



# The Searchers

Tel Aviv University Annual Report 2017



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Local,

global,

personal,

**universal –**

the pursuit of the unknown takes us to unexpected places.

Come meet

some of our (re)searchers

on their Tel Aviv University journeys.



# “I’m learning not only good science, but how to think

SMART WORLD

As a doctoral student in biochemistry at the Chinese University of Petroleum, Qingdao, **Dr. Kai Tao** noticed a disproportionate number of Israeli papers in the top academic journals. He wondered, “How do they do it? It’s such a small country with so few people, but they’re doing so much exceptional work.” He decided to find out. Since 2014, Kai has been a TAU-funded post-doctoral fellow in the lab of **Prof. Ehud Gazit** (Life Sciences). Experimenting at TAU’s Center for Nanoscience and Nanotechnology and BLAVATNIK CENTER for Drug Discovery, and collaborating with the joint TAU-Tsinghua XIN Center among other partners, Kai is working with Gazit’s team on something futuristic. They’re developing self-assembling organic semiconducting particles for uses such as diagnosing cancer and improving the nerve function of the disabled. The Israeli defense industry is interested because of the potential to improve the lives of soldiers permanently injured in battle.

So what is Israel’s secret? Kai says, “I’m learning not only good science, but how to think. Israelis are always thinking the unbelievable and impossible. I get a lot of encouragement from Ehud to try out new things, because to do science, to do research, the idea is the most important thing.”

## A picture is worth 1,000 words... if you can read it correctly

We rely today on advanced medical imaging, but the accuracy of the resulting diagnosis and assessment of disease is based on the radiologist's subjective interpretation. By applying a powerful computational method called deep learning to medical imaging, **Prof. Hayit Greenspan** (Engineering) is developing a tool that correctly identifies abnormalities requiring treatment. The recipient of an Intel Award, Greenspan envisions that "this software has the potential to be embedded in the computer system of every medical center and radiological institution, improving early detection of killers like cancer and heart disease, and enabling progression toward personalized medicine."

## Virtual reality, coming to a theater near you

Virtual reality is a super-hot topic in both Silicon Valley and Hollywood; its application to interactive cinema is where the two industries meet. The Steve Tisch School of Film and Television is launching a new Digital Media Program to bring this cutting-edge field to TAU. **Prof. Nitzan Ben Shaul** (Arts) was joined by cinematographer, researcher and TAU graduate **Ehud Ben Arie** (Arts) in creating a unique and challenging curriculum that combines BA and MFA studies into a four-year track.

## Cyber experts of the world, unite!

Along with conducting some 30 research projects annually, the Blavatnik Interdisciplinary Cyber Research Center headed by **Prof. Isaac Ben-Israel** (Social Sciences) co-sponsors Cyber Week. Attendance at the annual event surged from 400 conference-goers in 2014 to 7,000 this year. Cyber security experts, practitioners, policy makers and enthusiasts converge from all corners of the globe to discuss topics such as online incitement; national security vs. individual rights; the Blockchain revolution in financial services; law enforcement's response to cyber-attacks; cyber law; and the future of artificial intelligence.

## Where big data meets medicine

- The Buchmann Faculty of Law and Edmond J. Safra Center for Ethics held "Big Medical Data," a joint workshop with Monash University, Australia, led on the TAU side by **Prof. Michael Birnhack** (Law). Multiple issues were addressed spanning technology, healthcare and ethics, with a focus on issues of privacy.
- In a cooperative endeavor, TAU and the University of Toronto held a 2-day joint workshop at TAU on "Big Data and Health." Organized by TAU Vice President for R&D **Prof. Yoav Henis**, the workshop covered health issues, medical research, and statistical models for handling medical data.

## All the world's a network

Network science is an emerging field that examines complex networks of any kind, from telecommunication and computer networks, to biological, semantic and social networks. Positioning Israel at the center of this highly interdisciplinary and creative new area, **Dr. Erez Shmueli** (Engineering) co-hosted this year's international conference on network science, NetSci-X 2017, held in Tel Aviv and attended by over 300 international participants.

## Fighting cancer with algorithms

**Prof. Ron Shamir** (Exact Sciences) of the Blavatnik School of Computer Science, Head of the Edmond J. Safra Center for Bioinformatics, brought together researchers from TAU and around the world to the Simons Institute for the Theory of Computing at UC Berkeley for a month of brainstorming sessions on computational problems related to cancer, gene regulation and biological networks. The aim: To create improved algorithms that will lead to better methods of disease detection, diagnosis, prognosis and therapy.

## Bringing the Dead Sea Scrolls to the digital age

**Dr. Noam Mizrahi** (Humanities) works with an international team of scholars and computer scientists to analyze textual variations in the Dead Sea Scrolls. For example, some versions of the scrolls differ from present-day accepted Biblical texts because the scribes updated the archaic language to suit readers of their time. These differences reveal much information about Biblical interpretation, the cultural atmosphere of the Second Temple period, and the development of the Hebrew language.

