

FOCUS

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NEW YORK CITY



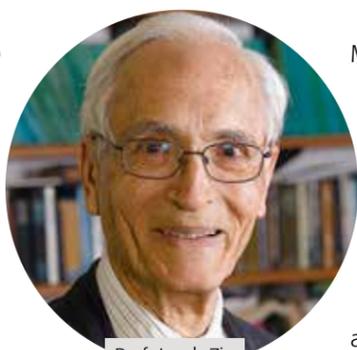
GUANGDONG



HAIFA

EMET PRIZE LAUREATE

Distinguished Prof. Jacob Ziv of the Andrew and Erna Viterbi Faculty of Electrical Engineering has been chosen as laureate for the 2017 EMET Prize in the category of 'Exact Sciences: Computer and Electronic Engineering.' The prize is awarded annually under the auspices of the Prime Minister of Israel, and consists of five categories of academic or professional achievements that have significantly benefited society.



Prof. Jacob Ziv

Prof. Ziv is being recognized for his game-changing contribution to the fields of information and communications.

Over the years, Prof. Ziv has won prestigious awards including the BBVA Frontiers of Knowledge Award, Israel Prize in the Exact Sciences, Israel Defense Prize (twice), Marconi International Award, IEEE Richard W. Hamming

Medal, and Claude E. Shannon Award. He has held positions including President of the Israel Academy of Sciences, Chair of the Planning and Budgeting Committee of the Israeli Council for Higher Education, and has been a member of leading American and European societies.

The Lempel-Ziv algorithm, which Prof. Ziv developed together with Prof. Abraham Lempel of Technion's Faculty of Computer Science, is an algorithm for compressing information that enables lossless compression regardless of the structure of the data and without prior knowledge of its statistical properties. Many of the compression technologies currently used in memory devices, computers, and smartphones were developed based on this algorithm.

The award ceremony is scheduled to take place on November 5, 2017.

\$200M for Technion Start-ups

Venture capital fund to support start-ups based on Technion-created knowhow

At the closing plenary of the 2017 meeting of Technion's Board of Governors, the Technion Research & Development Foundation Ltd. (TRDF) and UG Capital Management Ltd. (UGC) announced their intent to establish a new venture capital fund of \$200 million. The fund will focus on investments in science and technology companies mainly related to Technion and its alumni.

UGC is the venture capital arm of United Gain Investment Ltd. (UGI), a fund management company with extensive experience in global investments, asset management, and consulting services.

The fund's joint management team, with offices in Israel and Hong Kong, includes Jonathan Mitchell, CY Lau, and Thomas Lau of UGC; and Eddy Shalev, Dr Eyal Kishon, and Gary Gannot of Genesis Partners.

Prof. Wayne Kaplan, Executive Vice President for Research and Director General of TRDF, thanked the team that led the development on behalf of Technion and said, "Technion has been increasing its commercialization activities in recent years and we have already noted many successes in this field, including more than doubling the number of startup companies set up at Technion through the new DRIVE Accelerator. However, we must not rest on our laurels."

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FROM THE PRESIDENT



Technion President Prof. Peretz Lavie addresses the audience at the historic opening of the Cornell Tech Roosevelt Island campus, Sept. 12, 2017

Welcome to this Autumn 2017 edition of FOCUS. Technion is opening the academic year at the Jacobs Institute in New York; in Shantou, China, where the Guangdong Technion Israel Institute of Technology (GTIIT) commences its first semester; and here, in Haifa, where for over a century, Technion has been a wellspring of pioneering science, technology, and engineering.

Here, at Technion, is the fertile soil out of which the great tree of human progress grows. From superbugs and cancer research, to energy research, quantum physics, and world-class computer science - this is where it starts.

Over the past year, we have completed several exciting building projects. Four nine-story dormitory buildings with 116 apartments will house 488 additional undergraduate students. Research laboratories were renovated at the Schulich Faculty of Chemistry, Wolfson Faculty of Chemical Engineering, and Rappaport Faculty of Medicine for the use of our graduate students. A Learning Center has been added to the Zielony Student Union Building.

As we look with anticipation towards the coming academic year and the Jewish year 5778, many projects are underway, both those already under construction and several in the planning stage. Our two main entrance gates have already begun to undergo major upgrades; an additional floor of classrooms is being added to the

Ullmann Teaching Center; and the renovated David and Janet Polak Visitors Center is gaining an exhibitions wing.

Our plans are no less ambitious. Amongst others, a state-of-the-art dorms building in downtown Haifa will eventually accommodate 220 medical students. The Rappaport Faculty of Medicine will also acquire a new building to house the Integrated Cancer Research Center. At the Andrew and Erna Viterbi Faculty of Electrical Engineering, an additional wing will expand research space. The Center for Intelligent Composite Materials, a new wing of laboratories, is set to be added to the Faculty of Materials Science and Engineering. A new building will provide much needed laboratory space for research in Life Sciences. The Amado Mathematics Building will gain a wing, the Andrew and Aviva Goldenberg Architecture Studio Pavilion.

