis, Oded Shoseyov, Wonder Veggies

Danny has 15 years of experience as an entrepreneur, executive and CEO of start-up companies in the environmental and life science sphere. Oded is a proven expert in plant molecular biology, protein engineering and nano-bio-technology. He is the founder of 15 companies, including Collplant, Melodea and SavorEat.

Wonder Veggies, is developing a family of chicks and application protocols, enabling farmers to naturally grow vegetables and fruits packed with healthy probiotics supporting gut health and the immune system.

Itai Cohen, Allen Hazan, Uri Buri Jeremias, Proteins from Plants, Gavan Technologies

Itai Cohen has a BA from the College of Management and a MSE in Finance from Baruch College. Allen Hazan is an autodidact.

Uri (Uri Buri) Jeremias is an entrepreneur in the field of restaurant, foodtech, hotels.

Animal-free fats that can substitute the traditional fat experience are essential for alternative products to compete with the taste of conventional products.

Gava Technologies has developed an alternative fat solution using an exclusive protein extraction platform that extracts proteins from plants in their natural state. These proteins are then combined to form a cohesive structure that binds vegetable oil and water, resulting in the creation of Fatrix, a plant-based oleogel using 20 times less protein than prevalent alternatives on the market.

Ofek Ron, Ron Sicsic, Ariel Szklanny, and Hila Elimelech, Plant-based Fish Fillets, Oshi

Ofek Ron has a Bachelor's Degree from University of Tel Aviv 2014-2017 in Economics and Business Administration.

Ron Sicsic's background is in Organic Chemistry, Veterinary Medicine, Molecular Biology and Genomics.

Hila Elimelech is a Doctor of Materials Chemistry (Hebrew University of Jerusalem) and an Additive Manufacturing specialist. Well experienced with initiating and directing 3D printing projects.

Oshi is an Israeli startup co-founded in March 2021 by Ofek Ron, Ron Sicsic, PhD, Ariel Szklanny, PhD, and Hila Elimelech, PhD, specializes in sustainable plant-based fish alternatives, addressing both sustainability and ethical concerns associated with traditional fish farming and overfishing.

Oshi makes plant-based fish fillets that look and taste like real farmed salmon fillets as a protein alternative food product for the alternative seafood market. They have developed a novel technology that allows them to replicate the flaky texture of animal fish fillets.

Anat Natan, Esti Brantz, Meal Pods, Anina

Anina is using upcycled vegetables to create ready meal "pods" that use up imperfect vegetables for healthy plant-based meals (Ettinger, 2022). Anat Natan and Esti Brantz are the co-founders.

The meals can be cooked on the stovetop or microwave in a matter of minutes. Each pod contains two cups of vegetables—nearly half the recommended daily intake. The meals are also high in protein, fiber, and free from colorants or preservatives.

Anina uses a patented lamination process for thin slices of vegetables to build its layered pods that are filled with ingredients including herbs and spices, pasta, lentils, and bulgur wheat. It currently offers bowls in three flavors: Mediterranean, Italian Primavera, and Vietnamese.

Since its launch in 2020, Anina has secured USD \$3.3 million in a safe round from Strauss Group by The Kitchen Hub, Unovis, Unorthodox ventures, AgFunder VC, Wordcreate Inc., and the Israeli Innovation Authority. Following a successful product launch in Israel, Anina is now focused on bringing products to the U.S.

DEFENSE

The technologies and the developed innovative systems are related to the needs of the country in conflict with several enemies. Offensive and defensive weapons protecting the civile population, infrastructure strategic sites, and soldiers are developed by key researchers from the academy and the research departments of Israeli MNCs and SMEs subcontractors of those MNCs

Unmanned Aerial Vehicle (UAV)

Abe Karem, Albatros UAV

An Assyrian couple welcomed Abraham “Abe” Karem into the world on June 27, 1937, in Baghdad, Iraq. He lived the majority of his life in Israel after his family relocated there in 1951 (auaf.us site).

Abe Karem went to Israel’s Technion Institute of Technology where he earned an aeronautical engineering degree. As an Air Force officer for nine years, Karem learned to design and maintain real aircraft. After the Air Force, Karem joined Israel Aircraft Industries, where he rapidly made his way toward the top. He claims that he was in line to become the executive vice president for engineering within four years, while still in his 30s, but he chose to go it alone (Whittle, 2013).

He moved on for a number of reasons, but one of them was an epiphany he had in late 1973 while working on a pressing Air Force request to create a drone decoy that fooled radar. Working on the project led Karem to view unmanned aircraft as uncharted territory, but it ultimately failed since Israel ultimately purchased decoys from the United States. He quit IAI in early 1974 to launch his firm to design UAVs in spite of objections and cautions from superiors.

Following his departure from IAI, Karem offered the Israeli military UAV designs one after the other for three years without ever closing a deal. He finally came to the conclusion that Abe Karem would never sell anything to the government, which was the only shareholder in IAI and whose executives did not like his leaving. He became frustrated and made the decision to try his luck in the US, where he understood there were far more prospects for entrepreneurs.

Karem joined Developmental Sciences Inc., a small Los Angeles business that had provided Israel with a drone decoy in 1973, in 1977 in order to establish a presence in the American aerospace sector. The company was now engaged in projects that included a Defense Advanced Research Projects Agency (DARPA)-funded UAV. Karem went out alone once more shortly after. Dina discovered Abe would be working from home when he went to her house searching.

In 1977, he moved to Southern California. In his garage, he and a small team built the Albatross, a long-endurance UAV that flew for 56 hours—remarkable for its time goefoundation.org+1 The Washington Post+1. DARPA funding helped evolve the Albatross into Amber, which in turn led to the Gnat-750 and ultimately the celebrated MQ-1 Predator under General Atomics control.

Two other UAV enthusiasts were working with Abe in the garage: Jim Machin, a pre-med student who had impressed Abe at a free-flight modeling meet, and Jack Hertenstein, a smart but reserved engineer and radio control modeler Karem had met at Developmental Sciences.

Abe Karem established Karem Aircraft in 2004. The US Army's Joint Multi-Role Technology Demonstration (JMR TD) program includes Karem Aircraft as a participant. Karem has also recently contributed to DoD's Joint Heavy Lift (JHL) and Joint Future Theater Lift (JFTL) programs, as well as DARPA's VTOL X-Plane (VXP) program. Karem is also working on a number of privately funded projects, such as the creation of the AeroTrain® and AeroCommuter® Optimum Speed Tiltrotors for use in commercial passenger transportation. His latest venture, Overair, develops the “Butterfly” electric air taxi in partnership with Uber and Hanwha.

Gadi Kuperman, Military and HLS Drones Spear UAV

Gadi Kuperman was Elbit Systems from Oct 2010 to Dec 2011 in charge of the management/business development activities for Israel's foremost aerospace technology provider ([spearuav](http://spearuav.com) site). He established close working relationships with leading local/global defense agencies and organizations, including the Israel Defense Forces (IDF), Israeli Air Force (IAF), US Air Force, and leaders in private enterprise (Lockheed Martin). He was a pilot, Col. (Res.) in Israeli Air Force Israeli, Jun 1985 - Oct 2010. He has a B.A. in economics & Logistics (Hons) from 1994 - 1996 from Bar-Ilan University and an MA, MA, Strategy of National Security (Hons), Air University Maxwell Air Force Base Alabama, USA 2006 – 2007.

Founded in 2017 by Col. (res.) Gadi Kuperman, SpearUAV specializes in loitering munitions—autonomous weapon systems stored in capsule-like containers and launched using artificial intelligence.

SpearUAV developed a small, unmanned aerial vehicle equipped with a warhead that's launched from a 50-centimeter capsule. Because of its lightweight construction, soldiers can carry it or place it on tanks or APCs. It unfolds innovative, sensor-equipped arms after launch. A soldier or tank crew can quickly use artificial intelligence to find pre-identified targets, such as a fighter with an AK-47, a pickup truck with a mounted machine gun, or an armed person riding a motorcycle. Target settings can also be changed by operators.

The SpearUAV has a five-kilometer flight range. These drones are hard for radar to detect because they fly very low and have few thermal traces.

This system is being deployed from submarines for the first time in the world by SpearUAV. The capsule is released by the submarine when it is submerged, floats to the surface, and then gets commands.

Matteo Shapira, Aviv Shapira, Rubi Liani, Adir Tubi, UAV Realverse Technology, XTEND, Reply Technologies

Matteo is a world-leading expert and innovator in the field of image synthesis and computer graphics (imvc; xstend sites). During the past 20 years, Matteo has worked on numerous high-end award-winning visual effects, animation, and CGI projects. As part of his career, Matteo has been teaching at the Bezalel Academy of Art & Design in Israel as a senior member of staff from 2000-2007.

The Shapira brothers, Aviv and Matteo were the inventors of the first commercial volumetric video (3D hologram) in the world (Levanon, 2024). This format was developed at Reply Technologies, the business they established before Intel purchased it in 2016. The two discovered that the idea of the metaverse, as it is currently known, might be used in the actual world after meeting Israel Defense Prize laureate Adir Tubi and Israeli Drone Racing League (FRIL) creator Rubi Liani. They refer to their specific technology as the realverse. It makes it possible to somewhat "replicate" human senses—hearing, sight, and interaction—in distant machines. According to XTEND's vision, we shall all be able to access a distant reality at any time, anywhere in the world, and do anything that comes to mind.

The technology was transformed by XTEND into an operating system known as XOS, which stands for XTEND Operating System. The device makes it incredibly easy for users to remotely control a range of robotic platforms. Users can instruct the robot to intelligently do subtasks on its own, and the operating system offers ground-breaking capabilities including intelligent and transparent group robot administration and the use of end applications from different businesses. This results in a wide range of real-world solutions, from the military to others that can be useful in the construction industry, such as identifying cracks and leaks.

The top experts in the fields of aeronautics, flight algorithms, mechanical design, system architecture, user experience/user interface, and operations and integration specialists make up the XTEND team. Following a joint R&D program led by the Israel Ministry of Defense and the U.S. Department of Defense, this team has produced a combat-proven, human-guided drone system with an immersive remote interface that protects troops from various inbound aerial threats.

The government, defense, counterterrorism, and homeland security sectors have shown a strong demand for the tactical mid-range counter-unmanned aircraft system (c-UAS) solution SKYLORD GRIFFON; the micro-tactical intelligence, surveillance, and reconnaissance (ISR) solution SKYLORD XTENDER; and the tactical pick and drop arm system SKYLORD WOLVERINE, with heightened interest in physical security.

Human intelligence and machine autonomy are being brought together via XTEND's SKYLORD platform, which combines real-time VR/ARUX technologies, heuristic predictive visual and spatial technologies, 3D computer vision, and industry-leading, proprietary operating systems. Together to superpower soldiers' abilities and, simultaneously, save soldiers' lives.

Dov Raviv, Arrow Antimissile System

Dov Raviv was born in Bucharest, Romania, in 1937. His family emigrated to Israel in 1947. Dov enrolled at the Technion, faculty of aerospace engineering.

After earning a bachelor's degree in aviation engineering in 1959, Dov joined MLM, a division of Israel Aerospace Industries (IAI), as an employee. He excelled at all tasks and brought many new ideas to the company. He was also an Israeli Air Force officer responsible for ballistic missile trajectory while at MLM.

He was promoted to director of MLM in 1978, overseeing 180 employees and transforming it from IAE's manufacturing plant into an arm for engineering systems and production with 1,100 employees by the time he retired in 1992. During this period, he started working with a team of all Technion graduates to develop the Arrow interceptor missile and launcher he had envisioned. When a US Air Force delegation came to IAI in 1984, Dov was invited to give a presentation on ongoing initiatives. Six months later, astronaut and aeronautical engineer Lt. Gen. James Abrahamson of the United States asked for a proposal to fund the Arrow experiment. Gen. Abrahamson was the director of the new Strategic Defense Initiative Organization (SDIO), known as the Star Wars Program, to develop a sophisticated anti-ballistic missile system for the U.S. In 1986, a formal agreement between the U.S. and Israel agreed to co-fund an Arrow program worth billions of dollars. In 1988, SDIO ordered the Arrow 1 technological demonstrator from IAE. In 1990, Arrow 1 had successful testing. The Gulf War in 1991 was the impetus for further development of the Arrow. In 2000, Arrow 2 became the first operational missile defense system in history.

Arrow 3 — also led by a team of Technion alumni — became operational in 2017. During the space-flight phase of their trajectory, it can intercept intercontinental ballistic missiles with nuclear, chemical, or biological warheads up to 1,500 miles away. In April 2024, the Iranian long-range ballistic missile barrage was intercepted using both Arrow 2 and Arrow 3.

Chanoch Levin, Iron Dome

Levin was born in Tel Aviv in 1948, to parents who survived the Shoah and lost all their family (Maital, 2021). He started working at Rafael after earning his mechanical engineering degree from Technion in 1975.

He and his family were in a community in northern Israel when four missiles struck and rocked their home during the Second Lebanon War in 2006. He therefore presented Rafael's management with a plan to intercept and eliminate artillery munitions and short-range rockets. He was appointed to head the project, which became Iron Dome. A small crew started construction on the Iron Dome at Rafael in 2006.

Amir Peretz, the defense minister at the time, insisted that the project proceed in spite of criticism and supplied the initial financing.

A target is identified by the system. Depending on whether it is anticipated to land in populated areas or open ground, the computer determines whether to intercept it. Only when the rocket poses a threat to human safety is interception commanded, and the Iron Dome battery maps the area it guards.

It is an automatic system. For every rocket selected for destruction, the computer launches an interceptor missile. It will avoid other rockets that are not its target and only look for and destroy that one.

The Iron Dome was fully functional by 2011 and was first used in operation “Pillar of Defense” in 2012, where over 400 rockets were intercepted (idf site). The Iron Dome is a compilation of several features: the technology itself, the machinery that shoots out the rockets, the soldiers who operate the system, and the commanders who supervise the network.

Joel M. Avidor, Tactical High-energy Laser – Iron Beam

Joel M Avidor has a PhD Aeronautics and Astronautics from 1966 – 1971 Polytechnic Institute of Brooklyn.

The Nautilus Project was started in 1995 as a joint US-Israel feasibility study for using laser systems to defend against short-range artillery rockets (Shwartz et al,2002). The Tactical High Energy Laser (THEL) Advanced Concept Technology Demonstration (ACTD) Program has now developed into a successful laser weapon demonstration program.

In a lengthy series of demonstration tests at the US Army's White House, the THEL Demonstrator has already engaged and destroyed numerous artillery rockets in mid-flight. Sands Missile Range in New Mexico. The THEL ACTD hardware and development process are described in this paper, as well as the major test results.

IRON BEAM, the new laser system generation, is a ground-based high-power laser air defense system designed to counter aerial threats, including rockets, mortars, unmanned aerial vehicles (UAVs), and cruise missiles (rafael site). The project is led by the DDR&D R&D Unit of the Ministry of Defense (IMod), with Rafael and Elbit Systems serving as its principal developers. An international technological advancement is the Iron Beam system. The system is expected to integrate into Israel's multi-layered defense array as a complementary capability to the Iron Dome system. Israel's defense capabilities against present and future threats will be greatly improved by this combination, which will also result in much lower operating costs.

In December, the firm and Lockheed Martin inked a deal to work together on the development of an Iron Beam-based high-energy laser system for US usage.

Yossi Wolf, Elad Levi, Robotic Systems, Roboteam

Yossi Wolf and Eldad Levy are former officers in a classified Air Force unit. Wolf later studied physics at university, and Levy studied robotic engineering at the Technion Israel Institute of Technology in Haifa.

Wolf partnered with Elad Levi to build Roboteam defense, one of the top suppliers of tactical ground robotic systems worldwide (robo-team site).

ROOK is a multi-purpose robotic UGV especially designed for easy payload integration, for close and long-range operations to improve the efficiency in the front lines, and to SAVE LIVES.

With 360° day/night information gathering capabilities, MTGR is the lightest, most feature-rich, all-terrain tactical ground robot in the world. IRIS is a throwable, incredibly light reconnaissance robot designed for hazardous, small areas.

The military robot PROBOT is capable of carrying up to three times its weight when carrying a hefty load. PROBOT continues to demonstrate exceptional inside and outdoor mobility and land speed when carrying full cargo. A medium-sized UGV that can be carried by two people is called the Transportable Interoperable Ground Robot (TIGR). Operating in any terrain, the TIGR is an extremely mobile, all-weather system.

The ROCU-7 is an all-weather controller whose easy-to-master user interface enables a single operator to control several unmanned systems under any lighting conditions.

Prof. Jacob Bortman, Mori Arkin, Monitor Components Miniature Camera, Odysight

OdysightAI® is based, among other things, on the research of Prof. Jacob Bortman, a former director of the Air Force's equipment group and currently a professor in the

Mechanical Engineering Department at Ben-Gurion University of the Negev(odysight.ai site).

The company's main investors are Mori Arkin and his sons' Arkin Holdings, with a 52% controlling stake, and institutional investors such as Phoenix Holdings and Meitav Dash Investments.

Mori Arkin headed Agis, growing it into a leading dermatological company in the U.S., until its acquisition by Perrigo in 2005. Mr. Arkin has extensive experience in the development and commercialization of pharmaceutical drug products, having held leadership roles in several companies with significant ties to innovative and generic drug companies. He holds a degree in psychology and philosophy from the Tel Aviv University.

In 2018, Odysight, then under its former name ScoutCam, was split from the biomed company Medigus. The tiny optical sensors, which Odysight uses to monitor components in aircraft, are a further development of miniature cameras developed for medical applications. Their diameter is 1.1 mm, and they include a self-illumination source and allow a view into the human body.

OdysightAI® is pioneering the Predictive Maintenance (PdM) and Condition Based Monitoring (CBM) markets with its visualization and AI platform. Providing video sensor-based solutions for critical systems in the aviation, transportation, and energy industries, OdysightAI® leverages proven visual technologies and products from the medical industry. OdysightAI's unique video-based sensors, embedded software, and AI algorithms are being deployed in hard-to-reach locations and harsh environments across a variety of PdM and CBM use cases. OdysightAI's platform allows maintenance and operations teams visibility into areas which are inaccessible under normal operation, or where the operating ambience is not suitable for continuous real-time monitor

In the field of aviation safety the system is embedded in the Apache helicopters of the Israeli Air Force, in Elbit's new aircraft.

There are now systems that are supposed to identify malfunctions before they happen by analyzing vibrations. OdysightAI's system is based on a camera and is more accurate. OdysightAI's system has another advantage: the information that it collects can dramatically shorten the preflight checks by 40% from what is currently needed, saving mechanics' work and shorting turnaround time between sorties, a critical matter in wartime.

Yiftach Richter, Deep-tech Signal Processing, R2 Wireless

Yiftach Richter holds a Ph.D. in Electrical Engineering (signal processing and wireless communications) under the supervision of Prof. Itsik Bergel at the Faculty of Engineering, Bar-Ilan University (r2-wireless site).

Research Interests:, MIMO, Signal processing for communication, Deep learning for wireless communication and Routing in wireless ad-hoc networks.

R2 is a deep-tech signal processing company on a quest to secure the wireless front by reinventing wireless sensing. The company detects, classifies and geolocates any RF transmitting device, using proprietary signal processing and AI technology which is object, network, frequency, and protocol agnostic.

R2 provides full spectrum defense for the wireless front, protecting against the unseen.

Using deep tech signal processing and machine learning, our technology detects, classifies and geolocates any wireless threat or signal anomaly across the RF spectrum.

TELECOMMUNICATION AND SECURITY

Israel has pioneered several significant technologies in the telecommunications and security sectors, including: Miniature modems enabling compact and efficient data transmission; Text-based messaging systems for early and reliable communication; Network Voice Protocol (NVP) facilitating voice communication over data networks; Global Positioning System (GPS) technologies enhancing navigation and tracking; Cellular communication advancements driving mobile connectivity; Very Small Aperture Terminal (VSAT) systems for satellite communication; Security door technologies improving access control and safety; Automotive safety innovations enhancing vehicle protection and passenger security; These innovations have contributed substantially to the global advancement of communication and security infrastructures.

End-to-end Communication Systems

Yehuda Zisapel, Zohar Zisapel, Modem, Multiplexer, RAD Group

Born in Tel Aviv, Zohar Zisapel was one of three children of Polish immigrants who owned and operated a shoe company on Herzl Street. At the time, one of the city's main arteries. Upon graduation from high school, he enrolled as a student at the Technion–Israel Institute of Technology in Haifa. He received his B.Sc. and M.Sc. in electrical engineering from the Technion and later earned an MBA from Tel Aviv University. Upon completing his undergraduate studies at the Technion, Zisapel served in the Israel Defense Forces (IDF) (Kloosterman, 2009).

Yehuda Zisapel was born in Tel Aviv. He played the violin since he was a little boy and even owned a collection of vintage violins. During his military service, Yehuda began studying electrical engineering at the Technion. At the graduate school's management faculty, he earned his bachelor's and master's degrees in electrical engineering as well as a master's degree in business administration at the Recanati Graduate School of Business Administration, Tel Aviv University.

In 1981 Zohar oversaw the development of RAD's first product, a miniature modem that would revolutionize the industry. The modems that were then on the market were the size of pizza boxes. On the other hand, RAD's modem was portable and required no external power source because it was built to run on electricity that was sent over the phone line. One version of this modem, the SRM-3, would be recognized by the Guinness Book of Records as the smallest ever manufactured.

Within two years of its founding, RAD had become a profitable international manufacturer of access solutions for data communications and telecommunications applications (Computer Business Review, 1992).

Beyond tiny modems, the Zisapel brothers broadened their scope. The Zisapels were creating new concepts for enterprise-use communications products, such as server and security appliance adapters, integrated network management systems, video conferencing infrastructure and development tools, wireless devices, and other market niches, even as RAD would go on to launch its first fiber optic product in 1986 and its first multiplexer the following year. Instead of expanding their current business beyond its initial purpose, the Zisapels established a new business that would concentrate on each of the selected industrial niches. This approach grew into the RAD Group, a family of independent companies that develop, manufacture, and market solutions for diverse segments of the networking and telecommunications industries.

RAD is at the forefront of revolutionizing the world of networking. With a strong emphasis on Carrier Edge and AI-powered networking, that ensures that businesses and service providers are equipped with the best tools to navigate the digital landscape (rad site). Network Embedded Security offers unparalleled protection, ensuring that data and assets are safe from potential threats. With Smart Diagnostics, RAD provides real-time insights into network performance, ensuring optimal uptime and efficiency.

Yoel Gat, Amiram and Yehoshua Levinberg, End-to-end Communication Solutions, Gilat

Yoel Gat completed his BScEE in the Technion in Israel in 1974 and worked for 13 years in the Israeli MOD (Ministry of Defense). He left with Amiram and Yehoshua Levinberg, Shlomo Tirosh, and Gideon Kaplan and they founded Gilat Satellite Networks in 1987.

Joshua Levinberg co-founded Gilat Satellite Networks and JAL Ventures together with his brother, Amiram Levinberg. He graduated from Tel Aviv University and received a bachelor of science degree in electronics and electrical engineering.

Gilat Telecom specializes in offering worldwide clients, including cellular operators, Internet service providers, businesses, government agencies, and emergency and rescue services in Africa and the Middle East, end-to-end communication solutions that include bandwidth and connectivity via satellite, fiber optic, and radio infrastructure.

In 1991, Gilat launched Very Small Aperture Terminal (VSAT), which it sold to Rite Aid Corporation, an American drugstore chain that operated 2700 branches throughout the United States. It raised \$28 million when it went public on the NASDAQ in 1993. It introduced the Faraway system in 1994 to provide satellite phone services to far-flung areas. It introduced the Dial Away system in 1997. In 1998, Gilat executives acquired Spacenet for the amount of \$225 million through share-for-share exchange. General Electric became the company's largest stakeholder after the deal, owning 30% of Gilat's shares, the majority of which were sold for a significant profit within a few years.