## Investing big in the Internet of Things

What do General Electric, Microsoft, Qualcomm, India's Tata and China's HNA EcoTech have in common? They all invested in "i3 Equity Partners," a \$20 million fund for Israeli startups in the Internet of Things (IoT) field in cooperation with TAU and Pitango Venture Capital. The fund will provide 3 to 5 high-potential startups annually with a financial investment of up to \$1 million each. Selected companies will also benefit from academic, mentoring and business support at TAU's Miles S. Nadal Home for Technological Innovation and Entrepreneurship.

## Searching for game-changers in learning

Following a two-year stint at UC Berkeley, post-doctoral researcher **Dr. Rinat Rosenberg-Kima** has joined TAU in the framework of "Minducate," the new hub for developing next-generation learning technologies. Rosenberg-Kima pursues research at the Curiosity Lab headed by Dr. Goren Gordon (Engineering). She's studying and assessing the use of social robots as peers and tutors for children in educational settings. Minducate, run by the Sagol School of Neuroscience, offers PhD and post-doctoral fellowships to creative researchers from diverse fields with the aim of turning TAU and Israel into a leader in EdTech.



Increasingly, we expect our computer devices to understand questions or commands. But here's the problem: computer language is literal while human language is ambiguous and complex. Bridging between the two is new faculty member **Dr. Jonathan Berant** (Exact Sciences), a TAU alumnus who has joined the Blavatnik School of Computer Science after completing post-docs at Stanford University and Google. Berant is an expert in natural language processing. His research involves extracting the meaning and relation of words so that computer programs can respond to queries with the most relevant answers. "Machines are poised to access the depth and breadth of all the information in the world – if only they could understand what we're asking them," says Berant.



Is your virtual  
assistant  
being rude  
or did it not  
understand  
your question?

# Environmental responsibility begins at home

When **Dr. Ram Fishman** and **Dr. Dorit Kerret** (both of Social Sciences) wanted to teach students about social change in the area of sustainability, they thought, “why not start right here on campus?” Their unique MA seminar – a first for TAU – required teams of students to plan, execute and evaluate interventions to promote “green behavior,” such as convincing TAU students to use recyclable coffee cups or TAU office staff to cut down on printing. “Doing applied research in the real world is harder for students than the more conventional modes of learning, but also more rewarding,” says Fishman, a member of TAU’s School of Social and Policy Studies and Boris Mints Institute for Strategic Policy Solutions to Global Challenges. Stresses Kerret: “We need the policy makers of tomorrow to understand the complexity of effecting positive social change. They’ll be on the frontlines of protecting our planet.”



## Green chemistry for industry

**Dr. Roman Dobrovetsky** (Exact Sciences) is sending MSc student **Shlomi Volodarsky** to the University of Toronto for a 3-month internship on the subject of metal-free catalysts for industrial processes, as part of a collaboration with the Canadian school. The research aims at reducing toxins and pollutants in chemical reactions by utilizing cheap and abundant CO<sub>2</sub>, a gas that otherwise exacerbates warming of the atmosphere.

## Demystifying carbon footprinting

Porter School of Environmental Studies alumni **Ory Zik**, founder and CEO of the non-profit Greenometry, and **Ehud Grunfeld**, CTO, manage and run the Boston-based organization dedicated to mitigating climate change through data science. They are designing a data-driven, intuitive app that will help both companies and individuals gauge the carbon footprinting of everything they do and make this knowledge part of routine decision making. Both Zik and Grunfeld are serial entrepreneurs, having founded numerous startups and companies.

## Comparative study of recycling

**Yuktan Chow** arrived from China to attend the Porter School of Environmental Studies International Master's Program. Her thesis focuses on electrical waste dumping sites in rural China: Old computers, cellphones and other appliances are being dismantled to extract valuable metals in toxic recycling operations that damage residents' health along with the environment. In a truly global sharing of knowledge, Yuktan's study is drawing on Israel's experience in dealing with a similar problem in the area of Hebron.

## What the Bible tells us about nature

The Bible is a profoundly rich and varied source of information. Now, for the first time, its record of nature in the ancient world is being tapped. The Dictionary of Nature Imagery (DNI) Bible Project, an ambitious online database headed by **Prof. Dalit Rom-Shiloni** (Humanities), examines and interprets the Bible's references to flora, fauna, landscape characteristics, climate, water sources and geographical regions. DNI's website will make this unique body of information accessible to scholars and students of the Bible everywhere.