The quest continues. As one of Technion's founders, Albert Einstein, said, "The more I learn, the more I realize how much I don't yet know." The more our knowledge of our world expands thanks to Technion's devoted pursuit through both microscopes and telescopes, the more we realize just how much more is unknown and needs to be researched, and therefore just how much space is needed to accommodate it all.

As Technion's campuses in three global technology hubs welcome the new academic year, we look forward to the collaboration, opportunity, and innovation they will undoubtedly bring.

Peretz Lavie

\$200M for Technion Start-ups

▶▶▶ Continued from page 1



Technion Drive start-up Nanosynex, led by Diane Abensur (l), CEO, and Michelle Heymann (r), VP of Marketing and Business Development

"You could say we're doing alchemy here," said Jonathan Mitchell. "We've combined a number of components – the Israeli mind, institutional and private investors, and of course Technion and the local staff – and with all this we will contribute to the welfare of the world."

DRIVE
TECHNION ACCELERATOR

The Technion DRIVE (*Dream, Research, Invent, Venture, Excel*) Accelerator is a 9-month program whose goal is to capitalize on Technion's unique eco-system, innovative capabilities, and human capital. It offers seed funding,



In Loving Memory Amanda (Mandy) Jaffe-Katz 1960 - 2017

Amanda (Mandy) Jaffe-Katz was a valued and highly respected figure at Technion, known for her brilliant and sharp mind, high standards, professionalism, and loyalty to the Institute. She was the driving force and editor of FOCUS for the past 16 years, which she developed as an exemplary medium of science communication, disseminating groundbreaking discoveries, global news, and campus life with an unparalleled richness.

We all consulted with Mandy. Her brilliant mind was like an encyclopedia of everything "Technion" - from its history to the latest research breakthroughs. She was an avid fact-checker, initiator, and editor and will be missed as a devoted colleague of the highest standard.

To quote Technion Vice President Prof. Boaz Golany: "Mandy was a model for dedication, professionalism, and responsibility in everything she did."

She held two degrees in psychology from Manchester University and Haifa University. Over this past year, Mandy bravely battled her illness. She is survived by her loving husband, Gili, and three children Dror, Brit, and Nir in Haifa, and in England by sisters Jacqui and Carrie and mother Pamela.

Mandy is remembered lovingly and will be missed by all who worked with her at Technion, as well as her plethora of friends and colleagues worldwide.

business mentoring, and office space, as well as access to Technion's research facilities and equipment.

One of the many startups that has already benefitted from the Accelerator is Nanosynex, headed by Technion alumnae (MBA) Diane Abensur and Michelle Heymann.

"You could say we're doing
alchemy here"

- Jonathan Mitchell

The seed project is in the process of bringing to market a microfluidic diagnostic test to check bacterial resistance to antibiotics in record time. The biotech innovation is the brainchild of Prof. Shulamit Levenberg, Dean of Technion's Faculty of Biomedical Engineering, and doctoral student Jonathan Avesar.

FOCUS

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NOTICE OF NONDISCRIMINATORY POLICY AS TO STUDENTS

The Technion admits students of any religion, gender, race, color, national and ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the school. It does not discriminate on the basis of religion, gender, race, color, national and ethnic origin in administration of its educational policies, admissions policies, scholarship and loan programs, and athletic and other school-administered programs.

TECHNOLOGY FOR HUMANITY

Japan eyes Technion expertise

"Israel and Japan share a common vision of developing advanced technologies for the benefit of humanity," said Yosuke Tsuruho, Japan's Minister of Science, Technology, and Space, at Technion during his first ever visit to Israel in May. Accompanied by a large delegation of executives and academics, Tsuruho also met with Prof. Pini Gurfil, Director of the Asher Space Research Institute (ASRI).

"Technion graduates have always been a key factor in the technological development of the State of Israel," said Technion President Prof. Peretz Lavie. "Over the past 20 years Technion graduates have been involved in establishing and managing more than 1,600 companies in Israel. These companies generate revenues of more than \$30 billion and have created 95,500 jobs in Israel." President Lavie highlighted Technion's groundbreaking global initiatives in New York and China, as well as the expansion of the Technion's network of global academic collaborations.