Eli Reifman, Designs and Manufactures Mobile Telephones Emblaze

Born in Israel in 1970 Eli Reifman a BA from Tel Aviv University (1988 - 1991) and a MA, Philosophy (2005 - 2007) from Bar-Ilan University Bar-Ilan University. He is the controlling shareholder in Emblaze group, which has 600 employees worldwide, developing and producing next-generation software solutions for telecommunications infrastructures. Its subsidiary, Emblaze Mobile, designs and manufactures mobile telephones.

The launch of the Alpha 8 in 2004 represented an important milestone in cellular communication as this is the first time a carrier has an almost complete control over the handset design and applications (ISRAEL21c, 2004). The handset was designed by Emblaze Mobile alongside Partner, chiefly to incorporate video and games capability as key applications and value added services revenue driver for Partner.

The Alpha P8, based on the Emblaze M5 model, was one of the most technologically advanced devices with capabilities that include video camera (more than 30 minutes of video recording), Still images digital camera (more than 1,000 pictures), one of the largest color screens in the industry (2.2 Inch Mini TV 65,000 colors), 3D gaming capabilities, Java gaming, "Skins" application for changing under interface graphics look & feel, 7-way conference call, 3 hours tape recording, MMS, Email support and more.

Networks

Yair Goldfinger, Sefi Vigiser, Amnon Amir, Arik Vardi, and Yossi Vardi, Cross-platform Instant Messaging (IM) and VoIP Client, ICQ, Mirabilis

The founding company of ICQ, Mirabilis, was established in June 1996 by five Israeli developers: Yair Goldfinger, Sefi Vigiser, Amnon Amir, Arik Vardi, and Arik's father Yossi Vardi

ICQ was one of the first text-based messengers to reach a wide range of users. The technology Mirabilis developed for ICQ was distributed free of charge.

ICQ was a cross-platform instant messaging (IM) and VoIP client. The name ICQ derives from the English phrase "I Seek You". Originally developed by the Israeli company Mirabilis in 1996, the client was bought by AOL in 1998, and then by Mail.Ru Group in 2010.

The technology's success encouraged AOL to acquire Mirabilis on June 8, 1998, for \$287 million up front and \$120 million in additional payments over three years based on performance levels.

The service was shut down on June 26, 2024, following an announcement on the website of ICQ in May 2024 that the service would be discontinued (Kan, 2024).

Danny Cohen, Alon Cohen, Lior Haramaty Network Voice Protocol, Vocaltec

Born in Tel Aviv in 1966, Lior Haramaty learned in Ort Sigalovsky, Israel. He is a founder and Co-Founder of multiple companies, held various executive and board positions with a wide range and mix of responsibilities - managerial, business development, S&M, and R&D. He is the Co-Founder of VocalTec, a company that pioneered VoIP and PC audio, introducing products such as "Speech Board" 1985, "The CAT" and "VocalChat" 1992, "Internet Phone" 1995 and "Internet Phone Gateway" 1996. VocalTec's IPO took place in early 1996. Danny Cohen created the first visual flight simulator in real-time on a general-purpose computer in 1967. He also developed the first real-time radar simulator. His flight simulator work led to the development of the Cohen-Sutherland computer graphics line clipping algorithms, created with Ivan Sutherland (Newman, 2023).

He then modified the visual flight simulator to operate via the ARPANET in 1973, making him the first to use "packet video" and "packet voice" (Network Voice Protocol). It was the first application of packet switching to real-time applications. Cohen and his research group under ARPA sponsorship developed the USC/ISI ATOMIC LAN, which was based on the Caltech Mosaic components. It served as the study model for the high-performance system area network Myrinet. Later, he would co-found Myricom, which brought Myrinet to market. In 1980, he also initiated the MOSIS project. In today's interconnected world, where communication plays a vital role, Voice over Internet Protocol (VoIP) has emerged as a revolutionary technology that has transformed the way we make phone calls. VoIP allows voice communication via the internet in place of traditional phone lines.

The establishment of VocalTec Communications by two engineers, Alon Cohen and Lior Haramaty, in the mid-1990s marked the real breakthrough in VoIP. VocalTec is frequently given credit for developing the first Internet Telephony software, which popularized the idea of making phone calls via the Internet. With the 1995 release of their ground-breaking "InternetPhone," customers could now connect via voice signals sent over IP networks.

People were able to make long-distance calls for the first time at a much lower cost than with traditional phone companies. However, the audio quality of these early VoIP calls was frequently poor because of the constrained capacity and comparatively slow internet connections of the time. In 1996, the International Telecommunication Union (ITU) developed the H.323 protocol, a set of standards that defined audio, video, and data communication over IP networks. The future development of VoIP technology was made possible by this protocol.

Kobi Alexander, Voice Mail Technology, Comverse

Kobi Alexander is one of the founders of Efrat (1983) and its parent company, Comverse (1984) – one of the flagship companies of Israeli high-tech and a global pioneer of voice

mail technology. Alexander served as Comverse's President from its inception until the beginning of 2001 and as company CEO since 1987. Alexander later founded Comverse subsidiary Verint Systems, which has become another success story. Comverse Technology, Inc. was a US technology business that created and sold telecom software, with its headquarters in Woodbury, New York. The company focused on providing value-added services to telecommunication service providers, in particular to mobile network operators. Several of Comverse Technology's subsidiaries were either fully or partially owned. The terms "communication" and "versatility" are combined to form the moniker "Comverse".

The business was established in 1982, and in 1986 it went public on the Nasdaq Stock Market. Led by co-founder and CEO Jacob "Kobi" Alexander, the company originally specialized in centralized hardware/software systems for voice and fax messaging and sold them to telecommunications companies and other large enterprises.

Starting in the late 1990s, Comverse's voice messaging software became its main product and the company grew rapidly with the surge in mobile phone use, passing the \$1 billion mark in revenues. It offered a well-liked short message service center (SMSC) product and created a strong presence in the global mobile voicemail management market. While headquartered in the US, most of the company's research and development was done in Israel.

Ehud Shabati, Amir Shinar, Uri Levin, GPS, Waze

Waze Ltd. was established in Israel in 2008 by Amir Shinar, Ehud Shabtai, a software engineer, and Uri Levine. The company was originally called LinQmap.

Ehud Shabtai co-founded the company in 2006 Waze, after receiving a GPS from a friend (Hoffman and Shelah, 2013). Enthusiastic about the product, he made the decision to create an application that would facilitate the exchange of knowledge on speed cameras.

As the application grew, Mapa Ltd. sent him a letter alleging that he had infringed upon its copyright. Mapa refused to let him use the maps but was willing to purchase the program from him. He then made the decision to erase Mapa's maps and make brand-new ones.

Waze co-founder and VP of R&D Amir Shinar has more than 15 years of experience as a system architect, senior developer, and R&D manager. He currently heads Waze's development team. He became a co-founder of Waze after founding and serving as CEO of, X.L.Net, which offered a customized software solution. Prior to that, he worked at Comverse as an R&D manager with a focus on open-source technology. In the early days of the service, he was one of around 1,500 volunteers who mapped Israel at Waze. He graduated from Minnesota State University with an M.Sc. in Electrical Engineering and a B.Sc. in Electrical Engineering and Computer Science (cum laude).

Waze co-founder and president Uri Levine has 20 years of experience in marketing and business development in the wireless industry. He worked at Comverse and Celltrex as a product manager and independent strategic adviser before joining Waze. He has a BA in Economics from Tel Aviv University.

Ehud Shabati looked into GPS systems and found they were all effective at guiding their users, even in remote locations, but they all fell short in the same way: they couldn't provide traffic information in real time.

Shabati mapped out Israel, first on his own and later with co-founders Uri Levine and Amir Shinar, aiming to make a community-based navigation device that provided road reports on the go. The engineers quickly created a Waze community with thousands of drivers, gathering incident reports on accidents and road construction using crowdsourcing.

Drivers would often look down at their maps or pull over to ask any local or bystander for road directions. And it would be even worse if drivers became unfortunate victims of a traffic jam that got them stuck for over 30 minutes, simply because they never saw it coming.

While these usual on-the-road issues – traffic jams, bottlenecks, accidents, ongoing constructions, repairs, etc. – still happen today, thankfully, there's the technology that alerts us about them beforehand so that we have the option to take alternate routes. Waze, one of the most widely used map and GPS navigation apps available today, was made possible by this exact technology.

Waze differs from the conventional GPS as the former is a community-based application that gathers complementary map data and other information from its users. As a GPS-oriented mobile app, Waze learns from its users' driving times to provide real-time traffic updates, alerts, and alternative routing.

Only a handful of countries are fully mapped, including the USA, Canada, the United Kingdom, France, Germany, Italy, and of course, Israel. Google paid \$1.15 billion to acquire Waze in June 2013, which was the biggest amount ever paid for a consumer app at the time and undoubtedly changed my life and the lives of my co-founders. All of Waze employees, and the Israeli hi-tech ecosystem (Levine, 2023).

Asad Khamisy, Semiconductor and Infrastructure Software Solutions, Broadcom

Asad Khamisy born in the village of Tarshiha, Israel, received his Ph.D. in Electrical Engineering from the Technion — Israel Institute of Technology in 1994. Asad has several patents in the area of network switches.

Asad Khamisy has been at Broadcom for 20 years. He is the Vice President of R&D in the Core Switch Products group at Broadcom. All Broadcom Network Switching chips for the

Small, Medium, Enterprise, Data Center, and Service Provider sectors are developed by Asad, who leads the technical team (broadcom site).

The organization possesses the size, scope, and engineering skills to lead the industry into the future thanks to its merger with industry heavyweights Broadcom, LSI, Broadcom Corporation, Brocade, CA Technologies, Symantec's corporate security unit, and VMware.

Technology leadership and market-leading semiconductor and infrastructure software solutions are Broadcom's main priorities. The business serves the most prosperous businesses in the world and is a global leader in many product categories.

Ronen Hayatt, Danny Volkind, Oren Benisty, more Efficient Data Center Operators, UnifabriX

Ronen Hyatt was Huawei · 2018 - 2020· CTO and Group Manager at Huawei Cloud. He founded a new R&D center for Huawei, where he led a multidisciplinary team of software, hardware, and firmware engineers, building next-generation data center platforms for one of the world's fastest-growing Public Cloud players. He has an M.Sc EEM.Sc EE from the Technion

Danny Volkind worked at Huawei from 2018 – 2020. He was the co-founder and head of architecture in the Smart Platforms Innovation Lab. Providing future-looking, system-level solutions that combine software, firmware, and hardware.

He has a BSc, in Electrical/Electronics Eng. BSc. Electrical/Electronics Eng Technion - 2002 - 2006. Specialization in Electro-Optics and Micro/Nanoelectronics.

Oren Benisty was Head of Silicon global sales and marketing activity. He has an MBA, Marketing 2001 Henley Business School University of Reading and a BSc, EEE BSc, 1992 – 1993 Coventry University. Based on its novel RPU™ (Resource Processing Unit™), UnifabriX MAX™ enables data center operators to unleash the speed, density, and scale of their infrastructure (unifabrix site). In bare-metal and virtualized environments, UnifabriX CXL™-based systems deliver outstanding performance and elasticity across a variety of applications, including the most taxing workloads in database, AI, and processing. Organizations can better understand and manage their expenses and performance goals by partnering with UnifabriX.

Avigdor Willenz, Data Communications Systems on Silicon, Galileo Technologies

Avigdor Willenz was born in Rehovot in 1957 to parents who arrived in Israel with nothing (Gilad, 2023). The family relocated to the Kiryat Moshe area of Jerusalem, which is home

to the Mercaz HaRav yeshiva when the child was two years old. Willenz holds a degree in Electrical Engineering from the Technion.

He started working at Elbit in the early 1980s, where he developed the computer infrastructures for the F-16 and Lavi combat aircraft.

In 1988, he went to Integrated Device Technology (IDT) in California as a semiconductor developer. After three and a half years in the United States, he returned to Galilee and founded Galileo Technology, in cooperation with the American company who put their faith in his ability to launch an initial pilot in Karmiel. In 1997, he took Galileo public on Nasdaq, and in October 2000, sold it to chip giant Marvell Technology for \$2.7 billion in a share deal. Willenz turned Galileo into a leading provider of complex data communications systems on silicon. Avigdor Willenz moved his belongings to Gstaad in Switzerland, a small village of 2,000 inhabitants in the canton of Bern (Gilad, 2023).

ProteanTecs, Wekaio, Lightbits Labs, DustPhotonics, Xsight Labs, and Quantum Machines are just a few of the Israeli firms in which Willenz has made independent investments in recent years.

Billy Hrvoje, Nafea Bshara, Cloud Servers, Anapurna Labs

In 1992, Billy Hrvoje left war-torn Sarajevo on the last Jewish Agency flight to Israel (ver2018 site) With his life on hold, the young refugee convinced the dean of the Technion Faculty of Electrical Engineering to let him resume his studies despite the language barrier.

While at Technion, Billy befriended fellow student Nafea Bshara, a Christian Arab from the northern town of Tarshiha, who, because his father was a Technion student, was born into a Technion dorm. Nafea ended up enrolling in the Technion Excellence Program, which left a lasting impression.

After working at IBM and Galileo, the two Technion alumni decided to start up alone. They co-founded Annapurna Labs with Ronen Boneh and a group of leaders. The product accelerates cloud servers – claiming superior performance, security, and efficiency. Many companies weren't willing to take risks, but Amazon is forward-thinking with a long-term vision.

Soon Annapurna had 70 people doing R&D in Yokneam and 19 more around the world in sales and marketing. In early 2015, Amazon bought Annapurna Labs reportedly for over \$300 million. After the acquisition, Amazon announced the opening of two new centers in Tel Aviv and Haifa.

Silicon-level innovation was necessary for Amazon to keep prices and infrastructure under control, avoid relying on outside vendors for essential server components, and provide more value to customers by building capabilities like security and workload optimization directly into the hardware (Bishop, 2023).

As Arm processors were reaching huge volumes in mobile and Internet of Things devices, this would lead to better server processors with more research and development investment.

Bashara was recognized as able to form the basis for the second generation of Amazon's workhorse Nitro server chips, the first version of which had been adapted from an existing design from the Cavium semiconductor company. In a field that may feel like a high-wire act, Amazon had an early advantage thanks to Annapurna.

Amazon is keen to discuss this history in part to dispel the common belief that the emergence of generative artificial intelligence caught it off guard.

Even without using Amazon's AI chips, the company's Nitro processor plays a key role in significantly increasing network throughput in the Nvidia-powered EC2 P5 instances commonly used for AI training. Amazon took a big risk in developing its chips, but it has paid off by resetting the semiconductor industry and sparking new competition across the major cloud platforms.

Annapurna Labs - with offices in Haifa, Yokneam, and Tel Aviv - is responsible for the development of Amazon server chips that have saved AWS an estimated \$5 billion in costs, compared with competing products from Intel or NVIDIA.

Assaf Rappaport, Yinon Costica, Roy Reznik, and Ami Luttwak, Cloud Security, Wiz

Wiz, Inc. is an Israeli-American cloud security company, headquartered in New York City. The company was founded in January 2020 by Assaf Rappaport, Yinon Costica, Roy Reznik, and Ami Luttwak, all of whom previously founded Adallom.

Adallom was founded in 2012 by cyber defense veterans. The company is a leader in the market of Cloud Access Security Brokers. Adallom raised 3 rounds of funding led by Sequoia Capital Index ventures with a total of over 50 million dollars in funding.

Assaf Rappaport was co-founder and CEO of Adallom, a leading cloud access security broker (CASB) acquired by Microsoft in 2015. He led Microsoft's Cloud Security group and served as the General Manager of the company's Israel's R&D Center. He holds an M.Sc. in Computer Science from the Technion Israel Institute of Technology and a B.Sc. in Computer Science, Physics, and Mathematics from the Hebrew University. He has been recognized by both Cisco and Intel for content delivery network innovations.

Yinon Costica was the VP of Product at Adallom. At Microsoft, he led product for the Cloud Security Group from 0 to a \$1.5 billion revenue business. He holds an M.Sc. in Operations Research from the Naval Postgraduate School.

Roy Reznik was a Principal R&D Group Manager at Microsoft after co-founding Adallom and serving as VP of R&D there. Roy also has experience as a Software Team Lead in the Israel Defense Forces and as a Software Engineer in various companies.

Ami Luttwak, has Bachelor of Science (B.Sc.), Physics, Math and Computer Science, 2002 - 2004 and a Master of Science (M.Sc.) cum laude in Computer Science 2007 - 2011 from the Hebrew University of Jerusalem.

Are also partners Palo Alto Networks founder Nir Zuk and NBA player turned VC Omri Casspi, Shlomo Kramer, Mickey Boodaei, and Marius Nacht through their investment in Gili Raanan's Cyberstarts fund (Shulman and Orbach, 2025).

Gili Raanan, Eran Reshef, Web Application Firewall, Sanctum

Gili Raanan was born in Kfar Saba, Israel. He served in Unit 8200 for ten years. He earned a Bachelor of Computer Science In 2002 from the Tel Aviv University, he received a Master of Business Administration degree from the Recanati School of the Tel Aviv University.

In 2018, Eran Reshef with Marius Nacht, Roni Reshef founded Morpheus Cyber Security. Morpheus offered a unique platform for detecting, analyzing and mitigating influence operations.

Raanan and Eran Reshef started Sanctum in 1997, and created AppShield, a web application firewall and AppScan, a web application penetration testing tool (Roberts, 2003).

The AppShield product was an early Web application Firewall. AppShield was conceptualized by Eran Reshef and Gili Raanan and was introduced to the market in 1999. Raanan later started NLayers in 2003 which was acquired by EMC Corporation pioneering the science of Application discovery and understanding (Shelah, 2006).

In June 2000 the company introduced AppScan the world's first Web Security Vulnerability Assessment solution. Among the first clients for AppScan were Yahoo!, Bank of America and AT&T. Sanctum was eventually acquired by IBM and its products were sold as Rational's AppScan. IBM later sold AppScan and several other software products to HCL for \$1.8 billion.

Moshe Dolev and Avraham Bahry, Security Door, RBdoors (former Pladelet)

When a customer went into a Tel Aviv lock business in 1972, she requested that Avraham Bahri, the vendor, install a minimum of four locks on her front door. Bahri started working

on creating a lock that would meet the need for increased security (Lock Smith Ledger, 2014).

After discussing the difficulty with his buddy Moshe Dolev, the two came up with the concept of a door that had many bolts for locking. A year later, the Rav-Bariach (RB-LOCKS) company was born (rb-doors site).

The first Pladelet® door was unveiled in 1977, marking the end of the original development phase. A huge door with a steel core, welded reinforcing, and a locking mechanism consisting of seven bolts that attach to the doorframe had taken the place of the typical wooden door with a basic lock.

Customers were first put off by the enormous door, but the investment in technology, the design of the doors, and the marketing effort paid off, and the Pladelet doors became a well-known product in a few years.

In the year 2000, RB Lock Products Division was purchased by the Swedish corporation Assa Abloy for approximately 65 million dollars. The business was acquired by businessman Shmuel Dornstein in 2008. With an investment in R&D, new product lines, and the acquisition of companies abroad, RBdoors became Israel's leading company in the security doors and lock products market and the world's largest manufacturer of security doors. The Master Design Software was created by RB-LOCKS to give our clients a user-friendly, web-based Master Keying Software. The Master Design Software is simple to use and intuitive, and it generates schemes that are easy to read and map out the access control of your company using two Master Key System mathematical structures.

RB SMART LOCK: Advance to a more intelligent opening. The most recent locking methods are inventive and easy to use. Operated through a secured application on your smartphone. No key is required.

Jamil Mazzawi, Automotive Safety

He holds a B.Sc. in Computer Engineering from the Technion, Israel, and an MBA from San Jose University, CA.

Jami Mazzawi has over 25 years of experience in the semiconductor and EDA industries across Silicon Valley, Israel, and Europe (theorg.com site).

Mazzawi founded 2014, Optima Design Automation, a startup developing software for self-driving cars (optima-da site).

In addition to prior funding, Optima has been awarded a 2.5 million euro European Union Horizon 2020 Grant. As a result, the business has been able to keep top semiconductor tool development and safety specialists. A proprietary fault analysis technique that serves as the foundation for semiconductor safety verification was developed as a result of a

concentrated focus on automobile safety. By accelerating this process by orders of magnitude, Optima is positioned to become the leading safety solution vendor for automotive and other industry segments. The next advancement in vehicle safety verification is Optima Design Automation. For quicker semiconductor development, the business has developed a novel fault analysis technology that allows for a 1,000X performance gain over conventional fault simulation. In order to guarantee the safe operation of automotive semiconductor devices in accordance with the ISO 26262 safety standard, this platform powers the Optima Safety Platform, which focuses on Hard and Soft Error analysis.

The sophistication of automotive electronics has significantly risen. In 2018, a car usually had between 5 and 20 million lines of software code, 100 to 300 microcontrollers or CPUs, and more than 50 complicated electrical control units. Advanced computer-based artificial intelligence will be used in the upcoming generation of driverless automobiles. These electronic gadgets need to be deemed "safe" up to a certain acceptable risk threshold. The ISO 26262 safety standard defines this. It takes months of resource-intensive work to do the analysis necessary to demonstrate that the gadget is resilient to operational errors that occur spontaneously. A crucial engineering objective in this fiercely competitive industry is to maximize safety while simultaneously speeding time to market.

Fault simulation is the main analytical technique for ISO 26262 random fault risk analysis. Conventional fault simulation is slow by nature, taking months to complete and frequently producing subpar findings. A novel sort of Fault Injection Engine (FIE™) technology, developed by Optima, shows notable performance gains on actual design benchmarks, usually more than 1,000X over conventional fault simulation. This produces a dramatic improvement in development schedules and allows for increased analysis to prove device risk tolerance and ultimately improve device quality.

Key ISO 26262 analysis requirements are automated via a suite of solutions, or "apps," that are built on top of the Optima Safety Platform's FIE platform. These include Optima-HE™ for Hard Error analysis and coverage maximization, Optima-SE™ for Soft Error analysis minimizing final device power consumption, and Optima-SA™ for automated Static Analysis.

Automotive semiconductor suppliers and electronic companies in other safety-sensitive industries can greatly speed up development timelines, make it easier for them to meet ISO 26262 maximum risk tolerances, and improve the performance and quality of their products by utilizing Optima's Apps and Technology Platform.

Optima markets and distributes its products to global manufacturers of electronic semiconductors and systems. Through its global network of customer engineers, the company offers a range of customer support and service solutions, including on-site training and consultation.

Optima maintains a number of key partnerships to provide a range of options to their customers. The company works with service and Electronic Design Automation (EDA) partners, such as ANSYS and Mentor, a Siemens Company, to enable complete verification solutions.

Niv Karmi, Omri Lavie, and Shalev Hulio, Spyware Cyber-arms, NSO (Niv, Shalev and Omri), Group Technologies

NSO Group was founded in 2010 by Niv Karmi, Omri Lavie, and Shalev Hulio. Hulio and Lavie were school friends who went into the technology start-up sector during the mid-2000s (Lyngaas, 2019).

The Israeli cyber-intelligence company NSO Group Technologies is well known for its spyware, Pegasus, which can remotely monitor iPhones without a single click.

Pegasus is a spyware developed by the Israeli cyber-arms company NSO Group that is designed to be covertly and remotely installed on mobile phones running, iOS and Android. Although NSO Group promotes Pegasus as a tool for combating crime and terrorism, governments worldwide have frequently employed the malware to monitor human rights activists, journalists, attorneys, and political dissidents.

The sale of Pegasus licenses to foreign governments must be approved by the Israeli Ministry of Defense.

The founders of NSO Group, in 2019, re-acquired the company from private equity firm Francisco Partners.

Francisco Partners was asking for more than \$1 billion for NSO Group. Francisco paid \$120 million for a majority stake in the company in 2014.

