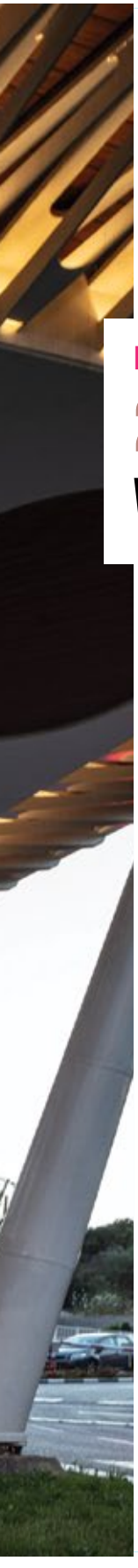
2021
REALITY CHECK.

President's Report

TECHNION
Israel Institute of Technology

Connecting the two promenades, the Technion Entrance Gate symbolizes a bridge between academic excellence and real-world innovation. The entrance runway to the future was designed by Schwartz Besnosoff Architects in collaboration with Rolka Studio.

1 From the President
8 Abraham Accords
10 Health Matters
12 Research Highlights
38 Students
42 Amos Horev Sports Arena
44 High Performance Computing
46 GTIIT's First Graduating class
48 Reports of the Vice Presidents
59 Facts and Figures



Connecting people! Leaving the station every 15 seconds, 150 cable cars will accelerate travel between Technion, Haifa University and Haifa Bay.

From the President

21C TECHNION
WHERE VISION MEETS REALITY

Welcome to the 2021 President's Report. This is an era in which we face unprecedented challenges to our health, the environment, and to the fundamental realities of our everyday lives. Never has the role of science in the service of humankind been more powerful. Meeting these real-world challenges is part of Technion's unwavering mission, and the steps we take.

Notwithstanding the pandemic, this past year has been a good one for Technion with new records: we have signed a record number of research agreements with industry; the largest number of start-up companies were launched within a year; a record number of prizes were awarded to Technion researchers; a record number of students are on campus; and a record number of new faculty were recruited.

The academic year

We began this academic year against a backdrop of dynamically changing uncertainties due to the global pandemic. The 2021/22 year opened at Technion Haifa campuses on October 24th with COVID precautions in place, reverberating with a synergy of passion for the Technion ethos, and sobriety in the gravity of unfolding daily realities. Slightly over two thousand freshmen arrived on campus, of which 44 percent were women, bringing the student population to nearly 15,000 in 17 faculties. Some 10,000 are studying towards a bachelor's degree, while the rest are pursuing advanced degrees, among them 1,354 doctoral students. Some 160 Master's students are studying in the Jacobs Institute on Roosevelt Island and a thousand more in GTIIT, China.

The incoming enrolment was especially drawn towards faculties that prepare students for high-tech professions - Electrical and Computer Engineering, Computer Science and Data Science. The demand for Medicine remains very high. There are also signs of an emerging interest in Biotechnology and Food Engineering, the only faculty in the country which trains food engineers.

The strategic plan

During the past year, we finished drafting the strategic plan for the coming decade. The plan lays down the steps needed to maintain Technion's global position among the top technological universities as it enters its second centennial.

Throughout the coming decade, Technion will strive to strengthen its position as an attractive and exciting university associated with leadership, innovation, and commitment to society; as a university with powerful ties with industry and government entities; and as an academic environment characterized by community, diversity, and unity.

Over the past six months, we have started to implement the plan, converting the strategy into a new reality. We developed a multi-year workplan with an action program for the coming two years. The foundations have been laid. To this end we have also shifted from a year-by-year budget to a five-year rolling budget and allocated the necessary means.

The main components of the plan include education, research, and ties with industry.

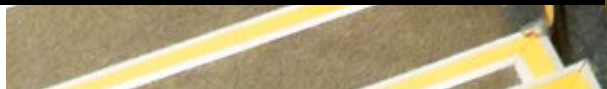
Education

We are revamping our unique Technion education study program to prepare students with both scientific-engineering knowledge, and skills adapted to the 21st century. This includes revising curricula content; exploiting new digital technologies to enhance and improve instruction and learning; and strengthening the Department of Humanities to provide our students with a broad education to equip them with the tools to make informed decisions concerning societal, ethical, and environmental impact.

Training a new class of scientists and entrepreneurs for leadership roles in cutting-edge research and disruptive technologies will generate tomorrow's leaders in science and technology. By nurturing and sustaining a

"NOTWITHSTANDING THE PANDEMIC, THIS PAST YEAR HAS BEEN A GOOD ONE FOR TECHNION"

- Prof. Uri Sivan, Technion President



Strategic plan kicks-off with the six Faculties of Biology, Biomedical Engineering, Chemistry, Chemical Engineering, Medicine, and Biotechnology and Food Engineering.

German Chancellor Dr. Angela Merkel received a Technion honorary doctorate on October 10, 2021.

"THE TECHNION SERVED AS A CORNERSTONE IN THE DEVELOPMENT OF HIGH TECH AND IN WHAT IS NOW CALLED THE STARTUP NATION."

- Angela Merkel

relationship with our students and alumni from the beginning of their studies and throughout their careers, we will strengthen the bond between Technion and industry, and Technion and policy makers.

Integral to realizing the vision, is attracting the best students and researchers to our ranks, and to develop and cultivate leadership among them and among our graduates. Locating and recruiting top faculty is a priority while creating the atmosphere and conditions on campus required to inspire a spirit of renewal and scientific excellence.

Research

We are shifting from investment in disciplinary research to tackling broad multidisciplinary challenges. So far, three frontiers have been identified: human health, sustainability including energy related aspects, and smart industry. To strengthen our focus on these areas, new research centers will bring together researchers from different disciplines collaborating on the same challenge but from different perspectives. These research initiatives will bring a sense of shared destiny to the faculties and help coordinate faculty recruitment.

To empower our research base, we require the recruitment of additional graduate students, research fellows, and an increase in the number of postdoctoral fellows. This expansion will be accompanied by building new laboratories and investing in advanced equipment.

These centers will leverage Technion's capabilities in selected areas in which great resources will be invested. Where there are clear academic benefits to structural change, we will reduce fragmentation through structural changes, and by establishing thematic research centers.

Ties with industry

Today, breakthroughs in science and technology depend on multidisciplinary research and tight collaboration between academia and industry. We are creating a new ecosystem with industry, based on pioneering models for synergetic collaboration, that will best serve Israel and the world in the 21st century. Over the last year, Technion has expanded relations with industry, including signed research agreements with leading software and energy companies, and an agreement to establish the Carasso FoodTech Innovation Center. In the past two years we have resolved most IP issues to facilitate swift technology transfer from the Technion to industry. As a result, the number of startups launched annually by Technion researchers has tripled to 14 new companies a year and our portfolio has grown to over 100 companies.

“FROM PURE SCIENCE TO ROBUST ENGINEERING, FROM OUTER SPACE TO QUANTUM DIMENSIONS, WE ARE HERE FOR REAL AND WE ARE HERE FOR YOU.”

On October 24th, with COVID precautions in place, 2,000 freshmen arrived on campus bringing the student population to over 15,000 students in 17 faculties.

(l-r) Rebecca Boukhris, Prof. Uri Sivan, and Sydney Boukhris in front of a rendering of the André Deloro Building for Transformative Biomedical Sciences and Engineering.

Promoting Women in Academia

A committee was established and tasked with proposing ways to increase the number of women among senior faculty. The committee submitted its report with the following findings: currently 23% of senior faculty are women; there is no bias in faculty recruitment and promotion processes; there is a shortage of women applying for postdocs; there are few women in the main academic committees, and none in senior management. The committee's recommendations have been adopted in full and as a result, the number of women in the main academic committees has already grown significantly. The lack of women representation in senior management will be rectified in the coming months when I present my candidate for the position of Vice President for Academic Affairs. Starting in January 2022, five faculties will be headed by woman deans and two out of four pan-Technion deans are women.

In three years, we will celebrate Technion's centenary since its doors were opened for academic study. We will launch the centennial program next June, and the celebrations will culminate with the anniversary in 2024. Looking back to the humble beginnings in 1924, with a class of 17 students, we feel great pride in what we have achieved and where we are today. I truly hope to see you all in person at those festivities.

Technion code of ethics *(abbreviated)*

- Strive for truth in research and education
- Advocate freedom of research and expression
- Act responsibly in all areas of academic activity
- Commit to honesty and transparency in the lab, classroom, and workplace.

Ratified by the Senate in 2021

Prof. Uri Sivan, Technion President

Ambassador of the United Arab Emirates to Israel, H.E. Mohamed Al Khaja at Technion, May 30, 2021

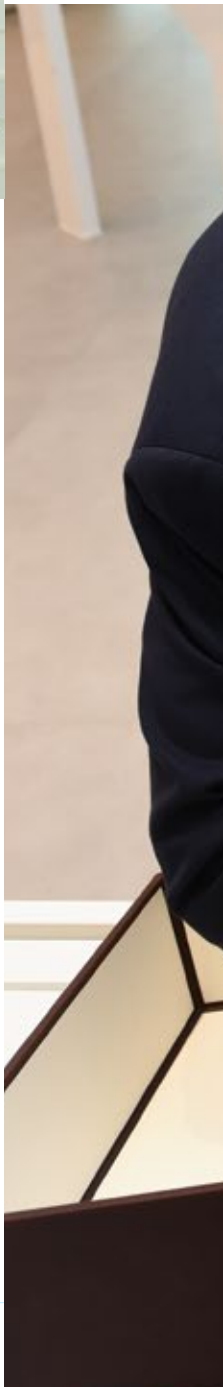
"THE ABRAHAM ACCORDS HAVE OPENED UP EXTENSIVE OPPORTUNITIES FOR REGIONAL COLLABORATION. MEDICINE, HEALTH, AND SCIENCE ARE SUBJECTS THAT CONNECT PEOPLE."

- Prof. Uri Sivan

UAE Ambassador H.E. Mohamed Al Khaja is at home in a university environment, and there was great warmth in his visit to Technion on May 30th 2021, in the spirit of the Abraham Accords, which are a series of treaties normalizing diplomatic relations between Israel, the United Arab Emirates (UAE), Bahrain, Sudan, and Morocco. The Ambassador has a degree in political science from Northeastern University in Boston and an MBA from Vienna University of Economics and Business.

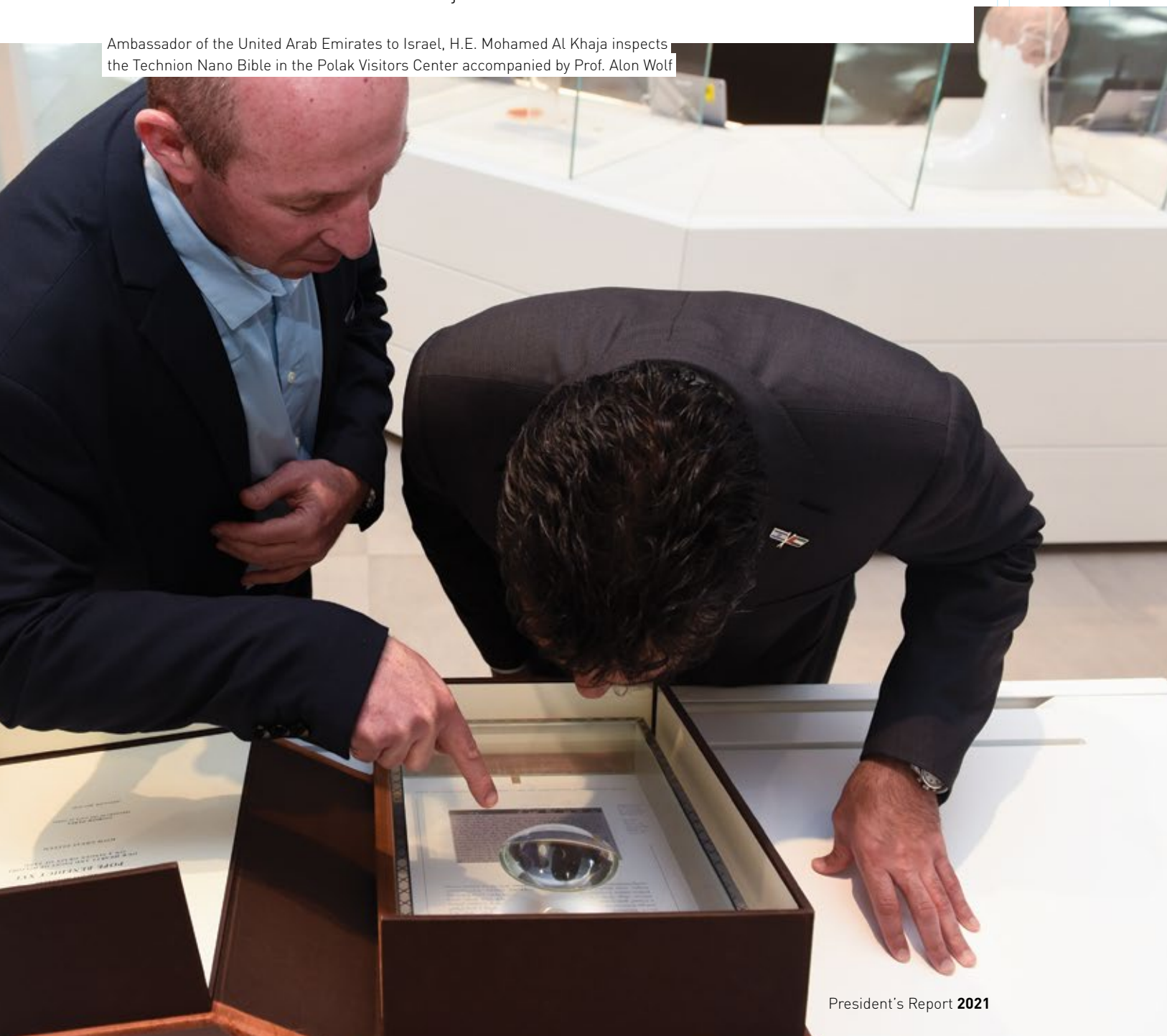
On tour for real at Technion City, Ambassador Al Khaja zoomed down to nano dimensions with a close look at the Technion Nano Bible, and touched base with top Technion research achievements, including discoveries of Technion's Nobel Laureates. He also connected with some Technion-born startup legends, such as Mazor Robotics, founded on the basis of technology developed by Prof. Moshe Shoham, and Novocure, founded by Prof. Yoram Palti.

"I am very honored to be the Ambassador of the United Arab Emirates to Israel, and consider myself as an ambassador of peace and cooperation... We must work together to change the perception of people in the Middle East," said Ambassador Al Khaja. "I will be happy to further encourage innovation and joint research between the Technion and our country, especially on issues associated with water and food security."



“THE TECHNION IS AN ESTEEMED RESEARCH CENTER WITH A WORLD REPUTATION, AND WE WILL BE DELIGHTED TO COLLABORATE ON ANY RESEARCH THAT WILL CONTRIBUTE TO THE WELLBEING OF THE RESIDENTS OF THE REGION.”

- Ambassador H.E. Mohamed Al Khaja



Ambassador of the United Arab Emirates to Israel, H.E. Mohamed Al Khaja inspects the Technion Nano Bible in the Polak Visitors Center accompanied by Prof. Alon Wolf

Health matters

The André Deloro Building for Transformative Biomedical Sciences and Engineering at Technion is pivoted to be a dynamic, state-of-the-art multidisciplinary research center to advance the real challenges of human health in the 21st century. Housing up to 28 laboratories and with world-class equipment, the building will facilitate interdisciplinary synergy and the advance of the science, engineering, and technology of health from the space of inspiration, all the way to life-enhancing applications in the real world.

"A significant revolution in human health requires multidisciplinary efforts. The idea is to bridge medicine and life sciences, exact sciences, engineering, data science, and design," said Technion President Prof. Uri Sivan. The initiative is supported by the Adelis Foundation.

“WITH THE UNPRECEDENTED PROGRESS OF NEW TECHNOLOGIES, WE ARE ENTERING A NEW PHASE IN THE DEVELOPMENT OF APPLIED AND CREATIVE RESEARCH IN THE FIELD OF HUMAN HEALTH.”

- Rebecca Boukhris, Adelis Foundation

Architectural rendering of the André Deloro Building for Transformative Biomedical Sciences and Engineering

Recalling inflammation

"THIS IS AN INCREDIBLY IMPORTANT CONTRIBUTION TO THE FIELDS OF NEUROSCIENCE AND IMMUNOLOGY. IT'S GOING TO BE REALLY EXCITING TO SEE WHAT COMES NEXT."

- Prof. Kevin Tracey, Neurosurgeon and President of the Feinstein Institutes for Medical Research

Delving into reality, recall and immunological memory, Technion researchers at the Ruth and Bruce Rappaport Faculty of Medicine reveal how the memory of inflammation can both trigger illness, and protect health through anticipatory response.

Assoc. Prof. Asya Rolls and her team have again transcended prevailing dogma of immunological memory with an elegant demonstration of how insular neuronal ensembles in the brain both store and recover highly specific representations of immunity. The research highlights the delicate and complex interdependence between mind and the matter of physical health.

The study, published in *Cell* in November 2021, was led by Rolls and MD/PhD student Tamar Koren.

The research showed that during colon inflammation, several brain regions exert enhanced neuronal activity, one of which is the insular cortex. Identifying neurons in the insular cortex of mice with enhanced activity during inflammation, the researchers were able to trigger these neurons and cause a recurrence of inflammation in the same bodily location.

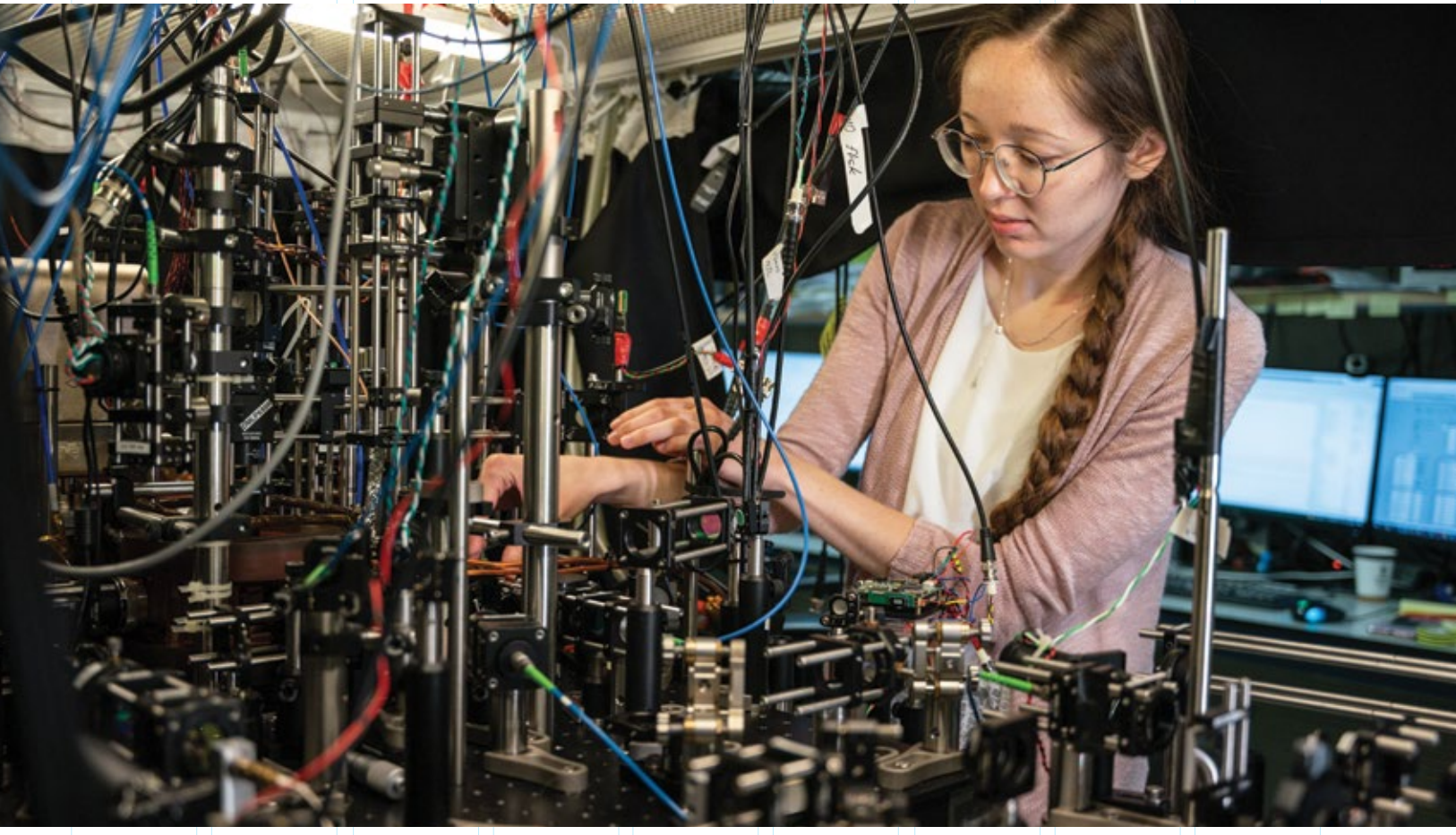
Having revealed a physiological mechanism of the psychosomatic bridge in which neurons trigger inflammation, Koren and colleagues then did some reverse engineering: by suppressing specific neurons in the insular cortex, they rapidly reduced inflammation. This discovery has the potential to generate new treatments for chronic inflammatory conditions such as Crohn's disease, psoriasis, and other autoimmune conditions.

"The body needs to respond to infection as quickly as possible before the attacking bacteria or viruses can multiply. A shorter response time allows the body to defeat the infection faster and with less effort," Rolls explained.

This work was supported by an ERC Starting Grant, the Allen and Jewel Prince Center for Neurodegenerative Disorders of the Brain, the Howard Hughes Medical Institute (HHMI), and the Wellcome Trust.

Graduate student Tamar Koren (left) with Assoc. Prof. Asya Rolls

Quantum for real



The Helen Diller Quantum Center is the Technion's center for Quantum Science and Technology. It is a physical and virtual home for this tradition of excellence in Quantum Science, that is built on the legacy of Nathan Rosen, who worked with Einstein on entangled wave motions and the EPR paradox, and Asher Peres, a pioneer of Quantum Teleportation.

The center serves as a resource to over 50 faculty members and more than 200 graduate students, postdocs and scientists contemplating a range of Quantum fields including: Quantum Computing, Quantum Communication, Quantum Simulations, Quantum Sensors and Quantum Matter. It houses world class laboratories in Photonics, Nonlinear optics, Quantum dots, Superconducting qubits and Cold atoms. Six faculties of science and engineering are involved in the center: Physics, Electrical and Computer Engineering, Computer Science, Chemistry, Materials Science and Engineering, and Mechanical Engineering.