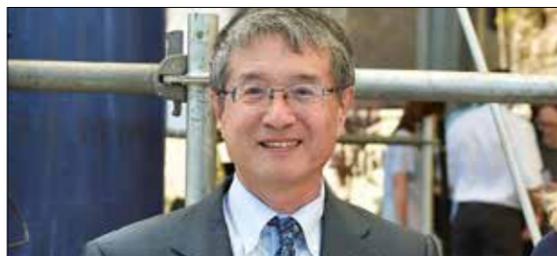
Prof. Peretz Lavie (l) converses with Minister Yosuke Tsuruho (r) on his visit to Technion

In June, Technion announced a \$4 million gift donated by Dr Hiroshi Fujiwara, founder and president of Tokyo-based firms BroadBand Tower (BBTower) and Internet Research Institute (IRI). The transformative gift is dedicated to the Technion Cyber Security Research Center, which opened in

April 2016. Founded in cooperation with the Israeli National Cyber Bureau, the Center concentrates on technical aspects of computer and cyber security, and has been named in honor of Dr Fujiwara.

"Japan and Israel share many similarities, as both are highly developed countries that rely heavily on technology as an economic booster," said Prof. Boaz Golany, Technion Vice President for External Relations and Resource Development. "We strongly believe that [this] pledge will enable us to better prepare ourselves for some of the cyber challenges both countries face at present and even more so in the future."

Dr Fujiwara first visited Israel and Technion in 2016. During his visit, Dr Fujiwara met with President Lavie as well as researchers and faculty. "I discovered a wide range of topics for potential cooperation between Israeli and Japanese researchers and entrepreneurs," Dr Fujiwara explained. "My involvement is intended to create the infrastructure for such cooperation with the hope that it will lead to the commercialization of technologies that will benefit both countries. The field of cyber security is one where Technion's leadership in the field perfectly matches the growing need in Japan and other countries to dramatically increase our abilities to face future threats."



"The field of cyber security is one where Technion's leadership in the field perfectly matches the growing need in Japan and other countries to dramatically increase our abilities to face future threats."

- Dr Hiroshi Fujiwara



Nobel Laureate Robert Grubbs (l) and Prof. Yitzhak Apeloig (r) next to the "Chemistry Wall of Fame."

Curiosity: The Key to Nobel-winning Chemistry

Nobel Laureate Prof. Grubbs at the Schulich Faculty of Chemistry

The Yitzhak Apeloig Distinguished Visiting Lectureship series was founded by the American Technion Society (ATS) and Technion Canada as a tribute to Prof. Yitzhak Apeloig at the end of his tenure as Technion President in 2009. Nobel Laureate Prof. Robert Grubbs, of California Institute of Technology (Caltech), was the third lecturer in the series. The two previous lecturers were Nobel Laureates Profs. Roald Hoffmann and Jean-Marie Lehn. Prof. Grubbs met with faculty members and outstanding PhD students of the Faculty.

Prof. Grubbs won the Nobel Prize in 2005 for his achievements in the study of the metathesis reaction, a reaction of two organic compounds with double bonds, which switch their substituents with the help of a catalyst. His unique contribution was the discovery and development of Grubbs Catalysts, ruthenium-based catalysts that enable the reaction to be easily performed and controlled so that only the desired products are obtained.

"The metathesis reaction is a great example of the importance of curiosity-driven basic research," said Prof. Apeloig. "Initial interest in this reaction stemmed from a desire to understand the mechanism by which it takes place, and this understanding has made it highly useful in many reactions in industry, worth billions of dollars. Today, we find compounds synthesized by the metathesis reaction in medicine cabinets, fuel tanks, innovative plastics, tires, road surfaces, and more. In fact, nothing limits the use of this reaction except the imagination."

"Nothing limits the use of this reaction except the imagination."

- Prof. Yitzhak Apeloig

In his lecture, Prof. Grubbs focused on innovations in the development of new catalysts and new uses for the metathesis reaction to synthesize innovative polymers and photonic crystals. He added his signature to the "Chemistry Wall of Fame," which bears the signatures of Nobel laureates and other groundbreaking chemists who have visited Technion.

China and the Technion Model

"Only using the Technion model will we be able to catch up with the Western world in the fields of science and technology."

- Hu Chunhua

Hu Chunhua, Secretary of the Guangdong Provincial Party, visited Technion at the helm of a delegation of senior Chinese academics and government officials. The visit was a milestone in the establishment of GTIIT, the Guangdong Technion Israel Institute of Technology, whose campus will be dedicated in December 2017 in the city of Shantou. Other senior officials who took part in the visit were Party Secretary of Shantou, Chen Liangxian, and China's Ambassador to Israel, Zhan Yongxin.

"Guangdong is the leading province in China in terms of gross domestic product, but in the fields of science and technology we have not yet caught up with the Western world," said Chunhua. "Only by adopting a model like that



President Lavie (l) presents Hu Chunhua with a personalized artistic representation of Technion

of Technion will we be able to succeed, and this is the idea that led to the establishment of GTIIT."