One of NSO Group's founders appears to have gained control of the blacklisted spyware company's shares after a legal fight over the group's future, according to corporate filings in Luxembourg (Kirchgaessner, 2023).

The "O" of NSO Group, Omri Lavie, who has recently distanced himself from daily operations, seems to have become the company's new majority owner.

According to the Luxembourg documents, Lavie's investment business, Dufresne Holding, is currently the only owner of the holding company domiciled in Luxembourg that eventually controls NSO Group.

The move comes at a time when NSO, which sells one of the world's most sophisticated cyber weapons, is facing lawsuits by Apple and Facebook in the US and remains on a US blacklist, which prohibits the sale of any US technology to the Israeli group.

In 2021, the Biden administration put NSO on the infamous "entities list" after claiming to have discovered proof the business had created and provided spyware to foreign countries that used the tool to maliciously target government officials, journalists, businesspeople, activists, academics, and embassy workers.

According to NSO, which is subject to strict regulation by the Israeli Ministry of Defense, it only provides the government with its primary monitoring product, a suite of software known as Pegasus. Clients fight serious crimes, such as terrorism, and it has no control over how a government client uses the surveillance tool once it is sold. The company has also said it investigates serious allegations of abuse by government clients and has said it has cut off clients in the past.

The Guardian and media partners also reported that talks over a possible sale of NSO to the US defense contractor L3 Harris fell apart last year after the White House said any potential deal would raise “serious counterintelligence and security concerns for the US government. The sale of Pegasus spyware to high-risk clients persisted, as did the company's response to claims of widespread product abuse. A district court in Tel Aviv had been alerted that the spyware company's lenders had transferred the company's shares to a new holding company, whose sole shareholder was Lavie. It also suggested, however, that additional directors would be named once a new group of investors were fully onboard.

Gil Geron, Cloud Security Space, ORCA Security

Gil Geron is the CEO & Co-founder of Orca Security. Gil has more than 20 years of experience leading and delivering cybersecurity products (orca.security site). Gil served as Orca's first chief product officer before taking on the position of CEO. At Check Point Software Technologies, Gil oversaw a sizable staff of cyber experts before co-founding Orca Security.

Gil Geron has a Bachelor of Science (B.Sc.), Physics and Computer of Science (B.Sc.), 2006 - 2008, from The Hebrew University of Jerusalem.

Orca is innovating in the cloud security space. The founders understood that modern computing technologies and the cloud required a re-architecture of security, so they set out to change the game.

Their idea became the first agentless cloud security solution in the industry, offering clients unprecedentedly light and comprehensive coverage. With a patent for this revolutionary SideScanning™ technology, Orca pioneered the path for modern cloud security and continues on the path of innovation.

With the Unified Data model offering contextual security insights, as well as our platform approach to securing your cloud infrastructure, Orca revolutionizes security and leads the conversation at every turn.

MICROELECTRONICS

Microelectronic components serve as the intelligent core behind countless modern applications. Their evolution—smaller, faster, and more powerful—has enabled the development of increasingly complex and high-value technologies across industries. Israel has been at the forefront of microelectronics innovation, contributing significantly to the global tech ecosystem with breakthroughs such as: EPROM, EEPROM, and NROM memory technologies; Digital Signal Processing (DSP) and Digital Signal Processing Cores (DSPC); Remote Direct Memory Access (RDMA) for high-performance computing; Advanced network switches for data communication; Miniature single-lens cameras for mobile and security applications; Chips for cellular telephony, enabling the mobile revolution; Disk-on-Key (USB flash drive)—a portable data storage invention; Cloud server architectures, supporting modern data infrastructure. These innovations demonstrate how Israeli researchers and engineers have shaped the digital age by pushing the limits of microelectronics.

Read-Only Memory and Digital Signal Processor (DSP) Software

Dov Frohman, Erasable Programmable Read-only Memory (EPROM), Intel

Prof Dov Frohman was born in Amsterdam, The Netherlands, on March 28, 1939 (Pruce, 2016). After they made sure he was securely stashed away by a Calvinist family in Holland, he lost his parents to the Holocaust. Later he spent time in orphanages for children whose parents had died in the war, before being adopted by relatives. Before beginning his higher studies, he served in the Israeli army while growing up in Tel Aviv.

He received the B.Sc. degree in Electrical Engineering from the Israel Institute of Technology, Haifa, Israel in 1963 and the M.Sc. and Ph.D. degrees in Electrical Engineering and Computer Sciences from the University of California, Berkeley, in 1965 and 1969, respectively. In 1965 he joined Fairchild Semiconductor Research and Development Laboratories, Palo Alto, California, working on the technology development and design of integrated circuits and nonvolatile (mobile network operator-MNOS) memory devices.

He accompanied former Fairchild execs Andrew Grove, Gordon Moore, and Robert Noyce to Intel Corporation, which they had formed the year before, in 1969 after earning his Ph.D. He was involved in the development and design of semiconductor memories and developed the first EPROM products.

He was a visiting professor at the University of Science and Technology for a year in 1972. Ghana's Kumasi. In 1974 he joined the School of Applied Science and Technology,

Hebrew University of Jerusalem, Israel, as Associate Professor of Applied Physics and director of the School Of Applied Science and Technology from 1975 to 1980.

While diagnosing an issue with an early Intel product in 1970, Dov came up with the idea for the EPROM. The foundation for Flash Memory was established by Intel's EPROM division, which continued to be one of its most lucrative products far into the 1980s. Dov spent around a year and a half teaching electrical engineering in Ghana after leaving Intel.

In 1974, Dov returned to Israel to set up the Intel Design Center in Haifa and supported its management on a consulting basis. In 1980 he was appointed Professor of Applied Physics at the Hebrew University of Jerusalem. In 1981 he took a leave of absence from the Hebrew University to establish the VLSI Wafer Manufacturing Plant in Jerusalem and direct Intel operations in Israel.

An educational venture called The Noah's Ark Initiative aims to influence society at large by extending the reach of education. Their education centers on three key areas: Dialogue (Community, Interpersonal, Personal), Thinking (Critical Thinking, Creativity, and Curiosity), and Coping (Difficulty, Challenges, and Successes). A network of "lighthouse kindergartens," the Noah's Ark Initiative sets an example of moral behavior for the community as a whole. Dov has joined forces with education entrepreneur Ran Cohen Harounoff, who has started kindergartens, schools, and teacher training programs.

Dr. Eli Harari, Electrically Erasable Programmable Read-Only Memory (EEPROM)

His parents came from Poland to Israel. He was born in Israel, in 1945. He grew up in Israel until age 13 and then went to England to boarding school. He entered the Israeli military at 18 years old over two years in the air force. He attended one year at the Hebrew University in Jerusalem, studying math and physics, then transferred to Manchester for physics, graduated in 1969, with a physics degree, and then came to the United States, Princeton University, Princeton, New Jersey. Princeton, he did his PhD work in what is called solid state sciences and graduated in '73.

After earning his Ph.D. from Princeton University in 1973, Harari joined Hughes Aircraft.

Around 1970, Dov Frohman, at Intel, invented the floating-gate EPROM device. Frohman's EPROM was a pivotal component in the microprocessor revolution it enabled, to know, a general-purpose computing machine to have different instructions, through the codes on that EPROM. What Harari was trying to do was to develop the (EEPROM), electrically erasable EPROM, as opposed to UV erasable, and that he did at Hughes.

In order to realize his goal of creating a system-level architecture (dubbed "System Flash") that effectively overcomes the basic physical constraints of flash EEPROM transistors, Harari co-founded SunDisk (later renamed SanDisk Corporation) in 1988. System Flash

transformed data storage in battery-powered, portable devices like cell phones, digital cameras, and handheld computers—markets that were still in their infancy in 1988.

Digital cameras, MP3 players, cellphones, tablets, and other consumer electronics that are so prevalent today probably would not exist at all without flash storage. SanDisk was the first company to master the usage of Flash for the numerous consumer and business applications that it is currently utilized for, despite not having invented it. Much of that early research and development was done at SanDisk's R&D centers in Israel. Today, SanDisk has about 4,000 employees, 380 of them in Israel (2024). SanDisk was acquired by hard disk drive manufacturer Western Digital from California USA on May 12, 2016, for US\$19 billion (James, 2015). Western Digital has been at the forefront of technologies that change the game for a long time. From the invention of the first hard drive to recent advancements in 3D NAND (westerndigital site).

Dr. Boaz Eitan, NROM (nitrate-read-only Memory) Technology

Dr. Boaz Eitan holds a B.Sc. in Mathematics and Physics (1976), a M.Sc. (1978), and a Ph.D. (1981) in Applied Physics, all from the Hebrew University of Jerusalem. Eitan, a former Israel Air Force combat pilot was a prisoner of war in Syria for three years.

He began working for Intel Corporation in 1981 as a physicist at their Santa Clara, California, research and technology development facility. In 1983, he joined WaferScale Integration Inc., where he was Vice President of Product and Technology Development. In 1992, he established and managed WaferScale Integration Inc.'s Israeli design center.

He founded Saifun Semiconductors, Inc. in 1997, and has since served as the company's Chief Executive Officer and Chairman of the Board of Directors. He is the inventor of Saifun's NROM technology. Saifun is traded on the NASDAQ.

Saifun patented the Nrom semiconductor memory device and fabrication method, designs, and applications for use in "non-volatile" memory products, or computer memory products that can retain stored information even if they are not constantly supplied with electric power (patents google site). The company also offers process installation, product design, and other turnkey solutions marketed to chip makers for use in their flash memory chips and other digital storage devices.

Spansion Inc., the world's largest pure-play provider of Flash memory solutions acquired Israeli company Saifun Semiconductors Ltd., a provider of intellectual property solutions for the non-volatile memory (NVM) market, for \$368 million (Ynet News, 2001). In 1993, AMD and Fujitsu Ltd. of Japan formed Spansion as a joint venture. FASL LLC was the previous name of Spansion (webarchive site).

Through this deal, all of the design, manufacturing, and intellectual property of MirrorBit and NROM are combined into one business.

Spansion Inc. has completed its acquisition of flash memory maker Saifun Semiconductors Ltd. in accordance with the definitive merger agreement and its amendment that the companies signed on October 8, 2007, and December 12, 2007, respectively (Shohet, 2008).

The sale price of Saifun's cash and Spansion shares was \$249 million, or \$7.70 per share. The final price is 17% less than the value on the day the deal was announced, and 67% less than Saifun's market cap when it went public in 2005.

Davidi Gilo, Chips for Cellular Telephones Digital Signal Processor (DSP)- DSP Communications- DSPC

Davidi Gilo was born in 1957 in Israel. Despite having almost no expertise in the technical or financial domains, Gilo left Berkeley after one semester of studying economics and philosophy in order to start a consultancy business.

Gilo is one of the most successful Israelis in the hi-tech arena in the US. He is the founder of a number of companies, among others, DSP Communications, a manufacturer of chips for cellular telephones, of which he and his family hold 8%. DSP Communications holds 35% of the Japanese market. Since the company's shares were offered over-the-counter on Wall Street last year, the share price has risen 500% and it was cited by Baronage as one of the most successful IPO's of 1995. He has purchased shares in a number of Israeli joint ventures in the past few years, including investing millions of dollars in the CTP of Petah Tikva last year.

One of the founders of two prosperous high-tech businesses, D.S.P., is Davidi Gilo. Group and D.S.P. Communication, whose shares are traded on Wall Street. Both companies develop special chips in the communications field, and their shares have registered very sharp rises over the past year. DSP Group and DSP Communications, Inc., which was acquired by Intel Corp. for \$1.7 billion in 1999.

Gilo is also the developer of medical image technology, Stentor Inc., which was acquired by Philips Electronics NV for \$280 million in 2005; and video chipmaker Nogatech Inc., which went public in 2000 and was acquired in the same year by Zoran Corp. for \$158 million. His global business operations involve extensive Israeli inputs – both manufacturing and research and development.

Eli Ayalon, Wireless Chipset Solutions, DSP Group

In 1952, at the age of nine, Eli Ayalon arrived in Israel from Egypt where his father had been working in business (Blackburn, 2003). Mr. Ayalon holds a BS degree in Electronics from Technion and was awarded his MBA from the University of Tel-Aviv.

Prior to joining DSP Group, Mr. Ayalon's professional background includes such experiences as: President and CEO of Mennen Medical, a company specializing in advanced medical equipment for intensive care units and catheterization laboratories. President and CEO of Teledata Communications, Ltd., a public company active in the Telecommunications industries, provide solutions that enable customers to increase their number of subscribers using existing infrastructure.

Corporate Vice President and General Manager of Elscint X-ray Division. President and CEO of Semiconductor Devices, a company dealing with advanced semiconductors for applications within the Israeli defense (twst site). He is the global pioneer in digital transceiver applications and a leader in the development of sophisticated wireless telephony processors, especially for home wireless communications. His company, DSP Group enables consumer electronics (CE) manufacturers to cost-effectively develop new revenue-generating applications with fast time to market. At the forefront of semiconductor innovation and operational excellence for over two decades, and with a dominant share of the wireless home telephony market, DSP Group provides a broad portfolio of wireless chipsets integrating DECT, Wi-Fi, PSTN, and VoIP technologies with state-of-the-art application processors. DSP Group actively collaborates with CE manufacturers to influence the direction of converged communications at home by enabling converged voice, audio, video, and data connectivity across a variety of consumer goods, from cordless and VoIP phones to home gateways and connected multimedia screens.

Synaptics Incorporated (Nasdaq: SYNA), has completed on December 2, 2021, the acquisition of DSP Group, a leading global provider of voice processing and wireless chipset solutions (synaptics site), for an aggregate purchase price of approximately \$549 million in cash. The acquisition, which was first revealed on August 30, 2021, brings together the two businesses' cutting-edge wireless, voice processing, and artificial intelligence capabilities, which together allow for a wide range of intelligent connected devices. Based in San Jose, California, Synaptics, Inc. is an American firm that develops neural network technologies and computer-to-human interface devices.

***Yechiel (Hilik) Frank, Jenya Papeer, Extreme Ultraviolet (EUV)
Lithography L2X Labs***

Yechiel (Hilik) Frank has a Master's degree, in Theoretical and Mathematical Physics 2007 – 2010 f and a PhD, in Atomic/Molecular Physics 2010 – 2017 and a PhD from the Hebrew University of Jerusalem. He was a post-doctoral Scientist at Lawrence Livermore National Laboratory Sep 2017 - Oct 2020 CA

His research areas are the atomic physics of laser plasma. Radiation transport. experiments design and analysis.

Jenya Papeer has a Master of Science - MS, Physics 2009 – 2011 and a PhD in Physics 2012 - 2017 from the Hebrew University of Jerusalem.

L2X Labs develops advanced light sources tailored for the semiconductor manufacturing industry, focusing on enabling extreme ultraviolet (EUV) lithography (l2xlabs.com). This technology supports the production of highly efficient and smaller semiconductor chips, essential for powering a wide range of technologies from the Internet of Things (IoT) to autonomous vehicles.

Read-Only Memory and Digital Signal Processor (DSP) Hardware Applications

Amnon Shashua, Single-lens Camera Advanced Driver Assistance System

Amnon Shashua was born in Ramat Gan, Israel, to parents of Iraqi origin. From a young age, he was fascinated with computers, a field that was in its early stages of development (Horovitz, 2019). He attended the ORT school in Givatayim for his early education in software engineering.

Amnon Shashua received his B.Sc. in mathematics and computer science from Tel-Aviv University in 1985 and his M.Sc. in computer science in 1989 from the Weizmann Institute of Science under the supervision of Shimon Ullman titled "Structural Saliency". His Ph.D. in brain and cognitive sciences was received from the Massachusetts Institute of Technology (MIT), while working at the Artificial Intelligence Laboratory, in 1993; and his postdoctoral training under Tomaso Poggio at the Center for Biological and computational learning at MIT.

He helped to clarify the fundamentals of deep learning and was a pioneer in using tensor analysis in computer vision and machine learning. Even prestigious theoretical physics journals have published his most recent work.

According to data from the World Health Organization, traffic accidents claim the lives of more than a million people annually (epo site). The most common causes of the accidents include speeding, rear-end collisions, and drivers veering out of lanes—all of which can be identified and avoided by electronic devices called advanced driver assistance systems (ADAS). Radar emitters and stereoscopic cameras were among the costly and inconvenient sensors used when ADAS first came on the market.

This trend was reversed by Amnon Shashua and his team at Mobileye, which includes Erez Dagan, Yoram Gedalyahu, Gaby Hayon, Elchanan Rushinek, Shai Shalev-Shwartz, and Gideon Stein. Their patented device uses a camera and a specially designed computer processor to keep drivers safe. The automobile's windshield is equipped with a single-lensed front-facing camera that scans the road and sends video to a specially designed

computer processor within the car. Artificial intelligence software uses the footage to identify road objects. The technology is equipped with sophisticated algorithms that compute the speed and trajectory of surrounding objects by comparing changes in their relative size and position every 27 milliseconds. This data is used by the technology to forecast driving risks in real time and deliver safety directives or warnings to the driver directly so that the car will respond automatically. The technology has already been deployed in over 40 million cars worldwide and was commercialized by Mobileye, a business that Shashua co-founded in Israel in 1999 and that is currently a division of Intel. An Israeli computer vision specialist created a sophisticated driver assistance system that recognizes and steers clear of traffic risks in real time using a single-lens camera and state-of-the-art artificial intelligence.

Eli Harari, Sanjay Mehrotra, and Jack Yuan, System Flash, SanDisk

Harari was born in Tel Aviv, Israel, in 1945. His parents were Polish Jews who had moved to Palestine prior to the creation of Israel in 1933. He completed his Bachelor's Degree at Manchester University in England, and his Master's degree in Physics at Princeton University, and his subject of study was semiconductors. After earning his Ph.D. from Princeton University in 1973 (computerhistory site), Harari joined Hughes Aircraft where his research on electronic tunneling in ultrathin dielectric films led to the invention of the first practical flash memory business of today was made possible by EEPROM.

Harari co-founded SunDisk (later re-named SanDisk Corporation) in 1988 with Sanjay Mehrotra, and Jack Yuan (Harris, 2008) to pursue his vision to develop a system-level architecture ("System Flash") that successfully Overcame the basic physical constraints of flash EEPROM transistors. System Flash transformed data storage in battery-powered, portable devices like cell phones, digital cameras, and handheld computers—markets that were still in their infancy in 1988.

Jack Yuan led the device process, while Sanjay Mehrotra designed the memory system. Digital cameras, MP3 players, cellphones, tablets, and other consumer electronics that are so prevalent today probably would not exist at all without flash storage. The majority of the early research and development for Flash was carried out in SanDisk's R&D centers in Israel, despite the fact that SanDisk was the first company to perfect its use for the numerous consumer and corporate applications it is currently employed for. Currently, SanDisk employs over 6,000 people, 700 of whom work in Israel. Harari served as SanDisk's chairman and CEO until his retirement in 2010.

The majority of SanDisk's research and development was carried out in Israel when it was founded 26 years ago by Harari, Jack Yuan, and Sanjay Mehrotra. The company is currently based in California. Being the first company to produce a flash memory product for commercial use, SanDisk established standards that are currently utilized in a variety

of digital devices, including computers, cameras, smartphones, and tablets. SanDisk is the owner of over 5,000 patents globally and has won nearly every technology honor and accolade available.

In 2016, Eli Harari, founder, and former CEO of SanDisk, foresees the inevitable scaling hurdles facing Dynamic random-access memory (DRAM) in the coming years with the advent of memory-hungry applications and found SunRise Memory (sunrise site).

In 2024 sunrise3d team of 40 engineers in the USA and Israel is developing the first 3D ferroelectric Random Access Memory (RAM) as a high capacity, high bandwidth, low power system solution, by bringing together deep expertise in semiconductor device, process, design, system architecture, manufacturing integration, assembly, and test. From the beginning, SunRise engineers created our ferroelectric RAM with the goal of manufacturing it on high-volume memory fabs that already had a firm grasp of 3D process flows (like 3D NAND fabs).

Through 3D scaling, akin to skyscraper construction, sunrise3d aims to improve memory bit density by 10X compared with DRAM. We anticipate significant gains in data immediacy with our ground-breaking system architecture, which simultaneously controls hundreds of separate memory banks on each chip, hastening the industry's transition to the memory-centric era of artificial intelligence and high-performance computing. For a more environmentally friendly world, our ferroelectric low-voltage memory cells will drastically cut down on energy use.

Dov Moran and Aryeh Mergi, Disc On Key, M-Systems

Dov Moran was born in Israel on July 29, 1955 (Berg, 2020). His parents were immigrants to Israel from Poland, survivors of the Holocaust. He earned a Bachelor of Science degree in Electrical Engineering (with honors) at the Technion, Israel Institute of Technology, in Haifa. He served in the Israeli Navy for eight and half years and was commander of its microprocessor department.

Aryeh Mergi was born in 1961 in Morocco. His parents came to Israel together with him when I was at the age of 3. It was 1964. They worked their way up and they became merchants.

Founding his first company in 1989 straight after graduating from Haifa's Technion, Moran started researching new ways to move data – financed by the US company Miltope in Hope Hull, Alabama. Nowadays Miltope is one of the top tiers of military equipment (Economy & Innovation, 2016). Back then they were simply fascinated by the idea to transport large amounts of data independent from batteries and robust data chips, remembers Moran.

M-Systems – m as Moran/Mobile, was a Nasdaq-listed Israeli producer of flash memory storage products founded in 1989 by Dov Moran and Aryeh Mergi, based in Kfar Saba,

Israel. They were best known for developing and patenting the first flash drive, marketed in 1995 as DiskOnChip (DOC), and the first USB flash drive, marketed in 2000 as DiskOnKey. They also created the patented True Flash Filing System (TrueFFS) which presented the flash memory as a disk drive to the computer.

The DOC was developed at the R&D Center established by M-Systems called EUROM. Rick Iorillo, Rony Levy, and David Deitcher were the individuals who worked on the development and marketing of the first 2 MB

Turnover was rising, from 2001 to 2006 from \$45 m to \$1B revenue. Moran received an offer that was too good to miss. 17 years after its foundation M-Systems was sold for \$1.6B to SanDisk Corp.

Eyal Valdman, Remote Direct Memory Access (RDMA), Mellanox

Waldman was born in Jerusalem to a father who was an economist and a mother who had a PhD in biology. He also spent some of his early years in Scotland. He attributes a large portion of his education to his army duty, having served in the prestigious Golani brigade (startupgrind site). Waldman began studying chemical engineering at the Technion before switching to computer science.

Eyal Valdman holds a Bachelor of Science degree in Computer Engineering and a Master of Science degree in Electrical Engineering from the Technion – Israel.

He then worked at Elbit Systems on the IAI Lavi project, the ambitious fighter plane undertaken by the Israeli Air Force. Though the project was eventually scrapped, its complex software development turned into the mission computer for the Israeli Air Force's upgraded F-16 fleet.

Waldman and a group of pals with an entrepreneurial spirit used to meet at pubs every Tuesday to talk about the "next big business," but they never came up with any brilliant ideas. Eventually, they decided they could start a semiconductor design center for American companies in Israel. This was in 1993 and it was the beginning of a new company called Galileo. Waldman describes Galileo as "four or five guys in a garage." Waldman remained with Galileo until 1999, a very exciting period for startups sponsored by venture funding.

Eyal was the Vice President of Engineering at Galileo Technology, Ltd., a semiconductor firm he co-founded, from March 1993 to February 1999. In January 2001, Marvell Technology Group, Ltd. paid USD 2.7 billion to buy Galileo Technology, Ltd., which had gone public in 1997.

Mellanox, founded in 1999 by Waldman and several partners, develops big data connectivity chips for end-to-end high-speed networking.

Waldman started Mellanox as a high-functioning elite unit of engineers developing big data connectivity chips for end-to-end high-speed networking.