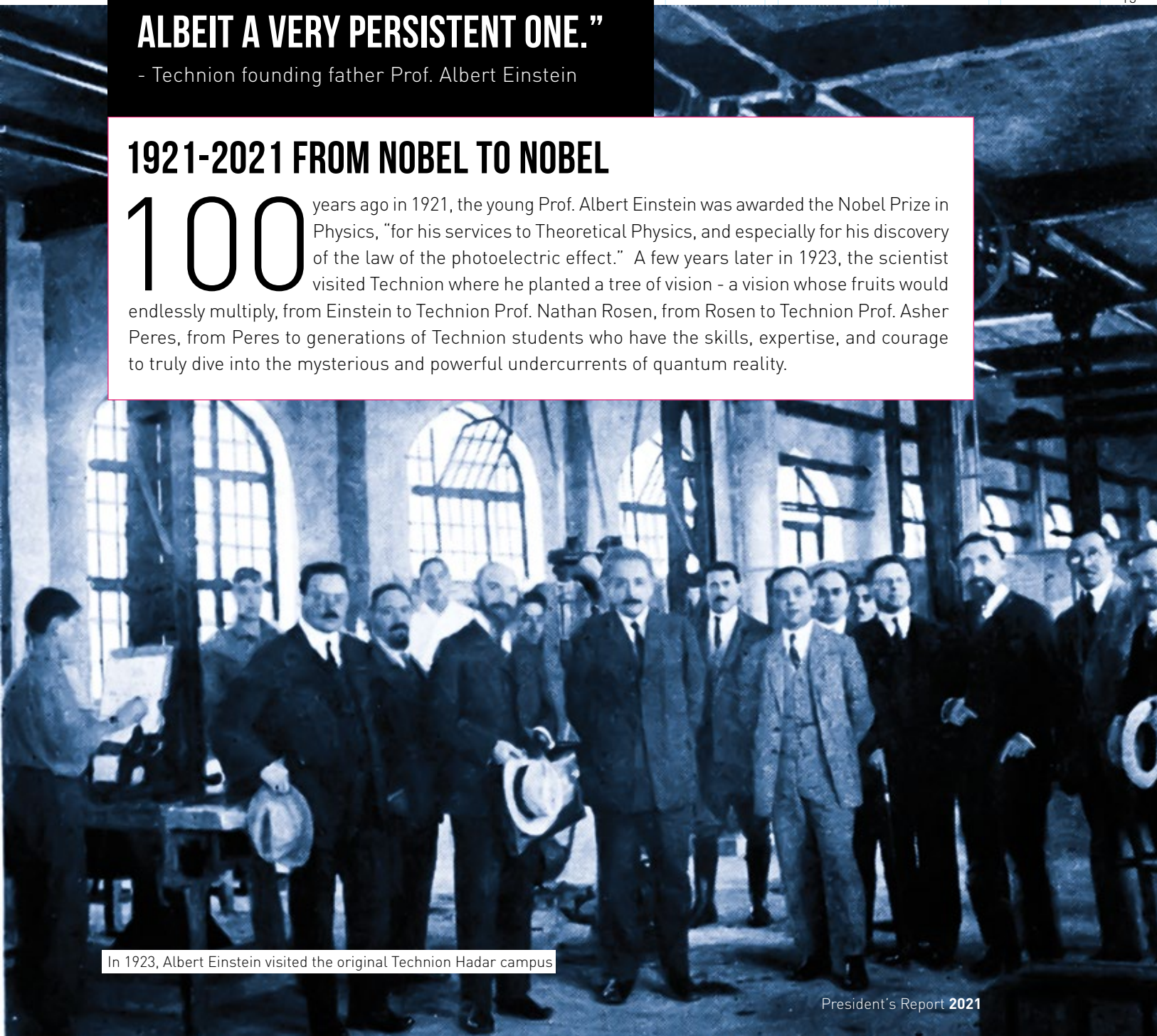
The Center also supports research, upgrades of laboratories and infrastructure centers, the recruitment of new faculty members, sponsorship of graduates and postdoc fellowships, the Peres-Rosen Distinguished Lecture Series, and seminars, workshops, and schools. It also promotes education with teaching laboratories in Quantum science and technology.

"REALITY IS MERELY AN ILLUSION, ALBEIT A VERY PERSISTENT ONE."

- Technion founding father Prof. Albert Einstein

1921-2021 FROM NOBEL TO NOBEL

100 years ago in 1921, the young Prof. Albert Einstein was awarded the Nobel Prize in Physics, "for his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect." A few years later in 1923, the scientist visited Technion where he planted a tree of vision - a vision whose fruits would endlessly multiply, from Einstein to Technion Prof. Nathan Rosen, from Rosen to Technion Prof. Asher Peres, from Peres to generations of Technion students who have the skills, expertise, and courage to truly dive into the mysterious and powerful undercurrents of quantum reality.



In 1923, Albert Einstein visited the original Technion Hadar campus

30 lasers, one light

(l-r) Eran Lustig, Prof. Moti Segev, Alex Dikopoltsev, Dr. Yaakov Lumer

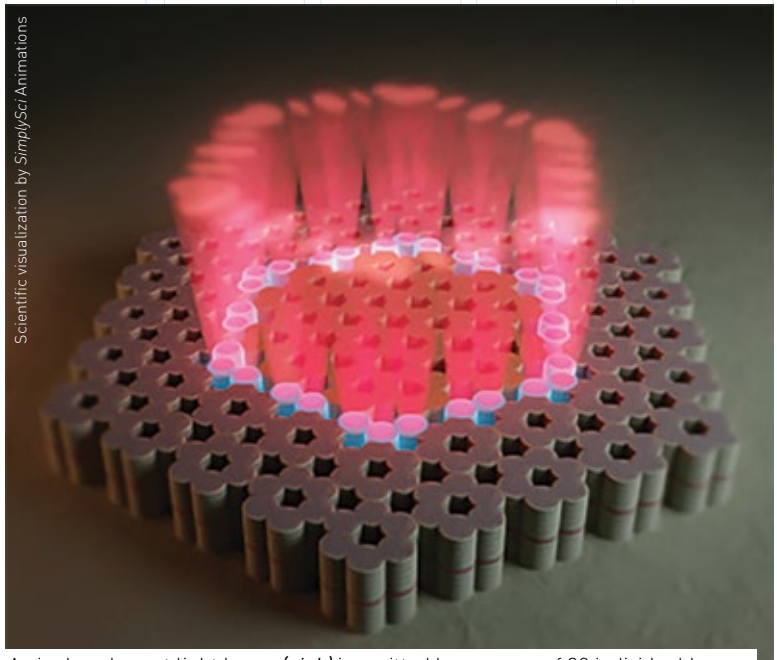
"WE WERE LIKE A BUNCH OF LUNATICS SEARCHING FOR SOMETHING THAT WAS CONSIDERED IMPOSSIBLE. AND NOW WE HAVE MADE A LARGE STEP TOWARDS REAL TECHNOLOGY THAT HAS MANY APPLICATIONS."

- Distinguished Prof. Moti Segev

It's all for one and one for all as an Israeli-German team led by Distinguished Prof. Mordechai (Moti) Segev has revealed, in a recent paper in *Science*, how to force an array of tiny vertical cavity lasers to act together as a single coherent laser – a highly powerful laser network the size of a grain of sand.

Cell phones, medical devices, sensors, and fiber optic networks all use Vertical-Cavity Surface-Emitting Lasers (VCSELs) – semiconductor lasers of miniscule size of a few microns, which strictly limits power output. For years, scientists have sought to enhance the power emitted by semiconductor lasers by combining many tiny VCSELs and forcing them to act as a single coherent laser, but with limited success. Segev's breakthrough uses a different scheme: it employs a photonic topological insulator platform, with a unique geometrical arrangement of VCSELs on the chip that forces the light to flow in a specific path.

This groundbreaking research demonstrates that it is theoretically and experimentally possible to combine VCSELs to achieve a powerful, robust, and efficient coherent laser, paving the way towards new applications for medical devices, communications, and a variety of real-world applications.



Scientific visualization by *SimplyScI* Animations

A single coherent light beam ***(pink)*** is emitted by an array of 30 individual lasers.

"TOPOLOGY, ORIGINALLY A BRANCH OF MATHEMATICS, HAS EMERGED AS A REVOLUTIONARY NEW TOOLBOX FOR CONTROLLING, STEERING AND IMPROVING LASER PROPERTIES."

Prof. Sebastian Klembt, University of Würzburg

"It is fascinating to see how science evolves," says Segev, the Shillman Distinguished Professor of Physics and Electrical Engineering. "Back in 2015, when we started, nobody believed it was possible, because the topological concepts known at that time were limited to systems that cannot have gain. Yet all lasers require gain. So topological insulator lasers stood against everything known at the time."

The international team included Segev's PhD student Alex Dikopoltsev and Klembt's PhD student Tristan H. Harder.

Waves of light and sound

"OUR NEW TECHNIQUE CAN IMAGE THE MOTION OF LIGHT WITHOUT DISTURBING IT."

- Yaniv Kurman, PhD student

(l-r) Yaniv Kurman, Assoc. Prof. Ido Kaminer

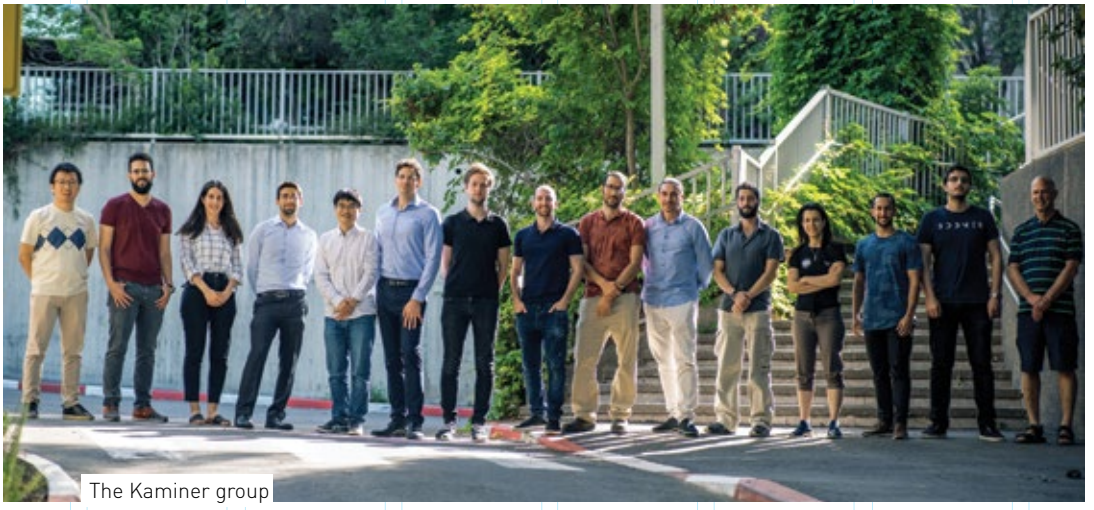
Using an ultrafast transmission electron microscope, Technion researchers have,, for the first time, recorded the propagation of combined sound and light waves in atomically thin materials.

At the height of the pandemic lockdown, with the Kaminer lab at Technion City closed, graduate student Yaniv Kurman took his mathematical calculations home, where he predicted how light pulses should behave in 2D materials and how they could be measured. At the same time, fellow student Raphael Dahan realized how to focus infrared pulses into the group's electron microscope and made the necessary upgrades to accomplish that.

Once lockdown was over, Assoc. Prof. Ido Kaminer's group met for real and succeeded in proving Kurman's theory, and even discovered new and unexpected phenomena. The scientists shone pulses of light along the edge of a 2D material, producing hybrid sound-light waves in the material. Not only were they able to record these waves, but they also found the pulses can spontaneously speed up and slow down. Surprisingly, the waves even split into two separate pulses, moving at different speeds. "The hybrid wave moves inside the material, so you cannot observe it using a regular optical microscope," Kurman explained. "Our results could not have been achieved using existing methods. So, in addition to our

“THIS PRESENTS A REAL BREAKTHROUGH IN ULTRAFAST NANO-OPTICS AND REPRESENTS STATE OF THE ART AND THE LEADING EDGE OF THE SCIENTIFIC FRONTIER. THE OBSERVATION IN REAL SPACE AND IN REAL-TIME IS BEAUTIFUL AND HAS, TO MY KNOWLEDGE, NOT BEEN DEMONSTRATED BEFORE.”

- Prof. Harald Giessen, University of Stuttgart



The Kaminer group

scientific findings, we present a previously unseen measurement technique that will be relevant to many more scientific discoveries.”

The discovery, published in *Science*, revolutionizes the capabilities of electron microscopes and opens the possibility of optical communication through atomically thin layers. “We are planning experiments that will measure vortices of light, experiments in Chaos Theory, and simulations of phenomena that occur near black holes. Moreover, our findings may permit the production of atomically thin fiber-optic “cables”, which could be placed within electrical circuits and transmit data without overheating,” said Kaminer.

The experiments were performed in the Robert and Ruth Magid Electron Beam Quantum Dynamics Laboratory headed by Prof. Ido Kaminer. Team members included Dr. Kangpeng Wang, Michael Yannai, Yuval Adiv, and Ori Reinhardt. Kaminer is a member of the Viterbi Faculty of Electrical and Computer Engineering and the Helen Diller Quantum Center.

New realities with artificial intelligence

Technion researchers are putting artificial intelligence to work for real with living solutions ranging from health to robotics. **In 2021, Technion AI was ranked No.1 in Europe.** AI collaborative initiatives at Technion are multidisciplinary, national and global, engaging industry and inspiring whole new generations of scientists and engineers. Currently, 46 Technion researchers are engaged in core AI research areas with more than 100 researchers in AI-related fields, including health and medicine, autonomous vehicles, smart cities, industrial robotics, cybersecurity, natural language processing, FinTech, and human-machine interaction.

No. 1

Informing Fauci

"WE WERE ABLE TO SEE HOW OUR RESEARCH CAN MAKE A REAL IMPACT ON POLICY MAKING... IN FACT THESE PAPERS HAVE BEEN CITED BY ANTHONY FAUCI IN A WHITE HOUSE BRIEFING."

- Prof. Roy Kishony

Prof. Roy Kishony

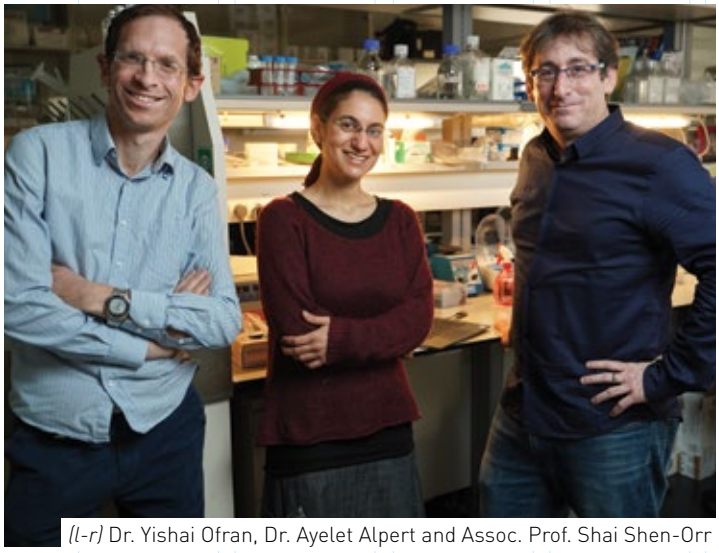
In the midst of the pandemic, the research team at the laboratory of Prof. Roy Kishony met the global crisis with a rapid scientific response, offering insights, informed strategies, and vital information across the emergency frontier. This included a 2021 publication in *Nature Medicine* showing that in communities with high vaccination rates, there is significant decline in infection among the unvaccinated. For every 20 percent vaccinated in the community, there was a reduction of a factor of two in the infection rate of the unvaccinated. This paper was cited by Anthony Fauci at a White House briefing and was used by the director of the CDC to inform the decision to lift the recommendation on wearing masks. "It gives a real feeling of how we can close the gap from data to analysis, to actually making a major impact on policy making, and patient lives," said Kishony.

AI gets real with antibiotics

"THIS IS A MAJOR MILESTONE IN PERSONALIZED MEDICINE ON THE WAY TO AI-BASED ANTIBIOTIC TREATMENTS, WHICH ARE PERSONALLY TAILORED TO THE PATIENT."

- Prof. Roy Kishony

In partnership with Israel's leading healthcare provider, Maccabi Healthcare Services, the Prof. Roy Kishony's research team recently began applying an AI predictive algorithm to advise doctors on personalized antibiotic treatment for patients, initially focusing on urinary tract infections (UTI). Maccabi doctors report that the algorithm has led to a drop of around 35% in the need to switch antibiotics following the development of bacterial resistance to the drug prescribed.



(l-r) Dr. Yishai Ofran, Dr. Ayelet Alpert and Assoc. Prof. Shai Shen-Orr

AI gets personal

Researchers at the Rappaport Faculty of Medicine have developed an innovative algorithm to compare tumors at different stages of treatment. The tuMap algorithm places different tumors on a uniform scale to provide a benchmark for comparison. The tumors of different patients can thus be compared, as well as tumors of the same patient over the course of the disease. The resolution provided by the algorithm enables prediction of clinical indices with high accuracy, outperforming traditional tools. The researchers tested the algorithm on leukemia tumors. The findings were published in *Cell Systems* by Assoc. Prof. Shai Shen-Orr, Dr. Yishai Ofran, and Dr. Ayelet Alpert, in collaboration with Rambam Health Care Campus, Shaare Zedek Medical Center, and the University of Texas.

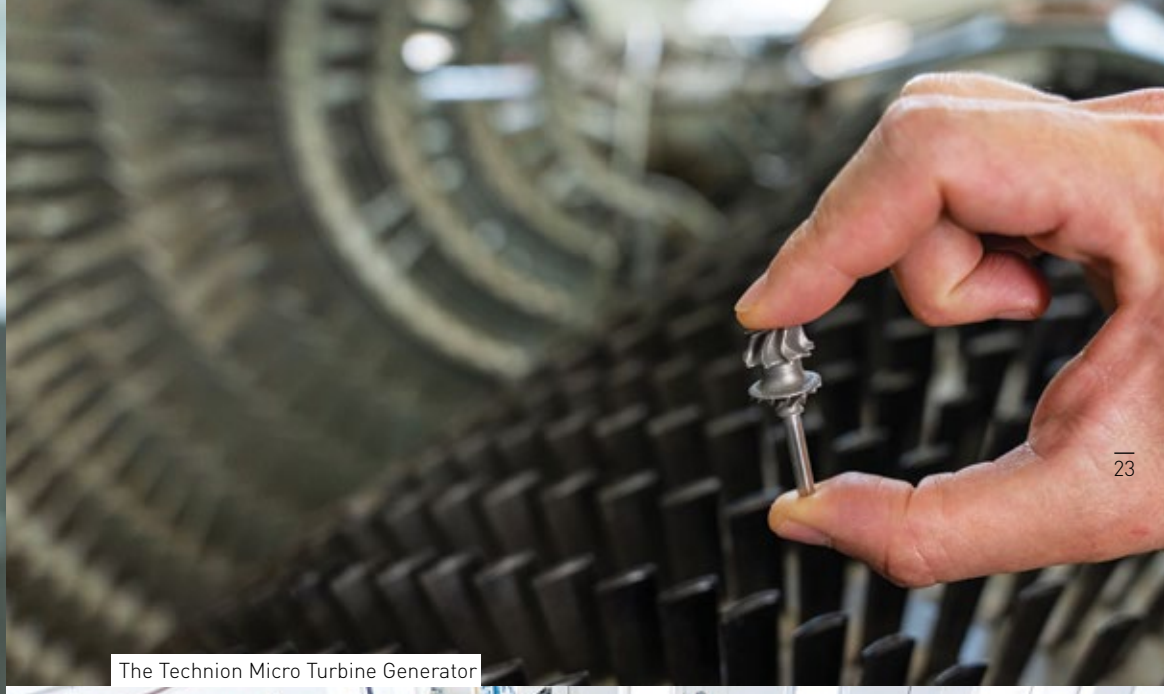
“THE FINANCIAL OPPORTUNITIES FOR THE PRIVATE MARKET ALONE ARE ESTIMATED AT USD 13.6B”

- Assoc. Prof. Beni Cukurel

An ultimate downsize

Tiny, long-range turbine power for applications ranging from biotechnology through to unmanned aircraft.

Assoc. Prof. Beni Cukurel



The Technion Micro Turbine Generator

Assoc. Prof. Cukurel's team at the Turbomachinery and Heat Transfer Laboratory

In a post-pandemic reality home delivery is a new normal with an endless range of applications for drone-delivery, from emergency aid to consumer goods.

A tiny and innovative Micro Turbine Generator developed by Assoc. Prof. Beni Cukurel and his Technion team promises to increase the flight range of drones five-fold. With patents pending, the engine is expected to impact industries from shipping, entertainment, to search-and-rescue.

The breakthrough at the Laboratory for Turbomachinery and Heat Transfer at the Faculty of Aerospace Engineering, results from a perception shift - instead of using lithium-polymer batteries, the researchers developed an entirely new type of gas turbine engine. For the first time, all the engine's rotating components are 3D printed as a single unit, as well as the unique combustion chamber.

“THE THREE PRIZE WINNERS REPRESENT THE GROWING RECOGNITION THAT INTERDISCIPLINARY RESEARCH THAT RUNS ACROSS FACULTY, DISCIPLINARY, INSTITUTIONAL AND NATIONAL BOUNDARIES IS AN ESSENTIAL CONDITION FOR BREAKTHROUGHS IN BASIC SCIENCE AND ITS TECHNOLOGICAL APPLICATIONS.”

- Prof. Uri Sivan

Prof. Avner Rothschild

(l-r) Prof. Avner Rothschild, Dr. Hen Dotan, Dr. Avigail Landman, Prof. Gideon Grader at Technion startup H_2PRO

Power for the future

Technion energy innovation received the world's biggest prize for smart mobility and alternative fuels for transportation. But the true value of this kind of innovation to our future is priceless.

The 2020 Eric and Sheila Samson Prime Minister's Prize for Global Innovation in Smart Mobility and Alternative Fuels for Transportation was awarded to Prof. Avner Rothschild and Prof. Gideon Grader.

Rothschild and Grader are members of the Grand Technion Energy Program and the Faculties of Materials Science and Engineering and Chemical Engineering respectively. They were awarded the Groundbreaking Research Prize for their contribution to the development of innovative green energy technology, that aims to yield hydrogen at a competitive cost and with zero greenhouse gas emissions. To develop and commercialize the technology, the scientists founded the startup H_2PRO.

Asst. Prof. Yaniv Romano won the 2020 Smart Mobility Researcher Recruitment prize, for his innovative work in data science, machine learning and signal processing, including their application to smart transportation.

(r-l) Gadi Dror, Director, Keren Hayesod; Daniella Gera Margaliot, Deputy Managing Director, The Smart Mobility Initiative; Himmat Younis, International Programs Head, The Smart Mobility Initiative; Yair Pines, Director General of the Prime Minister's Office; Minister of Innovation Orit Farkash-Hacohen; Samson family representative; winners Profs. Gideon Grader and Avner Rothschild; and Minister of Transportation Merav Michaeli

Assoc. Prof. Matthew Suss

“RESEARCH IN CATALYSIS IS KEY TO SOLVING MANY OF THE GREAT CHALLENGES FACING HUMANITY. THE FUTURE OF OUR PLANET DEPENDS ON OUR ABILITY TO THINK DIFFERENTLY AND UNCOVER NEW WAYS TO ADDRESS GLOBAL SUSTAINABILITY ISSUES. THE GOAL OF THE NEW TECHNION CENTER FOR SUSTAINABLE PROCESSES AND CATALYSIS IS TO DISCOVER AND DEVELOP NEW CATALYSTS FROM NATURALLY ABUNDANT ELEMENTS, INTRODUCING A WHOLE NEW LEAGUE OF SUSTAINABLE PROCESSES.”

- Prof. Ilan Marek, Head of Center for Sustainable Processes and Catalysis

Membrane catalysis

Discoveries are flowing out of the laboratory of Assoc. Prof. Matthew Suss in the Faculty of Mechanical Engineering, where research is having a catalytic impact on sustainability. With a system to let two electrolytes flow together without intermixing, MSc student Lihi Amit constructed a flow battery using bromine and zinc – cheap and readily available materials. This allows new batteries in which the expensive membrane can be replaced with the cheap and fluid membrane of each individual droplet. This innovative membraneless, single-flow battery with multiphase flow was recently reported in *ChemSusChem*.

Elsewhere in the lab, the science of desalination was simplified. An innovative modelling technique to predict the behavior of boron during desalination by means of capacitive deionization was showcased by PhD students Amit Shocron and Eric Guyes, with supervisor Prof. Matthew Suss and collaborators from Wageningen University and Wetsus. This emerging technique for water treatment and desalination uses cheaper, porous electrodes, as opposed to expensive membranes. When an electric current is applied, charged particles are adsorbed by the electrodes and hence removed from the water. The theoretical framework and experimental results were reported in *PNAS* in October 2021.

Organic innovations

"THE TECHNION FOR ME IS A HOME."

- Renana Gershoni-Poranne

New faculty member at the Schulich Faculty of Chemistry, Asst. Prof. Renana Gershoni-Poranne arrived at Technion in October 2021 from ETH Zürich.

The Poranne research group is working in the field of computational physical organic chemistry. The work focuses on polycyclic aromatic systems, ranging from fundamental investigation into molecular properties and structure-property relationships to use of machine-learning and deep-learning models for data-driven molecular design and discovery. The aim it to develop user-friendly pipelines and methods that help connect these abstract properties to real-world synthetic strategies.