Technion President Prof. Peretz Lavie welcomed Chunhua and said, "GTIIT, which was only a dream two years ago, will be inaugurated this year. Only China can realize such a large project in such a short time, and we at Technion feel that we are your true partners. Together with the team leading this important cooperation on behalf of Technion, we are in the process of recruiting the Institute's future faculty members, who are chosen according to Technion's criteria, so that the level of instruction at the new institute will not fall below that of Technion in Israel." At the end of his speech, paraphrasing Confucius' famous adage, President Lavie said, "Technion is your partner in a journey of a thousand miles, in which we have already taken much more than a single step."



Prof. Eugen Rabkin

WHAT DOES GOLD REMEMBER?

Think of a car that recovers its original shape after being totaled in an accident or the scent of perfume returning to the bottle all by itself. It does not sound realistic, just like spilled coffee jumping from the floor back into the cup.

Both plastic deformation (car damage) and atomic diffusion (scent spreading) are classic examples of thermodynamically irreversible processes, which proceed only in one direction, and there is no way back to the initial state. It is remarkable that a combination of these can lead to damage recovery and the restoration of the shape of small particles of pure gold.

Researchers from Technion, Israel, and the Karlsruhe Institute of Technology (KIT), Germany, were first to demonstrate the phenomena of "shape memory" and self-healing in gold microparticles, achieved through

defects-mediated diffusion. The study, published in *Advanced Science*, was conducted by doctoral student Oleg Kovalenko and Dr Leonid Klinger, led by Prof. Eugen Rabkin of Technion's Faculty of Materials Science and Engineering, together with Dr Christian Brandl of KIT.

Shape memory has been observed in a few metal alloys, such as Nitinol (nickel titanium), however this is the first time the phenomenon has been demonstrated in a pure metal. The researchers indented gold particles with a sharp diamond tip controlled by an atomic force microscope (AFM). Annealing of the indented particles at a temperature of 600°C (about 65% of the absolute melting temperature of gold) resulted in full healing of the damage, and recovery of the particles' shape prior to deformation.

The researchers investigated the atomic motion during indentation and heating using atomistic molecular dynamic computer simulations. They demonstrated that the plastic deformation during the indentation process is mediated by the nucleation and glide of dislocation half-loops (the dislocations are linear, one-dimensional defects in the

crystal through which it undergoes plastic deformation). The loops, which egress at the free surfaces, form terraces and ledges on the flat facets of the particle, with the ledges serving as "guide rails," directing the diffusion of gold atoms back to the indented site during high-temperature anneal. Thus, the particle recovers its original shape.

The discovery may lead to the development of mechanically stable and damage-tolerant electronic components and devices. One of the main reasons for the failure of mobile electronics is mechanical wear. Designing a contact geometry based on shape memory could solve this problem once and for all: the electric current flowing through the damaged electrical contact would heat up the contact area, and heat would be utilized to repair the damage.

Another possible use is controlled drug delivery to specific areas of a patient's body. A drug could be injected into the cavity on the particle surface produced by indentation, and released after heating.

Like coffee that returns to the cup of its own accord.

WHEN REWARDS CURE DISEASE

Fighting illness by triggering areas of the brain

"Technion, one of few technological institutes with a medical school, offers the unique opportunity to harness technological capabilities along with medical developments," said Prof. Asya Rolls of the Ruth and Bruce Rappaport Faculty of Medicine upon being named a Howard Hughes Medical Institute (HHMI)-Wellcome International Research Scholar.

The prestigious award is given to promising researchers outside the US poised to advance biomedical research across the globe.

The focus of Prof. Rolls' research is the effect of experiences in the brain on the immune system. "All emotions, all thoughts, involve the activity of specific brain regions," she explained. "By understanding how such activity affects immunity, we will be able to manipulate the potential embedded in the brain to cure disease."

"We will be able to manipulate the potential embedded in the brain to cure disease."

- Prof. Asya Rolls

hhmi

W
wellcome

HHMI, the Bill & Melinda Gates Foundation, the Wellcome Trust, and the Calouste Gulbenkian Foundation will jointly award a total of nearly \$26.7 million to 41 early-career scientists from 16 countries.

The award is a big boon for scientists early in their careers, and offers the freedom to pursue new research directions and creative projects that could develop into top-notch scientific programs. Their research covers a broad variety of biological and medical research areas including neuroscience, genetics, biophysics, computational biology, and parasitology.

Prof. Rolls joined Technion's Rappaport Faculty of Medicine in October 2012 after completing her postdoctoral training at Stanford University. She obtained her PhD from the Weizmann Institute, and her MSc from Technion. She is an elected member of the Federation of European Neuroscience Societies (FENS)-Kavli network of excellence (2015-2019); she received the Fulbright, Rothschild, and European Molecular Biology Organization (EMBO) long-term fellowships; the NARSAD Young Investigator Award; and the Krill Prize, awarded by the Wolf Foundation.