Mellanox specializes in switched fabrics for enterprise data centers and high-performance computing when high data rates and low latency are required such as in a computer cluster (Ackerman, 2011).

One typical application was a large database management system (Oracle, 2010). Remote direct memory access (RDMA) and RDMA over Converged Ethernet were enabled by Mellanox network adapters and switches.

From March 1999 to April 2020, when Mellanox Technologies was purchased by NVIDIA for USD 7 billion, Eyal Waldman was the company's co-founder, president, CEO, and board member. Eyal Waldman left the company six months after Nvidia completed its acquisition.

Dan Maydan, Sasson Somekh, and David Wang, Precision 5000 Device, Applied Materials

Dr. Maydan has a doctorate in physics from Edinburgh University in Scotland (silicomventures site), and he earned his bachelor's and master's degrees in electrical engineering from the Technion.

Dr. Maydan managed new technology development at Bell Laboratories for 13 years before joining Applied Materials in 1994. During that time, he made major advancements in photolithography and vapor deposition technology for semiconductor manufacturing, as well as pioneering laser recording of data on thin-metal films.

Together with Israeli scientist Dr. Sasson Somekh, and Dr. David Wang, Maydan invented a revolutionary device for producing silicon chips. The invention of the Precision 5000 device the company's sales from \$200 million in 1987 to a billion dollars within 6 years.

The Precision 5000 Series is a cost-effective Grade 1 exit device option for applications such as retail, hospitality, mixed-used, multifamily and commercial office spaces.

Precision 5000 device the company's sales from \$200 million in 1987 to a billion dollars within 6 years.

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Learning & Higher Education

In the school sector, security and budget are top priorities. PRECISION can help you achieve both—without sacrificing one for the other. The premium-quality panic and exit hardware give schools the access and egress they require. And because the products are

durable—which means, long life cycles and minimal maintenance—the reduction in cost of ownership makes it well worth your investment.

PRECISION products have been a standard in government markets for more than 70 years. The solutions have a proven track record in the government market, serving a wide range of applications and security requirements.

The Security Government Program makes it simple for federal and state agencies to get the panic and exit hardware they need through the purchasing channels they prefer.

Healthcare

Regardless of the type of healthcare facility—hospital, assisted living facility, long-term care building or a physician’s office—the objective is the same: create a secure environment that is easy to maintain. The products offer innovative features and provide the safety and security the healthcare market needs.

With a broad selection of functions, styles and finishes, it’s easier than ever to suite across all types of doors in a commercial or retail facility. The solutions have a proven track record, serving a wide range of applications and security requirements.

With a broad selection of functions, styles and finishes, it’s easier than ever to suite across all types of doors in a commercial or retail facility. The solutions have a proven track record, serving a wide range of applications and security requirements.

Maydan became a President Emeritus of Applied Materials (2003) together with Dr. Sasson Somekh, and has won a number of important global awards. Applied is enabling improvements in power, performance, area, cost and time-to-market (PPACT™) of semiconductor devices at a time when the need for semiconductor innovation has never been greater.

Leading the way in materials engineering solutions, Applied Materials creates almost all of the world's cutting-edge chips and screens.

Taleb Mokari, Novel Nanostructure

Mokari, a researcher at Ben-Gurion University of the Negev and the Ilse Katz Institute for Nanoscale Science and Technology.

He was born and reared in Kafr Kana, and his discoveries of new synthetic methods for producing high-quality semiconductor nanocrystals, hybrid nanoparticles, and nanowires earned him the 2015 Tenne Family Prize for Nanoscale Sciences.

Taleb Mokari received a BSc in chemistry from the Hebrew University in 2000, an MSc. and a PhD from Hebrew University in 2002 and 2006 (tandfonlinesite). He spent a year at the University of California, Berkeley as an Ilan Ramon and Fulbright postdoctoral fellow.

In 2007, he became a staff scientist at LBNL's Molecular Foundry. Since December 2009, he has been a professor at Ben-Gurion University's Department of Chemistry.

Mokari was among the first Israeli university students to investigate nanoscience as a means of comprehending energy conservation in the early 2000s. Today he heads a research group developing new classes of nanomaterials for optical, electrical, and energy-related applications.

The primary focus of his research activity is the development of novel nanostructures for optical, electrical, biological, and energy applications. Optimal preparation and characterization of metal, semiconductor, magnetic, insulating inorganic, and multi-component nanostructures with different interfaces, such as nanocrystals, nanotubes, and nanowires with regulated size, shape, and composition, are a field of study for Dr. Mokari.

HARDWARE SOFTWARE PLATFORMS

Israel has developed a range of hardware–software integrated platforms that support specialized applications across various industries. These platforms combine advanced computing hardware with domain-specific software to deliver high-performance, scalable solutions. Key areas of innovation include: Video synopsis technology platforms, enabling real-time summarization and analysis of surveillance footage; Point-of-Sale (POS) solutions, enhancing retail operations with integrated hardware and smart software systems; Software testing, logging, and recording tools, ensuring reliability, traceability, and performance in complex systems; Compact minicomputers, offering portable yet powerful computing for embedded and enterprise applications. These innovations reflect Israel's strength in building cross-disciplinary platforms that blend hardware excellence with software intelligence to drive digital transformation.

Management Platforms

Briefcam, Video-synopsis Technology, Shmuel Peleg

Shmuel Peleg received his Ph.D. in Computer Science from the University of Maryland in 1979. In 1981 he became a faculty member at the Hebrew University of Jerusalem where he is a Professor of Computer Science. Shmuel served as the first chairman of the Institute of Computer Science at The Hebrew University from 1990 to 1993 (briefcam site).

By simultaneously displaying several items and activities that happened at various times, BriefCam video-synopsis technology enables users to quickly study and index original full-length video footage. The time and labor required for event tracking, forensics, and evidence discovery are significantly reduced by this technique.

Today, millions of surveillance cameras are installed all over the world to monitor public and private spaces continuously, giving law enforcement a useful tool for apprehending criminals (Hebrew University, 2010). The majority of recorded video is never viewed or analyzed, making the process of viewing and retrieving videos from the millions of cameras time-consuming and occasionally requiring days or weeks of examination.

A solution to this problem has been developed at the Hebrew University of Jerusalem computer software that provides a synopsis of recorded video, generating a very short video preserving the essential activities of the original video captured over a very long time.

With video analytics software, hardware, and architecture solutions that make video searchable, actionable, and quantifiable, BriefCam® enables individuals, communities, and businesses of all sizes to see the value of their video surveillance footage. A wide range of essential video analytics features, including search, alerting, and visualization of video metadata, are available through the comprehensive and all-inclusive BriefCam Video Analytics Platform.

Shuky Sheffer Microservices Management Platform, Amedocs

Shuky Sheffer graduated from Tel Aviv University with a Bachelor of Arts in Computer Science.

Since October 1, 2018, Shuky Sheffer has served as our president and CEO. From October 2013 to September 30, 2018, Mr. Sheffer was the Global Business Group's President and Senior Vice President. Mr. Sheffer served as Chief Executive Officer of Retalix Ltd., a global software company, from 2009 until its acquisition by NCR Corporation in 2013. He was General Manager of Retalix until September 2013 after the takeover. Mr. Sheffer worked with Amdocs from 1986 to 2009 in a variety of executive roles, most recently as President of the Emerging Markets Divisions. With the market-leading portfolio of software products and services, Amedocs unlocks customers' innovative potential, empowering them to provide next-generation communication and media experiences for both the individual end user and enterprise customers. 30,000 workers worldwide are here to help service providers digitize and automate their processes, speed up their cloud migration, and help them stand out in the 5G era.

Amdocs' state-of-the-art platform for providing flexibility, security, and compliance powered by generative AI is called amAIz. GenAI application cases for customized solutions that promote timely, best-practices engineering are already preloaded into amAIz. Discover how AI can transform your company's operations, automate procedures, and provide insightful information right now.

In order to expedite the process of becoming a DevOps-enabled organization, Amdocs created the Microservices Management Platform, which facilitates the development and delivery of top-notch cloud-native applications for various cloud platforms.

The platform takes a comprehensive approach to AI-driven processes, automating every aspect of development and IT operations while utilizing Amdoc's amAIz and GenAI taxonomy to automate nearly any repetitive work. This updated platform version reduces mistakes and resolution times to almost zero, does away with the requirement for manual involvement in low-value activities, and provides enriched data that offers a higher level of business intelligence that was not available before.

Barry Shaked and Brian Cooper, Solutions for Point-of-sale (POS), Retalix NCR

Barry Shaked and Brian Cooper founded Retalix in 1982 under the name Point of Sale Ltd.

The company's primary focus was creating and marketing store-level software solutions to supermarket chains. The company expanded its product line in the late 1990s to include solutions for the retail fuel and convenience markets as well as chain-level retail operations

management. To reflect the growth of its solutions offering beyond the store level, the company rebranded itself as Retalix Ltd. in 2000 from Point of Sale Ltd.

The company's goods and services give retailers the flexibility and scalability they need to manage and improve their retail operations, differentiate their brands, and cultivate customer loyalty to support ongoing business transformation and growth. Retalix Ltd. offers solutions for point-of-sale (POS), sales channels and in-store management (including mobile and e-commerce), customer management and marketing, merchandising, and logistics. Software-As-A-Service (SaaS) is one of the several deployment options that Retalix Ltd. uses to service its extensive customer base, which consists of almost 70,000 outlets in more than 50 countries. The Company's headquarters was located in Ra'anana, Israel, and its North American headquarters are located in Plano, Texas. Retalix Ltd. trades stocks on the Tel Aviv Stock Exchange and the NASDAQ.

On November 4th, 2020, NCR Corporation (NYSE: NCR) announced a definitive agreement for NCR to acquire Retalix Ltd. (NASDAQ: RTLX, a transaction value of approximately \$650 million (ncratleos site).

Global technology leader NCR Corporation (NYSE: NCR) is influencing how people connect, communicate, and do business worldwide. Retail, financial, travel, hospitality, gambling, public sector, and telecom carrier and equipment demands are all met by NCR's assisted and self-service solutions and extensive support services organizations in more than 100 countries. NCR (www.ncr.com) is headquartered in Duluth, Georgia.

Arie Finegold, Software Testing, Mercury

While he has spent a not insignificant part of his life in the US, 52-year-old Finegold started in Israel, in the mid-'seventies, as an Elbit employee in defense electronics (Mendelson, 1999). For one thing, he was a member of the team that was awarded an Israel Defence prize for developing electronic warfare equipment for the Navy.

When Finegold began working for Intel in 1977, his American career officially began. After that, Finegold led the group in charge of designing the architecture for the next generation of goods.

Finegold credits an oddity he came upon while working for Intel with launching his independent career. Finegold observed that electronic engineers were still doing manual labor, using pencil and paper to create tools like word processors and electronic spreadsheets for others.

After weighing his choices, Finegold chose to quit Intel after spotting a possible gold mine. He and some others then proceeded to form Daisy. Daisy, founded in 1980, developed tools for making drawings directly on a computer, with no need for manual draughtsmanship, through simulation of the final system.

When he returned to Israel in 1989, he thought he would take time out for a year. But not long afterward, I met a few people, including Amnon Landan (currently Mercury's president), with whom I had worked previously, at Daisy. They spoke of a proposal they had for a technological solution for software inspection.

Mercury started as an Israeli company but was registered as a US company because Mercury's leading investor, incidentally, was Hambrecht & Quist.

Mercury Interactive Corporation is a world leader in the software testing market.

Hewlett-Packard declared on July 25, 2006, that it will purchase Mercury Interactive for about \$4.5 billion. Mercury Interactive officially joined HP in November (Israel21c, 2006).

Hewlett Packard Enterprise (HPE) received the majority of Mercury Interactive's software assets when HP split into two businesses. The majority of HPE's software assets, including the historical Mercury Interactive products, were sold to UK-based Micro Focus in September 2017. Micro Focus, which included Mercury Interactive products, was purchased by the Canadian software company OpenText in 2023.

Mercury LoadRunner is a powerful performance testing tool designed to identify and resolve performance issues in software applications before they reach the end users. The primary purpose of this testing tool is to simulate real-life user loads on the application under test, identifying and analyzing potential bottlenecks and performance-related problems that may arise when an application experiences high user traffic.

One of the key features of Mercury LoadRunner is its ability to create realistic and versatile load test scenarios to emulate various user behaviors (devex site). This is done by running virtual users or Vusers, which generate load on the application to simulate real-world traffic patterns. The tool collects a wide range of data metrics including response times, throughput, and server resource usage, presenting the gathered information in the form of detailed reports and graphs.

E-commerce Website: A major e-commerce company might use Mercury LoadRunner to simulate high volume user traffic during a Black Friday sale or other seasonal sales events.

Banking Application: A financial institution might use LoadRunner to test the performance of their internet banking system or mobile banking application. The tool would help the bank in understanding the system behavior under high load and peak usage hours.

Benny Levin, David Arzi, Micky Golan, Haim Shani, Logging and Recording Software, NICE Systems

Nice Systems was created in 1986 by a team of engineers led by Benny Levin including David Arzi, Micky Golan, and others (encyclopedia site). The team aimed to market the recording and logging software they had created for the Israeli Defense Forces (IDF)

overseas missions. Initially focusing on the global defense markets, Nice Systems was founded in Ra'anana and developed telecommunications systems and software for government and military use. The company's COMINT system, which enabled users to identify, track, monitor, and record radio signals, was one of its initial offerings. The company entered into a development cooperation with the U.S.-based TRW in order to break into international markets. Since Levin had been project manager for TRW's operations in Israel since the early 1980s, the company already had a solid relationship with TRW.

Nice established a relationship with Elta, a division of Israel Aircraft Industries, which assumed the sales operations of the Ra'anana-based business as part of its foreign sales endeavors. In order to develop digital communications and electronic information products, Nice and Elta have established a second partnership, Elnice. The business swiftly established a global footprint in this fashion, and by the end of the decade, the United States accounted for the majority of Nice's sales.

Leonid Belking, Ofer Smadari, No-code Automation Platform, Torq Developer

Leonid Belking managed various organizational units focusing on Software Engineering. 15+ years of experience leading products and technical solutions in the field of Enterprise Security / Management.

He has a B.Sc., Computer Sciences and Management, Tel Aviv University, 1999 - 2002, and an MBA from INSEAD, Executive Education, Strategic R&D Management 2015.

Ofer Smadari co-founded no-code security automation leader Torq in 2020 (cybersecurity-excellence-awards site)

He has overseen sales and business operations at Adallom (bought by Microsoft), maintained a number of senior operational security positions in top financial services companies over the past 20 years, and co-founded Luminate Security, a Zero Trust access startup that was later acquired by Symantec.

Torq Developer of a no-code automation platform is designed to remediate risks. Businesses can respond to threats with automatically triggered flows thanks to the company's platform, which is designed for security automation. It offers modern, lightweight security automation that can be integrated with its current toolkit and is flexible enough to scale seamlessly as an organization's needs change.

The Torque App is an application that facilitates the usage of your vehicle, including navigation, parking, fuel and oil systems, maintenance schedules, and financial instruments for auto purchases. Features include the ability to track your car's gasoline, oil changes, and maintenance expenses.

An instrument called a torque wrench is used to regulate and apply a particular torque to a bolt or nut. To guarantee the safety of clients, it is essential in general mechanics, tire-changing operations, and industrial maintenance & repair businesses.

Liran Hason, AI Deep Customization Capabilities for Model Monitoring, Aporia

Liran Hason has over 20 years of experience in software architecture and technology software, learning to code (Goldberg, 2024). Prior to founding Aporia, Liran was a Machine Learning (ML) Architect at Adallom (acquired by Microsoft for \$320M) and later an investor at Vertex Ventures. Liran received his BS in Computer Science at the College of Management Academic Studies.

His personal experience with machine learning started in 2008, as part of a collaborative project at the Weizmann Institute, along with the University of Bath and a Chinese Research Center. There, he built a biometric identification system by analyzing images of the iris. He was able to achieve 94% accuracy.

He worked as an investor at Vertex Ventures, for three years. He saw how more and more organizations used ML, and how companies transitioned from just talking about ML to doing machine learning.

Aporia offers deep customization capabilities for model monitoring with full support for public cloud and managed-on-prem, allowing data science teams to build the exact monitors they need for their use cases. Multibillion-dollar businesses utilize Aporia to keep an eye on billions of forecasts every day and preserve data integrity. Aporia was founded in 2020 and is supported by Vertex Ventures and TLV Partners.

Amir Hever, Automated Vehicle Inspection Systems, UVeye

UVeye, which was founded in 2016 by CEO Amir Hever and his brother Ohad, provides automated vehicle inspection systems for the automotive industry that are based on cutting-edge artificial intelligence, machine learning technology, homeland security industries, and major vehicle fleets, as well as security checkpoints around the world.

Before Alibaba acquired Visual Lead in 2017, Amir served as its vice president of research and development. He is a Software Architect and Software Engineer.

UVeye builds top-of-the-line inspection systems for military and police organizations. UVeye systems are increasing the speed and quality of inspection processes on assembly lines, as well as at new- and used-car dealerships, used-car auction houses, and major vehicle fleets, as well as security checkpoints around the world.

UVeye raised \$100 million in additional funding after recently completing a Series D investment round led by Hanaco VC, a venture capital firm (Jewish Business News, 2023). The company will be used to start production of UVeye inspection systems in North America, support further sales growth in the U.S., and fuel new-market expansion efforts.

Ami Daniel co-founded Windward in 2010, raising almost \$85m to date. Took it public in London in December 2021. He has an L.L.B in law from Tel Aviv University.

Matan Peled, the co-founder and Head of US Business at Windward has over twenty years of experience in the maritime domain, He served as a naval officer in the Israeli Navy for almost a decade. He has a Bachelor's degree, Business Administration and Management 2008 - 2011, from Reichman University

As a world leader in maritime risk analytics, Windward assists governments, law enforcement, and marine insurers, among other institutions, in understanding maritime risk so they can better manage it. Renowned investors such as XL Innovate, Aleph, Horizons Ventures, Marc Benioff, and Lord Browne support Windward, which has offices in Tel Aviv and London. For additional information, go to: XL Innovate, Aleph, Horizons Ventures, Marc Benioff, and Lord Browne are among the well-known investors who support Windward.

The platform developed by Windward provides real-time information and insights on ships at sea while allowing stakeholders within the maritime sector to receive risk management intelligence and gain business and operational insights.

Windward is being sold (2024) for \$270 million (Shulman, 2024). FTV Capital, an American investment fund, is the buyer.

Computing HS Applications

Kossay Omary and Rabeeh Khoury, CuBox, SolidRun

Co-founders Kossay Omary and Rabeeh Khoury, who had previously worked as an engineer at Marvell Technology Group, established SolidRun in 2010. One of the tiniest computers ever created was created by Kossay Omary and Rabeeh Khoury. Omary, 41, and Khoury, 38, met as students at the Technion-Israel Institute of Technology. Omary was raised in Nazareth, while Khoury grew up in Tarshiha, just east of the northern coastal city of Nahariya.

The goal of SolidRun has been to develop, produce, and market components aimed at integration with IoT systems (Klein Leichman, 2014). The company today is situated in Acre in the Northern District of Israel and is headed by Dr. Atai Ziv (CEO).

The major product development line aimed at the consumer market is the CuBox family of mini-computers. The first of which was announced in December 2011, followed by the

development of the CuBox-i series, announced in November 2013. Announced in December 2014, the CuBoxTV is the latest model in the CuBox family and has been promoted mainly for the home entertainment market. A further primary product developed by SolidRun is the Humming board, an uncased single-board computer, marketed to developers as an integrated processing component.

The world's smallest computer is the 2x2x2-inch CuBox-i. SolidRun, a 10-person firm cofounded by two Arab-Israeli electrical engineers with experience in the high-tech sector, makes it in Israel and sells it for just \$55.

Weighing only about 91 grams with a built-in operating system and WiFi, CuBox can be your Android TV box, multimedia streamer, networked storage solution, and pocket-size personal computer, running Lite Desktop and infinite open-source applications.

Zeev Farbman, AI Photo and Video Generation, Lightricks

Zeev Farbman had planned on a career in academia, studying computer science for his Bachelor's, Master's, and eventually his Ph.D. at Hebrew University in Jerusalem.

In addition to being a regular contributor to publications on tech, start-ups, employing a bootstrap model, the creator economy, and computer imaging, Zeev is an expert in photo image optimization and has produced peer-reviewed works on the subject.

Goldman Sachs Growth Equity, Insight Partners, Viola Ventures, ClalTech, Greycroft, Hanaco Venture Capital, Altshuler Shaham Investment Holdings, Harel-Hertz Investment, and Qumra are among the well-known investors who support Lightricks, which was founded in 2013. Capital House, Migdal Insurance and Financial Holdings, Shavit Capital, and Stonebridge Partners share our enduring commitment to driving the future of content creation. Lightricks, an AI-first company, is revolutionizing how visual content is created (lightricks site). Lightricks AI photo and video generation models, which power apps and platforms including Facetune, Photoleap, Videoleap, and LTX Studio, allow creators and brands to leverage the latest research breakthroughs, offering endless control over their creative potential. Through customized creative agreements, Popular Pays gives companies the chance to scale their content while also enabling creators to make money off of their creations.

Axios: Whole films are produced by Lightricks' AI film creator.

TechCrunch: The future of AI is video, and it's coming at us fast

Adam Singolda, Discovery Platform, Taboola

Adam Singolda is the founder and CEO of Taboola, a content discovery, and native advertising platform. With his experience in machine learning and data-driven

technologies, Singolda has developed Taboola to be a leader in the field of content recommendation. His company reaches over a billion users monthly. Singolda has been an active contributor to industry thought leadership, speaking at technology conferences and writing for respected business publications. His entrepreneurial mindset and leadership skills enable him to drive continuous growth and innovation in the digital advertising industry.

Taboola serves personalized content recommendations, partnering with the world's top publishers, brands, and marketers to drive audience development, engagement, and monetization. Taboola also empowers editorial, product, and sales teams with solutions built around real-time page optimization, robust native advertising offerings, and more. Taboola empowers businesses to grow through performance advertising technology that goes beyond search and social and delivers measurable outcomes at scale.

Taboola works with thousands of businesses who advertise directly on Realize, Taboola's powerful ad platform, reaching approximately 600M daily active users across some of the best publishers in the world. Publishers like NBC News, Yahoo, and OEMs such as Samsung, Xiaomi and others use Taboola's technology to grow audience and revenue, enabling Realize to offer unique data, specialized algorithms, and unmatched scale.

Yigal Ezra Eli Arad, High Speed Data Transmission, ColorChip

Yigal brings high speed data transmission to the world's top mega-datacenters and enterprises. Yigal Ezra joined the company as Vice President of Business Development and Global Sales in 2011. During his first three years at ColorChip, Yigal focused on defining an application platform that would enable mega Data Centers transition to higher data rates and longer reach applications for the next decade.

Yigal holds an MBA from Emory University, Goizueta Business School, and a BA in Economics and Accounting from Ben-Gurion University.

Eli Arad joined the founding team of ColorChip and leads the R&D activity of the company. Mr. Arad has gained over 15 years of industrial experience in developing PLC (Planar Lightwave Circuit) devices and optoelectronic systems.

He is an expert in fabrication and processing of active and passive optical waveguided devices using technologies based on Lithium Niobate and ion exchange in glass. Eli holds a MSc in physical electronics from Tel Aviv University.

ColorChip is the pioneering global leader of hyperscale single-mode solutions, leveraging our patented SystemOnGlass™ platform to deliver robust yet compact optical transceivers that support immense rates of data-intensive traffic. Colorchip high speed solutions and end-to-end production processes push mega data centers and social media providers far into the future, and bring communities everywhere closer together.

AI Applications

Israel has earned a reputation as an artificial intelligence powerhouse. It is ranked third on the 2024 Global AI Index for commercial indicators, which include local startup environment and venture capital activity in language models, computer performance, robotics, GenAI applications, healthcare, agriculture and in energy and sustainability.