Poranne's group works closely with collaborators around the world to better understand the reactivity and behavior of polycyclic aromatic systems, and to leverage their unique properties for various applications.

The group believes in an inclusive and collaborative culture, where team-work and mutual respect are top priorities.

A renaissance scholar, Gershoni-Poranne studied classical poetry for many years. She served as a soloist in the IDF Orchestra and was called to the microphone at many of the ceremonies held at Technion during her undergraduate and graduate studies.

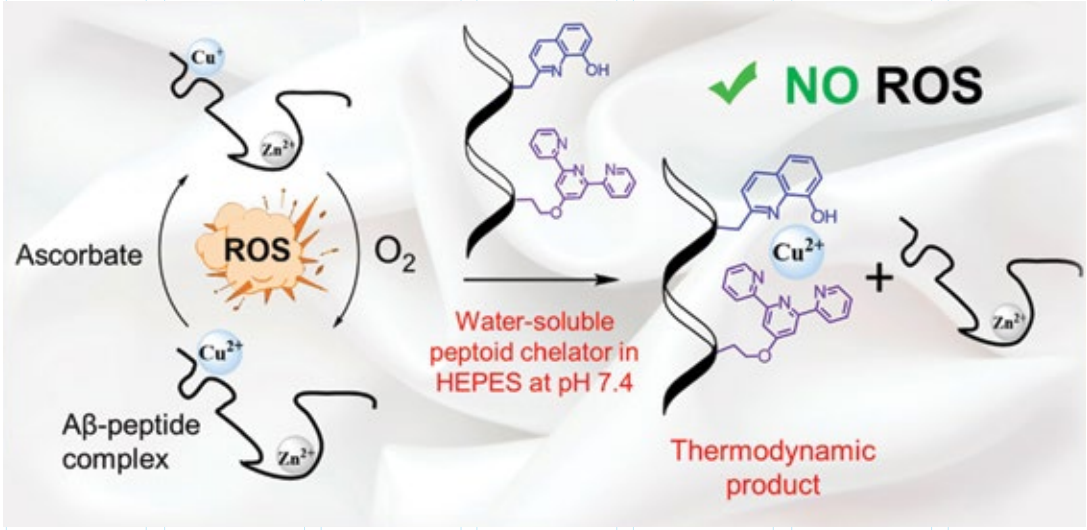
As a graduate student at Technion, Poranne received the Schulich Graduate Fellowship twice, as well as numerous awards for excellence in teaching; as a postdoc, she received a VATAT Fellowship for exceptional women postdocs. In 2019, Renana was awarded a prestigious Branco Weiss Fellowship to support her research into the discovery of novel materials using a combination of computational chemistry and deep learning.

"WE KNOW WHAT FUNCTIONS WE REQUIRE. BUT HOW CAN WE DESIGN MATERIALS TO PERFORM THEM?"

- Renana Gershoni-Poranne

Asst. Prof. Renana Gershoni-Poranne

Disarming free radicals



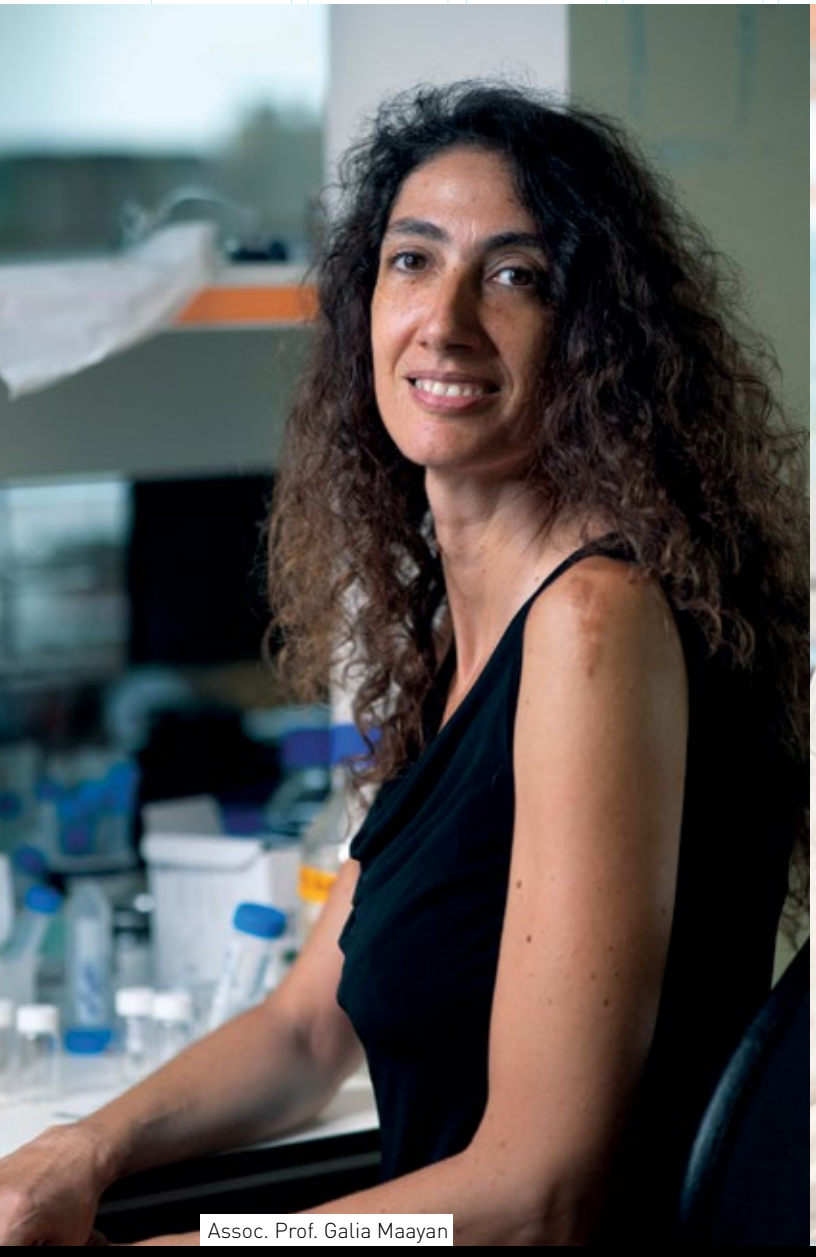
Technion researchers have developed an artificial molecule that could inhibit degenerative processes related to Alzheimer's and other diseases.

Copper ions are a key component of the structure and function of various cells in the body. But their accumulation can lead to cell toxicity, causing dangerous conditions such as oxidative stress, cardiovascular disorders, and degenerative diseases of the brain, including Alzheimer's.

One of the mechanisms involved in the development of Alzheimer's is the formation of free radicals that damage the brain cells. These are oxidizing agents formed, among other things, by Cu–Aβ, a complex of copper and amyloid beta.

Aware that the breakdown of this complex, and the removal of copper from the amyloid, prevents cell death, inhibiting disease, the Technion team began to seek a more effective way to extract the copper by chelation. Chelation uses molecules that bind the copper ions and extract them from the amyloid. The team developed a new artificial chelator called P3. This is a peptide-like water-soluble synthetic molecule that performs its task selectively; it strongly binds copper and forms the complex CuP3, extracting the copper from the amyloid. By doing so, it inhibits and even suppresses the formation of harmful oxidizing agents, without creating new oxidation processes. Although it binds zinc ions and even extracts them from the amyloid faster than it extracts the copper ions, the binding to zinc is weaker, making the zinc-amyloid complex unstable, so in practice P3 mostly binds copper ions.

The study was led by Assoc. Prof. Galia Maayan and PhD student Anastasia Behar from the Schulich Faculty of Chemistry, in collaboration with Prof. Christelle Hureau from the Laboratoire de Chimie de Coordination du CNRS, Toulouse, France.

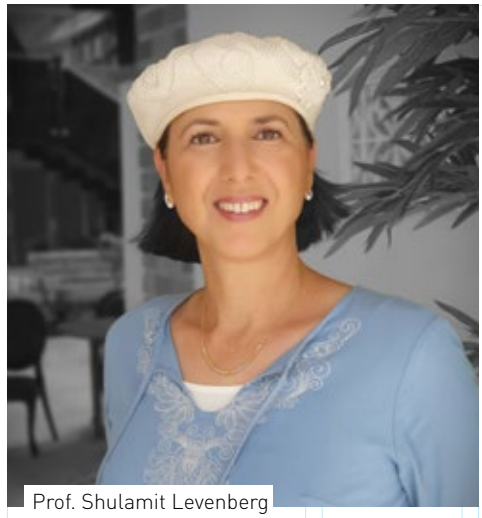


Assoc. Prof. Galia Maayan

Anastasia Behar

“TECHNION RESEARCHERS HAVE DEVELOPED AN ARTIFICIAL MOLECULE THAT COULD INHIBIT DEGENERATIVE PROCESSES RELATED TO ALZHEIMER'S AND OTHER DISEASES.”

Is this steak for real?



Prof. Shulamit Levenberg

"THE EARTH IS AT A TIPPING POINT AND WE FACE A STARK CHOICE: EITHER WE CONTINUE AS WE ARE AND IRREPARABLY DAMAGE OUR PLANET, OR WE REMEMBER OUR UNIQUE POWER AS HUMAN BEINGS AND OUR CONTINUAL ABILITY TO LEAD, INNOVATE AND PROBLEM-SOLVE.

- Prince William, Founder of the Earthshot Prize

Can a bright future be a piece of meat? Technion's slaughter-free steak is gaining recognition and acclaim from leaders across the world, as tissue engineering offers sustainable ways to feed the world without cruelty to animals and damage to the earth's ecosystem.

Environmental concerns, a hungry and expanding world population, and the rise of vegetarian diets are making Aleph Farms a key player in the food tech industry. Co-founded in 2017 by Didier Toubia and Prof. Shulamit Levenberg of the Faculty of Biomedical Engineering, the company developed the world's first slaughter-free ribeye steak by 3D bioprinting non-GMO cow cells. The engineered steak uses just a fraction of the land and water required to raise traditional cattle, it cuts greenhouse gas emissions drastically, and will not harm animals. Media reporters have hailed the taste and texture of the steak, which in the near future will be coming to a supermarket near you.

Prince William and Sir David Attenborough showcased the breakthrough in the first episode of *"The Earthshot Prize: Repairing Our Planet,"* considered the Nobel Prize for Environmentalism. "What's produced is not just similar to beef - it is beef," said Sir David Attenborough.

Aleph Farms

Aleph Farms 3D bioprinted the world's first slaughterfree ribeye steak

"THEY DEMONSTRATE HOW CREATIVITY AND INGENUITY CAN HELP SOLVE SOME OF HUMANITY'S GREATEST CHALLENGES."

- Leonardo DiCaprio, Board member of Aleph Farms

In addition, environmental activist and Academy Award winning actor, Leonardo DiCaprio, has joined Aleph Farms as an investor and board member. "Aleph's extraordinary technology platform combined with their inclusive approach to bringing about systemic change in our food systems make them a leader in this field. With their one-of-a-kind cultivated steaks, they demonstrate how creativity and ingenuity can help solve some of humanity's greatest challenges," said DiCaprio.

"Growing meat like this is really so fast. It takes just three weeks compared with an average of two years using conventional methods of growing meat and it uses a fraction of the resources required for raising an entire animal for meat," explains Prof. Levenberg in the *Earthshot* documentary which was released in the run-up to the COP26 United Nations climate talks. "It's great to see the reaction when people try our cultured meat for the first time - it's such a surprise - that realization that this is meat but we've not killed any cows to have it. It makes me feel proud to be doing this. We're helping give people choices that help the planet."

"IT TASTED OF A FUTURE FREE OF ANY FEELINGS OF GUILT FOR CRUELTY TO ANIMALS AND POLLUTION OF MOTHER EARTH. BUT REALLY, IT TASTED JUST LIKE A GOOD STEAK."

- *The Times*

A matter of perspective

A student project from the joint faculty course displays a new perspective on Babushka dolls.

“THIS COURSE HAS THE POTENTIAL TO CREATE HOLISTIC IDEAS AND DESIGNS THAT GO MUCH FURTHER THAN WHAT EACH DISCIPLINE CAN CREATE INDIVIDUALLY.”

New digital research labs in the Faculty of Architecture and Town Planning

Called: "A Matter of Perspective," the joint faculty course between Computer Science and Architecture led to projects that included a printed object that casts a shadow in various shapes when rotated; 3D "eclairs" dominated by a pattern of laser-cut parameters based on oxidation shape; a printed object that contains three different images, which reveal themselves depending on the direction from which you look at them; and 3D-printed lenses with transparency and color transitions that create shapes projected on the wall.

The 2021 course was taught by Prof. Gershon Elber (Computer Science), Prof. Miri Ben-Chen (Computer Science), Asst. Prof. Yoav Sterman (Architecture) and Dr. Kacper Pluta (postdoc). In the long term, the course is seen as a stepping stone towards joint research and collaboration between the two faculties.

Impacting reality atom by atom

"SINCE 2016, THE ZUCKERMAN FACULTY SCHOLARS PROGRAM HAS CONTRIBUTED TO ISRAEL'S 'BRAIN GAIN' BY BRINGING 30 ISRAELI SCIENTISTS BACK TO ISRAEL FROM THE UNITED STATES."

- Eric and James Gertler, Trustees, Zuckerman Institute

Technion scientists have changed a material's electrical properties by removing an oxygen atom. Applications include electronic-device miniaturization and reduction of energy consumption. The research was led by Asst. Prof. Yachin Ivry of the Faculty of Materials Science and Engineering, with postdoc Dr. Hemaprabha Elangovan and PhD student Maya Barzilay, and was published in *ACS Nano*.

The research group also demonstrated that oxygen vacancies can be engineered by exposing the material to electronic radiation. Consequently, it may also be possible to utilize the effect for radiation detectors, allowing for the early detection – and prevention – of nuclear accidents.

"Our main focus is controlling the onset of collective-electron phenomena at the nanoscale, mainly in ferroelectricity and superconductivity," explains Ivry. "We seek to understand these fascinating phenomena scientifically and to facilitate them for next-generation low-power computational technologies and other nano and quantum devices."

The Nano and Quantum Functional Structures Laboratory is headed by Prof. Ivry a Faculty Scholar in the Zuckerman STEM Leadership Program.

TECHNION SALUTES 5-YEARS TO THE ZUCKERMAN STEM LEADERSHIP PROGRAM

Asst. Prof. Yachin Ivry, a Faculty Scholar in the Zuckerman STEM Leadership Program

The real race

Technion took first place in October at Israel's Formula SAE race which took place at MotorCity racing track in Beersheba.

Israel's Formula SAE student teams – unable to participate in international competitions for two years because of COVID-19 – have established their own Formula Race for students. This year's Technion team was the largest ever and they competed with students from Tel Aviv University, and Ben-Gurion University. Formula SAE is a series of international competitions in which university teams compete to design, manufacture, and race the best performing race cars.

Headed by Muans Omari, a Master's student in the Faculty of Mechanical Engineering, the Technion team included over 60 students.

"THIS IS A UNIQUE, ADRENALINE-INTENSIVE MOTORSPORT EVENT THAT COMBINES ENGINEERING THEORY AND TECHNOLOGICAL APPLICATIONS. WE BELIEVE IT WILL HAVE A DIRECT IMPACT ON THE VEHICLE INDUSTRY IN ISRAEL AND ENCOURAGE INVESTORS AND LOCAL FIRMS TO DEVELOP VEHICLES AND OTHER RELEVANT PRODUCTS."

- Muans Omari, head of Technion Formula Team

Members of the Technion 2021 Formula SAE team took first place in the national competition.

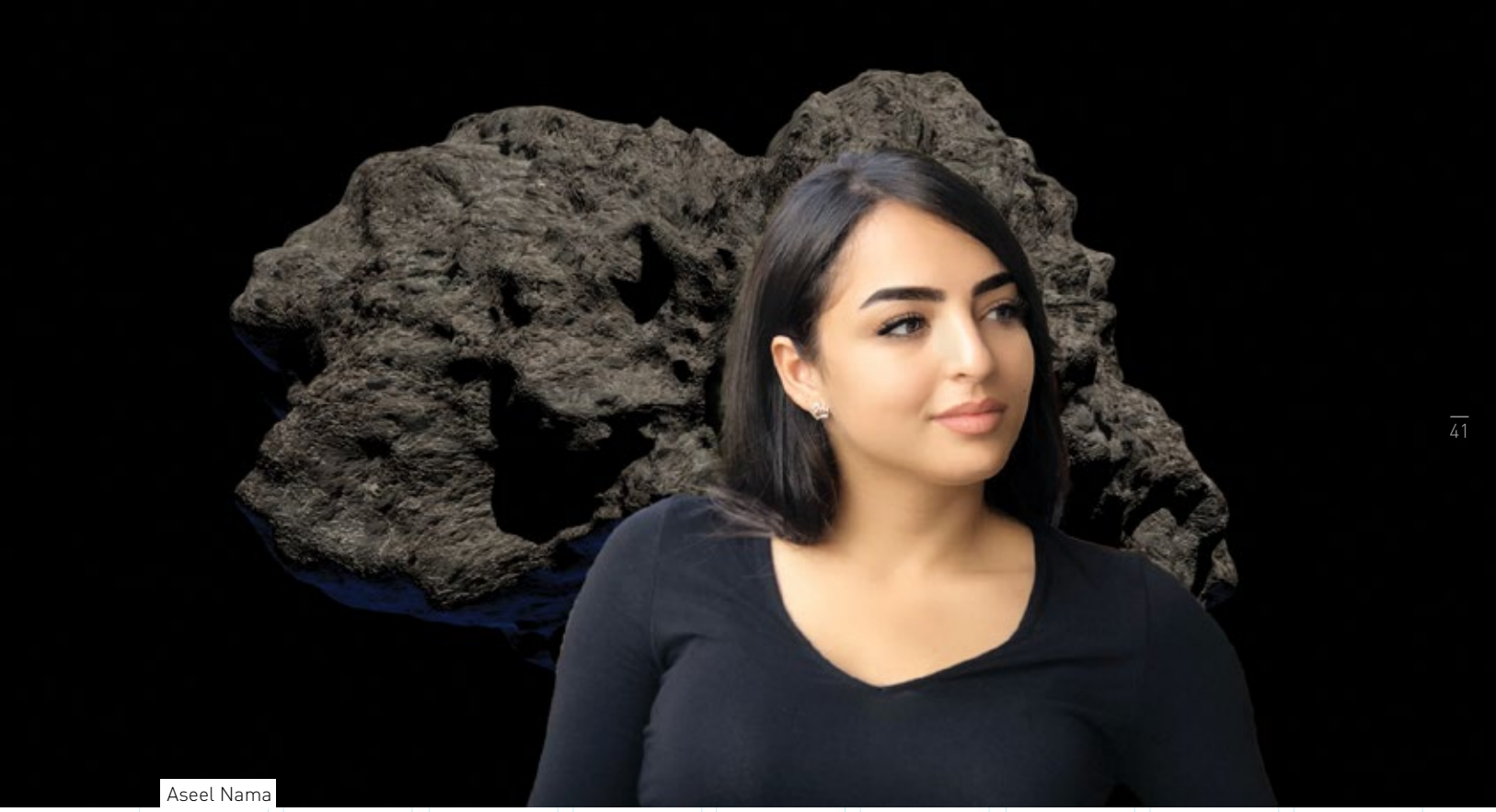
Formula SAE student competition in pre-Corona times in Italy.

The beat is in the air

Air drums, dancing "spiders," and robodogs were among many cool student projects presented at the Henry and Marilyn Taub Faculty of Computer Science. In a project fair held at the end of the 2021 school year, students graduating from the Faculty of Computer Science presented their work. These included mobile apps, virtual reality systems, and the evolving field of Internet of Things (IoT).

Almog Algranti, Nadav Abayov, and Yarden Wolf created air drums. Using computer vision algorithms, their app detects the drumsticks in the user's hands, and plays as if the user were seated at a drum set. "I play piano, and recently got interested in drums," Algranti (pictured) explained. "This was an opportunity for me to create an 'instrument' that would let me practice without the financial investment in a drum set, and without disturbing the neighbors."

Almog Algranti



Aseel Nama

Two thousand freshmen arrived on campus in October 2021.

Shooting stars

Two new asteroids discovered by Technion student Aseel Nama of the Faculty of Biomedical Engineering will be named after her. Nama's discovery came as part of NASA's asteroid-hunting campaign. Nama grew up in Deir al-Asad in the Galilee region. Her studies involved the mastery of segmentation – the division of images into sections – in the laboratory of Prof. Dan Adam. She credits that skill for the asteroid discoveries. "I got a set of photos and videos from NASA to search for new asteroids," she explains. "I called my 'team' ANI (Aseel Nama Israel) and the asteroids I discovered will be called ANI1801 and ANI2001."

Maj. Gen. (Res.) Amos Horev

Fit for the future

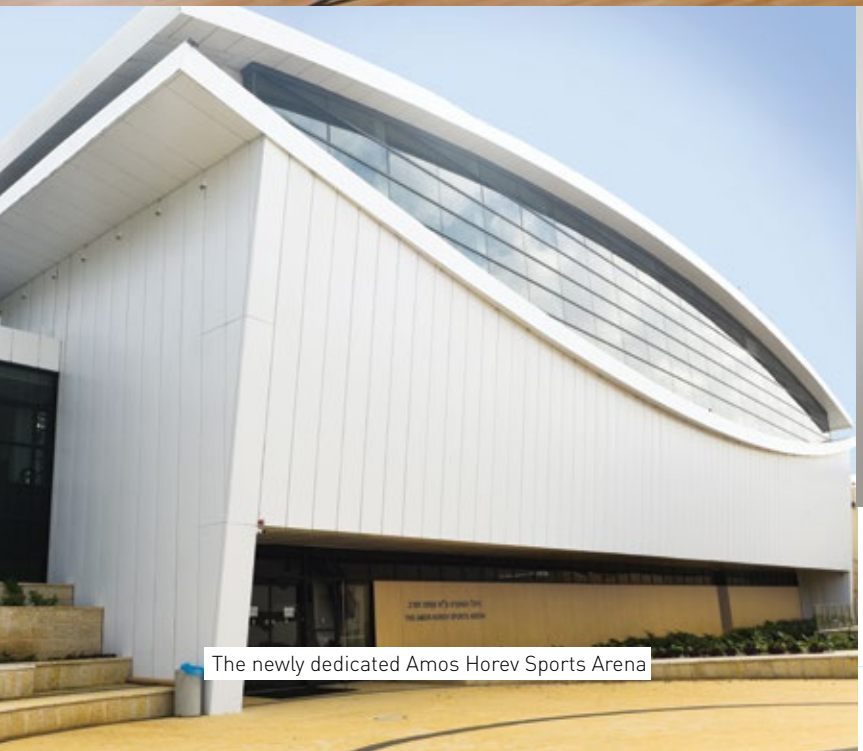
A living Technion legend, Maj. Gen. (Res.) Amos Horev was honored in October, with the inauguration of the Amos Horev Sports Arena.

Maj. Gen. (Res.) Amos Horev served as president of the Technion from 1982-1973. During this tenure he contributed greatly to the development of the campus and invested considerably in the well-being of the students. To help students who fought in the Yom Kippur War he sent faculty members to outposts to deliver lectures on site and also arranged for recordings of lectures on campus. Horev established the psychological service at Technion and the audio-visual library at the Moshe and Paloma Carasso Center for Self-Study. He took care of the students at Technion by providing them with student jobs on campus, by building student residences, an Olympic-size pool, and the sports center. During his tenure, the campus doubled its built-up area to 260,000 square meters and the Rappaport Family Medical Science Building, home to the Medical Faculty, was built in Bat Galim.

"WITHOUT EXCELLENCE, OUR SMALL COUNTRY WILL NOT ENDURE. FOR ME, THIS NEW STRUCTURE IS ALSO AN EXPRESSION OF EXCELLENCE."