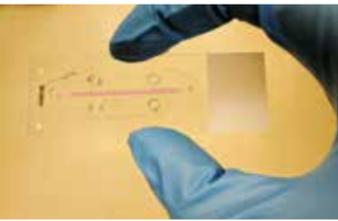


(l-r) Technion President Prof. Peretz Lavie, Prof. Asya Rolls, and Rebecca and Sidney Boukhris of the Adelis Foundation

Rolls: Adelis Brain Research Award

The 2017 Adelis Award for groundbreaking research by a young scientist was presented to Technion's Prof. Asya Rolls for her work in the field of brain-regulated immunity. The ceremony took place during Technion's Board of Governors.

In 2016, Prof. Rolls published an outstanding paper in *Nature Medicine* in which she demonstrated a mechanism that connects the placebo effect to systemic immune activation. In her submission to the Adelis Foundation, Prof. Rolls proposed to test how the reward system affects the immune system – a novel approach to fighting tumors.



Close-up of SNDA-AST

SUPPRESSING THE RESISTANCE

In 2014, infections with antimicrobial resistance (AMR) claimed the lives of more than 700,000 people worldwide. Using nanotechnology, Technion researchers have developed a system that enables rapid and accurate customization of an antibiotic to the patient.

For patients with life-threatening infections, urgent treatment is required; for every hour that effective antibiotic treatment is delayed, survival rates drop by about 8% for patients with septic shock. In order not to leave the patient without adequate protection while awaiting the results, many doctors prescribe an antibiotic with a broad spectrum of activity in large doses. This phenomenon facilitates the emergence of AMR and affects the microbiota – the population of “good” bacteria found in the human body.

The importance of technologies that can predetermine the resistance of a specific bacterium to specific antibiotics is obvious: they would enable the healthcare team to choose the most effective antibiotic a day earlier than traditional methods.

Such a system, developed at Technion, enables rapid and accurate customization of an antibiotic to the patient. It quickly analyzes bacteria isolated from patients with infections, and assesses their level of resistance to specific antibiotics. The device is a chip with hundreds of nanoliter (1,000 times smaller than a milliliter) wells inside it, each containing a few bacteria and a specific antibiotic. Bacterial response is detected using a fluorescent marker, image processing tools, and statistical analysis of the fluorescent signal.



Prof. Shulamit Levenberg

The study was led by Prof. Shulamit Levenberg, Dean of the Technion Faculty of Biomedical Engineering, and carried out by three researchers in her lab: doctoral students Jonathan Avesar and Tom Ben-Arye, and postdoctoral student Dekel Rosenfeld.

In addition, the researchers demonstrated the ability to test bacteria directly from raw patient urine samples, thereby skipping the isolation step, and potentially saving two vital days for patients with urinary tract infections. The system makes for faster diagnostics, earlier and more effective treatment of infectious bacteria, and improved patient recovery times.

According to Avesar, “The use of the technology we developed reduces the size of the required sample by several orders of magnitude, reduces the scanning time by half, significantly reduces lab space required for testing, and reduces the cost per test.”

The study was carried out in cooperation with Prof. Moran Bercovici of the Technion Faculty of Mechanical

Engineering and doctoral student Marianna Truman-Rosentsvit, in cooperation with Dr Yuval Geffen, head of the Microbiology Laboratory at Rambam Health Care Campus. It was funded by a KAMIN grant from the Innovation Authority and the Israeli Centers of Research Excellence (I-CORE). The findings were published in the *Proceedings of the National Academy of Sciences* (PNAS).

Charting Bacterial Socialization

Technion team to lay out how bacteria interact in their natural habitats



Prof. Roy Kishony

Three teams of researchers will receive the Kavli Microbiome Ideas Challenge grant, which supports the development of novel tools and methods in the field of microbiome research. One of the teams is led by Roy Kishony, professor of Biology and Computer Science at Technion, who promises to introduce an innovative method of mapping interactions between bacterial species within their natural communities. The team’s research will use micro-droplet co-localization and rare-element DNA labeling in order to uncover which species support or inhibit the growth of others, and quantitative biodiversity and stability in microbial communities.



Bacteria in action

The two other teams are from the University of Washington and the University of Oregon. The Kavli Ideas Challenge is led by the American Society for Microbiology (ASM), and carried out in partnership with the American Chemical Society (ACS) and American Physical Society (APS). “The Kavli Microbiome Ideas Challenge is an exciting opportunity to support high risk, interdisciplinary research that does not normally receive traditional funding,” said Tim Donohue, Chair of the Scientific Advisory Board for the Kavli Challenge. “The grants selected for funding demonstrated great potential for the generation of novel tools and methods that will be broadly applicable across the many environments and move the field forward in the causal understanding of microbial and community function.”

In June, Prof. Kishony was amongst 65 outstanding life scientists elected as members of the European Society of Molecular Biology (EMBO), joining a group of more than 1,700 of the best researchers in Europe and around the world.