Customized Applications

Gil Perry, AI Automagical Transformation of Any Picture or Video, D-ID

Gil Perry has a BSc from Tel Aviv University on computer science 2011 – 2014. He is the co-founder and CEO of generative AI platform D-ID, which is transforming the user experience by enabling real-time face-to-face conversations between people and computers. He was among the first developers in generative AI, working in the space since it emerged a decade ago, developing the first algorithm in the world to protect against face recognition technology (Jewish Business News, 2022). He served in various technical and business roles in leading global tech companies, including Meerkat/Houseparty, where he was a senior software engineer. D-ID offers AI-driven creative media services Founded in 2017, D-ID's Creative AI enables the automagical transformation of any picture or video into extraordinary experiences. The technology is used by leading marketing agencies, production companies, and social media platforms globally.

D-ID uses AI and deep learning to develop reenactment-based products ranging from animating still photos to developing high-quality digital avatars. D-ID's wide range of customers includes Warner Bros. Studios, Mondelez, Publicis and MyHeritage, whom D-ID partnered with to create the viral sensation Deep Nostalgia, which has created nearly 100M animations since its launch, and more recently, LiveStory, which enables the creation of AI-generated biographical videos narrated by photos of users' ancestors. D-ID has also partnered with The Glimpse Group (NASDAQ: VRAR), a diversified virtual reality and augmented reality platform, to develop AI, AR and VR applications for the Metaverse.

Ori Goshen, Language Models and Tools, AI21 Labs

Ori Goshen has a Bachelor of Fine Arts (BFA), Film/Cinema/Video Studies 2005 - 2008, Tel Aviv University and a BFA, Robotics Technology/Technician 1997-2000, Hebrew Herzliya Gymnasium. In 2009, he founded Crowdx and launched its first product (Tawkon) a popular mobile consumer application (startupnationcentral site). The app has received recognition and design awards (e.g. Wired Magazine Top 10 Apps) and has been installed and used by millions of users worldwide.

Before founding Crowdx, he served as a mobile team leader at Fring (acquired by Genband), one of the most popular VoIP and messaging apps globally.

AI21 Labs is a company that develops AI, massive language models, and tools for natural language generation and comprehension. Customers are able to comprehend, analyze, and visualize abstract knowledge structures and read more efficiently thanks to the company's tool, which uses deep learning frameworks and computer vision algorithms to rephrase writing to say exactly what is meant by providing summaries.

Amazon is joining the generative AI race (Kabir, 2023). Among the companies that Amazon will provide access to their AI models is Israel's AI21 Labs.

Elad Raz, High Performance Computing (HPC), NextSilicon

As founder and CEO of NextSilicon, Elad Raz pioneered a radically new approach to HPC architecture that drives the industry forward by solving its biggest, most fundamental problems (nextsilicon site). Before starting NextSilicon, Elad had important roles in a number of software businesses, demonstrating his aptitude for teamwork and strategic planning.

He was the founder of Integrity Project, a software development company that Mellanox Technologies (now Nvidia) acquired in 2014.

Elad Raz founded NextSilicon in 2017. The company has raised \$215 million and has 250 employees.

NextSilicon is a deep tech company focused on developing the next-generation compute platform for the HPC market. Its products are a pioneering, first-of-its-kind approach to software-defined hardware that allows developers to run their existing code faster than ever before, and without the need for rewrites, recompilation, or vendor lock-in. Maverick-2 ICA hardware.

The NextSilicon Maverick-2 is a software-defined hardware accelerator card for high-performance computing that comes in two different form factors: a dual-die OCP Accelerator Module (OAM) and a small, scalable single-die PCIe format. Advanced 5nm process technology, HBM3E memory, and other technologies are combined in the Maverick-2 ICA. and high-bandwidth interfaces to deliver scalable, efficient performance. Maverick-2 reduces power consumption and maximizes efficiency while accelerating the most taxing HPC and AI tasks, whether in a single-die or dual-die architecture.

Maverick-2 ICA software

NextSilicon software utilizes real-time telemetry and intelligent algorithms to dynamically optimize performance, power efficiency, and scalability for your most demanding HPC and AI workloads. In addition to optimizing performance right away, this clever, software-

defined flexibility future-proofs your infrastructure so it can grow with new workloads and applications. NextSilicon's strategy eliminates the drawbacks of fixed-function accelerators and offers a long-term solution that adapts to your company's needs to produce sustainable innovation.

Yossi Wolf, Oded Tahori, Robotic Systems, Temi, Jeens.ai

Today Temi is a multinational robotics company that specializes in Robot as a Service solutions (RaaS), autonomous platforms, AI, smart assistants, and cloud-based services. Temi maintains blue chip customers across core industries including technology, enterprises, healthcare, telecom, education, retail, and hospitality to provide cost-effectively, 24/7 autonomous staff members for everyday tasks with a focus on engagement efficiency.

It's a family of solutions that varies from a 1.5-kilogram (3.3 pound) robot to 10 kilograms (22 pounds) to a product called probot that carries 200 kilograms (440 pounds).

The one-meter high, 12-kilogram Israeli robot is a combination of a tablet, a set of loudspeakers, and a charging surface on wheels (Berkovitz, 2018). It is capable of following users all over the house or office and is equipped with Google Assistant software that turns it into a mobile assistant capable of following users anywhere in the house and speaking to them. It is like a version on wheels of smart speakers - products such as Google Home, Amazon Echo, and Portal, which Facebook launched this month, which have become very popular in recent years.

Oded Tahori and Yossi Wolf, GenAI Applications, Jeen.ai

Oded Tahori and Yossi Wolf, founded Jeen.ai, a company that has developed a secure platform for the rapid implementation of GenAI applications (Orbach, 2024). The company began as a spin-off of the GenAI activities at One Technologies, which owns 25% of Jeen.ai. It became independent in July 2024, operating out of new offices in Tel Aviv with about 25 employees.

Corporate chat, conversation transcription, and analysis, a digital AI assistant based on corporate data, an AI bot for customers, and other services that blend innovation with an easy-to-use interface and speedy deployment are just a few of the GenAI-based solutions that Jeen.ai's clients can personalize and deploy to meet their business needs. The Jeen.ai system can be set up on NVIDIA servers in a secure local setting or cloud environment.

The system can be installed on various cloud services or on-premises, and it's already serving dozens of major Israeli companies, including Isracard, Delek, Reichman University, Amdocs, Perrigo, and Cellcom (Hennessy, 2024).

The concept is that businesses can leverage Jeen.ai's services to create better chatbots for customer interaction. At the same time, the platform can analyze the conversations that customers are having with its bots and offer the company analytics based on those chats.

Danny Weissberg, Speech Recognition, Voiceitt

Danny Weissberg has a B.A, Computer Science 1998 - 2001 from the Open University and a B.Sc, Civil Engineering 1991 - 1995 from the Technion. He has more than 10 years of experience in AI and ML in the space of speech recognition and accessibility developing cutting edge technologies leveraging the power of DNN and big data.

Voiceitt is a stand-alone Web app supporting communication with people and with technology. Voiceitt was created in collaboration with people living with speech disabilities and speech-language pathologists, as an accessible and inclusive Voice AI solution. It is an Augmentative Alternative Communication(AAC) tool for communicating with others and an Assistive Technology (AT) tool for dictation, home automation.

Medical Applications

Netanel Peri, AI Algorithms to Analyze Medical Image, MedyMatch Technology

Netanel Peri is entrepreneur and executive in the tech and healthcare space with a track record of founding, building, and growing AI technology-driven global businesses.

MedyMatch Technology owned by him uses AI algorithms to analyze medical images and assist doctors in making more accurate diagnoses. Their software can identify critical abnormalities on CT scans within seconds, providing faster and more precise results than traditional methods. This not only saves time but also enables doctors to catch potentially life-threatening conditions early on.

Alex Zhavoronkov, Insilico Medicine

Alex Zhavoronkov, is the founder of Insilico Medicine and a leader in generative artificial intelligence technologies for drug discovery and biomarker development. Dr. Zhavoronkov has a combined background in biomedicine and computer technology. He has been recognized by Deep Knowledge Analytics in 2019 as one of the top 100 AI leaders in drug discovery and advanced healthcare globally and has been selected as one of Clarivate's Global Highly Cited Scientists for 2022.

Insilico Medicine combines deep learning with genomics data analysis to discover new compounds that could potentially treat age-related diseases better than existing drugs. By

using these AI-driven approaches, they are significantly shortening the time it takes for new medications to enter clinical trials.

Yonatan Adiri, Image-recognition, Healthy.io

At the age of 26, Yonatan was appointed by the President of Israel, Shimon Peres, as the country's first Chief Technology Officer (CTO) and steered a policy of technological diplomacy. Yonatan participated in the inaugural class (2009) of Singularity University's Graduate Studies Program (GSP), where he co-founded GetAround. In 2012 Adiri was chosen by the World Economic Forum as one of its 100 Young Global Leaders and was selected by TIME Magazine as one of the 50 most influential people in healthcare in 2018.

Healthy.io (formerly called OwnHealth) has developed an app that uses image-recognition technology which helps doctors to diagnose their patients. It has leveraged smartphone and cloud technology to provide the benefits of color-based healthcare and medical imaging. It claims that the app can read images of test strips photographed by the user, regardless of the smartphone operating system or the lighting condition the image was taken under. As of 2016, the app is being examined by the FDA for its approval.

Joseph (Yossi) Mossel, Chaim Linhart, Cancer Diagnostics, Ibex

Joseph Mossel has a Msc, Computer Science Msc, Computer Science 2000 - 2003 from Tel Aviv University and a Msc (cum laude), Environmental Resource Management -

Energy Specialization 2010 - 2011 from Vrije Universiteit Amsterdam (VU Amsterdam). Chaim Linhart has a Ph.D., Computer Science 2003 - 2009 from Tel Aviv University. His Thesis was in Thesis in Computational Biology: "Discovering motifs in large genomic datasets" (advisors: Prof. Ron Shamir and Prof. Yosef Shiloh). Ibex is a provider of AI-based analytic solutions for cancer diagnostics. The company has developed an analytical and diagnosis platform called the GALEN platform which assists with treatment diagnosis and planning. Other products such as First Read and Second Read use AI technology for the diagnosis of cancer based on pathological image analysis. The platform uses computer vision-based image analysis and machine learning technologies in digital pathology.

Agriculture Applications

Sagi Briteman, Cloud Based Software Boost Crops, CropX

Sagi is an innovative executive with record of leading design and development of B2C, B2B, and enterprise-grade products.

20+ years of experience in Web/Cloud based products, advance eCommerce technologies, mobile, AI, and enterprise solutions.

CropX Ltd., an ag-analytics company, develops cloud based software solutions integrated with wireless sensors, which boosts crops yield and saves water and energy. It offers advanced adaptive irrigation software service that delivers crop yield increase, and water and energy cost saving services while conserving the environment. The company also generates irrigation maps and automatically applies the right amount of water to different parts of the same field. It serves farmers worldwide. CropX Ltd. was founded in 2015 and is headquartered in Tel Aviv, Israel with an additional office in Denver, Colorado.

Yaniv Maor, Autonomous Robot, Tevel Aerobotics

Yaniv Maor founded Tevel Aerobotics Technologies in 2017 after recognizing the hardships and challenges farmers face due to scarcity in fruit-picking labor. During his career at IAI, Yaniv led multidisciplinary R&D projects and oversaw the implementation and success of numerous projects from initial concept into mass scaling and production.

He holds a Bachelor of Science in Computer Engineering and a Master of Science in Systems Engineering from the world-renowned Technion Institute of Technology. develops autonomous flying robots for fruit harvesting. These robots use computer vision and AI to identify ripe produce and pick it efficiently. The Flying Autonomous Robots™ are driven by cutting-edge guidance and control algorithms that enable incredible accuracy and maneuverability. They continuously collect data on every single piece of fruit they pick, providing real-time harvesting data. The Robot interacts with foliage and is designed to continuously fly in and out of the trees without harm.

Valery Kogan, Cromptimus™ Platform, Fermata

Valery Kogan completed a master Master of Science (M.Sc.), Applied Mathematics and Physics (2014-2016) from Moscow Institute of Physics and Technology (State University) (MIPT) and a PhD in bioinformatics (2017-2021) from Ariel University. He started as a researcher in the lab and gained management experience leading AI teams in biotech start-ups in Europe and the US. This path eventually led to co-founding Smartomica, a company focused on developing an AI-based platform which assists oncologists in diagnosis of severe cancer patients.

The concept for Fermata came from the understanding that plant health is also very important for each one of us, and for the planet. 30% of crops are lost globally due to late detection of plant diseases — a huge source of food waste. Further, the current approach to overcome this challenge is intensive use of various chemicals (fermata-tech site. Fermata has built a sustainable AI-based solution for automatic monitoring of plant health in

greenhouses and on the fields. The system notifies the growers in case of disease and allows them to prevent harvest losses by up to 30% and apply less chemicals in the course of food production.

Croptimus™ uses advanced computer vision technology and artificial intelligence to detect pests & disease before they become serious issues, allowing growers and IPM teams to deal with these problems before they get out of hand.

This early detection saves growers both time and money, with up to a 50% reduction in scouting, 30% reduction in crop loss, and 25% reduction in crop inputs.

Croptimus™ collects data from inexpensive cameras, which is then transmitted to the cloud for analysis. Advanced AI algorithms process this data to identify potential issues, and a notification is sent to the grower or IPM team to highlight the detected problem and its exact location. They may then undertake a mitigation strategy, and Croptimus™ will continue to monitor the issue to determine this strategy's efficacy.

Energy Applications

Eran Dgani, Robot Cleaning Solar Panels, Ecoppia

Eran Dgani has over 20 years of experience in operations and R&D in the print, semiconductor and PCB sectors. Before joining Ecoppia Eran served as VP Operations at Scodix (TLV: SCDX) – a digital print technology company. Eran holds a B.Sc. in Mechanical Engineering and a BA in Polymer Chemistry & Computers.

Founded in 2013, Ecoppia is the pioneer and world leader in robotic cleaning solutions for PV, offering a cloud-based platform and a suite of advanced, fully autonomous robots cost-effectively maximizing the performance of utility-scale PV sites all over the world.

Eco-Ops. Ltd., led by Ecoppia management members, acquired Ecoppia in 2024, providing operational services to solar projects around the globe, utilizing unparalleled experience gained in 10 years of operational excellence, and continues to offer the widest offering of fully autonomous robotic cleaning solutions in the market.

Or Yogev, Energy Storage, Augwind

Or Yogev has a Msc in Applied Mechanics from The Technion 2003-2005 and from CalTech a PhD in Applied Mechanics and Computational Mathematics, Engineering Design.

He founded Augwind, a technology company specializing in compression, expansion and storage solutions for energy storage and energy efficiency applications.

The core developments are proprietary underground pressure chambers in which gases and liquids can be stored and pressurized and Proprietary liquid piston process which enables highly efficient isothermal compression and expansion of air.

Augwind combines AI algorithms with compressed-air technology to provide sustainable energy storage for renewable sources.

Defence Applications

Alon Abelson, Ido Yahalomi , Ronen Racz, Converting Off-the-shelf Drones into Super Drones, High Lander

Alon Abelson holds a BA in Economics, College of Management and has 20 years of experience in the field of air traffic control filling various positions for the Israeli Air Force. During his military service, he was in command of the northern military airports and served as the commander of the northern flight control unit with the rank of Major.

Ido Yahalomi hold a BA from Ruppin College. His current role at High Lander centers around business development, but he also has an intimate knowledge of everything that's happening with new technologies and how we can best implement them into our platform. Ronen Racz holds a B.Sc. Software Engineering, Tel Aviv Academic College of Engineering. His is a backend and Cloud professional developer with over 15 years of experience. Built finance, location based, big data and security applications. Looking for my next challenge.

High Lander offers a cross-platform solution for converting off-the-shelf drones into super drones without the use of any additional hardware. High Lander's drones are capable of being fully autonomous and can detect and inspect objects, land and charge themselves, and perform multiple missions.

The company's Mission Control is a turnkey solution for managing any kind of drone fleet operations at scale. Universal UTM is an end-to-end solution for complex air traffic management of both manned and unmanned aircraft.

DIGITAL IMAGING

Efi Arazi was a trailblazer in digital printing, founding Scitex and developing computerized color prepress systems that revolutionized the printing industry. Benny Landa, often referred to as the "father of digital printing," founded Indigo and introduced liquid electrophotography, leading to groundbreaking commercial digital printing solutions. Guy Menchik contributed to the evolution of 3D printing applications, pushing the boundaries of digital imaging in manufacturing and prototyping. Gil Perry, through AI-driven platforms like D-ID, enabled the automated, "automagical" transformation of photos and videos—blending deep learning with synthetic media to power new forms of digital storytelling and security. Together, these innovators positioned Israel as a global leader in digital imaging, spanning traditional printing, 3D technologies, and artificial intelligence applications.

Efi Arazi, Digital Imaging Printing and Video, Scitex, EFI

Efraim R. (Efi) Arazi, founded Scitex in 1968, blazed the trail for other start-ups, manufactured all its products in Israel and, at its peak, employed 4,000 Israelis.

Efi won a prize for his military ideas and eventually became a cadet at the Israel Air Force Technical High School. Arazi left Israel for America in 1959, having completed his army service with little more than \$50 in his pocket, speaking virtually no English, and lacking a high school certificate. He knocked on the door of the Massachusetts Institute of Technology (MIT) admissions officer in Boston and requested admittance. Arazi worked as a spy camera specialist for Itek, a Route 128 defense contractor, to support himself while attending MIT. Itek's camera captured images of Neil Armstrong walking on the moon during Apollo 11 in 1969. According to reports, Arazi played a significant role in its development, particularly in the area of scanning technologies.

In 1967, shortly after the Six-Day War, Arazi hurried back to Israel and established Scitex (Scientific Technologies) in 1968. He took nine Israeli engineers with American training with him to serve as the company's core. Initially, Scitex offered computers and software that allowed textiles to be color-printed straight from minicomputer screens. However, Arazi soon recognized a more significant application for his technology: creating color plates straight from a computer screen to print periodicals and newspapers instead of using the expensive, time-consuming cut-paste-and-film approach.

In 1975, Scitex started working on a computerized color prepress system after realizing the potential of new technology in the expanding global printing and publishing sectors. When Arazi initially showed off the Response 300 system at the GEC expo in Milan, Italy, in the fall of 1979, it completely shocked the graphic arts community.

The Response 300 had a built-in laser film plotter, image processing workstation, and color drum scanner. Scitex was the first firm in the world to integrate color image retouching and page makeup onto a single console, directly challenging the dominance of high-tech graphic arts equipment by Hell (Germany) and Crosfield (UK).

The electrical color scanning method used before the Response 300 relied on an analog transfer of color separation data straight from a drum scanner to the film output unit. Arazi and Scitex came up with the novel idea of sandwiching a minicomputer (an HP1000 at the time) between the plotter and scanner so that the color separations could be recorded and saved digitally. Before being finalized as film separations, the proprietary image files could then be color-adjusted, retouched, resized, and cropped on screen.

In 1988, media tycoon Maxwell purchased a quarter of Scitex's stock and then took over as chairman, forcing Arazi to step down as chairman. After raising some funds in Silicon Valley, he founded EFI (Electronics for Imaging), a company that was the first to develop software that converted color photocopiers into color printers. Hewlett-Packard purchased a portion of Scitex, which in 2005 changed its name to Scailex. Suny Electronics now owns 79 percent of the company, while entrepreneur Ilan Ben-Dov owns 73 percent. Ben-Dov utilized Scitex's vast debt and cash to acquire cellular operator Partners.

Since EFI raster image processors were incorporated into numerous high-end color laser and toner-based printing equipment, the new business was just as successful as Scitex. By the 1990s, the EFI Fiery technology for inexpensive, high-quality color proofs had swiftly established itself as a standard in the graphic arts sector. The business, which is an acronym for its founder's first name, subsequently branched out into inkjet printing equipment, productivity software for the printing sector, and print server and workflow software. EFI is currently among the most significant and prosperous technological firms in the quickly evolving printing sector.

By integrating Scitex into the HP Indigo Division, HP is simplifying its digital printing operations in Israel (Gilad, 2022).

By relocating Scitex from HP Industrial to the HP Indigo Division, HP is simplifying its digital printing operations in Israel. 60 persons will lose their jobs as a result of the procedure, primarily in the finance, administration, and development sectors. One of the pioneers of Israel's IT sector was Scitex. Indigo maintains offices in Kiryat Gat and Ness Ziona.

Currently, Scitex produces digital printing equipment for the market for signs and product packaging. Its headquarters are in Netanya, and until recently, it was run as a separate entity with divisions for marketing, finance, services, and research and development, just like Indigo.

HP has moved its Scitex operation in Israel under the control of Indigo and out of the industrial division which houses the majority of its inkjet interests (Print Business, 2022).

Indigo, Nanoink, Landa Benny Landa ElectroInk,

Benny was born in Poland in 1946 to Holocaust survivors (landanano site). His family moved to Edmonton, Alberta, Canada, from Europe when he was two years old. After eight years as a carpenter, Benny's father bought a small tobacco shop. He constructed a photo booth at the back of the store that doubled as a studio and darkroom to help make ends meet. Using bicycle components and pulleys, Mr. Landa Sr. created a novel camera that would record images straight onto photographic paper without the use of film. Later, when Benny debuted digital printing in 1993, this crucial idea became widely accepted. In these early days, Benny assisted his father in the darkroom and developed his first invention: a mixer for photographic chemicals using rubber tubing and an electric motor from an old phonograph.

Following a varied academic background that included studies in psychology and literature at the Hebrew University of Jerusalem, engineering and physics at Israel's Technion, and filmmaking at the London Film School, Benny received his degree. He started working for CAPS, a micrographics research business, in 1969. He helped create a ground-breaking micrographic product that helped the company land a significant contract with Rolls-Royce Aero Engine Division, and he was quickly promoted to head of R&D.

He and a coworker established Imtec in 1971, which grew to become the biggest micrographics company in Europe. In addition to creating the company's primary imaging technology, Benny developed a high-speed image development technique that would eventually result in his ground-breaking creation of ElectroInk® while studying liquid toners.

In 1974, Benny moved to Israel. Three years later, he founded Indigo, which commercialized the ElectroInk concept. His novel method created a thin, smooth, plastic layer on paper by combining tiny color particles with an electric charge. Indigo made it possible to produce high-quality color images at high speeds with quality that almost equaled offset printing. By the early 1990s, Indigo had expanded into a manufacturer of printing equipment and introduced a cutting-edge new printing technique that put it directly in rivalry with industry titans like Xerox, Kodak, and Heidelberg.

Guy Menchik PolyJet 3D Printing, Objet, Stratasys

Guy Menchik earned a Bachelor of Science degree in Electronic Engineering from Tel Aviv University (1983-1987) (clay site). He was Objet Geometries - VP R&D (2001 – 2012) Scitex - Project Manager (1992 to 2001) and Stratasys - Chief Technology Officer (2020-2024). He is the key contributor to the invention of PolyJet technology (jiga site).

PolyJet 3D Printing is a cutting-edge technology that uses inkjet heads, UV light, and photopolymers to rapidly produce exact objects. It creates digital materials by layering

resins to attain precision. A CAD model is first converted into a printable format to begin the process. Layers are bonded by jetting photopolymer drops onto the build platform and curing them with UV lights. For the final PolyJet model, support materials are either dissolved or manually deleted. PolyJet material jetting technology is appropriate for a broad range of applications across different industries because it can create parts with multiple colors and materials in a single monolithic print. This technology produces precise, aesthetically pleasing models from prototyping to low-volume production without the need for tooling.

To produce the smoothest surfaces and thinnest walls, polyjet printers may achieve an accuracy of 0.1mm. They are therefore perfect for creating prototypes with intricate geometry. Furthermore, mixing different materials is only possible with Polyjet.