# Fired up about clean power

In 30 to 40 years, world demand for the most common type of fuel – crude oil – will begin to outstrip supply. Where will alternative fuel come from? Indian post-doc **Dr. Sarika Singh**, who earned her PhD at the prestigious IIT Bombay, is working with **Dr. Brian Rosen** (Engineering) of TAU's Center for Renewable Energy to convert natural gas – a much more abundant resource – into clean-burning, synthetic liquid fuels to power cars, planes and industry. Singh is developing a new class of robust ceramic catalysts used to drive the chemical reaction that turns gas into liquid fuels. About 60 Indians research and study at TAU annually, including Singh's husband who was also a post-doc in engineering before returning home for a position in academic research.



# Can you speak “Plant”?

The question of plant hearing has intrigued humans since ancient times. Embracing the emerging field of plant bioacoustics, former Smoler-Winnikow Scholar **Marine Veits** and PhD student **Itzhak Khait** (pictured) of the Smolarz Family Graduate School of Life Sciences are studying the responses of plants to the sounds of their pollinators in the lab of **Prof. Lilach Hadany** (Life Sciences), TAU Botanic Garden. Preliminary results suggest that flowers rapidly react to the buzz of a flying bee by producing sweeter nectar, whereby the flower serves as the plant’s “ear.” These results shed new light on the interaction between plants and their environment, including predators and pests, opening the possibility for sound-based methods in agriculture.

S U S T A I N A B L E P L A N E T



## Safeguarding the world's food

The George S. Wise Faculty of Life Sciences and Manna Center Program for Food Safety and Security are jointly offering a new International MSc in Plant Sciences with an emphasis on food safety and security. Designed to attract students from the developing world, the program's second graduating class included students from Vietnam, Myanmar, Nepal, Ethiopia, Rwanda, Uganda and Nigeria. The curriculum includes hands-on agricultural experience in Israel's Arava desert. Academic Head **Prof. Nir Ohad** (Life Sciences) says, "We're preparing the next generation of scientists and policymakers with the knowledge and skills they will need to guide global food security."

## Predicting the fate of fish

Coldblooded organisms shrink in body size when reared in warmer temperatures. To test whether fish might become smaller in warming oceans, PhD student **Itai van Rijn** (Life Sciences) examined 74 species at varying temperatures in the Mediterranean Sea. A recipient of a Manna Food Security Center fellowship, he worked under the supervision of **Dr. Jonathan Belmaker** (Life Sciences) of the Steinhardt Museum of Natural History, Israel National Center for Biodiversity Studies. Van Rijn's results confirmed that fish lose 5 percent of their maximal size with each 1°C increase in temperature, while more active species lose nearly 10 percent. These results are highly significant for predicting the negative effects of global warming on fisheries, important contributors to the world's food supply.

# Virtuosity meets opportunity



When violinist **San Win Htike** (Arts) from Myanmar completed his bachelor's at the National University of Singapore, he could have pursued graduate studies anywhere. But he sought out TAU's Buchmann-Mehta School of Music because he was intrigued by its roster of big-name stars. The 22 year-old enthuses: "Just in the last two years at TAU, I've met many major artists, including Itzhak Perlman, Julian Rachlin and Gil Shaham." He hopes to parlay his training and networking into a position at a top international orchestra and, eventually, to bring his colleagues back home to teach classical music in Myanmar. Fellow student **Lilia Pocitari** (Arts), a 19-year old violin prodigy from Moldova, followed her elder brother Dumitru to TAU's Adler-Buchmann International Program for Outstanding Foreign Music Students. The siblings are third-generation musicians, and now Dumitru is a member of the Israel Philharmonic Orchestra.

## How does one instill civic responsibility?

In a pioneering program for Israel and possibly the world, TAU has launched over 35 new courses in civic engagement across the campus and plans to double that number next year. Led by Dean of Students **Prof. Tova Most** and the Unit for Social Involvement, Ruth and Allen Ziegler Student Services Division, the program aims to educate students on the theory and practice of community involvement. The fully accredited courses deal with the various challenges facing Israeli society. As other universities follow TAU's lead, it is anticipated that thousands of graduates will enter Israeli society with greater social awareness, creating a critical mass of capable and influential change-makers.

## When cities become textbooks...

Students of TAU's David Azrieli School of Architecture were walked through a new kind of textbook – the city streets of Tokyo, Venice and Berlin. **Prof. Ayala Ronel** and **Dr. Eran Neuman** (both of Arts) brought 30 students to Tokyo for a seminar at Waseda University on local urban phenomena. The study tour culminated in the students designing 3D works of art that examined perceptions of space. Similar study tours were led by Azrieli School faculty to Italy and Germany.

## Growing new generations of film artists

Students and graduates of the Steve Tisch School of Film and Television, rated among the top 15 schools worldwide by *Hollywood Reporter*, celebrated the 30th anniversary of the Tel Aviv International Student Film Festival. The competition has become a major event for student filmmakers and industry leaders alike, providing a springboard for career development. At the 2016 festival, 60 films were screened from 42 schools representing some 25 countries.