Viterbi’s Golden Nugget

Algorithm that changed the face of digital communication marks 50th anniversary at Technion

“I didn’t set out to produce an algorithm which would receive the attention which it has,” wrote Prof. Andrew Viterbi recently. “I’d stumbled over a golden nugget which others might have ignored because it didn’t look shiny.”

Upon publication of the algorithm, Viterbi announced that he was donating it to the benefit of the public and waiving royalties. The algorithm has been adopted and deployed in a variety of applications, including voice transmission over phone calls, image and voice transmission in video calls, and Internet and cellular transmission, revolutionizing data decoding and optimal noise and interference filtering, and leading to the development of key communications technologies including Code Division Multiple Access (CDMA).

Prof. Viterbi visited Israel for the first time in 1967, the year the algorithm was published. Here, at Technion’s Faculty of Electrical Engineering, he established close friendships with Profs. Jacob Ziv and Abraham Lempel who later became the developers of the Lempel-Ziv algorithm, which also revolutionized the field of communications. Over the years, Prof. Viterbi’s close ties with Technion have found expression in his activities at the American Technion Society (ATS), which awarded him the



Prof. Andrew Viterbi

Albert Einstein Prize; and the establishment of the Andrew and Erna Finci Viterbi Center for Advanced Studies in Computer Technology, Andrew J. and Erna F. Viterbi Chair in Information Systems/Computer Science, Andrew and Erna Finci Viterbi Fellowship Program, and Viterbi Family Foundation Faculty Recruitment Program. His greatest contribution to Technion’s Faculty of Electrical Engineering, \$50 million, was announced in 2015, and followed by the naming of the Faculty of Electrical Engineering after him and his late wife, Erna.

Technion marked the jubilee of the Viterbi Algorithm at a festive ceremony. The event was held during the 7th Annual Henry Taub TCE (Technion Computer Engineering) Conference, which focused on coding for storage and information systems.

Nobel PREDICTOR

Harvey Prize awarded for the discovery of gravitational waves and development of optogenetics

The 2016 Harvey Prize was awarded to two research groups that revolutionized two fields of science: astrophysics and brain research, with the ceremony held as part of Technion's 2017 Board of Governors events. "Both of these groups have contributed significantly to our understanding of the universe," said Technion President Prof. Peretz Lavie. "One achieved a breakthrough in our understanding of the outer universe, and the other at the most internal level – the living cell."

The Prize is the most prestigious scientific award conferred by Technion, and has been awarded annually since 1972 in recognition of outstanding contributions to science, technology, medicine, and peace. The prize fund was established by the late Leo M. Harvey, an industrialist and inventor from Los Angeles. Scott Leemaster, Chair of the American Technion Society (ATS), said that the Harvey Prize has become a "Nobel predictor," since around 20% of its winners are later awarded the Nobel Prize.



(l-r) Prof. Hegemann, Prof. Emeritus Thorne, President Lavie, Prof. Emeritus Weiss, Prof. Deisseroth, Dr Drever, and Prof. Hagit Attiya

In the field of science and technology, the prize was awarded to Profs. Emeritus Ronald Drever and Kip Stephen Thorne of the California Institute of Technology (Caltech) and to Prof. Emeritus Rainer Weiss of the Massachusetts Institute of Technology (MIT). The three scientists, who led the LIGO experiment, received the prize for the discovery of gravitational waves, which verified a key prediction of Einstein's general theory of relativity and opened a new window to the universe.

Prof. Drever passed away in March. His brother, Dr Ian Drever, who accepted the prize on his behalf, said that Ronald was a born scientist who invented many things even in childhood.

In the field of human health, the prize was awarded to Prof. Karl Deisseroth of Stanford University and Prof. Peter Hegemann of the Humboldt University of Berlin. They received the prize for the discovery of the opsin molecules involved in sensing light in microorganism cells and their digitalization in the development of optogenetics. This innovative and original approach, which has revolutionized the field of neurobiology, enables the study of the function of nerve cells, and the connection between neural networks and animal behavior.

Prof. Deisseroth said, "The development of optogenetics is indeed a tremendous achievement; however, it does not belong solely to two researchers, but to generations of scientists whose work led to the accumulation of the knowledge necessary for the breakthrough." He continued, "Basic science often leads to dramatic developments in medicine without the scientist knowing at the outset where his research will lead. The lesson to be learned from the development of optogenetics is the importance of public support for basic science."

JUST
ANNOUNCED
Oct. 3, 2017

Nobel Laureates, Physics
Kip Thorne
Rainer Weiss

Planting the Seeds of a Promising Future

Technion's Ronald S. and Jo Carole Lauder Student Dormitory building was inaugurated at a festive ceremony attended by Minister of Education Naftali Bennett, and Haifa Mayor Yona Yahav. The state-of-the art structure was donated by World Jewish Congress President Ronald Lauder and his wife, Jo Carole.