- Maj. Gen. (Res.) Amos Horev

Amos Horev Sports Center



The newly dedicated Amos Horev Sports Arena

(l-r) Prof. Uri Sivan and Amos Horev

Crunching Zeus

If reality is a flow of information, and information is data, then the phrase "information is power" gathers immense relevance. Across the faculties, and through all emerging fields of research, the ability to compute becomes definitive to progress and discovery. In this, the new High Performance Computing (HPC) Center at Technion is a living intelligent resource, delivering world-class high performance computational capabilities to Technion researchers and students, providing the resources to efficiently solve the most demanding computational problems. The center includes ZEUS - a computer cluster of 1056 cores and hosted and maintained by the Division of Computing and Information Systems.

“THE NEW HIGH PERFORMANCE COMPUTING CENTER HAS BEEN LAUNCHED FOLLOWING A STRATEGIC DECISION TO DOUBLE TECHNION COMPUTING CAPABILITIES IN THE COMING YEARS.”

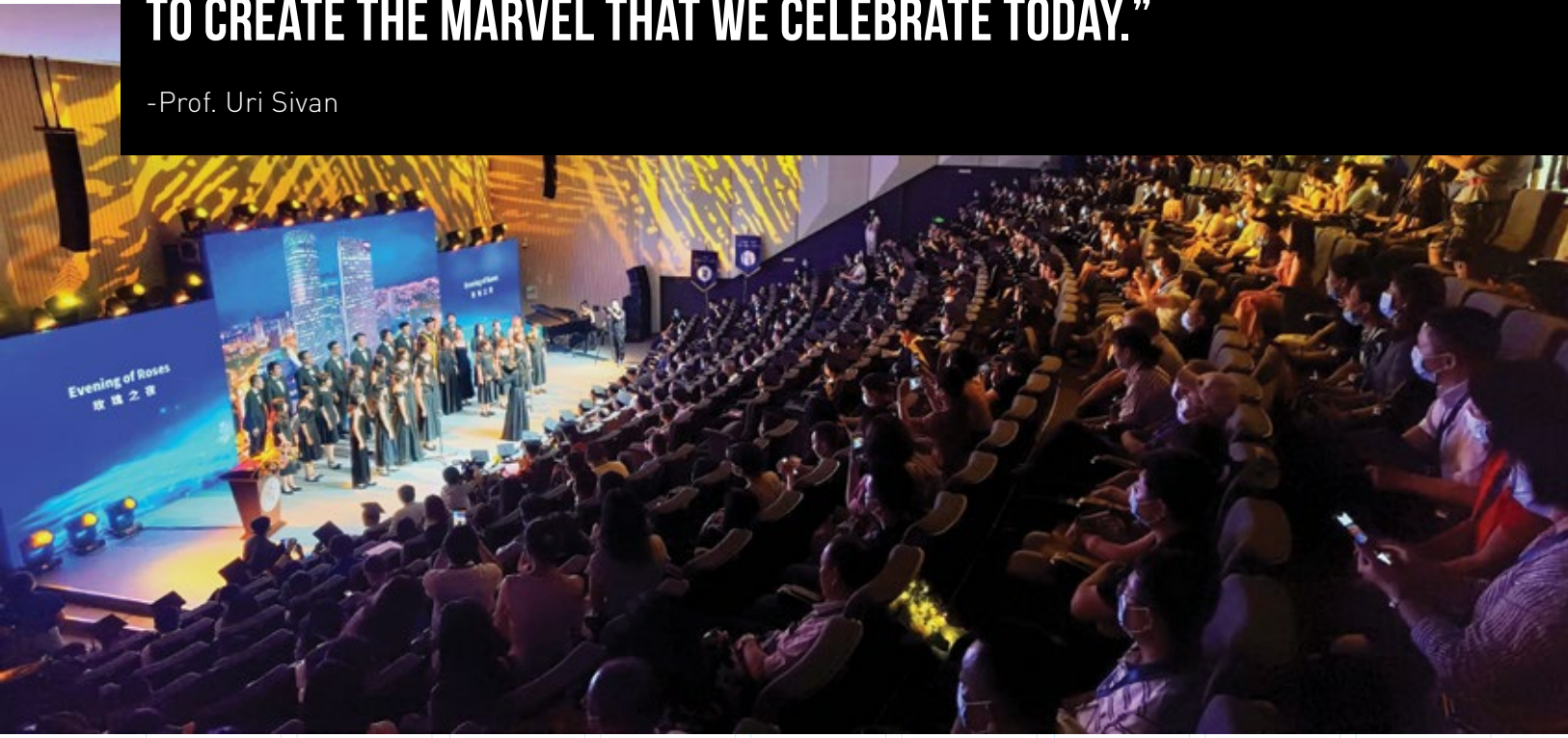
Prof. Boaz Golany, Executive Vice President
and Director General

GUANGDONG TECHNION
FIRST GRADUATING CLASS

Technion history is happening in China, 149 students received their Bachelor's degrees in July 2021 at the Guangdong Technion - Israel Institute of Technology. "GTIIT is the first and only endeavor of its kind in the mutual history of China and Israel," said Technion President Prof. Uri Sivan. "The language of science bridges geographies and cultures to connect all people for the benefit of humanity. It is this language that you, dear graduates, have acquired at GTIIT."

"TWO ANCIENT NATIONS, WHICH SHARE THE VALUES OF KNOWLEDGE, SCHOLARSHIP, AND INNOVATION FOR THOUSANDS OF YEARS, HAVE BRIDGED ACROSS GEOGRAPHY AND LANGUAGE TO CREATE THE MARVEL THAT WE CELEBRATE TODAY."

-Prof. Uri Sivan



Hats off to the first class of Guangdong-Technion alumni

Reports of the Vice Presidents

Prof. Oded Rabinovitch
Senior Vice President

Technion is undergoing significant organizational and conceptual changes in order to improve instruction and mentoring campus-wide, which will provide our graduates with a richer and broader education through teaching, learning, and research. These changes are being realized through a broad array of initiatives, as highlighted below:

Department of Humanities and Arts
The department is undergoing a complete transformation to evolve it from a service unit offering courses in sports, English, and humanities, to a center that supports in-depth study and research. The department's new mission emphasizes the importance of the field of Humanities as an integral part of the education of engineers and scientists through research, mentoring and teaching with focus on history and philosophy of science and engineering, ethics, and social and environmental awareness.

International campus
The ongoing conceptual and organizational changes regarding the decentralization of the Technion International School, aim to strengthen the international culture campus-wide. This activity, which is critical at a time when international relations have been directly affected by the coronavirus crisis, aims at a cultural change on campus, taking a significant step towards reinforcing Technion as a major player in the global arena.

Center for Promotion of Learning and Teaching
The center's mission has been redefined to become the primary facilitator for the transformation of learning and teaching within the faculties in addition to its current role. The strategy is to motivate individual faculty members, as well as the whole faculty, to broaden teaching capabilities, to exploit the latest digital techniques, and to integrate advanced methodologies into the Technion's curriculum.

English Language Studies
Undergraduate English language courses have been revised and revamped to emphasize reading, writing, comprehension and communication skills. Technion has also begun to implement the Council of Higher Education's requirement to teach two mandatory professional courses in English. A pilot scheme will be launched to teach English to graduate students with a focus on communication skills.

Undergraduate School Admissions
Technion is investigating new methodologies for screening potential undergraduate candidates including: the replacement of the psychometric exam with a math test; combination of the "sechem" and a personal interview; or credits acquired outside of Technion. The goal of these experimental models is to recruit outstanding students who otherwise would not be accepted, and to increase the diversity of the student population.

Entrepreneurship Center
t-Hub, the Technion Entrepreneurship Center continues to develop and integrate formal and

extra-curricular entrepreneurship courses and activities at all levels, throughout the campus, such as the undergraduate study program in entrepreneurial leadership. We are integrating entrepreneurial training for graduate students, including: the Start Up MBA program, the t-start programs and t-doc entrepreneurship programs for PhD students. Also in the pipeline are programs for faculty, an Entrepreneurship Day in collaboration with Eurotech, and other such activities.

These above initiatives are accompanied by a comprehensive in-depth process led by Prof. Hossam Haick, Dean of Undergraduate Studies and Prof. Arnon Bentur, and focus on the development of a strategic plan for undergraduate studies at Technion. The aim is to redefine the objectives of undergraduate studies with an emphasis on education, rather than just teaching and learning, within the framework of Technion's overarching strategic plan. The goal is to augment the added value of the Technion graduate, creating the leaders of tomorrow. An in-depth analysis of undergraduate studies was conducted to identify fundamental challenges, including:

- Combining subjects from the humanities, social sciences, life sciences and data sciences to develop leadership in engineering and science
- Encouraging interdisciplinary, multidisciplinary, and supra-disciplinary studies
- Recruiting candidates who best fit the profile of our ideal graduate
- Creating teaching models that maximize interactions with faculty members to leverage the potential of Technion's human capital.

On a final note, it is impossible to talk about the past year without relating to the pandemic. Since Friday, March 13, 2020, when exams were canceled because of the pandemic, not a single day has gone by without dealing with issues related to the pandemic and its implications for Technion.

During this period, Technion underwent significant and accelerated changes as **online learning and teaching** became the new normal, continuing throughout the entire academic year. Consequently, we reinvented how we teach, examine, and communicate with our students and how they learn. Not only that. We then reinvented how we teach, learn, and communicate with students within the framework of new **hybrid** teaching models. For this purpose, we worked closely with the heads of the academic departments, the Technion Deans, the center for promotion of learning and teaching, and the Campus administration to plan and provide the academic, physical, computing, and operational infrastructure required across the whole campus during the pandemic.

After intense planning and preparations, I am happy to report that this semester, we welcomed the return of students en masse to campus, a return to face-to-face teaching and learning, accompanied by distance learning using an array of online means, and the vital and constructive interaction that derives from being on campus.

Prof. Shimon Marom
Executive Vice President for Academic Affairs

The Office for Academic Staff handles the appointment, tenure, and promotion of faculty and teaching fellows; sabbaticals and vacations; trips abroad; the appointment of postdocs and academic visitors; scholarships; and prizes. Key facts and initiatives are reported below.

New Faculty Recruitment

As of October 1st, 2020, 60 new faculty members started research and teaching at Technion, of which 15 are women; these numbers include three Technion faculty that are based in Jacobs Technion-Cornell Institute. Four more faculty will join the Technion in March 2022. Note that five of the faculty who joined the Haifa campus are non-Israelis, which maybe an indication of a welcome trend. We are deep in the process of recruiting for the next academic year (beginning October 2022). The number of faculty members at Technion is climbing at a steady rate (October 2019: 563, October 2020: 576, October 2021: 578); the proportion of women faculty remains ca. 20%. I would like to thank the Deans, the Senate committee members, the Faculty Administrations, and the Faculty Office, who swiftly adapted to the new work environment that was thrust upon us by the pandemic.

Postdoctoral Fellows

In the 2020-21 academic year, there were 368 postdocs, 229 from overseas (compared to around 414 in the previous year, of which 273 were from overseas). This is a fair number given the pandemic constraints. We have been flexible in our recruitment procedures for postdocs, from obtaining special entry visas to Israel, to approval of working remotely. We were proactive regarding the situation of graduates from other Israeli research institutes; many of whom could not travel overseas due to the pandemic, and we invited them to join Technion research groups. Perhaps this exposure of first-rate graduates to Technion will have a positive impact on the profile of candidates for the coming years.

Key Initiatives

In addition to the regular workload, we promoted several new initiatives.

›› Together with the Deans, we completed a long process of updating the academic regulations regarding appointment and promotion procedures and redefined the make-up of our academic faculty. This includes streamlining the teaching faculty into a single track; defining the status of research fellows in order to improve our ties with industry; and defining the rank of 'professor of practice' and 'professor of creative arts' as per the Council for Higher Education guidelines.

›› We are proactive in our efforts to increase the representation of women on all important academic committees. This has not been an easy task, as there are only 35 females (out of 216) at the rank of full professor Technion-wide. I am happy to report that women professors now comprise 39% of the two major senate committees, that handle hiring, tenure, and promotion of senior Technion faculty.

›› On the recommendation of the Senate, an ethical code of conduct for faculty members and senior management was prepared and ratified.

›› With the help of Prof. Ariel Orda, our liaison with the Jacobs Institute in New York, we established regulations, guidelines, and procedures to regulate working with Cornell Tech.

›› Other issues handled included: mentoring new faculty; streamlining faculty submissions for prestigious prizes and awards; appointment of distinguished professors; procedures to approve deferred retirement; remuneration for additional academic workload; and procedures for approving requests to work outside Technion.

Prof. Jacob Rubinstein

Executive Vice President for Research;
CEO of Technion R&D Foundation

The academic year 2019/20 was marked by the worst pandemic the world experienced over the last 100 years. In spite of the pandemic and the long periods of lockdowns, Technion's research activity maintained a strong momentum.

Sponsored Research

Research contracts signed in 2019/20 by the Research Authority amounted to $108.4 million - a record high. In the previous two years the Technion's research contracts totalled $90 million in 2017/18 and $101.5M in 2018/19. The main increase in income was from competitive grants in Israel, mostly the Israel Science Foundation (ISF) and also government contracts. We performed fairly well in winning European grants. On the negative side we saw a decline in contracts from industry, including the Innovation Authority, due to the pandemic.

In 2019/20 Technion researchers submitted 180 proposals to the ISF and won 69 grants (39% success rate). This is compared to 192 submissions and 82 grants in 2018/19 and 64 grants out of 179 submissions in 2017/18. Overall, the success rate of Technion researchers for ISF funding continues to be higher than the national rate.

A highlight of 2019/20 was wining an unprecedented number of 4 European FET grants. This is one of the most prestigious and competitive grant programs of the EU. To win, the proposal must articulate a radical new vision with strong potential for technological breakthrough.

Technion continued to invest heavily in research infrastructure for new faculty. In 2019/20 we invested NIS 70.5M in new faculty research allocations, compared to NIS 74M in 2018/19 and NIS 63.5M in 2017/18.

Challenge:
The main challenge we now face is Israel's position vis-a-vis the EU grant agencies. The EU is starting the new Horizon Europe program this year and Israel is not yet a partner. This is already impacting our ability to apply for Horizon Europe-related grants. In addition, the EU recently announced that associated countries (for example Britain and Israel) are excluded from certain programs, including space and quantum technology. Even when Israel joins Horizon Europe, new restrictions may limit the grants available to Israeli scientists.

External Research Funding

In addition to the external funding mentioned above, Technion received contributions from donors for individual researchers or for the creation of research infrastructures in the sum of $12M, the same amount in 2018/19, and $17.4M in 2017/18.

Challenge:
Donations tend to be focused on specific fields (e.g., healthcare). To address this issue, the Technion Research Directory was established in 2018, which is a searchable database of proposal abstracts to help donors find topics of interest.

COVID-19 Research

Immediately at the outset of the pandemic in Israel, about 50 Technion labs turned their attention to research to combat the disease. Some of these labs achieved significant results. For example, Prof. Eyal Zussman's lab developed a face mask sticker that greatly enhances effectivity; Prof. Naama Geva-Zatorsky's lab developed a novel, fast and low-cost COVID-19 diagnostic kit; Prof. Friedler developed a method to detect the virus and track its proliferation through the sewage system. The technology developed by Friedler's group was deployed successfully at Technion and enabled us to curb the chain of infection in the dormitories.

International Collaboration

Expanding scientific collaboration with institutes abroad is an important goal for Technion. A significant example of such collaboration is our membership in Eurotech – an alliance of six leading European technological schools: Technion, TUM (Munich), EPFL (Lausanne), DTU (Copenhagen), Ecole Polytechnique (Paris) and TU/e (Eindhoven). We are also members of CESAER, the leading association of European universities of technology.

We have joint projects with University of Michigan (together with the Weizmann Institute) and University of Waterloo. We maintain our long-term partnership with the Universities of Aachen and Julich. New ties were established in 2020 with the Einstein Hospital in Sao Paulo, Tokushima University in Japan, and the Ingham Institute in Australia.

Industrial Collaboration

We attribute great importance to collaboration with industry. We believe that industrial contracts are a win-win situation. Technion benefits from research support, student ties, and providing our faculty with up-to-date knowledge of emerging needs. Industry benefits from Technion's commitment to help Israeli industry and the country's economy. A recurring obstacle in recent years has been the issue of IP ownership. We resolved this problem by creating flexible models for industrial contracts. Each company is encouraged to select its preferred model. Indeed, several new contracts were signed and several more are in progress. Some contracts are pending because of the pandemic. New industrial contracts in 2019/20 amounted to $8.3M compared to $8.8M in 2018/19. We expect a considerable number of new such contracts in 2020/21. One of our goals is to make Technion a hub for traditional industries, including food and pharma.

Pre-Clinical Research

The pre-clinical research authority provides animal research facilities for faculty members at Technion, affiliated hospitals, and companies. The facilities are in two separate locations, one in the Medical School and one on the main Technion campus.

In 2019/20, the authority started to implement its development plan that was drafted the previous year. This plan includes a revised budget structure, new infrastructure, and improved services for commercial entities. In addition, we started preparations for upgrading our facility to conform with the AAALAC standards.

Challenge:

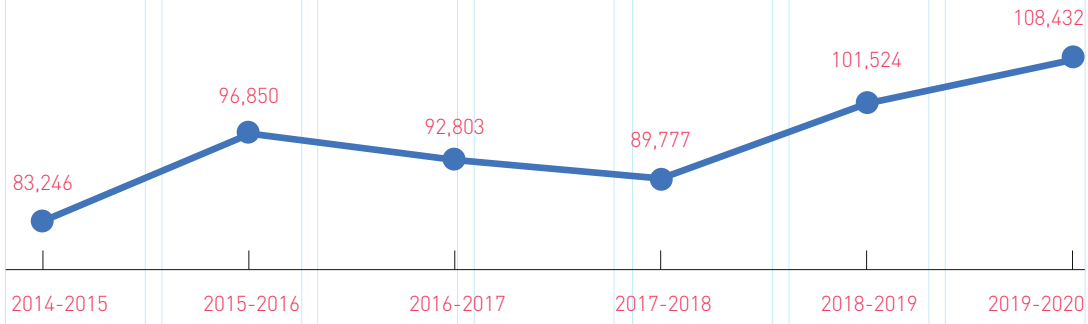
Maintaining a high level pre-clinical facility is crucial for conducting first-rate research in the life sciences. Such a facility is extremely expensive to operate as new equipment is continuously needed. We invested heavily in this facility in 2020/21 and have allocated funds for 2021/22.

Translational Research

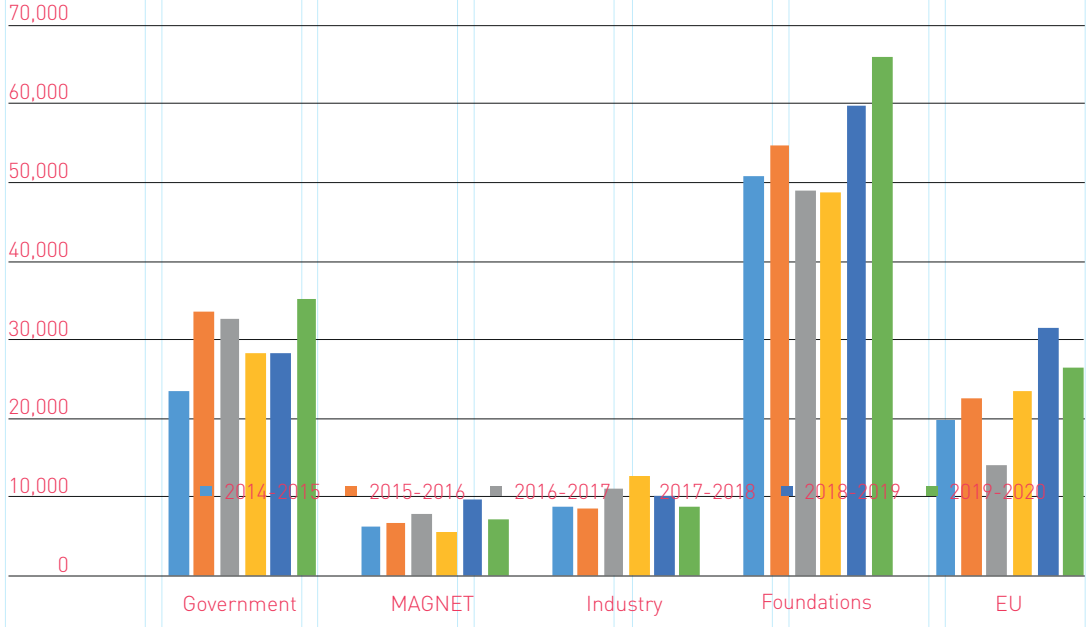
The translation of knowledge is handled by the Technion Technology Transfer (T3) Office, a division of the Technion Research and Development Foundation (TRDF), Ltd. TRDF is a for-profit company, owned by Technion and the Executive Vice President for Research serves as its CEO. Income from licenses and royalties plays an important role in supporting Technion research infrastructure. We also emphasize commercialization of scientific discoveries to foster an ecosystem of innovation and entrepreneurship on campus. The Technion considers translational research an important contribution to the State of Israel.

The T3 unit underwent a complete restructuring that started in 2018/19 and was completed

New external research contracts – total
(Thousands USD, "Foundations" include all competitive grant agencies except those of the EU).



New external research contracts – breakdown to various sources
(Thousands USD, "Foundations" include all competitive grant agencies except those of the EU).



in 2019/20. A new director was hired; the business staff was replaced; and the management of the patent portfolio was outsourced to a specialist law firm.

New models for commercialization were developed during 2020, with the understanding that different approaches are needed for different disciplines. The results are impressive. For instance, 14 spinoff companies were launched in 2019/20 compared to 6 companies in 2018/19 and a similar number in 2017/18.

These 14 spinoff companies offer various technological solutions such as a non-invasive blood count device; rapid and simple detection of pathogens; attention evaluation; solar electricity generation; spinal cord injury; zero-knowledge proof system for blockchains; lung disorders; biological and genomic informatics solutions; fintech software; assessment of fatigue during radiotherapy for breast cancer with/without homeopathy treatment; chemotherapy-induced cell activation to improve tissue regeneration; structural optimization using nonlinear dynamics; minimally-invasive continuous clinical monitoring of small molecules; and naturally targeted drugs and a gene delivery system.
A total of 71 new agreements (licenses, industrial and innovation authority contracts) were signed in 2019/20 compared to 41 in 2018/19 and 47 in 2017/18.

We now have a patent portfolio of 715 families, compared to 635 in 2018/19 and to 550 families in 2017/18. New software installed in 2019/20 enables better management and recovery of uncollected patent royalties.

During 2019/20, we streamlined our monitoring process of spinoff companies based on Technion inventions. A new user-friendly database with detailed information of these companies was created. We maintain the right to make additional investments both to support these companies and to minimize dilution of our holdings when new investments are raised. Prominent private spinoff companies founded by faculty include Aleph Farms (cultured meat), Xact Robotics (medical robotic navigation), Starkware (blockchain software), H2Pro (hydrogen manufacturing), Codota (software), Qedma (quantum computation), Canasoul (cannabis), Cytoreason (bioinformatics) and many more. We are particularly proud of earlier Technion spinoff companies traded on NASDAQ, including Novocure, currently the highest-valued Israeli company on NASDAQ.

The TRDF recognizes the importance of investment in research infrastructure. To this end, we established a new internal fund in 2019/20 with an initial budget of NIS 6M. The fund was used to match outside grants (VATAT and ISF), for a Technion-wide safety project, for the preclinical authority and more. We expect to grow this fund which is fully financed by our success in commercializing Technion technologies.

Prof. Boaz Golany
Executive Vice President and Director General

Budget

The Technion's 2020/2021 operating budget was NIS 1,599M, with a planned deficit of NIS 50M, which was higher than the previous year.

Income from VATAT was budgeted with an increase of NIS 16M compared to the previous year, mainly due to an increase in the number of students. Income from Technion funds included a withdrawal of the 2019/2020 interest accrued from the pension reserve fund. Income from Technion societies was budgeted at NIS 44M, which is lower than in the previous year, due to the pandemic. The main change in expenditure is increased allocations for student fellowships. Pension payments are expected to increase as well.

As in the previous year, the main challenges for 2020/2021 were the recruitment and absorption of new faculty; improving the quality of teaching; and upgrading facilities.

The deficit will be covered by a withdrawal from an internal unrestricted fund.