In November 2024, Guy Menchik joined flō Optics, a trailblazer in Additive Manufacturing (AM), to its leadership team (Business Wire, 2024).

flō is using Advanced Manufacturing (AM) to resolve the complex problem in today's ophthalmic industry around coatings. Coatings are essential to the manufacturing of every lens. Today's coatings process is time-consuming, expensive, and limited in its options; different coatings call for different systems. However, each person has a unique lens (power, coating, and cut). flō's proprietary technology offers vast improvements in the optical coatings process down to the level of micro-sized pixels and opens a wide new range of design possibilities in terms of functionality, cost, ease of use, and sustainability.

Jonathan Jaglom started at Objet Geometries (later to become Stratasys) in 2005 as a Sales Manager and helped build its presence in Europe. I took over as CEO of MakerBot in 2015, which had 600 employees at the time, and I assisted with the company's PMI (post merging integration) process with Stratasys. In 2017, he departed from Stratasys. Today he is the CEO and Chairman of flō and he has been involved with the company since 2021.

Gil Perry, AI Automagical Transformation of Any Picture or Video, D-ID

Gil Perry has a BSc from Tel Aviv University in Computer Science from 2011 – 2014.

He is the co-founder and CEO of the generative AI platform D-ID, which is transforming the user experience by enabling real-time face-to-face conversations between people and computers. Working in the field since its inception ten years ago, he was one of the pioneers of generative AI, creating the world's first program to defend against face recognition technology (Jewish Business News, 2022). He worked as a senior software engineer at Meerkat/Houseparty and in other top international tech businesses in a variety of technical and business capacities.

D-ID offers AI-driven creative media services. Founded in 2017, D-ID's Creative AI enables the automagical transformation of any picture or video into extraordinary experiences. Globally, top production firms, marketing agencies, and social media platforms employ the technology.

D-ID creates reenactment-based products using AI and deep learning, which range from creating high-quality digital avatars to animating still images. Warner Bros. Studios, Mondelez, Publicis, and MyHeritage are just a few of D-ID's many clients. D-ID collaborated with these companies to develop the viral phenomenon Deep Nostalgia, which has produced almost 100 million animations since its debut, and LiveStory, which allows users to create AI-generated biographical videos that are narrated by images of their ancestors.

In order to create AI, AR, and VR apps for the Metaverse, D-ID has also teamed up with The Glimpse Group (NASDAQ: VRAR), a diverse virtual reality and augmented reality platform. D-ID is leading the charge to leverage Synthetic Media for good. The company has worked with nonprofit organizations and governments in public awareness campaigns on sensitive issues such as domestic violence and HIV awareness.

Chen Yogev, Matteo Shapira, Aviv Shapira, FreeD Technology, Replay

Replay Technologies is owned by its co-founders, CTO Matteo Shapira and COO Aviv Shapira, as well as US fund Cervin Ventures. It is led by CEO Chen Yogev. Replay's FreeD technology creates a 3D scene from all angles, even if no camera is present (Volk, 2014).

Even without a camera, Replay's in-house free-dimensional video (FreeD) technology can produce a three-dimensional scene from various perspectives. The technology's computerized perspective and advanced processing offer the viewer any angle of a scene, even if there is no camera present from that angle. The technology also saves production costs, by eliminating the need for scores of cameras at an event, making it possible to provide 360-degree coverage with only a few cameras and a small crew.

The freeD technology allows producers, directors, and consumers alike to create impossible camera views of real-life scenes, as seen in Yankee Baseball YES View, an Emmy Award-winning freeD innovation. FreeD will enable people to fully and interactively immerse themselves in the content as technology advances.

By supporting a service that allows viewers to "jump" into live events and experience them from any angle, Replay Technologies is taking advantage of the potential rise of virtual reality and augmented reality. The FreeDTM technology from Replay Technologies is revolutionizing how consumers connect, manage, and watch live events. This idea was most recently realized when Replay and Intel collaborated to provide 360-degree instant

replays that were controlled by the user for the NFL during Super Bowl 50 and the NBA during All-Star Weekend.

Intel Corp. (Nasdaq: INTC) acquired 2016 Israeli sports imaging startup Replay Technologies for \$175 million for the acquisition (Tsipori, 2016).

Since 2013, Replay and Intel have worked together to optimize their immersive, interactive video content for Intel systems.

The Dallas Mavericks owner Mark Cuban, Samsung Ventures, OurCrowd, and \$13.5 million in a funding round led by Deutsche Telekom Capital Partners (DTCP) are among the other investors in the company, which has raised \$27 million so far.

Alon Moshe and Erez Moshe, Digital Thread-dyeing System, Twine Solutions

As the name suggests, Twine Solutions is an Israeli firm that was established in 2015 by twin brothers Erez and Alon Moshe, who have both worked for many years in the digital printing industry (twine-s site). Alon Moshe studied EMBA at Northwestern University. The brothers started researching and experimenting, and their hard work culminated in creating the TS-1800, a waterless, eco-friendly dyeing machine, based on a similar idea as today's digital printers.

Twine Solutions has created a digital dye-to-match color application and a patented digital thread-dyeing technology. A single white, store-bought thread is continuously dyed by Twine's technique to any desired length and color.

Twine's Digital Selective Treatment technology enables thread dyeing on demand and is ready to use within seconds in a waterless, eco-friendly process. Because Twine's process eliminates the requirement for colored thread stock and lowers logistics, dead stock, and other waste expenses, it provides an alternative to traditional bulk dyeing. The single-thread, single-needle, multi-color method improves production efficiencies, margins, and overall profitability, resulting in a return on investment of less than a year and a low total cost of ownership. The process is called Digital Selective Treatment (DST™) which refers to how the company digitally, and selectively, applies the ink on the thread/yarn.

DST can be broken down into five steps: Mix the ink to match the color you specified; Apply the ink; The thread/yarn passes through the machine's treatment chamber to ensure that the mixed TDI is applied evenly and penetrates the thread or yarn fiber; Dry and cure; Lubricate, the amount of lubricant can be fine-tuned according to the type of thread/yard and your end product; Collect and filter.

EDUCATION

Education-as-a-Service (EaaS) represents a transformative shift in education, offering AI-powered personalized learning. MagniLearn platform serves: K–12 schools; Higher education institutions; Adult learning programs. The rise of virtual learning environments has introduced the concept of 3D3C domains—defined by four key components: 3D – Immersive, spatial learning environments; Community – Multi-participant, interactive learning groups; Creation – Learners and educators co-creating content; Commerce – Exchange of virtual goods, services, or educational assets. This model supports experiential and collaborative learning, especially within metaverse-based or gamified platforms.

Arie Rappaport, Lana Rappaport, Michal Etzion, Itay Gissin, Education-as-a-Service (EaaS), AI-based Personalized Learning, MagniLearn

Arie Rappaport is an Associate (Full) Professor at the Hebrew University of Jerusalem, Israel. His main contribution is in the areas of Neuroscience, Neurology, and Psychiatry, where he developed comprehensive theories of the brain and brain disorders and diseases.

Lana Tockus has more than 10 years of experience in the ed-tech field. She holds a B.Sc. in Mathematics & Computer Science, an M.Sc. in Computer Science, and a Ph.D. in Science Education, all from the Hebrew University. In 2018, Lana Co-Founded Bilanga, a company in the field of Educational Technology.

Michal Etzion is an expert in the field of computational linguistics algorithms. She holds a B.Sc. in Mathematics and Computer Science and an M.Sc. and Ph.D. in Computer Science, all from the Hebrew University. Michal brings with her over 20 years of management & tech experience in leading companies.

Itay Gissin combines over 20 years of startup leadership with expertise in building, growing, and selling ventures. He holds an MBA from INSEAD and has served as CEO of Apester and Investing.com media, fostering strategic innovation and notable growth. His skill in managing and expanding tech enterprises was formed by his leadership positions at Orange and NICE.

AI-based personalized learning that can be tailored to any curriculum, textbook, or subject is provided by the Israeli education-as-a-service (EaaS) provider MagniLearn. The company focuses on adult learning, higher education, and K12 schools, primarily targeting the B2B sector. By partnering with content providers and book publishers, MagniLearn enables companies to transform their static information into individualized and adaptable learning environments.

Using AI and NLP technologies, along with neuroscience and cognitive principles, the company has developed a linguistic engine that understands where learners are struggling and adapts its lessons in real time to match individual needs. This adaptable technology is appropriate for online tutoring, homework assignments, remedial sessions, flipped classrooms, and mixed-ability settings since it is made to support remote teaching and learning. It can be used as a stand-alone digital course or seamlessly incorporated with a paper textbook. Joint creation and learning in multi-participant 3D worlds are made possible by the educational technology business Eureka World.

Microsoft Israel's AI for Good Acceleration Program has chosen EdTech startup MagniLearn, founded by artificial intelligence (AI) researchers from the Hebrew University of Jerusalem, as the most promising startup innovation in the EdTech space after closing agreements with public and private school networks in Israel, Korea, and Japan (Martin, 2021).

Each student's strengths and limitations are identified by MagniLearn's algorithms, which then automatically customize the subsequent course for them.

MagniLearn has been successful in developing enough linguistic awareness to evaluate students' knowledge, identify areas in which they require assistance, and determine the most effective way to express feedback in their mother tongue in order to help them advance.

Shabtai Kaminer, Uri Shapira, 3D Creation and Learning, Eureka World

Shabtay Kaminer, Entrepreneur, Director of leading television programs in Israel for 20 years, owner & director of "Shabluli Children Content" develops content for preschoolers and elementary-level students (eurekaworld site)

With the help of physical interfaces like 3D printers, robotics controllers, virtual reality headsets, and more, Eureka World, an education technology business, allows collaborative creation and learning in multi-participant 3D worlds. 150 educators have acted as mentors for students using Eureka's 3D environments during the past three years.

The definition of 3D3C domains is because learning in virtual worlds and 3D domains includes a multi-participant community, creation, and commerce. The game's straightforward rules allow us to address the fundamental problem of adding value to the creative process.

Eureka's technological learning environment improves individuals' capabilities by facilitating human, emotional, and experiential connections in an augmented reality setting. In reality, it is a 3D game that students and teachers made. Every group selects a subject and develops a game that it can invite other groups to participate in. The greatest way for

students to learn the material is to create the game. Additionally, building a world using Eureka fosters the development of critical abilities including collaboration, technological thinking, game-based storytelling, overcoming programming, logic, and design, among others. Every game is different, and players have the option of creating an assignment and sending it to their friends using a 3D printer or giving each other a printed prize.

Numerous learning approaches, such as gamification, project-based and problem-solving learning (PBL), shared learning, peer evaluation, and alternative evaluation procedures, as well as a high degree of tangibility throughout the learning process, teamwork, developing groundbreaking technological orientation in the classroom and at school, examining Geolocal characteristics and using informal tools in education, and more. The diverse range of abilities offered within enables customized customisation to meet the demands of each student and gives various pupils the chance to showcase their unique skill sets. Three-dimensional layout, programming, project research, and management.

The solution is deployed at Haifa, Nes Ziona, Shoham, Tel Aviv–Yaffo, Migdal Haemeq, Ktsrin, Gezer, Ashdod, and Kiryat Malakhi municipalities.

Hen Eytan, Kirill Slavkin, Genadi Sokolov, Active Collaborative and Social Learning Video, Annoto

Hen Eytan, Kirill Slavkin, and Genadi Sokolov created Annoto (in Latin: “to react to”) – an educational startup they founded together, which transforms the passive watching of a video into an active collaborative and social learning experience.

Annoto aims to increase learner involvement, enhance both communication between the pupils and the quality of video learning, and provide meaningful insights for the organization and teacher about the pupils’ level of understanding. Annoto adds an interactive layer of dialogue to the video thereby allowing the pupils to conduct a discussion at any point during the class. In addition to allowing students to summarize key points in their notebooks, this dynamic information layer of questions, answers, and opinions also enables them to revisit the course and gain a deeper understanding of the material contributed by other participants.

Annoto works with a large number of entities in Israel and abroad and offers support in 28 languages. The business recently took first place at BettShow London, the biggest learning technology conference in the world. Since it is the first time an Israeli enterprise has received this honor, it is a national accomplishment that has brought us international recognition as a nation that fosters innovation in education.

With thousands of customers, Annoto offers a solution for both "Mooc" courses and brief 2-minute video clips of the psychometric test. The Digital Israel Campus is a prime example. The university is the centerpiece project of Digital Israel and serves as a

nationwide online learning platform where top universities contribute their top courses at no cost.

This implies that anyone can sign up for a course that has cost hundreds of thousands of shekels, giving people on the periphery equal opportunities and supporting universal education.

Talpiot College's Introduction Diversity course was the first campus course to be made available online using Annoto. It was taught in Hebrew, Arabic, and English. The course deals with complex contemporary issues such as identity, culture, prejudices, and relations between different groups in the global world. The students, who represent all facets of society, used Annoto to discuss and share their individual opinions and experiences while watching different simulations of actual events.

THE POTENTIAL LOCAL IMPACT OF ISRAELI INNOVATIONS

The core objective of this study is to strengthen the local economic impact of Israeli innovations by identifying opportunities and strategies to enhance their commercialization, integration, and adoption within domestic markets—beyond their current international focus. This study examines 249 high-impact innovations supported by two key national bodies: The Israeli Ministry of Education (academic sector); The Israel Innovation Authority (IIA) (industrial sector). 21 Radical Innovations, 7 have demonstrated local market impact. 94 Discontinuous Innovations, 6 have achieved local implementation. 134 Disruptive Innovations, 3 have been adopted locally.

Research Objective

The Israeli innovation policy, as outlined in the *Law for the Encouragement of Industrial Research and Development—1984* (the R&D Law), primarily supports high-tech firms that both export and maintain local production. In Israel's high-tech sector, local manufacturing often depends on imported and processed raw materials, as well as external hardware and software components. As a result, the sector's main contribution to the local economy stems from the advancement of human capital—through the cultivation of knowledge and skilled labor—rather than from extensive manufacturing activity or widespread domestic application of innovations.

However, the implementation and integration of these innovations into the local market remain limited. This is largely attributable to the limited absorptive capacity of domestic customers and the substantial financial resources required for effective integration. To bridge this gap, we propose targeted modifications to the existing R&D policy, aimed at enhancing the local economic impact of innovations supported under the R&D Law. For each innovation evaluated in this report, we assess both its global market potential and its underutilized local impact within the Israeli economy. In our research, we have also included radical innovations developed in universities and research centers with support from the Ministry of Education. For each innovation assessed in this report, we examine both its global market potential and its unrealized local impact within the Israeli economy.

Requested Support to the Local Market

The cost of implementing these innovations for local customers—whether public institutions (such as hospitals and schools), businesses, or private individuals—could be partially supported by local bodies such as the Ministry of Health and the Israel Innovation Authority (IIA), in the case of hospitals or municipalities for public services.

Implementation proposals may also include components such as training programs, subcontractors, and service providers. A limited number of systems, products, or installations will be defined based on the available budget and the anticipated added value.

Israeli Innovations Sample

The study includes: 21 radical innovations, 94 discontinuous innovations, 134 disruptive innovations, a total of 249 innovations. The radical innovations are in Mathematics, Healthcare, and Chemistry.

The discontinuous innovations are in Agriculture, Energy, Healthcare, Telecommunication and Security, and Digital imaging.

The disruptive innovations are in Agriculture and Water treatment, Healthcare, Telecommunication and Security, Micro-electronics, Hardware Software platforms and products, Digital imaging, and Defense.

Innovation Types

Frugal innovation, also known as “Bottlead innovation”, emphasizes simplicity, affordability, and accessibility (Manoj, 2021). Inclusive innovation involves finding innovative solutions to problems, in the low-end market, by utilizing limited resources and constraints as opportunities for creativity.

Radical innovation represents the highest level of innovation, characterized by groundbreaking advances (Chandy & Tellis, 1998; Ettlie, Bridges, & O’Keefe, 1984). It is followed by discontinuous innovation, which opens entirely new markets (Danneels, Kleinschmidt, & Cooper, 2001), and disruptive innovation, which introduces novel technologies that create solutions for emerging or underserved markets (Christensen, Verlinden, & Westerman, 2002; Markides, 2006).

Frugal Innovation

The term "frugal" originates from the Hindi word "jugaad", a colloquial expression meaning an inventive, improvised solution born out of necessity and resourcefulness (Khan, 2016). Frugal innovation addresses customer needs through creative, cost-effective approaches when resources are limited. According to Gupta and Wang (2009), frugal innovation involves the development of products, services, processes, and business models that are frugal in three key dimensions: minimal use of raw materials, reduced environmental impact, and ultra-low cost.

Despite its potential to serve underserved populations and stimulate local economic activity, frugal innovation aimed at the domestic market is currently not supported **by** the Israel Innovation Authority (IIA).

Inclusive Innovation

Inclusive innovation targets broad, low-income market segments by creating livelihood opportunities and offering affordable solutions without compromising on quality or effectiveness. It is designed for consumers whose purchasing decisions are driven by cash availability and economic constraints (World Bank, 2013). Despite its potential to reduce inequality and stimulate grassroots economic development, inclusive innovation focused on the local market is not currently supported by the Israel Innovation Authority (IIA).

Radical Innovation

Radical innovation is defined as the introduction of products that incorporate fundamentally different technologies and address core customer needs more effectively than existing solutions (Chandy & Tellis, 1998). These innovations often create entirely new platforms, targeting emerging needs in new markets through transformative solutions.

Radical innovation is typically driven by scientific breakthroughs and can significantly enhance the value delivered to both local and global economies. In Israel, such innovations are primarily supported at the academic level by the Ministry of Education and by domain-specific ministries such as Agriculture and Energy. The Israel Innovation Authority (IIA) generally does not support radical innovations unless they are linked to export-oriented firms. However, fostering collaboration between scientific innovators and export-capable companies could open a path for IIA involvement—bridging fundamental research with commercial application and market scaling.

Discontinuous Innovation

Discontinuous innovation creates a new technological or market trajectory, often requiring firms to move beyond their existing capabilities and prior experiences—essentially thinking “outside the box” (Tripsas & Gavetti, 2000; Hodgkinson & Sparrow, 2002). This type of innovation is marked by market newness, where potential customer segments exist, but actual demand has not yet emerged, and where firms must operate within a new competitive landscape (Picaud, 2013; Bijaoui, 2024, 2025).

The Israel Innovation Authority (IIA) currently supports discontinuous innovations primarily when they target international markets, rather than leveraging their potential for local market development.

Disruptive Innovation

Disruptive innovation refers to the introduction of new technologies that address unmet or underserved needs within segments of the mainstream market (Corsi & Di Minin, 2011). These innovations typically offer a distinct set of features, performance levels, and price points, targeting two key market segments (Bijaoui, 2024, 2025).

1. Customers willing to pay a premium for new value, and
2. Cost-sensitive users seeking "good enough" solutions at lower prices (Govindarajan et al., 2011).

The Israel Innovation Authority (IIA) supports disruptive innovations, which are primarily aimed at international markets due to their focus on emerging or newly defined market segments. These innovations often require a combination of intensive R&D and strategic marketing efforts to reach commercial viability.

Israeli Innovations Sample and Analysis

Radical Innovations Analysis

These 21 radical innovations typically originate from scientific research and require close collaboration with professionals from the technology, industry, and business sectors—particularly those with practical experience in both local and global markets. While the application potential of these innovations spans multiple sectors, only five have so far been implemented locally within Israel (see *).

Dr Bruria Kaufman, Mössbauer Emission of Gamma Rays from Solid Material, Spectroscopy.

Steel & Alloys: Determine phases (austenite, martensite, etc.), oxidation states, and magnetic properties.

Mineralogy: Identify iron-containing minerals in rocks and soils.

Mars Rovers: NASA's Spirit and Opportunity used Mössbauer spectrometers to analyze Martian surface minerals (iron oxidation state → water history).

Catalysts: Characterize oxidation state and coordination of iron in Fe-based catalysts (e.g., Fe-ZSM-5 in SCR).

Organometallic compounds: Study of Fe-containing complexes and electron density variations.

Metalloenzymes: Explore the environment of iron in heme and non-heme proteins (e.g., hemoglobin, ferritin).

Iron-storage proteins: Determine oxidation and spin states.

Hyperfine interactions: Study magnetic ordering (ferromagnetism, antiferromagnetism).

Precise energy measurements: Hyperfine structure of nuclear levels.

Fundamental physics tests: Search for variation of fundamental constants over time, gravitational redshift (Pound–Rebka experiment).

Prof. Robert Aumann, Acceptable Points in General Cooperative n-Person Games

Three municipalities plan to jointly build a wastewater treatment facility. The facility benefits all of them, but each would incur different costs if they built one alone or in smaller coalitions.

Acceptable point ensures fair cost savings. Core allocation: stable—no subgroup has incentive to leave.

Shapley value: fair in expectation, balancing all orderings.

Dr Elon Lindenstrauss, Jean Bourgain, Benjamin Weiss, Mikhail Gromov, Number Theory

Cryptographic algorithms that guarantee data privacy, integrity, and authenticity fundamentally rely on number theory—the study of integers and their properties. These algorithms use mathematical problems that are easy to compute in one direction but hard to reverse (asymmetric difficulty).

Prof. Yoav Benjamini, Prof. Daniel Yekutieli, and Prof. Ruth Heller, Screening of a Large Number of Experimental Results to Identify Significant Discoveries

The concept of False Discovery Rate (FDR) was born from a need in medical research, specifically, studies examining large numbers of success parameters to evaluate new treatments. In modern medicine, especially with high-throughput technologies (like microarrays, genome-wide association studies (GWAS), and proteomics), researchers test thousands of hypotheses simultaneously.

Prof. Dan Shechtman, Quasicrystalline Materials

The practical applications of Shechtman's findings are for reinforced metal.

Low thermal and electrical conductivity; High hardness and brittleness.

Surface Coatings (Anti-friction & Wear Resistance). Machine parts; Non-stick cookware (e.g., frying pans); Cutting tools; Pistons and engine components;

Thermal Barrier Coatings. Jet engines; Gas turbines; High-temperature insulation. Poor thermal conductivity; High-temperature stability

Hydrogen Storage. Hydrogen fuel technologies; Clean energy systems. Certain quasicrystals (e.g., Ti–Zr–Ni) can absorb and desorb hydrogen efficiently due to their complex atomic structure.

Reinforcement in Composites. Metal-matrix composites (MMCs); Lightweight structural components. Their hardness and low density make them excellent reinforcements for aluminum alloys and other lightweight metals.

Missile nose cones; Thermal shielding; Lightweight armor; High strength-to-weight ratio; Low radar signature (due to electrical properties);

Catalysis Oxidation and dehydrogenation reactions; Industrial chemical processes. Their unique surface structure offers active catalytic sites.

Decorative and Functional Coatings. Jewelry and decorative items; Consumer electronics casings; Unique metallic luster, combined with scratch resistance; Non-stick and fingerprint-resistant surfaces

Prof. Michael Levitt, Arieh Warshel, and Martin Karplus, Development of Multiscale Models for Complex Chemicals

Drug Design & Biomolecular Simulations

QM/MM models used to study enzyme catalysis. MD simulations for protein–ligand binding. Coarse-grained models for DNA/RNA folding or membrane behavior

Catalysis & Surface Reactions

DFT for active site reactions. Kinetic Monte Carlo or mesoscopic models for reaction dynamics on surfaces. CFD for reactor-scale behavior

Polymer and Soft Material Modeling

Atomistic MD to understand monomer interactions. Coarse-grained dynamics to model polymer self-assembly or phase separation. Continuum mechanics to model viscoelastic behavior.

Combustion and Reactive Flows

QM calculations of reaction mechanisms and rate constants. Mesoscale models for reaction-diffusion. CFD to simulate engine performance and emissions

Environmental and Electrochemical Systems

Modeling of batteries and fuel cells. Multiscale modeling of ion transport and electrode reactions. Integration of molecular-level kinetics into continuum transport models Ernest David Bergmann, Aromatic Compounds and Reactive Aliphatics from Petroleum, Nuclear Bomb.