Bennett said at the ceremony, "Technion's secret lies in its role as an integral part of Israeli society and of the vision of the State of Israel. You are not hidden away in an ivory tower. On the contrary, you are connected to the Israeli experience and operate out of a commitment to society... The new dormitories will enable students to invest their time and energy in their demanding studies. On this day, we are planting the seeds of a promising future."

"Technion [is] an integral part of Israeli society and of the vision of the State of Israel."

- Naftali Bennett

The complex consists of 116 apartments in four 9-storey buildings. The new dormitories will house 408 single students and 40 couples.

"This is a great day of celebration for us," said Technion President Prof. Peretz Lavie. "It is our explicit policy to make dorms available to all students, practicing what we preach in terms of diversity and equal opportunity."



(l-r) Avi Balashnikov, Naftali Bennett (Minister of Education), and President Lavie unveil the Lauder building

"The Lauder family visited Technion about three years ago and fell in love with it," said Avi Balashnikov, Ronald Lauder's representative in Israel. "The Lauder Foundation works to promote education and academia in Israel and the donation to Technion continues this important support for the advancement of higher education in the State of Israel."



Michael Ada (l) and Roy Atinesh (r) with prototype

Life-saving UNICYCLE

Technion students develop a lightweight rescue stretcher

The Product Design Exhibition is held annually at Technion's Faculty of Mechanical Engineering as part of the New Product Design course, led by Dr Hagay Bamberger and under the guidance of Prof. Reuven Katz.

One unique development presented this year was a field stretcher developed by students Michael Ada and Roy Atinesh, under the guidance of Dr Zvi Fruchter, for United Rescue of Israel and with the assistance of Segal Bikes Ltd.

"On many terrains, such as bicycle paths, it is impossible to reach the injured person by car, or else the time required for evacuation is too great," explained Ada. "We were asked to develop a lightweight stretcher with a carrying mechanism that would... include a rigid surface to protect the injured person's spine, for easy and quick evacuation to the means of transportation."

Atinesh added, "We developed a folding stretcher comprised of a surface with carrying beams, with a single tire attached to it. We manufactured it from aluminum and it weighs 14 kg. In a future development it will be manufactured from magnesium and its total weight will be about 11 kg, so that two medics can carry it on their backs."



The Honorary Doctors (front row, l-r): Prof. Bernard Amadei, Dr Joseph Ciechanover, Prof. David L. Donoho, Prof. Odile Eisenstein, Emanuel Zvi Liban, Martin Paul Moshal, Joseph Neubauer, and Prof. L. Rafael Reif

Universities' Role in Making the World a Better Place

"Now is a moment of change. As we navigate uncertainty around the globe, it is useful to remind ourselves that universities can be a powerful, steady force for good. In fact, I believe that this moment offers a remarkable opportunity for research universities to be leaders: in education, in research, and in solving problems - to make a better world."



"Now is a moment of change. As we navigate uncertainty around the globe, it is useful to remind ourselves that universities can be a powerful, steady force for good."

- MIT President Prof. Rafael Reif

The remarks were made in June by MIT President Prof. Rafael Reif, at the Technion's Honorary Doctorate Conferment Ceremony.

Technion President Prof. Peretz Lavie spoke about the rapidly changing world and academia's duty to adapt. "Among other things, we must provide our students with the tools they will need in the changing labor market, adopt the appropriate learning methodologies for the new world, expand a framework to encourage interdisciplinary research, and strengthen the triangular relationship between academia, government, and industry. Thanks to leaders like you, Honorary Doctorate recipients, I have no doubt that we will be able to successfully deal with the Fourth Industrial Revolution, which we are in the midst of."

Prof. Reif, responding on behalf of the eight recipients, said, "Technion's impact on the world is enormous relative to its size, and that is why I chose to spend my sabbatical year in 1988 here – at a university that I admire and with colleagues I deeply respect. My choice also had personal roots: in 1938, my parents fled Eastern Europe shortly before most of their families were exterminated or died of starvation and disease. My parents came to Venezuela with nothing – no language, no money, no friends. They taught my brother and me that even if you leave your home, the one thing you will always take with you is education. Education is the tool that allows you to invent your future, and due to this perspective, I chose academia."

YOUTH WITH A MISSION

Technion's annual SciTech program attracts high school students from around the world, and combines scientific research with cultural and social activities. Participants work on a research project of their choice, supervised by academic staff, making use of the state-of-the-art facilities on campus.

This year, 60 youth from Australia, Brazil, Canada, China, Cyprus, France, India, Israel, Korea, Spain, UK, and US participated in the month-long challenge.