The Technion Management decided to prepare a multi-year development budget built on a 5-year development plan supported by a 5-year development budget. Each year the Technion Council reviews the full 5-year horizon and approves the first year of the plan. The development budget comprises: construction; faculty recruitment; research infrastructure; special projects; preventive maintenance; computing infrastructure; safety; and strategic initiatives. The budget approved for 2020/21 was NIS 170M.

Technion 2019/2020 operating budget was NIS 1,580M, with a planned deficit of NIS 42M. The actual deficit was NIS 47M. The deficit is covered by a withdrawal from an internal unrestricted fund.

Total donations from Technion societies during 2019/2020 amounted to $79.2M, including $11.8M for the Operating Budget. Total expenditure on development projects during 2019/2020 was NIS 189.7M. As of September 30, 2020, Technion investments amounted to NIS 7,032M. The actuarial liability of Technion, as of September 30, 2020 was NIS 6.6B (the consolidated liability of Technion and TRDF was NIS 7.1B).

Corona Crisis

During January 2020 the World Health Organization (WHO) announced the outbreak of the rapidly spreading Coronavirus as a global pandemic. Along with the effect on human life, the outbreak of the virus had significant global and local economic and macroeconomic impact, with growing implications.

With the spread of the virus, capital markets around the world and in Israel responded with a sharp decline in prices and rising volatility.

However, as of mid-April 2021, most markets and indices in Israel and around the world have seen price increases that have erased most of the declines.

As a result, the Technion investment portfolio, which also includes marketable securities and equities and is therefore affected by capital market trends, yielded returns as follows: during the period October 1, 2019 until September 30, 2020 a return of 1.5% was recorded. From October 1,2020 to the end of February 2021, a return of 5.4% was recorded.

Throughout the crisis, the Technion Investment Committee has monitored the state of the capital markets in Israel and abroad. It acted accordingly and in line with the investment policy established by the Technion Council, which is subject to VATAT regulations regarding Israeli university investments.

Technion continues to monitor developments regarding the pandemic in Israel and around the world and acts in accordance with the authorities' guidelines. Technion upgraded teaching infrastructure to support online instruction and learning, including the necessary investment in equipment, hardware and software.

The Corona crisis has led to increased student enrollment for the 2020/2021 academic year. The State of Israel began an extensive vaccination campaign in December 2020 and today a large percentage of the population is vaccinated. Since the pandemic is evolving and is characterized by uncertainty, Technion cannot assess the full impact of the pandemic on its activities.

Physical Development

The Division of Construction and Maintenance at Technion faced a challenging year in 2021, navigating the obstacles posed by the pandemic which erupted in March 2020. While frontal teaching on campus ceased, and stricter regulations for research activities and administrative work were issued, most of the construction and maintenance activities continued. In many cases the work progressed at an even faster pace than anticipated.

Taking advantage of the opportunity offered by a nearly empty campus, and working in accordance with stringent Health Ministry regulations, we expedited construction and maintenance operations throughout the entire campus, shortening the schedules of many projects, while experiencing delays in several projects due to difficulties in obtaining supplies.

During this period, the Division focused on completing projects that typically incur a great deal of noise and disturb in-class teaching. An example of this is the Viterbi Faculty of Electrical and Computer Engineering's underground parking garage for which excavation of hard rock at a depth of eight meters was required.

Other examples include: Ullmann Teaching Center – fifth and six floor renovations were completed, including the addition of a fire prevention sprinkler system; Zielony Student Union Building – the entire food court was renovated; teaching facilities and study centers across campus – installation of multimedia equipment to facilitate remote learning.

The Elyachar Central Library and Zielony Student Union Building were renovated and extended, and new dormitories and a sports arena were built for students.

Many new labs were established in multiple faculties, and additional research buildings are either under construction or in various planning stages. Electricity, air conditioning systems, and plumbing were modernized. Within the framework of the Green Campus campaign, more solar roof panels were added, and a new electrical supply using natural gas is being investigated.

The campus is being enhanced to make it more walkable and bikeable. New signposts, campus wide, are improving orientation.

Documentation of the Technion Campus Heritage buildings (in addition to the Hadar Campus Complex) is in progress, including guidelines for the renovation of these buildings to meet contemporary standards.

Projects Status Report
Division of Construction and Maintenance

Under Construction

- New Zisapel Electrical Engineering Building: 5,250 m^2, budget NIS 87.23M
- Broshim - 2 new high-rise dormitory buildings: 143 apartments for families, couples and singles, budget NIS 157.5M
- New Andrew and Aviva Goldenberg Architecture Studio Pavilion: 900 m^2, budget NIS 17M
- New Sagol Center for Intelligent Composite Materials: 2,800 m^2, 3-story building for research laboratories, budget NIS 33M
- Mehoudar Creative Design Center Renovation: budget NIS 13.8M
- Polak Visitors Center Renovation: budget NIS 3.6M
- New water collection reservoir for potable water: 1,500 m^3, budget NIS 5M
- New Clinical Skills Training Center: 1,000 m^2, budget NIS 9.86M (excluding multimedia)

In the Planning Stage

- New Rappaport Building for Advanced Medical Research (2): 16,000 m^2
- Chemical Waste Disposal Site: budget NIS 5M
- Expansion and renovation of Health Food Innovation Center Pilot Plant: 2,500 m^2, budget NIS 31M
- New 3-story Rosman Computer Center building: 2,082 m^2, budget NIS 23M
- New Taub building adjacent to existing Taub Faculty of Computer Science building: 5.5-story, 3-story car park; 11,845 m^2
- New Andre Deloro Building for Transformative Biomedical Sciences & Engineering: 5-story, car park, 15,100 m^2, budget NIS 120M

Prof. Alon Wolf
Vice President for External Relations and Resource Development

The passing year has seen a continuation of changes within PARD. As we continued to operate under the uncertainty that the COVID19 crisis has brought with it, the structural reconstruction of the Division continued nonetheless. A notable example is incorporating the International Marketing Department into PARD, which enables us to better coordinate marketing efforts and utilize resources more efficiently. The Public Affairs Department also went through a significant overhaul following the retirement of its director and staff.

Staffing vacant positions within PARD continues to be a challenge, with the uncertainty that the COVID19 crisis brought to the labor market being a contributing factor. Nonetheless, we were able to staff all vacant managerial positions within the Division with highly experienced professionals recruited through a rigorous process.

While the pandemic limited some aspects of our operations, other areas were not affected as drastically. In some cases, we were even able to expand the scope of our work, mainly through applying new digital means.

An excellent example of this trend is the area of visits on campus. While the David and Janet Polak Visitors Center had to close its doors during lockdowns, and the number of visitors went down from 12,427 in 2019 to 2,710 in 2020, PARD produced in collaboration with our societies worldwide, over 50 webinars and online events featuring Technion faculty and management and reaching thousands of people globally. Other significant events held online included the 2021 graduation ceremonies and the 2020 Board of Governors. The new on-campus digital studio was a tremendous asset in our efforts.

The Donor Services department has also undergone a restructuring, as part of which two teams were established to take care of different aspects of donor acquisition, stewardship, and retention.

The mission of the Donor Services department is to ensure that Technion priorities are adhered to throughout the fundraising process, all the while providing the best services to our societies and donors.
The Donor Relations team focuses on donor stewardship. It works closely with Technion management, faculty, and societies to produce tailored materials to present to potential and current donors.

The Gift Administration and Compliance team works with Technion management, research, and administrative staff to produce accurate and feasible budgets, financial reports, and post-gift compliance mechanisms.

In its new structure, the department produced the following over the past year:

- 170 project proposals prepared
- 155 projects were adopted
- 366 reports prepared
- 3,000 scholarships and fellowship personal thank you letters

PARD continued its efforts to expand and increase the Technion's presence in the public eye. Our PR efforts include both traditional and social media. From October 1st, 2020, to June 27th, 2021, we published some 145 press releases (Hebrew and English), 7 newsletters (Hebrew and English), and 2 Technion Magazines (Winter 2020 and Summer 2021) and continued to disseminate news, articles, videos and publish posts on our Hebrew and English social media platforms daily.

FACTS AND FIGURES
2020-**2021**

NEW GIVING 2020-2021

GUARDIANS
2020

Technion Guardians have made the highest level of commitment to the Institute

Helena and Berek Bigos
MN, USA

John Finberg
Tivon, Israel

ISEF-Israel Scholarship Education Foundation

Jeffrey Louis
CA, USA

Bernard and Lusia Milch
NY, USA

Dr. Eric Schmidt
NY, USA

***Steven Schwarz and Henryk Schwarz**, NJ, USA*

Dr. Natalie Shaffer
Montreal, Canada

***Dr. Allan and Goldie Singer and Family**, CA, USA*

Estate of Aliza Yemini
Herzliya, Israel

GIFTS
2020-2021

Bernard and Annabel **Abraham** First Steps Fund to Support Assoc. Prof. Ari Turner

Avraham **Ashkenazi** Space Defense Research Fund

Bar-Nir **Bergreen** Family Graduate Student Research Lounge

Olga and Euval Shlomo **Barrekette** Academic Chair

Berrie Foundation Fund for Planning the Advanced Manufacturing Center

Jeremy and Debbie **Brown** Apartment in the Undergraduate Student Village in Memory of M. Harvey Brown

Buncher Family Foundation Gift for CMU-Technion AI Research Partnership

Milton H. **Callner** Fund for the First Steps Program

Chadera Enterprises Ltd. Gift to the Guy Sela Memorial Project

May/Blum/Dahl MRI Research Center

Davis Family Fund for Additive Manufacturing Center

Estate of Sylvia **Davison** to Support Broshim Dorms

Cathy and James **Deutchman** Technion Maintenance Fund

Emerson Family Faculty Recruitment Fund for Prof. Yuval Garini

Field Family Fund for Atidim Program in Memory of Edward J. Field

Fischer Fund for the Development of Undergraduate Courses in the Department of Humanities and Art

Gellman-Lasser Fund for Medical and Biomedical Research and Innovation

Solvin and Wendy **Gordon** Emergency Vehicles

Hittman Family Foundation Biomedical Innovation Fund

Hyman Mitchner Trust Fund

Jerold and Judi **Jacover** Apartment in the Stanley Shalom Zielony GSV

Mark S. **Kahn** Family Fund for Applied Research in Biomedical Engineering and Science

Inge **Marcus** Endowment Fund for the Jack Kadesh Career Advancement Chair

New Giving spans June 1, 2020 to June 31, 2021
A complete list of giving is available at: presidentsreport.technion.ac.il

Frederic and Trisha **Margulies** Fund for the Ofanim Program

Dan **Maydan** Gift for the Neuroscience Collaborative Research Initiative

Mentormore Foundation Gift to the Guy Sela Memorial Project

Hy and Myrna **Mitchner** Lapidim Lounge

David and Janet **Polak** Family Distance Learning Studio

Victoria and Robert **Polak** Fund for the Amos Horev Sports Arena

Morton and Beverley **Rechler** Family Foundation Faculty Prizes for Excellence in Research

Benjamin **Reznik** Fund for Applied Technology Development for the Defense and Security of Israel

Said **Cohen** Foundation Atidim Program Fund

Dr. Natalie **Shaffer** Distance Learning Studio

Prof. Amnon **Shashua** Gift to Support Prof. Tamir Hazan's Research

Paul and Deane **Shatz** Fund to Support Chinese Postdoctoral Researchers

S. Fred **Singer** Fund for the Elevator to Horizon

SolarEdge Technologies Inc. Gift to the Guy Sela Memorial Project

Ullmann Family Foundation Gift to Support GTEP

Avi **Shaked** and Dr. Babs **Waldman** Faculty Recruitment Fund

Wolfson High Field Physics and Attosecond Science

FELLOWSHIPS
2020-2021

Valerie and David **Farkas** Endowed Fellowship Fund

Ghodsian-Fischel Fellowship Fund in the CSST

Eduardo and Graciela **Haim** Fellowship Fund

Ernest **Kretzmer** Doctoral Fellowship

Alden and Lorraine **Leib** Doctoral Fellowship Fund

Florence and Efraim **Margolin** Endowed Fellowship Fund

Milner Foundation Fund for PhD Fellowship Initiative, NJ, USA

Norman **Seiden** Fellowship Fund in Nanotechnology and Optoelectronics

Sherman and Jackier Families Faculty Fellowship Fund

Eli and Doris **Welt** Fellowship Fund

SCHOLARSHIPS
2020-2021

Scott **Black** Fund for Applied Security Science and Technology Research in Honor of Julia Simone Black

Desiree and Max **Blankfeld** Scholarship Fund

Scholarship Fund Donated by the Estate of Tzili and Lipa **Porat**

Jerome L. **Schostak** Endowed Scholarship Fund

Schulich Leaders Entrepreneurship Program

GUARDIANS

*Technion Guardians through the generations**

A

Menachem and Carmela Abraham, MA, USA
Adelis Foundation, France
Dr. Miriam and Sheldon G. Adelson Medical Research Foundation, MA, USA
Catherine and Frederick R. Adler, NY & FL, USA
Nathan Adler Stier, Argentina
Alon Family Foundation, CA, USA
Paul and Sherry Altura, CA, USA
Maurice Amado Foundation, CA, USA
Amdocs Ltd., Israel
Annenberg Foundation, PA, USA
Carl and Iris Barrel Apfel, FL, USA
Applied Materials Foundation, CA, USA
Eng. Paul S. Arieli (Goldschmidt) and Dr. May Arieli, Israel
Arison Foundation, FL, USA / Tel Aviv, Israel
Lester Aronberg Foundation, IL, USA
Norman and Helen Asher, IL, USA
Avraham and Patricia Ashkenazi, VA, USA
Victor and Efpichia Asser, Athens, Greece
Automatic Data Processing, Inc., NJ, USA
Florette and Henri Avram, Paris, France
Itice Avram, Paris, France
David and Stephanie Azrieli, Montreal, Canada

B

Morton and Selma Bank, FL, USA
Bank Hapoalim, Israel
Ovadia Barazani's Foundation, Haifa, Paris, London
Samuel Barliant Family, IL, USA
Daron and Ron Barness Family, AZ, USA
Matilda and Gabriel Barnett, CA, USA
Dr. Euval and Olga Barrekette, NY, USA
Syd Barrel, FL, USA
Claire S. Behar, CA, USA
Bellock Family - Florence and Jack, FL, USA
Madeleine Morrison and Chuck, CO, USA,
Emily and Steven, MI, USA
Hilda and Manasche Ben Shlomo Foundation, Liechtenstein
Miriam B. and Louis J. Benjamin, FL, USA
Yoda Leon and Luna Benoziyo, Lausanne, Switzerland
Dr. Irving and Jeanette Benveniste, CA, USA
Beracha Foundation, Jerusalem, Israel
Evelyn Berger, PA, USA
Ilene and Steve Berger, PA, USA
Bar-Nir Bergreen Family, PA, USA
Ruth Berkowitz, Switzerland
Randy L. and Melvin R. Berlin Family, IL, USA
Russell Berrie Foundation, NJ, USA
Helena and Berek Bigos, MN, USA
Jerry and Evelyn Bishop, NY, USA
Scott M. Black, MA, USA
Dahlia and Ilan Blech, CA, USA
Neri and Bernard Bloomfield, Montreal, Canada
James D. Blum, MD, USA
Harold and Penny B. Blumenstein, MI, USA
Richard C. and Carol Blumenstein, MI, USA
Simon and Tekla Bond, NY, USA
Octav Botnar, Switzerland
Samuel and Millicent Broadwin, FL, USA
Frances Brody, CA, USA
Dita and Yehuda Bronicki, Yavne, Israel
Jack Buncher Foundation, PA, USA
Bundesrepublik Deutschland, Bundesministerium für Bildung und Forschung, Bonn / Berlin, Germany
Paul and Rodica Burg, CA, USA
Marshall and Marilyn Butler, NY, USA

*The Guardians listing is correct through 2020.

C

Caesarea Edmond Benjamin de Rothschild Foundation, Caesarea, Israel
Milton H. Callner Foundation, Joan C. Miller and Family IL, USA
Arie Carasso, Israel
Macabi and Matty Carasso, Herzliya, Israel
Moshe Carasso and Sons Ltd., Tel Aviv, Israel
Yoel and Stella Carasso, Ramat Gan, Israel
Fausta Carli, Gilberto Finzi, Italy
Ruth S. Carne, FL, USA
Caster Family, PA, USA
Yoram and Zahava Cedar and their Trustees, CA, USA
Stanley and Pamela Chais, CA, USA
Leona and Marcy Chanin, NY, USA
Paul and Carol Chanin, FL, USA
Dr. Lillian Chutick, NY, USA
Dr. Rebecca Chutick, NY, USA
Said Cohen Foundation, CA, USA
Jacob and Rosaline Cohn, IL, USA
Marcia Cohn, Il, USA
Jerome J. Cole, IL, USA
Joan and Reginald Coleman Cohen, Brighton, England
Alex and Tina Coler, CA, USA
Sydney and Florence Cooper, Toronto, Canada
Elizabeth and Sidney Corob, London, England
Jeffrey Cosiol, NJ, USA & Costa Rica
Crown Family, IL, USA
Dr. Gilbert and Betsie Cullen, MD, USA

D

Haron Dahan Foundation, MD, USA
Barbara and William Dahl, NC, USA
Ruth and Gerard Daniel, FL, USA
Davidow Charitable Fund, CA, USA
William Davidson, MI, USA
Rebecca and Oscar Davis, NY, USA
Simon and Annie Davis Foundation, NY, USA
Rosalee C. and Richard S. Davison, MD, USA
André Deloro, Monaco
Frances and Ralph DeJur, NY, USA
Relly and Brent Dibner, MA, USA
Dibner Fund, a Family Foundation, CT, USA
Digital Equipment Corp., MA, USA
Helen Diller Family Foundation, CA, USA
Jay "Yechiel"and Nilly Dor, FL, USA and Tel Aviv, Israel
Max and Lottie Dresher, IL, USA
Jerome and Sylvia Drexler, CA, USA
Eleanor and Mel Dubin, NY, USA

E

Louis Edelstein Family, NJ, USA
Alvin and Helene Eicoff Charitable Foundation, IL, USA
Eldee Foundation, Montreal, Canada
George Elbaum and Mimi Jensen, CA, USA
Elron Electronic Industries Ltd., Haifa, Israel
Carla and Dr. Hugo Elsbach-Hertzdahl Estate, Israel
Col. J.R. and Anna Tulin Elyachar, NY, USA
The Emerson Family, CA, USA
Dr. Joseph N. and Beatrice B. Epel, MI, USA
Carol B. Epstein, MD, USA
E. Ike Eshaghian Foundation, NY, USA
Alex J. and Toby Etkin, MI, USA

F

Hortense and Lawrence Fairberg, CT, USA
Israel and Elizabeth F. Feldman, MD, USA
Ben and Fanny Fieldman, CA, USA
Helgard and Irwin S. Field, CA, USA
Lotte Fields, NY, USA
John Finberg, Tivon, Israel
Sylvia and David I. A. Fine, CA, USA
Minnie and Ruben Finkelstein, CA, USA
Joseph and Edith Fischer, CA, USA
Jess and Mildred Fisher Family, Washington D.C., USA
Dr. Regina Flesch, PA, USA
Ruth Elaine and Stan Flinkman, CA, USA
David and Paula Flitner, WY, USA
Eva and Dov Florian on behalf of Joseph Florian Memorial Fund, Haifa, IL
Benjamin and Lena Fohrman, CA, USA

Fohs and Sohn Families, OR, USA
Hilda and Rudolph Forchheimer, NY, USA
Alan and Tatyana Forman, NY, USA
Reinhard Frank, MA, USA
Ben and Florence Free, FL, USA
Joseph and Sharon Freed, MI, USA
Aron and Ruth Frenkiel and Family FL & NY, USA
Hilda Friedland, FL, USA
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Elisha M. Friedman, NY, USA
Dr. Orrie and Laurel Friedman, MA, USA
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Linda and Michael Frieze, MA, USA
Estate of Eugenie Fromer, NY, USA
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Rosalind Fuerst, NY, USA
FS Foundation, MN, USA

G

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Terry and Shifra Gardner, TX, USA
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German-Israel Foundation for Science and Development, Jerusalem, Israel; München, Germany
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Dr. Andrew and Aviva Goldenberg, Toronto, Canada
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Bess and Paul Goldings, NY, USA
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Howard and Anne Gottlieb, IL, USA
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Emanuel Green, FL, USA
Henry D. Greenspahn, IL, USA
Herman and Gertrude Gross, NY, USA
Irwin and Linda Gross, PA, USA
Jeanne and Bela Grunberger, France
Joseph S. and Caroline Gruss, NY, USA
Rosalind and Joseph Gurwin, NY, USA
Monroe Guttmann Foundation, PA, USA
Miriam and Aaron Gutwirth Fund, Tel Aviv, Israel
Nahum Guzik, CA, USA

H

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Uzi and Michal Halevy, TX, USA
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Homer and Gloria Harvey, CA, USA
Morven and Michael Heller, London, England
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Paula Herschberg, NY, USA
Hewlett-Packard, CA, USA
Beverly And Charles Hirsch, IL and FL, USA
Jon and Melissa Hirschtick, MA, USA
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Eddie and Sala Hudes, CA, USA

I

William Ingram, CA, USA
Intel Israel Ltd., Israel
ISEF-Israel Scholarship Education Foundation

J

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Lawrence and Eleanor Jackier, MI, USA
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Shirlee Jacobs, FL, USA
Leon and Ben Jacobson Foundation, Ra'anana, Israel
Jarndyce Foundation, Switzerland
Max And Rachel Javit, FL, USA
Family of Ludwig Jesselson, NY, USA
Julis/Dalven/Rabinowitz Family, CA, USA

K

Kadoorie Charitable Foundations, Hong Kong
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Sanford Kaplan Family, CA, USA
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Jack And Candee Klein, CA, USA
Michael F. Klein, MD, USA
Stephen B. Klein, PA, USA
Dr. Isaac and Judy Kliger, MA, USA
Amb. Philip M. and Ethel Klutznick, IL, USA
Dorothy Kobritz and Anthony Rios, FL, USA
Frances and Leo Kogan, CA, USA
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Sidney and Vivian Konigsberg, CA, USA
Anna and Alexander Konoff, NY, USA
Jon-David Koppel, FL, USA
Koret Foundation, CA, USA
Yaacov and Batya Kotlicki, Tel Aviv, Israel
Jacob L. Kram, NJ, USA
Margaret Strauss Kramer, FL, USA
Theodore H. and Joan Krengel, IL, USA
Helen G. Kruger, FL, USA
George and Hannah Krumholz, FL, USA
Sybil and Reuben Kunin, Toronto, Canada
Saul and Gitta Kurlat, MA, USA
The Kurzbauer Family, DC, USA and Amsterdam, Netherlands
Kyocera Corporation, Kyoto, Japan

L

Land Niedersachsen, Ministerium für Wissenschaft und Kultur, Hannover, Germany
Benny and Patrisia Landa, Israel
Noemi and Jacques Landau, NY, USA
Stephen A. Laser, IL, USA
Lois and Leonard Laser, IL, USA
Ronald S. and Jo Carole Lauder, NY, USA
Scott J. and Susan S. Leemaster, MI, USA
Rose Lefkowitz, Toronto, Canada
Legacy Heritage Fund Limited, NY, USA
Corina Legrain, Barcelone, Spain
Henry J. Leir, CT, USA
William M. and Gloria Lester, FL, USA
Leumi, Israel
Dr. Seymour Levine, NJ, USA
Velva G. and H. Fred Levine, TX, USA
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Meyer (Max) Lewin Estate, WV, USA
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Prof. Jacques and Dr. Colette Lewiner, Paris, France
Eric and Leza Lidow, CA, USA
Mark and Claire Boonov Litchman, WA, USA
Lorry I. Lokey, CA, USA
Jeffrey Louis, CA, USA
Norman and Trudy Louis, CA, USA
Samuel and Claire Luffman, FL, USA
Herbert and Marianna Luxenberg, OH, USA
Estate of David Lyman, HI, USA
Natalie B. and Arthur J. Lyons, FL, USA