Chemical Feedstocks

Compound Applications

Benzene Styrene → polystyrene plastics; phenol → resins, adhesives

Toluene TDI → polyurethane foams; solvents

Xylenes PTA → polyester fibers, PET plastics

Naphthalene Phthalic anhydride → dyes, plasticizers

Used in the synthesis of dyes, drugs, agrochemicals, plastics, and detergents.

Solvents and Additives

Aromatics dissolve oils, resins, polymers, and greases. Used in: Paints, coatings; Inks; Cleaning agents; Adhesives

Polymers and Plastics

Benzene → styrene, caprolactam, etc.

Toluene → polyurethanes

Xylenes → PET bottles, polyester fibers

Prof. Chaim Weizmann, Acetone Butanol-ethanol (ABE)

Typically refers to n-butanol produced biologically (as opposed to petrochemical production). Common microbial producers: Clostridium species (e.g., *C. acetobutylicum*)

Biofuel (Transportation Energy)

Case: Gevo Inc. (USA)

Isobutanol from corn starch using genetically modified yeast. Converted to renewable gasoline, jet fuel, diesel. Used in commercial aviation (partnered with airlines and USAF)

Case: Butamax™ (DuPont + BP)

Joint venture aimed at scaling biobutanol as a gasoline blendstock. Developed G2 biofuel infrastructure compatible with existing pipelines. Key advantage: Higher energy density than ethanol, no need to modify engines.

Industrial Solvents and Chemicals

Biobutanol is chemically identical to petroleum-derived n-butanol, used in: Paints and coatings. Plasticizers (e.g., butyl acrylate, butyl acetate). Resins and adhesives. Textile and leather processing.

Prof. Aaron Ciechanover, Prof. Avram Herskho, Discovery of Ubiquitin-mediated Protein Degradation

Ubiquitin: a small protein (76 amino acids) that is covalently attached to target proteins via ubiquitin ligases (E3). Polyubiquitin chains mark the substrate for degradation by the 26S proteasome. It regulates: Protein turnover; Cell cycle; Signal transduction; Immune responses; DNA repair

Drug Discovery and Cancer Therapy

Proteasome Inhibitors. Targets the proteasome to prevent degradation of pro-apoptotic proteins in cancer cells. Bortezomib (Velcade) – approved for multiple myeloma. Carfilzomib, Ixazomib – next-generation proteasome inhibitors

Targeted Protein Degradation (TPD)

PROTACs (Proteolysis Targeting Chimeras). Synthetic bifunctional molecules that bring a target protein in proximity to an E3 ubiquitin ligase, leading to its ubiquitination and degradation.

ARV-110 (targets androgen receptor) – prostate cancer (clinical trials)

ARV-471 (targets estrogen receptor) – breast cancer

Cell Cycle and Proliferation Studies

Ubiquitin-mediated degradation regulates cell cycle proteins like: Cyclins CDK inhibitors (e.g., p27^{Kip1}).

Neurodegenerative Disease Research

Impairment of ubiquitin–proteasome system (UPS) is implicated in diseases like: Alzheimer's; Parkinson's; Huntington's; UPS activity measured as a biomarker.

Therapeutic strategies aim to enhance proteasomal clearance of toxic aggregates.

Gene Regulation via Degradation of Transcription Factors

Regulated degradation of factors like NF- κ B, p53, c-Myc influences: Inflammation; Stress response; Tumor suppression; Application in immunomodulation and cancer therapy.

Functional Genomics & Synthetic Biology

Ubiquitin fusion techniques used to modulate protein half-life in research. Degron tags allow controlled protein degradation in yeast, mammalian cells, plants. Auxin-inducible degron (AID) system: conditional degradation of target proteins in cell lines or model organisms

Agricultural and Plant Biology Applications

Ubiquitin pathway regulates: Hormone signaling (auxin, jasmonate); Stress responses (drought, pathogens); Developmental processes; Genetic engineering of E3 ligases (e.g., TIR1, COI1) is used to: Improve disease resistance; Modify growth and yield traits

Prof. Ada E. Yonath, the Structure of Ribosomes, New Antibiotics

The bacterial ribosome is a structure of significant therapeutic value, being the target of half of all known antibiotics.

Structure-based design leads to next-gen ribosome inhibitors, including: Lefamulin (pleuromutilin class); Linezolid (oxazolidinone); Odilorhabdins (new binding site on 30S). Modeling mutant ribosomes in drug-resistant bacteria; Exploring ribosome-targeted antivirals and anticancer agents

Weizmann Institute, Hebrew University, and Tel Aviv University lead research on: Ribosome plasticity and evolution; Antibiotic resistance mechanisms; Structure-guided development of new antimicrobial agents; Israeli biotech companies explore; Ribosome-targeting peptides; Selective bacterial ribosome disruptors.

Prof. Carmit Levy, Prof. Yaron Carmi, and PhD Student Avishai Maliah, Modified Protein to Stimulate the Immune System to Fight Cancer Cells.

Key Classes of Modified Proteins in Cancer Immunotherapy

Cytokines & Cytokine Mimetics

Modified cytokines are engineered for targeted immune activation. IL-15 Superagonists. Engineered IL-15 complexes enhance NK and CD8⁺ T cell activation. under clinical trials for melanoma, bladder cancer.

Engineered Tumor Antigens and Vaccines

Modified proteins designed to present tumor-associated antigens (TAAs) more effectively to the immune system. Personalized Neoantigen Vaccines; Tumor-specific mutated proteins (neoantigens) identified from patient tumors.

Used in mRNA or protein-based vaccines to elicit strong CD8⁺/CD4⁺ T cell responses.

HPV E6/E7 Fusion Proteins. In cervical cancer vaccines (e.g., VGX-3100), modified viral proteins stimulate strong antigen-specific immunity.

Immune Checkpoint Fusion Proteins

Modified proteins that block immune checkpoints or fuse activating ligands.

CTLA-4-Fc or PD-L1-Fc fusion proteins. Bind inhibitory receptors or ligands to modulate immune cell activation. Often used to enhance or dampen specific immune pathways.

Bispecific T Cell Engagers (BiTEs)

BiTEs are engineered proteins with two binding domains: One for a tumor antigen. One for CD3 on T cells. → Forces T cells into close contact with tumor cells, leading to targeted killing. Blinatumomab. Targets CD19 (on B cells) and CD3 (on T cells). FDA-approved for B-cell acute lymphoblastic leukemia (ALL)

CAR-T Cells with Modified Surface Proteins

Chimeric Antigen Receptor (CAR) T cells are T cells engineered with modified receptor proteins that: Recognize tumor antigens independently of MHC; Trigger T cell activation and killing. CAR structure includes: Antigen-recognition domain (scFv from antibody); Costimulatory domains (CD28, 4-1BB); CD3 ζ activation domain.

Approved CAR-T therapies target: CD19 (B-cell cancers); BCMA (multiple myeloma)

Toll-like Receptor (TLR) Fusion Agonists

Modified proteins that activate innate immune receptors (e.g., TLR7, TLR9), enhancing dendritic cell activation and antigen presentation. TLR agonist–tumor antigen fusions used in cancer vaccines.

Prof. Ephraim Katchalsky–Katzir, Deciphering the Genetic Code, the Production of Synthetic Antigens, and the Clarification of the Various Steps of Immune Responses.

The deciphering of the genetic code—understanding how sequences of DNA and RNA correspond to specific amino acids—was a foundational achievement in molecular biology. It enabled the rational design and production of synthetic antigens, which are now central to vaccines, cancer immunotherapy, and infectious disease diagnostics.

Vaccines

mRNA vaccines: encode synthetic antigens that mimic viral proteins (e.g., Pfizer-BioNTech's SARS-CoV-2 spike protein). Protein subunit vaccines: recombinant viral proteins produced using synthetic genes (e.g., Novavax). DNA vaccines: plasmids encoding synthetic antigens (e.g., ZyCoV-D for COVID-19).

Cancer Immunotherapy

Synthetic neoantigens (based on tumor-specific mutations) are used to: Design personalized cancer vaccines; Prime the immune system to recognize and destroy tumor cells.

Monoclonal Antibody Production

Synthetic antigens help generate specific antibodies by: Immunizing animals; Screening human B-cell libraries. These antibodies are used in: Cancer therapy (e.g., trastuzumab for HER2); Autoimmune disease treatment; Diagnostic tests

Diagnostic Tests

Lateral flow assays (e.g., COVID-19 antigen tests); ELISA kits for infectious disease; detection; Serological tests based on recombinant synthetic antigens

**** Prof. Michel Revel, Interferon***

Interferon beta (IFN- β) is a type of Type I interferon, a group of naturally occurring cytokines that play crucial roles in the body's antiviral defense, immune regulation, and anti-inflammatory pathways. It is widely used as a therapeutic protein, especially in the treatment of multiple sclerosis (MS) and is being explored in other diseases such as cancers and viral infections.

Multiple Sclerosis (MS)

MS is an autoimmune disease in which the immune system attacks the myelin sheath of nerves. Reduces activation of autoreactive T cells; Limits movement of immune cells across the blood-brain barrier; Lowers inflammatory cytokines (e.g., IL-1, TNF- α); Increases anti-inflammatory cytokines (e.g., IL-10)

COVID-19 and Other Viral Infections

IFN- β is part of the innate immune defense against viruses, making it a candidate for:

Early-stage COVID-19: Trials showed mixed results depending on timing and delivery method; MERS & SARS: Used in combination therapy in preclinical/compassionate use cases; Hepatitis B/C (limited due to replacement by direct antivirals)

Cancer Immunotherapy

IFN- β can: Activate NK cells and cytotoxic T lymphocytes; Induce apoptosis in tumor cells. Inhibit angiogenesis.

****Professor Raphael Mechoulam, Medical Cannabis, Weizman Institute and Hebrew Discovery of THC (1964)***

Mechoulam and his team at the Hebrew University of Jerusalem successfully isolated and identified: Δ^9 -tetrahydrocannabinol (THC) – the main psychoactive compound in cannabis.

Discovery of Cannabidiol (CBD) Structure

CBD is now widely used in treatments for: Epilepsy (e.g., Epidiolex). Anxiety; Pain and inflammation; Neurodegenerative disorders;

Discovery of the Endocannabinoid System

Mechoulam's work helped identify endogenous cannabinoids produced by the human body. This led to the discovery of the endocannabinoid system (ECS), a regulatory network involved in Mood; Pain; Appetite; Immune response; Neuroprotection.

****Prof. Ora Kedem, Biomembrane Processes for the Treatment of Water and Wastewater***

Professor Ora Kedem (1924–2015) was a pioneering Israeli physical chemist whose research laid the foundations of membrane science—especially in the context of separations and water purification. She is globally recognized for her thermodynamic theory of membrane transport, and her work has had profound impact on the development of membrane-based water treatment technologies.

Reverse Osmosis (RO)

Kedem's models helped advance RO membranes, which are now central in: Seawater desalination; Brackish water treatment; Wastewater reclamation.

Forward Osmosis (FO)

Uses osmotic gradients rather than pressure. Applications: wastewater treatment, hydration systems.

Ultrafiltration & Nanofiltration

Kedem's theory applied to understanding membrane pore size, flux, retention. Used for removing: Organic matter; Pathogens (bacteria, viruses); Micropollutants

****Dr. Eli Putievsky, Plant Geneticist, Agricultural Research Organization (ARO), Neve Ya'ar Experiment Station***

Dr. Eli Putievsky is a renowned Israeli agronomist and plant scientist known for his extensive work on the domestication, cultivation, and breeding of medicinal and aromatic plants, particularly those native to Israel and the Mediterranean region. His pioneering

contributions laid the foundation for Israel's medicinal plant industry, including work on oregano, basil (*Ocimum*), rosemary, sage, and other essential oil-producing species.

Domestication and Genetic Improvement of Aromatic Plants

Dr. Putievsky led efforts to domesticate wild aromatic plants, improving them for: Essential oil yield and composition; Agronomic traits (e.g., plant architecture, disease resistance); Consistency in medicinal active compounds.

Plants he worked on include: *Ocimum basilicum* (basil); *Origanum vulgare* (oregano); *Rosmarinus officinalis* (rosemary); *Salvia officinalis* (sage); *Melissa officinalis* (lemon balm)

Essential Oil Chemistry and Chemotypes

Identified and categorized chemotypes (chemical varieties) of essential oil plants; Supported the selection of genotypes with specific terpenoid profiles (e.g., thymol-rich oregano, linalool-rich basil); Published extensively on the relationship between genetics, environment, and oil quality.

Cultivation Protocols & Agronomy

Developed growing techniques and harvest timing recommendations to maximize yield and oil quality; Introduced irrigation and fertilization regimes tailored for medicinal plants in arid/semi-arid Israeli climates; Contributed to the commercial scaling of medicinal and culinary herb production in Israel. He elucidated the cytogenetic relationships between clover species and *Glycine* (family Fabaceae), *Emex* (Polygonaceae), and *Ocimum* (Lamiaceae) as part of his plant genetics research.

****Dr Elisabeth and Dr Hugo Boyko, Use of Salt Water for Irrigation***

Dr. Hugo Boyko (1892–1978) and Dr. Elisabeth Boyko were German-born scientists who emigrated to Israel and became pioneers in desert agriculture, particularly in using saline water (including seawater) for irrigation.

Their work, primarily during the 1950s–1970s, helped lay the groundwork for sustainable farming in saline and arid conditions—a field now known as biosaline agriculture.

Pioneering Experiments with Salt Water Irrigation

Conducted controlled experiments in the Negev desert and along the Red Sea near Eilat. Demonstrated that certain crops and halophytic plants (salt-tolerant species) could grow using: Brackish water; Diluted seawater; In some cases, even pure seawater.

Introduction of Salt-Tolerant Species

Tested various halophytes (plants adapted to salty environments), such as: Atriplex (saltbush); Salicornia; Suaeda; Avicennia (mangrove); Promoted agroforestry, forage production, and biomass cultivation using saline irrigation.

****Haim D. Rabinowitch and Nahum Kedar, RIN (Ripening Inhibitor)***

Haim D. Rabinowitch and Nahum Kedar were two of Israel's most influential agricultural scientists, globally recognized for their groundbreaking work on tomato genetics, physiology, and breeding. Their most famous discovery—the RIN (Ripening Inhibitor) gene—has had lasting global impact on how tomatoes are cultivated, stored, and shipped.

Identified Spontaneous Ripening Mutants

Isolated tomato varieties with ripening-related mutations, including: rin (ripening inhibitor), nor (non-ripening), alc (alcobaca).

These mutants had dramatically delayed or altered ripening patterns.

Characterized RIN's Effects on Physiology

Showed that the rin mutation affects ethylene production and perception. Demonstrated that hormonal signaling and gene expression networks are disrupted in rin mutants. Contributed to understanding how transcription factors regulate ripening at the genetic level.

Enabled Breeding of Long-Shelf-Life Tomatoes

The rin mutation was introduced into commercial cultivars. Resulted in tomatoes suitable for: Long-distance shipping, Storage under minimal refrigeration, Processing and fresh markets

Discontinuous Innovations Analysis 94

The applications of these innovations in the local market exist mainly as pilot projects.

Agriculture 16

miRNA, genome regulator in plants

Useful in medicinal plants (e.g., Ocimum, Salvia) for enhancing antioxidants, pigments, or therapeutic compounds.

Tomato resistant to tomato brown rugose fruit virus (TBRFV). ARO Volcani

Desert Agriculture at BGU: Leveraging miRNAs for Crops Grown in the Negev Desert.

Volcani Center: Research on miRNA regulation in crops facing climate stress.

Kenaf plant (*Hibiscus cannabinus*)

Kenaf Green Industries (KGI) – Full-Chain Valorization. Kfar Warburg. Customized seed varieties suited for Mediterranean and arid climates. On-site processing technologies to separate bast and core fibers. Product lines include paper pulp, non-woven fabrics, insulation mats, bioplastics, concrete composites, animal bedding, and bioenergy crops.

Monitor pollinator

Israeli seed firm Hazera collaborates with BeeHero to pilot the Pollination Insight Platform (PIP), using IoT sensors in seed-production fields across Israel and France.

Beewise: Israeli startup building fully automated “Beehomes”—robotic beehives controlled via AI and sensors—enabling 24/7 remote hive management, reducing hive mortality, and easing beekeeper labor.

BloomX: Developed an electrostatic pollination device pulled through orchards (e.g. avocado), complementing bees and boosting yields by up to 40%.

Edete: Working on mechanized/artificial pollination to offset insect declines.

Platform monitors crop development in real-time

Agritask. A SaaS platform aggregating data from satellites, field sensors, and weather services.

Prospera. Combines computer-vision sensors and smart cameras in greenhouses and open fields. AI continually monitors plant health and irrigation needs for timely decision-making.

Netagrow. Offers a unified farm-management suite: the NetaSense IoT sensor network, FarmAssist mobile app, and NetaBusiness farm-analytics dashboard—covering soil, weather, pest alerts, financials, e-commerce and expert chat support.

NOF Cooling

NOF Cooling (aka Natural Offset Farming). Portable, electricity-free cooling and post-harvest treatment platform that uses liquid CO₂ to chill produce, extend shelf life, and create controlled atmospheres in the field.

Croptune, monitoring of crops development

Croptune is a mobile-first precision-agriculture solution developed by AgriIOT in partnership with Haifa Group. It enables real-time, in-field detection of nutrient

deficiencies (N, P, K) using just a smartphone camera, combined with AI and big data analytics.

Hydroponic systems

GrowPonics. World's leader in automated hydroponic greenhouses (AHGHs). Built modular, controlled-environment systems managing nutrients, CO₂, oxygen, and water year-round. Achieves up to 80% water savings and pesticide-free produce.

TAP / TAPKIT Hydroponics. Specializes in large-scale hydroponic greenhouses for herbs, microgreens, and vegetables. A turnkey 500 m² modular kit with app-guided support, AI cameras for real-time crop monitoring, lettuce, herb bunches.

Customized robotics, Robotic Perception

MetoMotion – GRoW (Greenhouse Robotics Worker). High-tech greenhouse tomato harvesting. Dual robotic arms, 3D vision, AI-driven ripeness detection, conveyor crate loading (~16 sec per cluster)

Robotic Perception. Robotic sprayer: reduces pesticide usage by $\geq 25\%$.

Bluewhite Robotics. One operator can manage fleets remotely seeding, spraying, cutting, harvesting

Against the avian flu virus, H5N1.

Sambucol®, a standardized black elderberry (*Sambucus nigra*) extract developed by Dr. Madeleine Mumcuoglu at the Hebrew University–Hadassah Medical Center and produced by Razei Bar Industries in Jerusalem, exhibits significant antiviral activity against avian influenza (H5N1) in vitro.

Energy 8

Solar converter's technology

SolarEdge Technologies, solar inverters with a distributed PowerBox optimizer + central inverter solution. Each PV panel has its own optimizer ("PowerBox") enabling module-level MPPT control, minimizing shading losses, increasing efficiency (>97%) and allowing detailed remote monitoring.

Lightweight flexible solar panels

Apollo Power: Israel's Flexible Solar Pioneer. Produce solar films/panels (~3 kg/m²) that are light, bendable (~12 m² per roll), and conform to rooftops, vehicles, water surfaces, and even aircraft. Global Deployments & Partnerships Amazon, Volkswagen, Audi, Hyundai, Renault, and Geely for solar vehicle roofs

Organic photovoltaic cells (OPC)

Prof. Nir Tessler Technion, invented structural modifications that raised organic cell efficiency from ~10% to ~15% by adjusting electrode spacing and layer configuration

Israel's MIGAL Galilee Research Institute is pioneering national agrivoltaics, integrating OPVs into farming systems.

Batteries 3D Current Collector manufacturing

Addionics has developed porous 3D copper and aluminum current collectors ("Smart 3D Electrodes™"). Boost energy density and power delivery

Nano-technological coating that cools

SolCold's nanotech coating offers a world-first: turning sunlight into passive cooling through quantum anti-Stokes emission.

IceBrick energy storage system

Nostromo Energy, the pioneer behind IceBrick®, a modular, ice-based thermal energy storage system that powers building cooling driven by sustainability and scalability.

Each IceBrick® cell is a capsule-filled module (~50×50×400 cm, ~780 kg) housing ~200 water pods with glycol mixtures, freezing into ice during off-peak or surplus renewable energy periods.

E-TAC (Electrochemical–Thermally Activated Chemical) method for producing green hydrogen

New technique for testing the efficiency of hematite and other semiconductor materials

Healthcare 34

Computed tomography_magnetic resonance breast imaging

Vayyar Imaging. Developed radar-on-chip technology for 4D imaging, initially aimed at early-stage breast cancer screening.

Detect and classify cancer early

Nucleai. Uses AI and deep learning to analyze pathology images for precise tumor classification, grading, and predicting patient outcomes.

PathAI . AI for pathology slide interpretation, supporting early cancer diagnosis.

Ibex Medical Analytics. Applies AI to digital pathology, enabling early breast and prostate cancer detection with improved accuracy.

Robotic brain surgery

Tamar Robotics. Developed a pen-sized (10 mm diameter) robotic endoscope equipped with two micro-arms and camera, enabling keyhole surgery for accessing deep brain

tumors/cysts through a single small incision—significantly reducing tissue damage and recovery time.

Mazor Robotics (now Medtronic). Creator of Renaissance/SpineAssist, a bone-mounted guidance robot used in spine and now approved for brain surgeries

Connected home Avoset™ infusion pump

A compact, patient-centric ambulatory infusion pump designed for home and post-acute care. Fully connected via Bluetooth and cellular, enabling real-time monitoring and data transfer through the Eitan Insights cloud.

Portable hyperbaric oxygen therapy (HBOT)

Development of Bariks, a foldable, suitcase-sized, soft-chamber capable of delivering therapeutic oxygen pressures up to 3 ATA. 60 sessions of 2 ATA HBOT significantly improved resistant Post-traumatic stress disorder (PTSD) symptoms in veterans.

Drug therapy for acute bleeding conditions

In Israel, tranexamic acid (TXA) stands as the primary pharmacological therapy for acute bleeding, with extensive use in both prehospital and hospital settings (military and civilian). Magen David Adom (MDA).

Technology for Endometriosis

EndoCure integrates robotic-assisted ultrasound scanning with AI detection to identify tiny (<1 mm) endometriosis lesions—often missed in manual. The robotic arm methodically collects 10-micron spaced image frames over 3 minutes, creating detailed volumetric data. AI then maps and locates lesions.

Wheeled motorized device

ReWalk Robotics – Exoskeleton for Paralyzed Individuals

UPnRIDE Robotics – Standing-Wheelchair Hybrid for Paralyzed Individuals

Cell membrane of mesenchymal stem cells (MSCs)

Israel has made notable strides in engineering cell membrane-based platforms using mesenchymal stem cells (MSCs) for regenerative medicine, tissue engineering, and targeted therapy. MSCs maintained classic spindle morphology and could proliferate directly on these membranes—demonstrating scaffold potential for tissue grafts and cell delivery systems. Technion, Tel Aviv University); Weizmann Institute and Hadassah Medical Center; Bar-Ilan University and Sheba Medical Center

Platform for cancer treatment

OncoDecipher. An AI-driven computational platform developed at Tel Aviv University.

Imagene & Sheba Accelerator. Sheba Medical Center partners with Imagene to power a rapid, AI-enhanced digital pathology pipeline.

OncoHost (PROphet®). A Binyamina and U.S.-based precision medicine company using machine learning to analyze a single blood test (~7,000 proteins).

Nucleai – Spatial Biology Platform leverages spatial biology—assessing the spatial arrangement and interaction of cells in tissue biopsies—with AI to predict therapy response, especially for immunotherapies.

C2i Genomics – MRD Monitoring. This startup enables whole-genome minimal residual disease (MRD) testing via cloud-based AI.