ROLL of HONOR



Prof. Ashraf Brik
Chemistry

Won the Bruno Prize, awarded to Israeli scientists and researchers under the age of 50 who have proven outstanding talent, creativity, and potential for significant breakthroughs.

Prof. Yonina Eldar

Electrical Engineering

Was elected to join the elite group of only 125 lifetime members of the Israel Academy of Sciences and Humanities, an honor reserved for top-level researchers. Prof. Eran Yahav (Computer Science) was elected to the Israel Young Academy (IYA) of the Israel Academy of Sciences and Humanities, which is comprised of leading young scholars in the humanities, social sciences, and natural sciences.



Prof. Orna Grumberg

Computer Science

Received an Honorary Doctorate degree in Informatics and Mathematics from the Technical University of Munich. She is known for developing model checking, a method for formally verifying hardware and software designs.

Prof. Hossam Haick

Chemical Engineering

Was awarded an Honorary Doctorate degree from the University of Haifa for his significant contributions to the development of cutting-edge approaches to non-invasive medical diagnosis of early-stage disease.



Prof. Aviad Shapira

Civil and Environmental Engineering

Was elected as an honorary member of the American National Academy of Construction (NAC). He is the first member from outside of North America.

Prof. Yoav Shechtman

Biomedical Engineering

Was selected as a Zuckerman Faculty Scholar, thanks to his extraordinary scientific achievements and leadership qualities.





Science, Politics, and Ideology

... and what the three have to do with forest fires



Prof. Daniel Orenstein

Fires in Haifa



In late November 2016, Haifa experienced its first large scale urban fire: smoke turned the skies a cloudy orange and was visible from outer space.

OPINION

is an excess of knowledge regarding how to contend with the threat.

Prof. Orenstein believes the main factor is failure to implement recommendations made after the fires of 1989, 1995, 1998, 2005, and 2010. Each fire was followed by a review committee and funding for research grants, and yet the threat continues to exist.

For more than 25 years, ecologists and fire experts have recommended more fire stations, equipment, access roads, and airborne capabilities; prevention through fire breaks and buffer zones; reduction in fuel load; the facilitation of natural regeneration, reintroduction of native species, thinning and removal of biomass; and even a biosphere initiative.

Much of the population, however, is appalled by the unaesthetic appearance of some such measures. After

all, protecting communities against forest fires would mean reducing the number of trees that provide shade for houses, streets, and prime cookout spots. The historic role of tree planting in Israel has also not been forgotten. As the Professional Committee for the Restoration and Development of the Carmel noted in 1990, they were "aware that a large number of donors and volunteers in Israel and abroad were raised on tree planting as a value and a symbol."

This places foresters, eager to implement buffer zones around neighborhoods, in a difficult situation; as one said in 2012, "We're getting sued twice: once for ruining the view by cutting down trees and once for endangering homes by not cutting down trees."

DESIGN | STATE OF MIND

Because even Israel's leading technology university has an eye for art

According to Prof. Ezri Tarazi, who has chaired the Industrial Design graduate program at Technion's Faculty of Architecture and Town Planning since 2016, "We are at a crucial moment in the history of technology and the way it is transforming the lives of people. As a designer who loves technology, I see a huge opportunity to collaborate with almost every department at Technion." He founded and chaired the Bezalel Academy of Arts and Design Master's Degree Program in Industrial Design before coming to Technion, and believes that design is critical to the advancement of technology.

Design Thinking, a method used by designers to solve complex problems, is quickly becoming one of the leading engines of innovation, and universities that have realized this are encouraging the synergy between engineering and design. Designers help 'good' innovations become 'great,' which improves their chances of succeeding in the market, and in turn help more people embrace technology.

Prof. Tarazi sees an opportunity for Technion to develop innovative methodologies with both humans and the environment as a top priority. He is founding a 'Design and Make' laboratory – DMion ('imagination' in Hebrew) – at Technion, which will explore the way digital fabrication technology such as huge 3D printing machines could enable the creation of objects the size of a chair. "We are on the verge of a fourth industrial revolution, and design plays a major role. Designers and engineers play key roles."

As a designer, he believes it is his mission to "bring design and Design Thinking into the heart of a technology hub such as Technion."



"It is my mission to bring design and Design Thinking into the heart of a technology hub such as Technion."

– Prof. Ezri Tarazi

Before joining Technion, Tarazi was responsible for creating an exhibition that has been in high demand at museums around the world. The exhibition, titled "Higher View," is a series of ten coffee tables that reflect various aspects of Jerusalem's history, culture, and sociology. Each table's profile is in fact that of the walls of the Old City, and made of materials found in the city. The tables were digitally manufactured using high technologies including 3D printing, computer controlled machining (CNC), and water jet cutting, and interactive technologies that combined 3D cameras or computer-based music.



Table made of objects found in the Old City of Jerusalem, symbolizing its fragmentation