M

Bernard L. Maas Foundation, MI, USA
Alex and Mary Mackenzie, FL, USA
Dr. Saul Mackoff, IL, USA
Robert and Ruth Magid, Sydney, Australia
Ruth Mahler, FL, USA
Miriam Malach, NY, USA
Alexandre Mallat, Paris, France
Claude and Alfred E. Mann, CA, USA
Hal and Inge Marcus, WA, USA
William and Cynthia Marcus, MA, USA
Jennie and Dorothy Markowitz Trust, IL, USA
Sonia Marschak, IL, USA
Mauerberger Foundation Fund, Cape Town, South Africa
Dalia and Dan Maydan, CA, USA
Medvedi, Shwartzman and Gensler Families, Israel
Rafi (Raphael) Mehoudar, Tel Aviv, Israel
Marjorie Meltzer, NY, USA
Eta Meilichson, Herzliya, Israel
Frank and Sharon Meyer, CA, USA
Andre and Bella Meyer Foundation, NY, USA
Philippe Meyer, Paris, France
Vincent Meyer, London, UK
Joseph Meyerhoff Fund, MD, USA
Bernard and Lusia Milch, NY, USA
Maxwell E. and Frieda Miller, NJ, USA
Amos and Anna Milo, FL, USA
Minerva-Stiftung, München, Germany
Marianne Minkoff Lerner, FL, USA
Jessie Kaplan Mintz, CO, USA
Raphael and Miriam Mishan, NJ, USA
Dr. Hyman and Myrna Mitchner, CA, USA
Selma T. Mitrani, PA, USA
Mitrani Family Foundation, NY, USA
Maxine and Monte Monaster Foundation, IL, USA
Monterey Design Systems, Inc. CA, USA
Ilana and Martin Moshal
Dr. Morton and Toby Mower, MD, USA
Peter Munk, Toronto, Canada
Dr. Alfred Munzer and Mr. Joel Wind, MD, USA
David and Inez Myers Foundation, OH, USA

N

Hubert and Lisette Nassau, London, England
Bernice and Ruth Nathenson, IL, USA
Samuel Neaman, CA, USA
Abraham Nemes, Haifa, Israel
Albert and Jean Nerken, NY, USA
Neubauer Family Foundation, PA, USA
Bela B. and Clara Nevai Charitable Foundation, FL, USA
Naomi and Jon Newman, WA, USA

O

Or Yarok, Israel
Bernard and Barbro Osher, CA, USA

P

Curt and Eleanor Parker, IL, USA
Gertrude and Raymond L. Pepp, CA, USA
Beth S. Perlman, MD, USA
Laura and Isaac Perlmutter Foundation, FL, USA
Jeannette and Emery Pick, CA, USA
David and Janet Polak, CA, USA
Victoria and Robert Polak, IL, USA
Sandy and Herb Pollack, MA, USA
Edith and Israel Pollak Foundation, Tel Aviv, Israel
Malka and Simha Pratt, Israel

R

Gabriella and Shlomo Rakib, CA, USA
Leonid and Alexandra Raiz, MA, USA
Sully Rapkin, FL, USA
Bruce and Ruth Rappaport, Geneva, Switzerland
Rashi Foundation, Israel
Sacta-Rashi Enterprises, Geneva, Switzerland
Shirley and Manny Ravet, CA, USA
The Ravitz Foundation founded by Edward Ravitz, MI, USA
Maria and Joseph Rebhun, CA, USA
Morton and Beverly Rechler Family Foundation, Inc.,

NY, USA
Rudolph Reese, FL, USA
Clara Reiss, NY, USA
Barbara and Frank Resnek, MA, USA
Hilda A. and Hershel M. Rich, TX, USA
Milton Richter and Daniel I. Friss, FL / NY, USA
Eugene N. Riesman, Montreal, Canada
Lloyd E. Rigler - Lawrence E. Deutsch Foundation, CA, USA
Dorothy Kobritz and Anthony Rios, FL, USA
Edward G. and Paula Robison, FL, USA
Abraham and Sonia Rochlin Foundation, NV, USA
Morris and Renée Rochlin, MI, USA
Helen and Louis B. Rogow, CT, US
Ilsa Rooz Trust, IL, USA
Barrie Rose, Toronto, Canada
David Rose, NY, USA
Frederick P. Rose, Daniel Rose, Elihu Rose, NY, USA
Betty and Raymond Rosen, CA, USA
Michele and Maurice M. Rosen, PA, USA
Irving and Adele Rosenberg Foundation, Inc., NY, USA
Claire and Emanuel G. Rosenblatt, FL, USA
Ben and Esther Rosenbloom Foundation, MD, USA
Grace and Martin Rosman, MD, USA
Eric and Lore Ross, NJ, USA
Sheldon R. Roth Family, AZ, USA
Henry M. and Lillian R. Rothberg and Family, FL, USA
Steven and Beverly Rubenstein Charitable Foundation, NJ, USA
Allan Rubin, FL, USA
Arthur Rubloff, IL, USA
Julia and Joshua Ruch, NY, USA

S

Edmond J. Safra Philanthropic Foundation, Vaduz, Liechtenstein
Edmond and Lily Safra, Monaco
The Sagol Family, Tel Aviv, Israel
Ed Satell, PA, USA
Michael and Helen Schaffer Foundation, MA, USA
Dr. Eric Schmidt, NY, USA
Rina and Avner Schneur Charitable Giving Fund, MA, USA
Leonard and Harriet Schley, MA, USA
Seymour and Claire Schonwetter, AZ, USA
Seymour and Tanna Schulich, Toronto, Canada
Steven Schwarz and Henryk Schwarz, NJ, USA
Harvey L. Segal, Washington DC, USA
Vilma and Ladislas Segoe, OH, USA
Joan and Arnold Seidel, CA, USA
Barbara and Norman Seiden, NJ, USA
Les and Eileen Seskin, FL and PA, USA
Dr. Natalie Shaffer, Montreal, Canada
Avi Shaked and Dr. Babs Waldman, IL, USA
Prof. Rachel and Uriel Shalon, Haifa, Israel
William and Sophia Shamban, CA, USA
Andy and Kathy Shapiro, NJ, USA
Eugene and Marlene Shapiro, AZ, USA
Paul and Deane Shatz, Washington, D.C., USA
Sholom and Theda Shefferman, MD, USA
Max and Amparo Shein, Mexico City, Mexico
Irving and Sue Shepard, MS, USA
David Shepherd, London, England
Jane F. and D. Larry Sherman, MI, USA
Leonard and Diane Sherman, IL, USA
Honey and Barry Sherman, Toronto, Canada
Nate H. Sherman Foundation, IL, USA
Claire and Norton Sherman, MA, USA
Dr. Merry Sherman and Dr. Mark Saifer, CA, USA
Robert ("Dr. Bob") and Mao Shillman, MA, USA
Sylvia and Stanley Shirvan, NJ, USA
Ramie and Gerald Silbert, NY, USA
Roslyn and Julius Silver, CT, USA
David and Edith Simchi-Levi, MA, USA
Dr. Allan and Goldie Singer and Family, CA, USA
Irving and Branna Sisenwein, CA, USA
Bernard Sklar, AZ, USA
Jean and Jack Skodnek, FL, USA
Kenneth Skodnek MD, NY, USA
Richard P. Skodnek MD, FL, USA
Scott Skodnek, FL, USA
The Slater Family, MA and FL, USA
Michel and Esther Smidof, Geneva, Switzerland, FL, USA
Jerry B. Smoler Family, IL, USA
Janet Shatz Snyder, MD, USA
Sir Michael Sobell, Surrey, England
Edna and Jonathan Sohnis, NY, USA

Sheldon H. Solow Foundation, NY, USA
Samuel and Helene Soref Foundation, FL, USA
Ben and Shelley Sosewitz, IL, USA
Bernard Spira, CA, USA
Jacques H. Spreiregen, Monaco
Louis and Bessie Stein Family Foundation, PA, USA
Harry Stern Family Foundation, PA, USA
Harry J. and Lou Stern, NY, USA
Maria Steuerman, NY, USA
Robert, Yan and Samantha Stewart, MI, USA
Karl Stoll, NY, USA
Stone Family, Canada / USA
Estate of Harry H. Stone, OH, USA
Janice and Stanley H. Sussman, FL, USA
Janey and Albert Sweet, CA, USA
Gerard Swope, CT, USA

T

Dr. S. Jerome and Judith D. Tamkin, CA, USA
Bernice and Joseph Tanenbaum, NY, USA
Jordan and Irene Tark, IL, USA
Henry and Marilyn Taub and Family, NJ, USA
Joseph and Arlene Taub, NJ, USA
Ann and Andrew H. Tisch, NY, USA
Dr. Sam B. and Eve Topf, FL, USA
Benjamin and Sarah Torchinsky, Canada / Cayman Islands

U

Siegfried and Irma Ullmann Foundation, NY, USA
Anna, Louis and Dr. George Ury, CA, USA

V

Clément Vaturi, Paris, France
Andrew and Erna Finci Viterbi, CA, USA
Volkswagen-Stiftung, Hannover, Germany

W

Wagner-Braunsberg Family Foundation, MD, USA
Louis Waldman, FL, USA
Famille Warszawski, France / Israel
Weill Family Foundation, NY, USA
Drs. Mary and Arthur B. Wein, MD, USA
Charles and Juliette Weissmann, Zürich, Switzerland
Edna and K.B. Weissman, FL, USA
Robert and Carol Weissman, FL, USA
Harry and Mary Werksman, CA, USA
Lewis M. and Libby Weston, NY, USA
Shirley and Arthur Whizin and Shelley and Bruce Whizin, CA, USA
Susan and David Wilstein, CA, USA
Michael and Marilyn Winer, FL & MA, USA
Edith Witrofsky, NY, USA
Roma Broida Wittcoff, MS, USA
Joseph L. Wolf Foundation, MD, USA
Wolfson Foundation, London, England

Y

Moshe Yanai, Kfar Yehezkel, Israel
Estate of Aliza Yemini, Herzliya, Israel
Estate of Mildred Yellen, NY, USA

Z

Kal and Joyce Zeff, CO, USA
Ruth and Allen Ziegler, CA, USA
Shalom Zielony, NY, USA
Edith and Robert L. Zinn, TX, USA
Yehuda and Nava Zisapel, Israel
Zohar Zisapel, Israel
Isaiah and Harriet Zucker, NY, USA
Mortimer B. Zuckerman - Zuckerman Institute, NY, USA

HONORARY DEGREES AND AWARDS

TECHNION MEDAL

Uzia Galil, 1997
Gen. (Res.) Amos Horev, 1996
Irwin Jacobs, 2013
Martin Kellner, 2005
Justice Moshe Landau, 1996
Peter Munk, 2013
Samuel Neaman, 1997
Bruce Rappaport, 1998
Haim Rubin, 1997
Norman Seiden, 2001
Leonard Sherman, 2005
Ben Sosewitz, 2008
Henry Taub, 1998
Dr. Andrew J. Viterbi, 2015
Lewis Weston, 2008
Mortimer B. Zuckerman, 2016

HONORARY DOCTORS*

A

Sir Patrick Abercrombie, 1953
Prof. Anatole de Abragam, 1986
Joseph Ackerman, 2009
Frederick R. Adler, 1998
Prof. Yakir Aharonov, 1992
Elie Alalouf, 2010
Yoram Alster, 2013
Prof. Bernard Amadei, 2017
Walter H. Annenberg, 1991
Prof. Michael Aizenman, 2018
Efraim R. Arazi, 1985
MK Moshe Arens, 1986
Ing. Paul S. Arieli (Goldschmidt), 2003
Ted Arison, 1998
Prof. Alain Aspect, 2011
David J. Azrieli, 1985

B

Justice Aharon Barak, 1998
Alfred J. Bär, 2013
Zahava Bar-Nir, 2009
Prof. The Honourable Dame Marie Bashir AD CVO, 2016
Norman Belmonte, 2005
David Ben Gurion, 1962
Louis Benjamin, 1993
Miriam Benjamin, 1991
Gen. (Res.) Avihu Ben-Nun, 2006
Evelyn Berger, 2006
Prof. E. D. Bergman, 1955
Angelica Berrie, 2008
Prof. Sir Michael V. Berry, 2006
Dr. A. Biram, 1965
Ilan Biran, 2013
Prof. Joan S. Lyttle Birman, 1995
Dr. Joel Birnbaum, 1999
Prof. R. Byron Bird, 1993
Scott Black, 2007
Simha Blass, 1958
Arthur Blok, 1972
Melvyn H. Bloom, 2013
Michael R. Bloomberg, 2016
Bernard M. Bloomfield, 1978
Neri J. Bloomfield, 1990
Erik Blumenfeld, 1992
Prof. David Bohm, 1992
Dr. Niels Bohr, 1958
Dr. Zeev Bonen, 2004
Dr. Carl de Boor, 2002
Prof. Haim Brezis, 1998
Dr. Andrei Zary Broder, 2014
Frances Brody, 2002
Lucien Bronicki, 2007
Yehudit Bronicki, 2007
Prof. Bernard Budiansky, 1995
Marshall Butler, 2001

C

Dr. Santiago Calatrava, 2004
Prof. Alberto P. Calderon, 1989
Arie Carasso, 1988
Prof. Srulek Cederbaum, 2012
Prof. Malcolm Chaikin, 1991
Stanley Chais, 2008
Prof. Herman Chernoff, 1984
Prof. Alexandre Joel Chorin, 2003
Winston S. Churchill, 1997
Dr. Lillian Chutick, 1997
Dr. Joseph Ciechanover, 2017
Prof. Jacob Willem Cohen, 1988
Prof. Morris Cohen, 1979
Prof. Karl Taylor Compton, 1954
Sydney C. Cooper, 1992
Elizabeth Corob, 1993
Sidney Corob, 1986
Prof. Frank A. Cotton, 1983
Edith Cresson, 2011
Lester Crown, 1996

D

P. F. Danel, 1952
Dr. George B. Dantzig, 1973
Robert A. Davidow, 2007
Dr. Duncan Davies, 1982
Dr. Igor Dawid, 2009
Prof. Arnold L. Demain, 2000
Prof. Alan M. Dershowitz, 2014
Bern Dibner, 1976
Prof. François Diederich, 2012
Prof. David L. Donoho, 2017
Gen. Yaakov Dori, 1967
Prof. Israel Dostrovsky, 1994
Max Dresher, 1991
Prof. Mildred S. Dresselhaus, 1994
Prof. Daniel Drucker, 1983
Prof. Jack D. Dunitz, 1990

E

Prof. Beno Eckmann, 1983
Dr. Albert Einstein, 1953
Prof. Odile Eisenstein, 2017
Col. Jehiel R. Elyachar, 1979
J. Steven Emerson, 2013
Dr. Joseph N. Epel, 1994
Carol B. Epstein, 2019
Dr. Moshe Epstein, 2011
Prof. Paul Erdos, 1983

F

Yekutiel Federmann, 1989
Israel Feldman, 2003
Dr. Stuart I. Feldman, 2019
Harry F. Fischbach, 1971
Edith Fischer, 2005
Max M. Fisher, 1991
Dr. F. Julius Fohs, 1957
Dr. William Fondiller, 1949
R. J. Forbes, 1953
Prof. Dr. Alfred Forchel, 2019
Alan Forman, 2011
Prof. Stephen R. Forrest, 2018
Dr. J. Franck, 1953
Reinhard Frank, 2009
Thomas L. Friedman, 2008
Dr. Dov Frohman, 1995
Prof. Gilbert F. Froment, 1984

G

Uzia Galil, 1977
Dr. Jacob M. Geist, 1987
Mark Gelfand, 2011
Raya Gensler, 2002

* Including Doctor of Architecture, Doctor of Science, Doctor of Science in Technology, Honorary Doctor, Honorary Doctor of Science

Emmanuel Gill, 1994
Arthur Gilbert, 1999
Benno Gitter, 1991
Prof. Israel Gohberg, 2008
Alexander Goldberg, 1975
Edward R. Goldberg, 1990
Dr. Emanuel Goldberg, 1957
Gary Goldberg, 2012
Joan Goldberg Arbuse, 1987
Prof. Jose Goldemberg, 1991
Prof. Richard Goldstein, 1994
Prof. Andrew and Aviva Goldenberg, 2018
Dr. Sydney Goldstein, 1969
Prof. Solomon W. Golomb, 2011
Prof. Graham C. Goodwin, 2006
Dr. Bernard Gordon, 2005
Stephen Grand, 2010
Doreen Brown Green, 2014
Joseph Gruss, 1989
Joseph Gurwin, 2004
Dr. Nahum Guzik, 2018

H

Prof. Peter Haasen, 1993
Homer Harvey, 1989
Dr. George H. Heilmeier, 1997
Michael Heller, 2010
President Chaim Herzog, 1987
Sandy Hittman, 2015
Dr. Christian Hodler, 1998
Dr. Nicholas J. Hoff, 1980
Dr. Alan Hoffman, 1986
Prof. Roald Hoffmann, 1996
Prof. Robert Hofstadter, 1985
Gen. (Res.) Amos Horev, 1984
Dr. F. Houphouet-Biogny, 1962
Eli Hurwitz, 1990

I

Isin Ivanier, 1981
Gen. (Res.) David Ivry, 1996

J

Lawrence S. Jackier, 2004
Dr Irwin M. Jacobs, 2000
Ludwig Jesselson, 1988
HE David Johnston, 2016
Prof. Joshua Jortner, 2005
Prof. Michel Jouvet, 1991

K

D. Dan Kahn, 2011
Prof. Thomas Kailath, 2011
Dean Kamen, 2015
Sanford Kaplan, 1995
Dr. Shlomo Kaplansky, 1950
Dani Karavan, 2009
Prof. Marcus Karel, 1991
Prof. Samuel Karlin, 1985
Prof. Theodore von Karman, 1951
Prof. Richard M. Karp, 1989
Prof. Alfred Kastler, 1983
Prof. Ephraim Katzir, 1983
Martin Kellner, 1985
Michael Kennedy Leigh, 1983
Moshe Keret, 2000
Dr. Laurence R. Klein, 1982
Philip E. Klein, 2004
Prof. Leonard Kleinrock, 2010
Prof. Sir Aaron Klug, F.R.S., 1989
Teddy Kollek, 1994
Prof. Karl Ludwig Kompa, 1995
Sidney Konigsberg, 2002
Yaacov Kotlicki, 2011
Theodore H. Krengel, 2001

L

Frank R. Lautenberg, 1984
Benny Landa, 2004
Justice Moshe Landau, 1980
Prof. Rolf W. Landauer, 1991
Prof. Robert S. Langer, 1997
Dr. Stephen A. Laser, 2009
David Laskov, 1975
Dov Lautman, 1995
Dr. Jean-Yves Le Gall, 2018
Prof. Jean Marie Lehn, 2009
François Leotard, 1992
Dr. Richard A. Lerner, 2001
William Lester, 1999
Gustave Leven, 1991
Hubert Leven, 2005
Prof. Michael Levitt, 2015
Prof. Jacques Lewiner, 2016
Emanuel Zvi Liban, 2017
Robert L'Hermite, 1960
Israel Libertovsky, 1987
Arch. Daniel Libeskind, 2008
Eric Lidow, 1984
Prof. Anders Lindquist, 2010
Sir Ben Lockspeiser, 1952
Lorry I. Lokey, 2007
Dr. Walter C. Lowdermilk, 1952
Prof. Robert E. Lucas, Jr., 1996

M

Prof. Thomas L. Magnanti, 2007
Alexandre Mallat, 2002
Prof. Stéphane Mallat, 2019
Alfred E. Mann, 2005
Galia Maor, 2010
Harold Marcus, 2012
Inge Marcus, 2018
Prof. Rudolph A. Marcus, 1998
Dr. Herman F. Mark, 1975
Prof. Krzysztof Matyjaszewski, 2015
Dr. Dan Maydan, 2001
Raphael Mehoudar, 2014
Zubin Mehta, 2013
Etia Meilichson, 1997
Chancellor Dr. Angela Merkel, 2021
Prof. Angelo Miele, 1992
Dr. Hyman Mitchner, 2010
Gen (Res.) Amram Mitzna, 2010
Dr. A. I. (Ed) Mlavsky, 1994
Dov Moran, 2016
Martin Paul Moshal, 2017
Prof. Klaus A. Müllen, 2018
Prof. Benno Müller-Hill, 2000
Peter Munk, 2001
Dr. J. Fraser Mustard, 1995

N

Avinoam Naor (Aharonovich), 2008
Ruth Leventhal Nathanson, 2010
Samuel Neaman, 1982
Dr. Yuval Ne'eman, 1966
Shlomo Nehama, 2006
Robert Neter, 1999
Joseph Neubauer, 2017
Dr. Caroll V. Newsom, 1958
Itzhak Nissan, 2012
M. Novomeysky, 1957

O

Harry Oppenheimer, 1989
Dr. Eli Opper, 2012
Prof. Simon Ostrach, 1986

P

Prof. Amnon Pazy, 2006
Lois Peltz, 2006
Dr. Arno A. Penzias, 1986
Shimon Peres MK, 1985
Prof. Lev Pitaevskii, 2010
David Polak, 2009
Israel Pollack, 1993
Rachel Pollak, 2005
Manes Pratt, 1968
Dan Propper, 1999

R

Dr. I. I. Rabi, 1963
Yitzhak Rabin MK, 1990
Prof. Seymour Rabinowitz, 1991
Bruce Rappaport, 1979
Ruth Rappaport, 2014
Dr. Johannes Rau, 2000
Leon Y. Recanati, 1999
Arnold Recht, 1999
Prof. L. Rafael Reif, 2017
Prof. James R. Rice, 2005
Hershel Rich, 1998
Dr. L. A. Richards, 1952
Louis B. Rogow, 1988
Barrie Rose, 2000
Daniel Rose, 2013
David Rose, 1961
Edward E. Rosen, 1966
Maurice M. Rosen, 1978

Prof. Azriel Rosenfeld, 2004
Prof. Alvin E. Roth, 2013
Joel S. Rothman, 2015
Baroness Ariane de Rothschild, 2018
Sir Evelyn de Rothschild, 1982
Lord Rothschild, 1968

S
Rabbi Lord Jonathan Sacks, 2018
Moshe Safdie, 2019
Lily Safra, 2018
Sami Sagol, 2019
Dr. Henry Samueli, 2005
George Sarton, 1953
Ed Satell, 2016
Prof. Harold A. Scheraga,1993
Dr. M. Schiffer, 1972
Maximilian Schlomiuk, 1989
Michael Schor, 1985
Seymour Schulich, 2007
Prof. Helmut Schwarz, 2000
Al Schwimmer, 1968
Joan Seidel, 2012
Norman Seiden, 1986
J. R. Sensibar, 1963
Dr. Donna Shalala, 1994
Prof. Rachel Shalon, 1988
Prof. Ascher H. Shapiro, 1985
Max Shein, 1993
Irving A. Shepard, 2001
Dr. Bernard Sherman, 2004
Leonard H. Sherman, 1994
Dr. Robert J. Shillman, 2018
Stanley Shirvan, 2006
Avraham B. Shochat, 2002
George P. Shultz, 1992
Gil Shwed, 2004
Ramie Silbert, 1996
Julius Silver, 1971
Prof. Barry Simon, 1999
Dr. David J. Skorton, 2016
Haim Slavin, 1958
Prof. Richard E. Smalley, 2004
Prof. Louis D. Smullin, 1986
Dr. Solomon H. Snyder, 2002
Michael Sobol, 1980
Jonathan Sohnis, 2008
Ben Sosewitz, 1999
Prof. Jason L. Speyer, 2013
Dr. Philip Sporn, 1960
Prof. Günter Spur, 2012
Prof. Peter J. Stang, 2014
Eugene Stearns, 1986
Harry J. Stern, 2000
Prof. Eli Sternberg, 1984
Ing. Isaac (Eddie) Streifler Shavit, 2003
Prof. Werner Stumm, 1989
Prof. Nam Pyo Suh, 2007
Dr. Avraham Suhami, 1981
Albert Sweet, 2014
Gerard Swope, 1957
Joseph Szydlowski, 1984

T
Joseph Tanenbaum, 2007
Henry Taub, 1983
Marilyn Taub, 2014
PM Margaret Thatcher, 1989
Prof. Edwin L. Thomas, 2016
Dr. Lester C. Thurow, 2001
Laurence A. Tisch, 1989
Gen. Dan Tolkowsky, 1982
Sam B. Topf, 1992
Prof. Barry M. Trost, 1997
Abraham Tulin, 1957