Hadassah + Roche – Genomic Profiling. AVENIO and Foundation Medicine genomic panels for comprehensive mutation profiling in solid tumors—offering advanced precision oncology diagnostics within Israel's public healthcare system.

Regenerative medicine platform for spinal cord injuries

Matricelf – 3D Engineered Neural Implants. Autologous (patient's own) stem-cell derived 3D neural tissue printed within patient-specific hydrogel.

In preclinical rodent models: 100% recovery in acute and ~80% in chronic paralysis; gait restoration achieved.

Local fat reduction

Raziel Therapeutics. RZL-012 is an innovative injected lipolytic drug—a small-molecule therapy formulated without animal or human-derived components—designed for localized fat reduction in areas like the submental region ("double chin") and other body sites like flanks, lipomas, Dercum's disease, and lipedema.

Glucoma drug

Designed by Prof. Fisher's lab, A1-46 targets the P2Y₆ receptor to both reduce internal eye pressure and potentially protect the optic nerve.

Developed by ViSci/Biolight, VS-101 is a non-biodegradable implant that steadily delivers latanoprost for ~3 months—shown effective in Phase I/IIa trials in the US. novel antibiotic agents

Medical plants, cannabis

CanBreed (Givat Chen): Uses CRISPR gene-editing to create mildew-resistant cannabis—boosting yield and plant health

Plantis (Medical Group, Tikun Olam & BOL Pharma): Cultivate hundreds of strains under IMC-G.A.P. and EU-GMP. Tikun Olam developed the high-CBD/low-THC Avidekel strain, ideal for therapeutic uses without psychoactive effects.

Blood pressure monitoring, biobeat

The Biobeat Wrist Monitor is an Israeli-engineered, hospital-grade wearable device that offers continuous, cuffless blood pressure monitoring along with a suite of vital signs. Here's what you should know.

Nano drugs

Nano-Ghost platform for tumor-targeted drug delivery, including hard-to-reach brain cancers.

LipoCure develops liposomal versions of existing drugs to boost efficacy and minimize side effects in cancer and inflammatory diseases

Revim Rx (via LipoVation). Developing lipid-nanoparticle (Nano-Mupirocin) to treat resistant bacterial infections like MRSA systemically—potentially reviving old antibiotics

New Phase (SaNP + EIS). Uses Sarah nanoparticles and electromagnetic induction to induce hyperthermic cancer-cell destruction—currently in early clinical feasibility trials in Israel.

Nanocarry targets the blood-brain barrier; NurExone uses exosomes for targeted delivery.

Natural ingredient for skin protection

Alguard; cellular agriculture technology; lycopene, Lycored black seed oil (*Nigella sativa*) protection against oxidative damage and sun exposure; Jojoba oil.

Healthy Food 15

Cellular agriculture technology

Reduced content of sugar. Incredito Sugar (DouxMatok). Optimizes sugar's delivery to taste buds using a mineral carrier (silica), enhancing sweetness perception with less sugar.

Amai Proteins. Uses precision fermentation to produce sweet-tasting proteins, much sweeter than sugar, with minimal calories and high stability.

Better Juice. Natural enzymes convert sugars into non-digestible fibers or beneficial compounds in juice production lines.

BlueTree. Patented technology selectively reduces sugars directly in juice, preserving natural nutrients and flavor.

Animal free

Remilk Animal-free dairy

Alphafarm, Animal free meat

Natural flavor solutions

Gavan Technologies. Uses precision enzymatic processes to produce natural flavor and color compounds from plants.

NutriTech / NextFerm. Develops fermentation-based ingredients, including natural umami enhancers and yeast-derived flavor bases.

NutriTech / NextFerm Tivall (Nestlé Israel). Develops natural flavors and texturizers for meat alternatives using natural hydrolysates, spices, and plant extracts.

Plantish / Redefine Meat / Aleph Farms. Maillard precursors; Mushroom and yeast extracts; Natural fat-based flavor carriers

Plant-based food products

Vegan protein - Protevin™

SavorEat's automated robot chefs prepare plant-based burgers with customizable fat/protein ratios. I

Innovopro's chickpea protein featured in dairy-free yogurts

Sustainable protein purification

Protein from microalgae

Proteins from plants

Plant-based fish fillets

Meal pods.

Packaging Analytical Monitoring for Heat Sealed Packages

Telecommunication and Security 8

Cloud servers

Nebius Israel (by Aman)

Offers localized cloud services (compute, storage, virtual private cloud) from three Israeli data centers, with pay-as-you-go Hebrew/English support and compliance with national regulations..

Vultr

Entered the market in April 2023 with a Tel Aviv data center through Bezeq, delivering affordable cloud compute, block storage, Kubernetes, and bare-metal services.

Acronis

Opened a Tel Aviv-based cloud data center in 2021 targeting managed service providers and MSPs, offering cyber protection and backup services.

Anan Data Centers

Operates underground, high-security facilities in Afula and Tzora with 96 MVA power, tailored for HPC and AI workloads.

ASOCS

Provides on-prem and virtual private cloud solutions for industries including telecom, hospitality, and sports, using vRAN technologies.

Infinidat

Specializes in enterprise data storage solutions, recently acquired by Lenovo for global expansion.

CTERA Networks

Offers cloud storage gateways, distributed file services, and hybrid-cloud tools, partnering with AWS, HPE, IBM and enterprises like Deutsche Telekom.

K2view

Provides real-time data integration and synthetic data generation, ideal for Geneva enterprises using hybrid/multi-cloud environments.

Digital Imaging 13

3D Printing

Industrial & Construction Printing

Largix: Developed a cold 3D-printing platform capable of printing large industrial storage tanks (~4 m high) from recycled polypropylene/polyethylene, reducing production costs by ~50 %

Massivit 3D: A Tel-Aviv-based public company producing large-format printers (e.g., Massivit 10000) for marine, aerospace, and commercial composites.

3DM (DM3): Rosh HaAyin startup using semiconductor laser printheads to speed up thermoplastic printing via polymer melting and rapid layering

Ackerstein/Impact Labs + Thyssenkrupp: Jointly launched a metal AM center in 2023 enabling local production in aerospace and defense sectors

Technion's Solar AM Center: Houses electron-beam metal printers certified for Scalmalloy®—perfect for lightweight structural parts in aerospace imt.technion.ac.il.

CMI 3D Printing: Offers metal AM services for medical, aerospace, and automotive industries—ISO 9001 and IAI-approved

Bioprinting & Food-tech

MeaTech / Steakholder Foods: Pioneered 3D bioprinting of cultured meat (beef, chicken, foie gras) using stem cells; planning pilot plant in 2022

Tiny 3D-printed human heart model: Demonstrated by Israeli scientists in 2019, a milestone in bioprinting using human tissue.

Medical & Surgical Applications

Synergy 3DMed: Develops AI-driven, patient-specific anatomical models, surgical instruments, and implants—used extensively in trauma cases post-October 2023.

Hebrew University Functional Printing Center: Established Israel's first functional/3D bioprinting research center in 2015, exploring biomedical, microfluidic, and wearable applications.

Consumer & Fashion 3D Printing

Danit Peleg: Designer known for 3D-printed clothing and accessories, including a Paralympic-dancer dress (2016) and customizable bomber jackets.

AI automagical transformation of any picture or video

D-ID – Creative Reality™ Studio. Combines AI image-to-video with text-to-speech, lip-sync, full body gestures, and support for 119 languages using GPT-3 and Stable Diffusion.

Lightricks – LTX Studio & Videoleap. Lightricks offers powerful AI-driven image and video editing tools. LTX Studio: A platform for AI video generation and post-production, including an open-source image-to-video model launched in 2024.

Bazaart – Social-AI Visual Tools. Established in 2012, Bazaart uses AI to automate complex image and video editing (e.g., background removal, filters).

Cortica – AI Vision for Image/Video Analysis. Cortica specializes in unsupervised visual analysis—detecting objects, scenes, and ad placements in videos.

FreeD technology Video

Replay Technologies. Captures sports action and other live scenes using arrays of high-resolution cameras.

Digital thread-dyeing system.

Twine Solutions. Dye white polyester thread on-demand, to any color, any length, instantly.

Disruptive Innovations 130

Agriculture and water treatment 19

N-Drip Connect. An intelligent digital platform

Supree – Self-Drying Cherry Tomatoes. Semi-dried cherry

Genomically male chicks to grow ovaries

Golda Hen – Gene-Edited Female-Only Eggs.

Soos Technology – Acoustic Sex Reversal

5 Gene-editing tool. Cas-CLOVER (Demeetra Biotech). CRISPR-IL Consortium. Led by Evogene. It integrates AI-driven design and analysis for cross-species genome editing. CanBreed: CRISPR-Edited Livestock and Cannabis. PlantArcBio & ToolGen Soybean Project.

Water treatment

Reverse osmosis (RO). IDE Technologies; Mekorot; Aqwise WFI group

Vacuum Freezing Vapor Compression (VFVC). IDE Technologies

Water from air. Watergen and H2OLL

Closed-Circuit Desalination (CCD) technology. IDE Technologies; ROTec (Reverse Osmosis Technologies); Negev Eco Desal

Energy 2

Pressure Retarded Osmosis (PRO) producing power by a reverse electrodialysis heat engine (RED) from the osmotic pressure difference between freshwater and seawater or brine. Prof. Sidney Loeb BenGurion Robot cleaning solar panels. Ecoppia. Uses microfiber and airflow (no water). Powered by solar energy and controlled via cloud platform. Sol-Bright. Specializes in robotic arms that clean solar arrays using rotating brushes. Focus on automation, remote monitoring, and reliability in high-dust areas.

Healthcare 17

Hematology Oncology Paediatric Excellence (HOPE) generic drugs for Sub Saharan Africa

3 Stent. Medinol is the standout Israeli stent manufacturer; Corindus (robotic PCI) and early use of Tryton bifurcation stents.

PillCam SB capsule. Diagnosing obscure GI bleeding, Crohn's disease, small-bowel tumors, iron-deficiency anemia, NSAID-related injury, and malabsorption syndromes

Nano-artificial nose. Detected lung and head + neck cancers with high accuracy. Capable of detecting breast, colorectal, prostate cancers and Alzheimer's or Parkinson's

Home pregnancy monitor. HeraMED – HeraBEAT. Smartphone-based Doppler fetal heartbeat monitor for home use.

Intense Pulsed Light (IPL). Lumenis. Photorejuvenation (pigment, vascular lesions), acne. Applications now span cosmetic, dermatologic, ophthalmic, and emerging AI-enhanced treatments.

4 Non-invasive glucose monitoring devices.

OrSense. Developed the NBM-200G and earlier NBM-100G, this wearable ring gently occludes blood flow and uses optical spectroscopy to measure glucose, hemoglobin, and SpO₂

GlucoTrack. A handheld ear-clip sensor combining ultrasonic, electromagnetic & thermal measurement techniques

HAGAR GWave. Uses radio-frequency waves to measure blood glucose in real time

Gili Medical Hypoglycemia Monitor – Non-invasive Hypoglycemia Alert. Designed for nocturnal hypoglycemia detection in adolescents with T1D.

Early Detection of Autism, SensPD uses modified oto-acoustic emission (OAE) technology built into standard newborn hearing tests.

Print 3D heart using human tissue. Matricelf, a TAU spin-off, licensed the technology and is also working on personalized spinal cord implants.

Oxygen from water..“Like-a-Fish”. Invented by Alon Bodner, this wearable vest uses a high-speed centrifuge to mimic gill-like extraction of dissolved oxygen from water.

Creating sperm in a laboratory through a microfluidic system using a silicon chip (Polydimethylsiloxane PDMS)

Deep Brain Stimulation (DBS) procedure for Parkinson’s, dystonia, essential tremor, Tourette’s, and clinical trials for depression

Virtual Retinal Display (VRD) & Eye-Tracking, EyeJets. Combining laser-based retinal display with ultra-fast gaze correction, paving the way.

Miniature 3D replicas of human brains. With living tumor models, perfusable organoids, and vascular systems using advanced PDMS/microfluidics, 3D bioprinting, and stem-cell technologies.

Telecommunication 33

End-to-end communication solutions 3

AudioCodes provides complete VoIP systems—session border controllers, IP phones, media gateways.

DriveNets delivers a cloud-native network OS for telcos, enabling disaggregated routing on white-box hardware.

Gilat Satellite Networks offers end-to-end VSAT satellite communication systems,

Voice Protocol; voice mail technology 9

Comverse. Enterprise-grade PBX/cloud VoIP: Voicenter, Bynet, myTnet, Voipe — all integrate voicemail-to-email, IVR, call routing.

Consumer apps: TextVoice leads in voice transcription and missed-call intelligence.

Backend powerhouses: AudioCodes, VocalTec, Tdsoft, Mind CTI & CALLUP build and support core telecom technologies.

Cross-platform instant messaging (IM) and VoIP client 1

Viber. Founded in 2010 in Tel Aviv by Talmon Marco and Igor Magazinnik. Viber was acquired by Japanese e-commerce giant Rakuten for \$900 million.

Automotive safety 5

ADAS & Autonomous Driving Technologies

Mobileye leads globally in camera-based ADAS chips and software—EyeQ processors, REM mapping, SuperVision, Drive and Robotaxi systems embedded in hundreds of millions of vehicles.

Arbe Robotics delivers ultra-high-resolution 4D imaging radar (down to 1° resolution at +300 m), enabling advanced object detection and classification

Opsys Tech integrates windshield-based optical sensors across vehicles for full-field-of-view scanning at high resolution.

Art Sys360 and RFISee focus on miniature solid-state 3D radar sensors generating real-time peripheral mapping even under poor visibility en.globes.co.il.

V2X and Connectivity 1

Autotalks (Kfar Netter) is the global leader in V2X semiconductors, enabling seamless vehicle-to-vehicle, vehicle-to-infrastructure, and V2M communication. Their chips are already being standardized in new models as of 2024

Spyware cyber-arms 5

NSO Group – Pegasus enables zero-click surveillance of smartphones, allowing remote access to calls, messages, cameras, and location.

Candiru (a.k.a. Saito Tech). Their spyware (“DevilsTongue”/“Sherlock”) exploits zero-days to infect Windows, iOS, Android

Paragon Solutions – Graphite

Cytrox / Intellexa / Predator. Offers zero-click tools similar to Pegasus; tied to “Predator” spyware used in Greece, Saudi Arabia, Bangladesh via Cyprus

Quadream focused on iPhone-targeted zero-click spyware

Allegedly sold to Saudi Arabia and others before reportedly folding around April 2023

Cloud security 4

Wiz. Recently acquired by Google/Alphabet in a record-setting \$32 billion deal—the largest ever in cybersecurity—Wiz specializes in agentless cloud security posture management (CSPM) across AWS, Azure, GCP, Kubernetes, and IaC environments

Cato Networks. Coined the SASE pioneer, merging SD-WAN, managed network security, CASB, firewalling, and zero-trust into a global cloud-native platform.

Check Point Software Technologies. Long-time leader offering cloud security tools alongside firewalls and mobile defence. Revenue in 2023 reached \$2 billion) with strong net margins.

CyberArk. The veteran identity-security expert in Privileged Access Management (PAM).

Specialties in Cloud & Data Security 6

Ermetic: Cloud-native infrastructure security platform (CSPM/IAM)

Akeyless: Secrets & machine identity management in the cloud,

Laminar: DSPM specialist offering agentless discovery and classification of cloud data stores.

Cyera: Data security and compliance platform with agentless scanning and posture management

Perimeter 81: Zero-Trust Network Access and SASE provider

Lightspin. Contextual, code-to-cloud cloud security platform—another notable player

Web application Firewall

Micro electronics 9

EPROM; disc On Key; RDMA; EEPROM; NROM; DSP-DSPC wireless chipset solutions; EUV lithography, single-lens camera advanced driver assistance system; System Flash; Precision 5000 device; novel nano structure.

Hardware Software platforms 21

Microservices Management Platform

Kong. Provides an API gateway and microservices management platform that handles authentication, rate limiting, analytics, and service mesh integration.

Solo.io. Provides advanced API gateways and service mesh management for microservices.

Tufin. Helps manage complex microservices communication by automating security policy enforcement across hybrid cloud and microservices setups.

SpectralOps. Offers security and governance tools for microservices code and configuration, scanning infrastructure-as-code (IaC).

StackPulse. Provides a continuous operations platform with automated remediation, ideal for microservices ecosystems that require real-time monitoring and incident management.

Software testing

Mercury Interactive was a pioneering company in the field of software testing and quality assurance tools. It was acquired by Hewlett-Packard (HP) in 2006.

Testim. providing an AI-based test automation platform. Leverages machine learning to create, execute, and maintain automated UI tests with less flakiness.

Applitools. Specializes in visual AI testing and visual validation tools to catch UI regressions. Offers AI-powered visual checkpoints integrated into Selenium, Cypress, and other test frameworks.

Qyru. Provides automated testing services and platforms for functional and performance testing. Focuses on DevOps integration and supports web, mobile, and API testing.

Spyware cyber-arms

NSO Group – Pegasus; Candiru (a.k.a. Saito Tech); Paragon Solutions – Graphite; Cyrox / Intellexa / Predator; Quadream

Logging and recording software

Globitel – SpeechLog Call Recorder. A widely used, TDM/VoIP-based solution for call centers

Avdor CIS – Crystal Quality Suite

This platform records voice, screen, chat, text, and email interactions. It includes advanced reporting, analytics, compliance logging (e.g., CDRs), and agent performance dashboards.

Lanonyx – Telestat. Provides phone call logging and recording (SIP, ISDN, analog). Itemised billing, detailed call reports, leaderboards, remote recording access—all with a one-time license

Acmatel / Deepijatel – Voice Loggers. These systems offer multi-channel analog, digital, and VoIP voice logging; real-time monitoring; secure browser interfaces; CRM integration; and hardware-based recording modules.

Glassbox, platform offering session-replay analytics. It captures user behavior on web and mobile apps to help diagnose UX issues, optimize flows, and reduce friction.

Cellebrite. a global leader in digital forensics tools (e.g., UFED) for law enforcement and enterprises.

The CuBox series by SolidRun (Acre, Israel) is a pioneering family of cube-sized, low-power mini-PCs powering a range of applications from home streaming to embedded IoT solutions. They're developer-friendly, Linux/Android-capable, and appreciated for their power efficiency and compact form factor.

Discovery platform. AION Labs – AI-Powered Venture Studio is a consortium-driven venture studio backed by Pfizer, AstraZeneca, Merck KGaA, Teva, AWS, and Israel Biotech Fund, powered by BioMed X and supported by the Israel Innovation Authority.

Personalization of video assets. Treepodia;.Promo.com ; Lightricks. ; Alison.AI.; Persovi; VidZai.; Idomoo, VidMe, Gan.ai, Salemaker

Converting off-the-shelf drones into super drones. High Lander – Full Autonomy via Software; Xtend – AI & VR-Controlled Tactical Drones

3D creation and learning. Technion Additive Manufacturing Center (TAMC); Tel Aviv University 3D Printing Center.

AI platforms 23

Developer-Centric & MLOps Platforms

Qodo (formerly CodiumAI) – AI-powered code integrity and testing platform.

Aporia – ML observability platform enabling anomaly detection and model monitoring.

Run:AI – Virtualizes deep-learning infrastructure, optimizing GPU utilization for large-scale model training.

Pinecone – Leader in vector databases tailored for similarity search, recommendation systems, and LLM use cases.

Navina – Healthcare AI copilot that integrates with EHRs to detect clinical insights, medication conflicts, and now working on ambient scribing.

Reco – AI-first security platform focused on SaaS environments, with a \$55 M Series A extension

Finout – Cloud cost management & optimization AI platform; amassed \$85 M in funding

Exodigo – Uses AI + sensor fusion for underground mapping (infrastructure, utilities)

D-ID – Specializes in photorealistic AI-generated digital humans and video—\$48 M funding; strong in marketing and video avatars

Bria AI – Visual generative AI for enterprise-scale image/video creation and editing, prioritizing copyright-safe content

Visionary.ai – Low-light video & image enhancement via AI; partnered with Qualcomm, NVIDIA, and CEVA.

aiOla – Conversational AI platform enabling legacy industries to go digital via speech recognition across 120+ languages.

Beyond Verbal – Emotion analytics via voice, capable of inferring sentiment and even health markers.

Chorus.ai – Real-time transcription/analysis of sales calls, with actionable insights to improve performance.

Cortica – Computer vision platform translating neural concepts into real-time recognition for smart cities and autonomous systems.

Logz.io – Cloud-based AI log-analysis platform for DevOps and system monitoring.

MedyMatch – Medical imaging assistant focusing on stroke and trauma detection in partnership with Samsung & IBM.

Nexar – AI-powered dashcam app for accident analysis and situational awareness.

Robust Intelligence – AI firewall that validates and sanitizes data inputs to protect AI models.

FundGuard – AI-driven cloud-native platform for investment management and operations.

EverC – Fraud detection AI tool for banking led by Israeli entrepreneurs.

Optibus – AI-based software for public transport planning and scheduling

Insilico Generative AI Software for Drug Discovery

Croptimus™ AI Pest and Disease Detection for Agriculture

Digital imaging 5

Landa Nanographic Printing & NanoInk

Nanography process uses Landa NanoInk®—water-based nano-pigment inks (tens of nanometers) that create ultra-sharp, abrasion-resistant dots, print on any substrate without pre-treatment, and match or exceed offset quality at digital speeds.

HP Indigo & ElectroInk

HP Indigo Division produces digital presses and proprietary ElectroInk, based on liquid electrophotography (LEP)

PV Nano Cell – Conductive Nano-inks. specializes in inkjet conductive inks: silver, carbon, dielectric, gold—used for printed resistors, capacitors, and sensors

Nano Dimension & XTPL – Printed Electronics Ink. partners with Poland's XTPL to develop high-performance conductive nanoinks for additive manufacturing electronics (AME), enhancing 3D-printed circuits and devices.

Defense 9

Abe Karem, Albatros UAV

Gadi Kuperman, Military and HLS Drones Spear UAV

Matteo Shapira, Aviv Shapira, Rubi Liani, Adir Tubi, UAV realverse technology, XTEND, Reply Technologies

Dov Raviv, Arrow Antimissile System

Chanoch Levin, Iron Dome

Joel M. Avidor, Tactical high-energy laser – Iron Beam

Yossi Wolf, Elad Levi, robotic systems, Roboteam

Prof. Jacob Bortman, Mori Arkin, monitor components miniature camera, Odysight

Yiftach Richter, deep-tech signal processing, R2 Wireless.

Conclusion

Israel's innovation policy has succeeded in driving high-tech exports but provides little support for bringing those innovations to domestic markets. Of the 21 radical innovations emerging from Israeli academia in mathematics, healthcare and chemistry, only seven have developed a local market. Similarly, just 6 of 94 discontinuous innovations—those that create entirely new market trajectories in agriculture, energy, healthcare and telecommunications—have taken root at home. And among 134 disruptive innovations in sectors such as agriculture, healthcare, hardware-software platforms, digital imaging and education (including defense and water treatment), only three have found domestic customers. By contrast, inclusive and frugal innovations tailored specifically to local needs remain largely unsupported. Yet these approaches—whether low-cost solutions in food processing, hospitality, leisure and learning platforms, or AI and cultural-heritage services—offer enormous potential to evolve into discontinuous or disruptive breakthroughs. If the Israel Innovation Authority were to extend its case-by-case funding model to nurture these home-grown, locally oriented projects, the country could unlock new markets both in underserved regions of advanced economies and in developing countries, amplifying its global economic and technological impact.

Recommendation: Introduce a dedicated stream of domestic-market grants to:

1. Accelerate local adoption of radical, discontinuous and disruptive innovations.
2. Catalyze frugal and inclusive innovations across a wider range of domains—food, tourism, leisure, education and beyond.
3. Leverage these home-grown successes to generate exportable models and global partnerships.

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