U
Jacob W. Ullmann, 1980
Dr. Harold C. Urey, 1962
Prof. Heinrich Peter Klaus Ursprung, 1996

V
Dr. Yossi Vardi, 2009
Dr. Andrew J. Viterbi, 2000

W
Dr. Selman A. Waksman, 1966
Eyal Waldman, 2016
Prof. Arieh Warshel, 2015
Sanford I. Weill, 2015
Prof. Felix J. Weinberg, 1990
Aharon Weiner, 1971
Nina Avidar Weiner, 2019
Prof. Victor F. Weisskopf, 1989
Prof. Charles Weissmann, 2015
Dr. Chaim Weizmann, 1952
Eitan Wertheimer, 2011
Stef Wertheimer, 1992
Lewis Weston, 1996
Prof. Elie Wiesel, 2005
Dr. Eugene Paul Wigner, 1971
Dr. Shmuel Winograd, 1992
Ben Winters, 1993
Dr. J. Wolfowitz, 1972
Lord Leonard Wolfson, 1995
Prof. Chi-Huey Wong, 2007
Dr. Robert B. Woodward, 1966
J. W. Wunsch, 1955

Y
Prof. Rosalyn Sussman Yalow, 1989
Moshe Yanai, 2012
Elisha Yanay, 2013

Z
Dr Felix Zandman, 1997
Prof. Bruno Zevi, 1990
Stanley Zielony, 2003
Zvi Zilker, 2000
Yehuda Zisapel, 2001
Zohar Zisapel, 2001

HONORARY FELLOWS**

A
Giora Ackerstein, 2010
Reuven Agassi, 2008
Dr. Qanta Ahmed, 2015
Aron Ain, 2014
Dr Kenneth Alberman, 1995
Ruth Alon, 2013
Carl Alpert, 1988
Yosef Ami, 1990
Sarah Arenson, 2019
Helen Asher, 1991
Victor Asser, 2009
Drora Avissar, 2012

B
Alfred J. Bär, 1995
Moshe Bar-Ilan, 1995
Zahava Bar-Nir, 2004
Itzhak Bar-Nov, 1992
Sarah Baruchin, 1986
Albert Ben-David, 1990
Brig. Gen. (Res.) Yitzhak Ben Dov, 2003
Jack Bellock, 2000
Norman Belmonte, 1997
Louis Benjamin, 1986
Miriam Benjamin, 1986
Evelyn Berger, 2001
Ilene and Steve Berger, 2017
Stephen Berger, 1982
Sondra Berk, 2014
Samuel M. Bernstein, 1975
S. J. Birn, 1965
Franklin G. Bishop, 1991
Scott Black, 1999
Helene Blanc, 1991
Morley Blankstein, 1981
Ela Rousso de Blasbalg, 1993
Dahlia Blech, 2004
Arthur Blok, 1954
Melvyn H. Bloom, 1993
Harry J. F. Bloomfield, Q.C., 2015
Ilse Blumenfeld, 2009
Milford Bohm, 1999
Rebecca Boukhris, 2015
David Brecher, 2004
Frances Brody, 1992
Gen. (Res.) Shlomo Burstein-Inbar, 2008
Marshall Butler, 1994

C
Joan Callner Miller, 1984
Dr Coleman Caplovitz, 2007
Arie Carasso, 1976

Benjamin Carasso, 2004
Macabi Carasso, 2007
Yoel Carasso, 2007
Stanley Chais, 2002
Leona Chanin, 2004
Paul Chanin, 1993
Jack Chisvin, 1983
Frances Cohen, 1984
Simcha Cohen-Stern, 1999
Hans Cohn, 2003
Reginald Coleman-Cohen, 1983
Alexander Coler, 1988
Maurice Commanday, 1986
Sydney Cooper, 1988
Eedis Cooperband, 1981
Jeffery Cosiol, 2012

D

Jeannette Dankner, 2005
Robert Davidow, 1997
Oscar Davis, 2011
Albert Deloro, 2014
André Deloro, 2009
Brent Dibner, 2013
David Dibner, 2001
Prof. Dr Ing. Ulrich Draugelates, 2002
Max Dresher, 1985
Jerome Drexler, 1999
Melvin Dubin, 1991
Zvi Dvoresky, 1993
Dr. Isaac Dvoretzky, 2006

E

Louis Edelstein, 1995
Dr. George Elbaum, 2016
Anna Tulin Elyachar, 1983
Col. Jehiel R. Elyachar, 1953
Rita Emerson, 2016
J. Steven Emerson, 2008
Dr Joseph N. Epel, 1987
Carol B. Epstein, 2009
Alex J. Etkin, 1995
Aaron Etra, 2004
Joseph K. Even, 1991

F

Yekutiel Federmann, 1978
Israel Feldman, 1992
Rod Feldman, 2014
Elias Fife, 1955**
Ruben Finkelstein, 1985
Fausta Finzi Carli, 2011
Edith Fischer, 2001
Ruth Elaine Flinkman-Marandy, 2012
Benjamin Fohrman, 1991
Rudolph Forchheimer, 1997
Alan Forman, 2005
Reinhard Frank, 2004
Benjamin Free, 1991
Joseph Freed, 1998
David Friedman, 2001
Jerry Friedman, 1993
Michael Frieze, 2000
Michael Fuerst, 2010
Dr. Hiroshi Fujiwara, 2018
Samuel Fryer, 1959

G

Mark Gaines, 2017
Dr. Terry Gardner, 2017
Mark Gelfand, 2008
Samuel Geltman, 1998
Raya Gensler, 1994
Moshe Bernard Gitter, 1979
Dr. Amit Goffer, 2015
Aviva Goldberg, 2010
Gary Goldberg, 2005
Nathan Goldberg, 1977
Joan Goldberg Arbuse, 1982
Nathan Max Goldman, 1992
Horace W. Goldsmith, 1975
Ing. Aharon Goldstein, 1971
Salomon Gottesfeld, 1985
Ben-Ami Gov, 2010
Salman Grand, 1986
Doreen Green, 2000
Irving Greenberg, 1990
Marguerite Greenberg, 2000
Coleman Kenneth Greidinger, 2006
Chaim M. Gringlas, 1989
Irwin L. Gross, 2007
Josef Gruenblat, 1979
Joseph Gurwin, 1996
Dipl. Ing. Helmut Gutmann, 1994
Aaron Gutwirth, 1978

H

Uzi Halevy, 2014
Dr. Harry Handelsman, 2011
Tamara Handelsman, 1998
Robert Hanisee, 2016
Burt I. Harris, 1987
Louis Harris, 1988
Lawrence Harvey, 1977
Leo M. Harvey, 1972
Alexander Hassan, 1975
Max Hecker, 1954
Tess Heffner, 1994
Michael Heller, 2002
Rose Herrmann, 1978
Sandy Hittman, 2009
Dr. Christian Hodler, 1994
Ruth Hoenich, 2001
Zeev Holtzman, 2016
Charles Housen, 1997

I

Ivoncy Ioschpe, 1997
Dr. Jacob Isler, 1970
Ing. Shaul Ivtsan, 2006

J

Joseph H. Jackier, 1985
Lawrence Jackier, 2000
Jacobs K. Javits, 1973
Martin Jelin, 1985
Ludwig Jesselson, 1973
Anatol Josepho, 1980
Mitchell Julis, 2019
Prof. Eliahu I. Jury, 2001

K

D. Dan Kahn, 2006
Shmuel Kantor, 1989
Daniel Karp, 1994
Eyal Kaplan, 2016
Dr. Albert A. Kaufman, 1991
Dorothy Kellner, 1999
Leon Kempler OAM, 2008
Adelaide Kennedy Leigh, 1991
Michael Kennedy Leigh, 1975
Avi Kerbs, 2015
Nathan Kirsch, 1984
Michael Klein, 2010
Philip E. Klein, 1998
Stephen B. Klein, 2016
Sidney Konigsberg, 1997
Alexander Konoff, 1949**
Richard Aaron Koplow, 1992
Yaacov Kotlicki, 2006
Linda Kovan, 2019
Abba Kramer, 1988
Theodore Krengel, 1984
Reuben Kunin, 1991

L

Yeshayahu Landau, 1992
Ing. Zvi Langer, 1981
Dr. Stephen A. Laser, 2003
Ron Lazarovits, 2013
Scott Leemaster, 2009
Sidney Lejfer, 2011
Prof. Yossi Leshem, 2017
William Lester, 1991
Avraham Lev, 1976
Ruth Leventhal Nathanson, 2007
Charles Levin, 2010
Prof. Jacques Lewiner, 2006
Leon Lidow, 1976
Prof. Asger Lindegaard-Andersen, 1995
Louis L. Lockshin, 1979
Trudy Louis, 1994

M

Louis Bernard Magil, 1983
Alexandre Mallat, 1997
Hal Marcus, 2006
William Marcus, 1996
Dr. Shlomo Markel, 2016
Dr. Moshe Marom, 2018
Sonia Marschak, 2015

** Including Honorary Engineers

Justice Roy Matas, 1981
Frank G. Meyer, 2002
Pearl Milch, 1980
Raphael Mishan, 2012
Dr. Hyman Mitchner, 2003
Andre Molleson, 1989
Monte Monaster, 1989
Mark Moshevicz, 1983
Prof. Burkhart Müller, 2001
Ing. Gen. Robert Munnich, 1985

N
Ernest Nathan, 1982
Albert Nerken, 1992
Tzvi Neta, 2009
Albert Newman, 1989
Yehezkel Nussbaum, 1996

O
Seniel Ostrow, 1982

P
Daniel Peltz, 2014
Lois Peltz, 2000
David Polak, 2001
Herbert W. Pollack, 2004
Allen Prince, 2015
Miriam Pushkar, 2000

R
Judge Leonard Rabinowitz, 1984
Rona Ramon, 2018
Norbert M. Rand, 1997
Bennett Rechler, 2009
Hannah Rechler Rabinowitz, 2009
Arnold Recht, 1994
Frank Resnek, 2019
Hershel Rich, 1992
Eugene N. Riesman, 1986
Joseph Riesman, 1976
Morris Rochlin, 2002
Louis Rogow, 1983
Prof. Gerd-Volker Röschenthaler, 2012
Maurice M. Rosen, 1972
Howard Rosenbloom, 2010
Dr. Martin and Grace Rosman, 2018
Shmuel Rotem, 2005
Joel Rothman, 2010
Gyora Rubinstein, 1997
Joshua and Julia Ruch, 2016

S
Nina Sabban, 2004
Eliyahu Sacharov, 1973
Edmundo Safdie, 1991
Ed Satell, 2011
Prof. Dr. Thomas Scheper, 2019
Stefanie Sonia Schreier, 1984
Dorothy Schussheim, 1992
Alf Schwarcbaum, 1983
Arnold Seidel, 2017
Joan Seidel, 2005
Norman Seiden, 1979
Les Seskin, 2018
Emanuel Shachar, 1990
Uriel Shalon, 1982
William Shamban, 1997
Andy Shapiro, 2014
Eugene and Marlene Shapiro, 2019
Dr. Stephen Shapiro, 1993
Dr. Zalman M. Shapiro, 1988
Maurice Meir Shashoua, 2012
Paul M. Shatz, 2011
Max Shein, 1978
Irving A. Shepard, 1988
Harry Sheres, 1989
Beatrice Sherman, 1982
Leonard H. Sherman, 1987
Nate Sherman, 1977
Norton Sherman, 1996
Barnett Shine, 1972
Stanley Shirvan, 1999
David Silbert, 1984
Gerald Silbert, 1993
Ramie Silbert, 1988
Peter Simon, 1993
Cindy Sipkin, 2008
Rafael Sirkis, 2011
Jack Skodnek, 2006
Esther Smidof, 2005
Jonathan Sohnis, 2001
Ben Sosewitz, 1990
Eugene Stearns, 1976
Dr. Gideon Stein, 2019
Louis Stein, 1982
Senator Paul B. Steinberg, 2012
Sir Louis Sterling, 1956
Harry Stern, 1993
Harry J. Stern, 1996
Ivan Stern, 2010
Haim Stoessel, 1999
Harold M. Stone, 1989
Ing. Isaac (Eddie) Streifler Shavit, 1989
Henri Strosberg, 1986
Louis Susman, 1980
Stanley Sussman, 2011
Albert Sweet, 2011
Janey Sweet, 2007
Richard Swig, 1995
Mariane Szego, 2008
Sandor Szego, 2008

T
Victor Tabah, 1973
Joseph Tanenbaum, 2000
L. Shirley Tark, 1979
Henry Taub, 1980
Isaac Taylor, 1977
Dov Tirosh, 1997
Gen. Dan Tolkowsky, 1975
Sam Topf, 1983
Benjamin B. Torchinsky, 1999
Col. Yitzhak Turgeman, 2003

U
Jacob W. Ullmann, 1972
Yona Uspiz, 1994

V
Clément Vaturi, 1993
Lauren and John Veronis, 2019
Dan Vilenski, 2005

W
Dr. Arthur Wein, 1998
Naomi Weiss Newman, 2014
K. B. Weissman, 1997
Eli Welt, 2002
Irving Wenger, 1991
Mary Werksman, 1996
Lewis M. Weston, 1987
Alexander Whyte, 1972
William Wiener, 2005
Irma Wigdor, 1984
Dan Wind, 1996
Ben Winters, 1991
Roma Broida Wittcoff, 1992
Sir Isaac Wolfson, 1956
Sidney Wolberg, 1989
The Hon. Laura Wolfson Townsley, 2012
Abel Wolman, 1972
Joseph W. Wunsch, 1946**
Susan Raymer and Benjamin Wygodny, 2017

Y
Solm Yach, 1980
Elisha Yanay, 1998
Chaim Yaron, 2009

Z
Shlomo Zabledowitz, 1984
Samuel Zabner, 1992

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Avi Nathan, 2019
David Perlmutter, 2018
Guido Pardo-Roques, 2019

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Barbara Dahl, USA
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Robert Davidow, USA
Robert Davis, USA
John Davison, USA
Brent Dibner, USA
Shimon Dick, Israel
Prof. Alon Dumanis, Israel
Moshe Dunie, USA
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Irwin Field, USA
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Uri Frank, Israel
Prof. Eby Friedman, USA
Iaqueaniello Gaetano, Italy
Mark Gaines, USA
Jacques Garih, France
Itschak Gat, Israel
David Gat, Israel
James Gertler, USA
Zohar Gilon, Israel
Sam Ginsburg, USA
Dr. Amit Goffer, Israel
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Ben-Ami Gov, Israel
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Sir Michael Heller, Great Britain
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Yaacov Kotlicki, Israel
Prof. Gabriel P. Krestin, Netherlands
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Grace Rosman, USA
Helio Bruck Rotenberg, Brazil

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Kobi Rozengarten, Israel
Joshua Ruch, USA
Julia Ruch, USA
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Benny Schnaider, Israel
Arik Schor, Israel
Yigal Schreiber, Israel
Prof. Arie Scope, Israel
Dr. Yoram Sebba, Israel*
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Joan Seidel, USA
Stephen Seiden, USA
Les Seskin, USA
Haim Shani, Israel
Ing. Shaul Shashoua, Brazil
Janet Shatz-Snyder, USA
Raphi Shavit, Israel
Leonard H. Sherman, USA
Dr. Merry Sherman-Saifer, USA
Dr. Robert Shillman, USA
Avraham (Baiga) Shochat, Israel
Melissa Singer, Canada
Gadi Singer, Israel
Rafael Sirkis, Israel
Jonathan Sohnis, USA
Stefan Sturesson, Sweden
Prof. Zehev Tadmor, Israel
Rami Tamir, Israel
Ira Taub, USA
Irwin Tauben, Canada
Gideon Tolkowsky, Israel
Itzhak Turgeman, Israel*
Oded Tyrah, Israel
Carol Upton, Australia
Pim Van Den Dam, Netherlands
Dr. Yossi Vardi, Israel
John Veronis, USA
Dan Vilenski, Israel
Dr. Andrew Viterbi, USA
Dr. Kobi Vortman, Israel
Eyal Waldman, Israel
Joseph Weiss, Israel
Arthur A. Weiss, USA
Naftali Weitman, Israel
Eitan Wertheimer, Israel
Avigdor Willenz, Israel
Prof. Dr. Katja Windt, Germany
Stephen John Wiseman, Great Britain
Mauro Wjuniski, USA
Andrea Wolfe, USA
Ben Wygodny, Canada
Yoram Yaacovi, Israel
Danny Yamin, Israel
Res. Gen. Shlomo Yanai, Israel
Elisha Yanay, Israel
Chaim Yaron, Israel
Dr. Giora Yaron, Israel
Imad Younis, Israel*
Avi Zeevi, Israel
Yehuda Zisapel, Israel
Zohar Zisapel, Israel
Miriam Ziv, Israel
Dr. Amir Ziv-Av, Israel*

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Serge Bitboul, France
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Marilyn Caplovitz, USA
Cathy Deutchman, USA
Rita Emerson, USA
Rod Feldman, USA
Nathan Fischel, USA
Laura Flug, USA
Harold Garfinkle, Canada
Fariba Ghodsian, USA
Jon Hirschtick, USA
Harel Kodesh, USA
Linda Kovan, USA
Agota Kuperman, USA
Sid Lejfer, USA
Charles Levin, USA
Steve Merling, Canada
Gary Monnickendam, Great Britain
Hans Nachmann, Sweden
Beth Perlman, USA
Paul Raducanu, Canada
Andrea Rush, Canada
Bruce Sholk, USA
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Jozef Stern, Sweden
Prof. Dr. Roderich Suessmuth, Germany
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Lauren Veronis, USA

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Paul Bernstein, USA
Dr. Joel Birnbaum, USA
Scott Black, USA
Dr. Ilan Blech, USA
Robert Brand, USA
Leona Chanin, USA
Frances Helen Cohen, USA
Elizabeth Corob, Great Britain
Jeannette Dankner, Israel
Richard Davidson, USA
Michael Dresner, Israel
Prof. Jerome Drexler, USA
Meyer G. Frank, USA
Joseph Freed, USA
Dr. Avi Friedman, Canada
Michael Frieze, USA
Pearl Gameroff, Canada
Dr. Terry N. Gardner, USA
Edward R. Goldberg, USA
Sofia L. Grimberg, Argentina
Gary Gross, USA
Jack Hahn, Canada
Dr. Michael Helper, Canada
Dr. Christian Hodler, Germany
PD Dr. med. Victor E. Hofman, Switzerland
Maj. Gen. (res.) Amos Horev, Israel
Charles Housen, USA
Ivoncy B. Ioschpe, Brazil
Dr. Irwin Jacobs, USA
Maggie Kaplan, USA
Barbara Kay, USA
Nathan Kirsh, South Africa
Stephen B. Klein, USA
Alexander Lidow, USA
Raphael Mishan, USA
Jonathan Mitchell, USA
Ruth Nathanson Leventhal, USA
Justice Shoshana Netanyahu,Israel
Prof. Dr. Ewald Nowotny, Austria
Dr. Edgar H. Paltzer, Switzerland
Samuel Pisar, France
David Polak, USA
Rachel Pollak, Israel
Arnold Recht, Canada
Eugene Riesman, Canada
Elihu Rose, USA
Daniel Rose, USA
Howard Rosenbloom, USA
Nina Sabban, USA
Eric Samson, South Africa
Eugene B. Shapiro, USA
Harry Sheres, Canada
Emanuel Shimoni, Israel
Stanley Shirvan, USA
Abe Simkin, Canada
Janey Sweet, USA
Bernice Tanenbaum, USA
Maj. Gen. (Res.) Dan Tolkowsky, Israel
Lucy Ullmann, USA
Efraim-François Wasservogel, Israel
Stef Wertheimer, Israel
Bruce F. Whizin, USA
Roma Wittcoff, USA
Estelle Yach, South Africa
Robert Zinn, USA

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ISRAEL ASSOCIATION OF ENGINEERS AND ARCHITECTS
Ehud Noff
Amnon Bar-Tal
Emanuel Zvi Liban

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Prof. Joseph Kost

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Eyal Kaplan*
Sigal First

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Prof. Eli Biham*
Prof. Alfred Bruckstein*
Prof. Marcelle Machluf
Prof. Amit Meller*

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Prof. Moshe Moshe

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Aviv Sharon

FACULTY ASSOCIATION
Prof. Pinchas Gurfil

PRACTICAL ENGINEERS UNION
Naftali Blau

M4: ACADEMIC EMPLOYEES UNION
Riva Krayzelman

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Aliza Blasberg

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Moshe Barak

STUDENTS ASSOCIATION
Undergraduate Students
Ido Biran
Yana Grishchenko

Graduate Students
Shay Freilich
Linoy Nagar-Shaul

* Technion Council member

HARVEY PRIZE

The Harvey Prize, established in 1971 by Leo M. Harvey of Los Angeles, is awarded annually at Technion for exceptional achievements in science, technology, and human health, and for outstanding contributions to peace in the Middle East, to society and to the economy.

Prof. James P. Allison, 2014
Prof. Vladimir I. Arnold, 1994
Dr. Arthur Ashkin, 2004
Prof. Robert Aumann, 1983
Prof. Sir David Baulcombe, 2009
Prof. Wolfgang P. Baumeister, 2005
Dr. Charles H. Bennett, 2008
Prof. Charles L. Bennett, 2006
Prof. Seymour Benzer, 1977
Prof. Elizabeth H. Blackburn, 1999
Prof. Immanuel Bloch, 2015
Prof. Sydney Brenner, 1987
Dr. John Cahn, 1995
Prof. Pierre Chambon, 1987
Prof. Emmanuelle Charpentier, 2018
Prof. Claude Cohen-Tannoudji, 1996
Prof. Paul B. Corkum, 2013
Sir Alan Howard Cottrell, 1974
Prof. George B. Dantzig, 1985
Prof. Karl Deisseroth, 2016
Dr. Robert H. Dennard, 1990
Prof. Peter B. Dervan, 2002
Prof. Jennifer Doudna, 2018
Prof. Ronald Drever, 2016
Prof. Freeman John Dyson, 1977
Prof. David Eisenberg, 2008
Prof. Ronald M. Evans, 2006
Prof. Sir Richard Friend, 2011
Prof. Hillel Furstenberg, 1993
Prof. Robert G. Gallager, 1999
Prof. Pierre-Gilles de-Gennes, 1988
Prof. Reinhard Genzel, 2014
Prof. Shlomo Dov Goitein, 1980
Mikhail Gorbachev, 1992
Prof. Michael Graetzel, 2007
Prof. Harry B. Gray, 2000
Prof. David J. Gross, 2000
Prof. Stephen E. Harris, 2007
Prof. Peter Hegemann, 2016
Prof. Wayne A. Hendrickson, 2004
Prof. Eric Kandel, 1993
Prof. Michael Karin, 2010
Prof. Richard Karp, 1998
Prof. Marc Kirschner, 2015
Prof. George Klein, 1975
Prof. Jon M. Kleinberg, 2013
Dr. Donald Knuth, 1995
Prof. Willem J. Kolf, 1972
Prof. Roger D. Kornberg, 1997
Prof. Hans W. Kosterlitz, 1981
Prof. Eric Lander, 2012
Prof. Robert Langer, 2003
Prof. Paul C. Lauterbur, 1986
Prof. Philip Leder, 1983
Prof. Bernard Lewis, 1978
Prof. Saul Lieberman, 1976
Sir James Lighthill, 1981
Prof. C. Walton Lillehei, 1996
Prof. Jacques-Louis Lions, 1991
Dr. Benoit B. Mandelbrot, 1989
Prof. Herman F. Mark, 1976
Prof. Tobin J. Marks, 2017
Prof. Benjamin Mazar, 1986
Prof. Shuji Nakamura, 2009
Prof. Christos Papadimitriou, 2018
Prof. Judea Pearl, 2011
Prof. James E. Peebles, 2001
Prof. Jacob Polotsky, 1982
Prof. Alexander M. Polyakov, 2010
Prof. Michael Rabin, 1980
Prof. Ephraim Racker, 1980
Prof. Barnett Rosenberg, 1985
Prof. Franz Rosenthal, 1984
Prof. Bert Sakmann, 1991
Prof. Gershom Scholem, 1974
Prof. Claude E. Shannon, 1972
Prof. Barry Sharpless, 1998
Prof. Carla J. Shatz, 2017
Dr. Peter Sorokin, 1984
Prof. Edward Teller, 1975
Prof. Kip Stephen Thorne, 2016
Prof. Bert Vogelstein, 2001
Prof. Isaak Wahl, 1978
Prof. Alvin Weinberg, 1982
Prof. Robert A. Weinberg, 1994
Prof. Rainer Weiss, 2016
Prof. Edward Witten, 2005
Prof. Amnon Yariv, 1992
Prof. Eli Yablonovitch, 2012
Prof. Ada E. Yonath, 2002
Prof. Richard Zare, 1993
Prof. Feng Zhang, 2018

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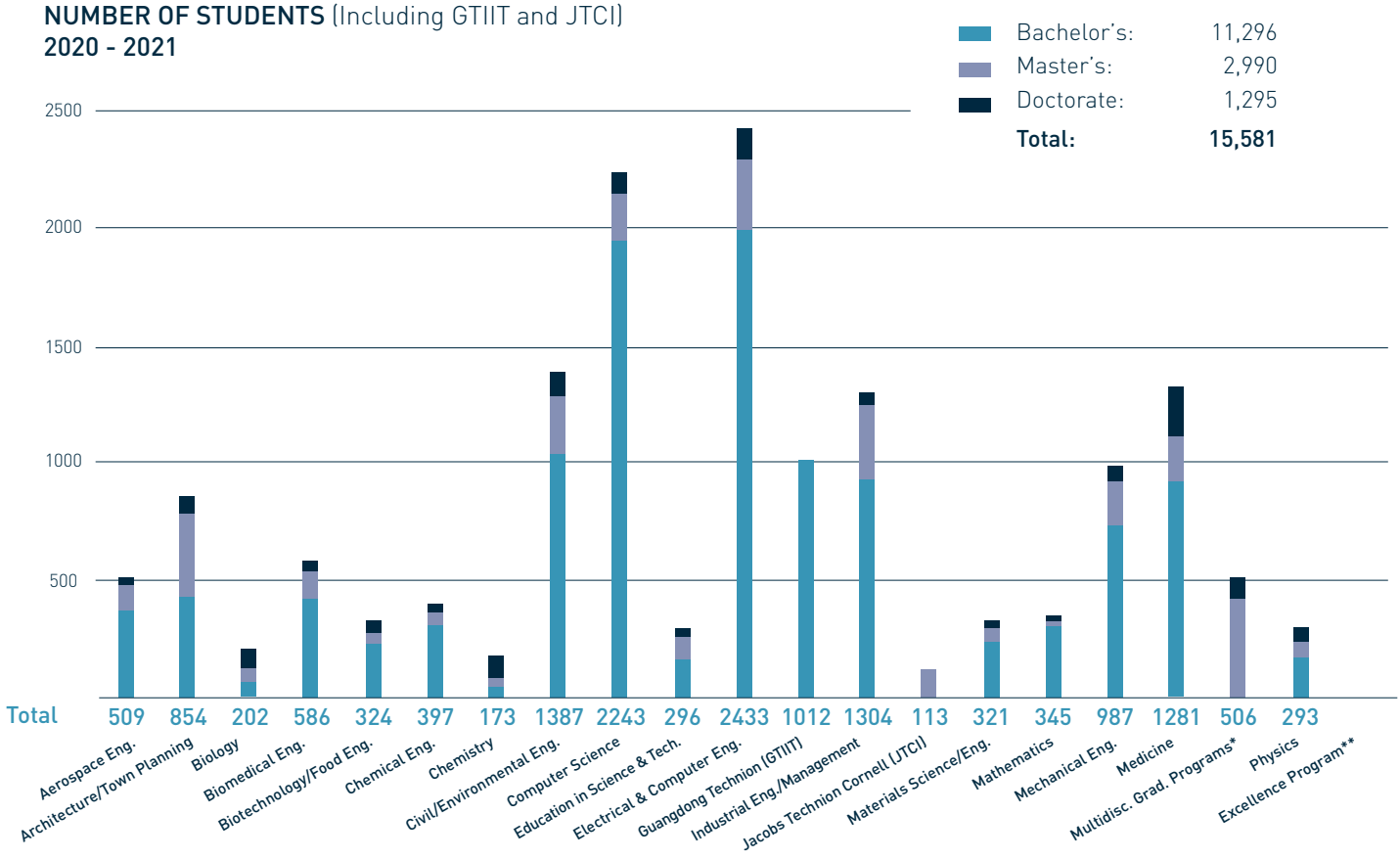
All data correct to May 1st, 2021

FACTS AND FIGURES

NUMBER OF STUDENTS (Including GTIIT and JTCI) 2020 - 2021



* Applied Mathematics; Autonomous Systems & Robotics; Biotechnology; Design & Manufacturing Engineering; Energy; Polymer Engineering; Nanoscience & Nanotechnology; Real Estate Studies; Systems Engineering; Urban Engineering; and Vehicle Systems Engineering

** First year intake and not including medical students

FAST FACTS 2021

FOUNDED	1912
STUDENT POPULATION	15,581
ACADEMIC DEPARTMENTS	18
UNDERGRADUATE PROGRAMS	60
GRADUATE PROGRAMS	83
DEGREES AWARDED	123,485
FACULTY	578
TECHNICAL AND ADMINISTRATIVE STAFF	1,120
RESEARCH CENTERS	60
BUILDINGS ON CAMPUS	106
BUILT-UP AREA	470,736 m^2
DORMITORY BEDS	4,697

DEGREES AWARDED (graduates)

	2020	2021
Bachelor's	1,949	1,939
MD	144	155*
Master's	902	827
PhD	231	199
Total	**3,226**	**3,120**

* Including 22 graduates of the Technion American Medical School Program

TOTAL DEGREES AWARDED (1924 - 2021)

Bachelor's	88,608
MD	3,299
Master's	25,343
PhD	6,235
Total	**123,485**

TOTAL STUDENT POPULATION

	2016/17	2017/18	2018/19	2019/20	2020/21
BSc	9,819	9,622	9,354	10,174	10,779
MD	501	436	505	529	517
Master's	3,105	2,879	2,573	2,873	2,990
PhD	1,113	1,150	1,155	1,158	1,295
Total	**14,538**	**14,087**	**13,587**	**14,734**	**15,581**

OPERATING BUDGET 2020/2021

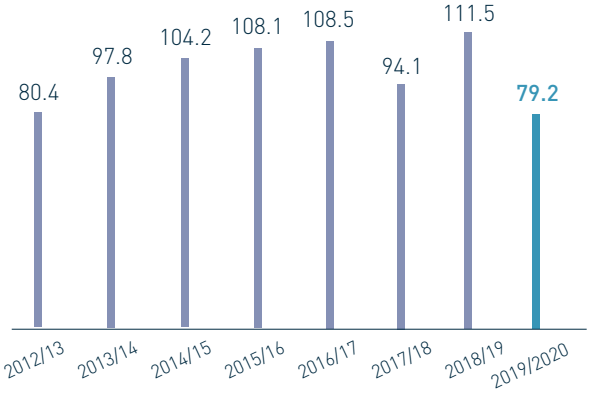
(October 1, 2020 - September 30, 2021)

Income	Thousands of NIS	%
Government Allocation	1,138,590	71.2
Self Income	234,200	14.6
Tuition Fees	132,000	8.3
Technion Societies	44,000	2.8
Deficit	49,940	3.1
Total Income	**1,598,730**	**100%**
Expenditure		
Staff Emoluments	811,766	50.8
Pension Payments*	310,183	19.4
Operating Expenses	209,902	13.1
Maintenance	129,059	8.1
Student Aid	137,820	8.6
Total Expenditures	**1,598,730**	**100%**

* The actuarial liability of the Technion as of September 30, 2020 was NIS 6.6 billion. The consolidated liability (Technion and TRDF) is NIS 7.1 billion.

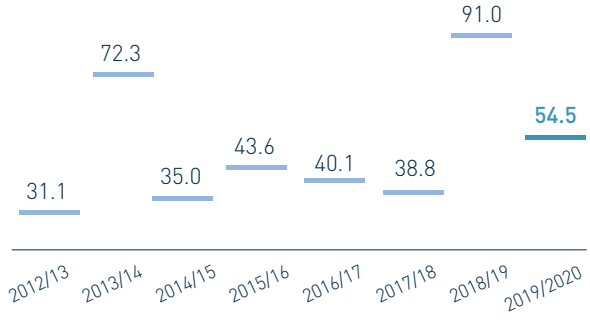
TOTAL INCOME FROM TECHNION SOCIETIES

($US M)



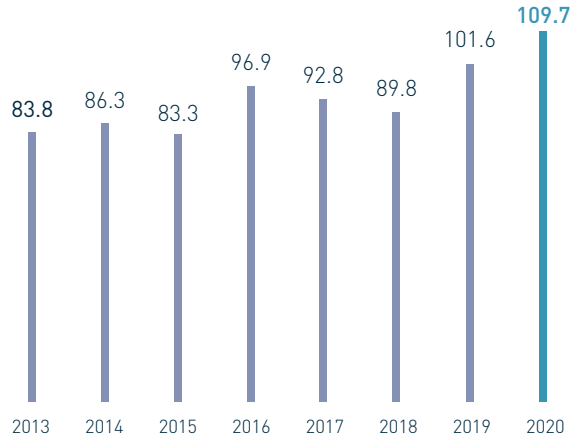
DEVELOPMENT EXPENDITURE

($US M)



SPONSORED RESEARCH FROM EXTERNAL SOURCES

($US M)



TECHNION INVESTMENT

	Millions of NIS	%
CPI Linked Investments	2,390	34
Stocks	2,461	35
Shekel Unlinked Investments	2,074	29
Foreign Currency Investments	107	2
Total	**7,032**	**100%**

DEVELOPMENT EXPENDITURE 2019/2020

(October 1, 2019 - September 30, 2020)

	Thousands of $US	%	Thousands of NIS
Buildings, Renovations & Infrastructure	30,013	55.0	104,746
Multidisciplinary Research Centers	6,711	12.3	23,328
Laboratories & Equipment	17,805	32.7	61,674
Total	**54,528**	**100%**	**189,747**

* $US 1 = 3.441

FACULTY 2020-2021

NEW FACULTY APPOINTMENTS

AEROSPACE ENGINEERING

Pavel Galich
Lecturer

Michael Karp
Assistant Professor

Alexandros Terzis
Assistant Professor

ARCHITECTURE AND TOWN PLANNING

Daniel Metcalfe
Assistant Professor

Yoav Shterman
Lecturer

BIOLOGY

Dvir Aran
Assistant Professor

Sagi Levy
Assistant Professor

Nadav Sharon
Assistant Professor

BIOMEDICAL ENGINEERING

Arielle G. Fischer
Assistant Professor

Yuval Garini
Professor

Menahem (Hemi) Rotenberg
Assistant Professor

Katrien Vandoorne
Assistant Professor

BIOTECHNOLOGY AND FOOD ENGINEERING

Yosef Maruvka
Assistant Professor

CHEMICAL ENGINEERING

Alon Grinberg-Dana
Assistant Professor

Michael Shoham-Patrascu
Assistant Professor

CIVIL AND ENVIRONMENTAL ENGINEERING

Yehezkel (Hezi) Grisaro
Assistant Professor

COMPUTER SCIENCE

Yonatan Belinkov
Assistant Professor

Nir Rosenfeld
Assistant Professor

ELECTRICAL AND COMPUTER ENGINEERING

Nir Weinberger
Assistant Professor

HUMANITIES AND ARTS

Ohad Nachtomy
Professor

INDUSTRIAL ENGINEERING AND MANAGEMENT

Nadav Hallak
Assistant Professor

Batya Kenig
Assistant Professor

Yoed N. Kenett
Assistant Professor

Ori Plonsky
Assistant Professor

Eviatar Procaccia
Associate Professor

Noa Zychlinski
Assistant Professor

MATERIALS SCIENCE AND ENGINEERING

Joshua Micah Grolman
Assistant Professor

Yoav Kalcheim
Assistant Professor

MATHEMATICS

Aviv Censor
Senior Teaching Associate

Ilya Gekhtman
Assistant Professor

Shay Moran
Assistant Professor

Zvi Jacob Nuer
Assistant Professor

MECHANICAL ENGINEERING

Dana Solav
Assistant Professor

MEDICINE

Professor
David Tanne

Assistant Professor
Yotam Bar-On
Assaf Marom

Senior Clinical Lecturer
Jonia Amer Alshiek
Ayelet Eran
Sagi Haimovich
Nizar Khatib
Firas Rinawi
Adel Shalata
Moshe Shashar

Senior Clinical Lecturer (Educator)
Yaakov Schachter
Ofer Shamgar

Lecturer
Amir Minerbi
Ruth Perets
Ma'anit Shapira
Karin Weiss

Clinical Lecturer
Joy Feld
Nir Haya
Avraham Ishay
Ron Jacob
Dan Levy-Faber
Vered Nir
Amir Solomonica
Vladimir Sopov
Michal Weiler Sagie
Renata Yakubov
Dana Yehudai-Ofir

Clinical Lecturer (Educator)
Adel Abu-Salih
Tal Almagor
Shifra Ash
Jalal Ashkar
Ayelet Avital-Magen
Ronen Bar-Yoseph
Ronit Beck
Eyal Behrbalk
Rachel Ben Hayun
Jacob Bickels
Arie Bitterman
Rita Brun
Irena Chestyakov
Jasmin Dagan
Haim David
Ruth Edry
Eran Gabay
Maya Garty-Ofir
Vardit Gepstein
Nabel Gharra
Avi Goldberg
Golda Grinblat
Salim Halabi
Vered Hermush
Tova Hershkovitz
Gil Hirschhorn
Azik Hoffman
Irit Ben-Aharon
Riyad Khnifes
Samer Khoury
Adi Kibari
Boaz Kimmel
Monica Laniado
Dmitry Lumelsky
Arbitman Marina
Ayelet Midbari
Shelly Rotschild
Irina Sabin
Guy Schusheim
Ina Shugayev
Bella Smolin
Dana Vitner
Scott Alex Weiner
Ariel Zilberstein

ACADEMIC FACULTY 2020-2021

Faculty	Individuals	Full Time Equivalents (FTEs)
Professor	229	228.5
Associate Professor	193	192.5
Assistant Professor	141	138.0
Lecturer	5	5.0
Others	10	9.5
Total	**578**	**573.5**
Clinical Track Appointments	417	115.75
External Adjuncts	733	260

INTERNATIONAL HONORS AND AWARDS

Academia Europaea
Elected Member
Prof. Ilan Marek
Chemistry

American Academy of Arts and Sciences
International Honorary Member
Dist. Prof. Mordechai Segev
Physics; Electrical and Computer Engineering

American Chemical Society (ACS)
Arthur C. Cope Scholar Award 2021
Prof. Ilan Marek
Chemistry

Fellow
Prof. Emer. Ehud Keinan
Chemistry

13th Bruno Zevi Prize
Dr. Irit Carmon Popper
Architecture and Town Planning

Chinese Chemical Society (CCS)
Honorary Fellow 2020
Prof. Nir Tessler
Electrical and Computer Engineering

Computer Aided Verification (CAV)
CAV Award 2021
Prof. Ofer Strichman
Industrial Engineering and Management

European Academy of Sciences (EurASC)
Elected Fellow
Dist. Prof. Yitzhak Apeloig
Chemistry

Hong Kong University of Science and Technology (HKUST)
Honorary Doctorate 2021
Dist. Prof. Emer. Daniel Weihs
Aerospace Engineering

Institute of Electrical and Electronics Engineers (IEEE)
Medal of Honor
Dist. Prof. Emer. Jacob Ziv
Electrical and Computer Engineering

Fellow
Prof. Yakov Krasik
Physics

Nuclear and Plasma Sciences Society Magne "Kris" Kristiansen Award 2020
Prof. Yakov Krasik
Physics

Power and Energy Society (PES) General Meeting 2020 Best Paper Award
Assoc. Prof. Yoash Levron
Electrical and Computer Engineering

Signal Processing Society (SPS) Sustained Impact Paper Award
Prof. Emer. David Malah
Electrical and Computer Engineering

IHP (Innovations for High Performance Microelectronics)
Wolfgang Mehr Award
Prof. Emer. Gad Eisenstein
Electrical and Computer Engineering

INFORMS Optimization Society
Farkas Prize 2021
Prof. Andrea Lodi
Jacobs Technion-Cornell Institute

Intel's Rising Star Faculty Award 2020
Asst. Prof. Daniel Soudry
Electrical and Computer Engineering

International Union of Pure and Applied Chemistry (IUPAC)
President Elect 2022
Prof. Emer. Ehud Keinan
Chemistry

MIT Technology Review 2021
35 Innovators Under 35
Asst. Prof. Emma Pierson
Jacobs Technion-Cornell Institute

Optical Society of America (OSA) Fellow
Assoc. Prof. Tal Carmon
Mechanical Engineering

PLEA Sustainable Architecture and Urban Design
Lifetime Achievement Award 2020
Prof. Emer. Edna Shaviv
Architecture and Town Planning

Royal Society of Chemistry
Member
Prof. Nir Tessler
Electrical and Computer Engineering

World Association of Theoretical and Computational Chemists
Schrödinger Medal
Dist. Prof. Yitzhak Apeloig
Chemistry

Young Academy of Europe
Fellow
Asst. Prof. Shai Berlin
Medicine

ISRAELI AWARDS AND HONORS

2021 Blavatnik Award for Young Scientists
Assoc. Prof. Ido Kaminer
Electrical and Computer Engineering

Council for Higher Education
Young Researcher Award 2021
Assoc. Prof. Ayelet Baram-Tsabari
Education in Science and Technology

Quantum Science and Technology Fellowship 2020-21
Asst. Prof. Yuval Shagam
Chemistry

2021-2022
Asst. Prof. David Gelbwaser
Chemistry

Asst. Prof. Anna Keselman
Physics

Alon Fellowship
Asst. Prof. Yaniv Romano
Computer Science; Electrical and Computer Engineering

Maof Fellowship
Asst. Prof. Khoury Luai
Materials Science and Engineering

EMET Prize 2020
Prof. Shamay Assif
Architecture and Town Planning

Prof. Bracha Chyutin
Architecture and Town Planning

2021 Eric and Sheila Samson Prime Minister's Prize for Global Innovation in Smart Mobility and Alternative Fuels for Transportation
Researcher Recruitment Prize
Asst. Prof. Yaniv Romano
Computer Science; Electrical and Computer Engineering

Groundbreaking Research Prize
Prof. Gideon Grader
Chemical Engineering

Prof. Avner Rothschild
Materials Science and Engineering

***Globes* magazine**
50 Most Influential Women in Israel 2021
Prof. Shulamit Levenberg
Biomedical Engineering

Israel Academy of Sciences and Humanities
Elected Member
Prof. Emer. Yeshayahu Talmon
Chemical Engineering

Israel Young Academy
Elected Member
Assoc. Prof. Yael Allweil
Architecture and Town Planning

Asst. Prof. Naama Geva-Zatorsky
Medicine

Assoc. Prof. Shahar Kvatinsky
Electrical and Computer Engineering

Assoc. Prof. Ido Kaminer
Electrical and Computer Engineering

Israel Physical Society (IPS)
Fellow
Prof. Assa Auerbach
Physics

Prof. Michael Gronau
Physics

Israel Society of Ecology and Environmental Sciences (ISEES)
Lifetime Achievement Award 2020
Prof. Emer. Yoram Avnimelech
Civil and Environmental Engineering

Israel Vacuum Society (IVS)
Excellence Award for Research 2020
Prof. Hossam Haick
Chemical Engineering

Palmach Association
2021 Yigal Alon Prize for Pioneering Excellence
Prof. Emer. Moshe Shoham
Mechanical Engineering

Peres Center for Peace and Innovation
Medal of Distinction 2021
Prof. Shulamit Levenberg
Biomedical Engineering

Tel Aviv-Jaffa Municipality
Weizmann Prize for Exact Sciences 2021
Prof. Michael Elad
Computer Science

Weizmann Institute of Science
Ofer Lider Annual Memorial Literary Prize for Scientists
Assoc. Prof. Dori Derdikman
Medicine

Wolf Foundation
2021 Krill Prize for Excellence in Scientific Research
Assoc. Prof. Ido Kaminer
Electrical and Computer Engineering

Assoc. Prof. Yoav Shechtman
Biomedical Engineering

Zoological Society of Israel
Honorary Member
Prof. Emer. Zeev Arad
Biology

Zuckerman Faculty Scholar
Asst. Prof. Omri Ram
Mechanical Engineering

* Select list

TECHNION PRIZES AND FELLOWSHIPS

Alexander Goldberg Research Prize 2020
Asst. Prof. Daniel Soudry
Electrical and Computer Engineering

Cooper Award for Excellence in Research
2019-2020
Assoc. Prof. Shenhav Cohen
Biology

2020-2021
Assoc. Prof. Hagai Perets
Physics

Daniel Shiran Memorial Prize 2020
Assoc. Prof. Meytal Landau
Biology

David Dudi Ben-Aharon Research Prize 2020
Asst. Prof. Yair Feld
Medicine

Diane Sherman Prize for Medical Innovation for a Better World
2019-2020
Prof. Roy Kishony
Biology

2020-2021
Prof. Lior Gepstein
Medicine

Assoc. Prof. Asya Rolls
Medicine

Henry Taub Prize for Academic Excellence 2020-2021
Assoc. Prof. Roy Schwartz
Computer Science

Asst. Prof. Ron Rothblum
Computer Science

Asst. Prof. Ori Rottenstreich
Computer Science

Hilda and Hershel Rich Technion Innovation Awards 2020
Prof. Yuval Shaked and Dr. Michael Timaner
Medicine

Assoc. Prof. Roee Amit and iGEM team
Biotechnology and Food Engineering

Prof. Oren Cohen and Dr. Pavel Sidorenko
Physics

Asst. Prof. Tamar Segal-Peretz and Dr. Barun Barick
Chemical Engineering

Prof. Alejandro Sosnik
Materials Science and Engineering

Assoc. Prof. Yoav Etsion and Dr. Dani Voitsechov
Electrical and Computer Engineering

Kurt Mahler Prize in Mathematics 2020
Prof. Amir Yehudayoff
Mathematics

Assoc. Prof. Chen Meiri
Mathematics

Morton and Beverley Rechler Prize for Excellence in Research
2019-2020
Prof. Gitti Frey
Materials Science and Engineering

Prof. Kinneret Keren
Physics

Assoc. Prof. Daniel Podolsky
Physics

Assoc. Prof. Yoav Shechtman
Biomedical Engineering

2020-2021
Prof. Dan Givoli
Aerospace Engineering

Prof. Ayellet Tal
Electrical and Computer Engineering

Prof. Emanuel Milman
Mathematics

Assoc. Prof. Assaf Shwartz
Architecture and Town Planning

Norman Seiden Prize for Academic Excellence
2019-2020
Assoc. Prof. Ronen Talmon
Electrical and Computer Engineering

2020-2021
Assoc. Prof. Shahar Kvatinsky
Electrical and Computer Engineering

Raymond and Miriam Klein Research Prize 2020
Assoc. Prof. Moran Bercovici
Mechanical Engineering

Uzi and Michal Halevy Innovative Applied Engineering Award and Research Grants 2020
Assoc. Prof. Carmel Rotschild
Mechanical Engineering

Prof. Hossam Haick
Chemical Engineering

Asst. Prof. Naama Geva-Zatorsky
Medicine

Prof. Ori Lahav
Civil and Environmental Engineering

CAREER ADVANCEMENT CHAIRS 2020-2021

Chaya Career Advancement Chair
Asst. Prof. Eviatar Procaccia
Industrial Engineering and Management

Deloro Career Advancement Chair
Asst. Prof. Dvir Aran
Biology

Technion Career Advancement Chair
Asst. Prof. Yaniv Romano
Computer Science; Electrical and Computer Engineering

Shalon Career Advancement Chair
Asst. Prof. Yuval Shagam
Chemistry

Jacques Lewiner Career Advancement Chair
Asst. Prof. Dana Solav
Mechanical Engineering

Career Advancement Chair in Economics and Finance
Asst. Prof. Noa Zychlinski
Industrial Engineering and Management

Norman Seiden Fellowship in Nanotechnology and Optoelectronics
Asst. Prof. Yoav Kalcheim
Materials Science and Engineering

* Select list

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