## Words, the conjurers of imagination

A new theory on the essence of human language has been developed by **Dr. Daniel Dor** (Social Sciences), Chair of the newly dedicated Dan Department of Communication. Dr. Dor sees human language as a communication technology, not unlike today's social media. It was collectively developed by ancient humans for a very specific communicative function – to instruct the imagination, or in other words, to make one another imagine things. This novel approach to language development promises to yield new directions in linguistic research.

## Quo vadis, world conservatism?

With the advent of the Trump presidency and the growing popularity of right-wing figures in Europe, one may well ask, where is the world's politics headed? As part of the American Studies Forum, **Prof. Milette Shamir** and **Dr. Yael Sternhell** (both of Humanities) are organizing a series of international conferences to shed light on this question. Entitled "American Conservatism – Then and Now," the series will host leading historians and focus on the rise and impact of conservatism in US culture.

## What if we could learn about parenting... from the Bible?

There may not have been fights over who gets the car keys, but **Dr. Talia Sutskov** (Humanities) has found many parallels between today's parenting challenges and those described in the Bible. Her study reveals two main recurring problems. The first is when parental love is unevenly distributed among children, which often tears the family apart and leads to intense sibling rivalry and even murder. The second major problem among Israelite families of old was the lack of boundaries set by fathers, leading to aberrant child behavior. Sound familiar? Her fascinating lecture series on the subject will be offered to the public by the Department of Biblical Studies and Beit Hatfutsot.

BETTER SOCIETY



## Immigrants among us: A hot button topic

- The newly formed School of Social and Policy Studies has launched an MA in Global Migration and Policy. Taught in English by internationally renowned experts, and offering the option of a semester abroad, the program provides students with the tools to pursue careers in fields ranging from public policy and research to international affairs. The program is run by Academic Head **Prof. Noah Lewin-Epstein** and Coordinator **Prof. Adriana Kemp** (both of Social Sciences).
- In a collaborative study with University College London, **Dr. Miri Yemini** (Humanities) of the Jaime and Joan Constantiner School of Education is looking at the immigrant experience on a local and global level, focusing on a London school with a diversified population. Her study of immigrant students' present status, anticipated future, and connection with their country of origin will provide insight into societal coping with mass migrations.

## Messages from the past

A group of scholars from Israel and Europe, including TAU's **Prof. Jonathan Price** (Humanities), have joined forces to collect all the ancient inscriptions found in Israel during an era of sweeping change – from Alexander the Great's conquest in the 3rd century BCE to the Muslim conquest in the 7th century CE. Unprecedented in scope, the project will include 13,000 texts in 10 languages, written on stone, mosaic, ceramics, plaster, cave walls and metal. It will provide unique and vivid physical evidence of the complex, multilingual and multicultural history of the people who lived in this part of the world across the vast expanse of antiquity.

## An out-of-the-box look at culture, adopted worldwide

**Prof. Itamar Even-Zohar** (Humanities) has generated a novel framework for understanding the significance of phenomena like language or literature within the context of their moment in history and against the background of social processes. His "Polysystem," or "PS theory," has been recognized around the world as an enormously effective and versatile model for cultural analysis. It generated the establishment of the International Society for Polysystem Studies by a group of scholars in 2016. The Society's first meeting was held last June in Iceland, with participants from the USA, Spain, Belgium, the Netherlands, Italy, Turkey, Hong Kong and Israel. The next event will be held in Italy and will feature the first "Annual Even-Zohar Lecture," named in honor of the pioneer of PS theory.

## Looking at animals through a cultural prism

Historians from China, Hong Kong, Australia and the US will be attending a workshop co-organized by **Prof. Meir Shahar** (Humanities), together with Israeli academic colleagues, on the diverse roles and meanings of animals in Asian cultures. Whereas monotheistic tradition sees a sharp dichotomy between man and beast, with the former created to rule and the latter to serve, Buddhist tradition acknowledges the spiritual potential inherent in all creatures. The workshop promises fresh and unusual insights into Asian culture, religion and history.



BETTER SOCIETY

# Fostering confidence

When **Salam Kedan**, 22, brought some of her international friends from TAU to meet elementary schoolchildren in her home town of Baqa al Gharbiyye, near Haifa, "this was the first time they ever saw a foreign student." Salam organized visits by Indian, Russian, Chinese and American former classmates from TAU International's BA Program in the Liberal Arts, which she completed last year. Majoring in Middle Eastern studies, Salam says her time at TAU was one of the most unforgettable experiences of her life. Now, Salam is founder and director of the NGO, "Salam Center for Peace." It arranges for high school students from Baqa to attend Model United Nations events and other conferences abroad, for example in NY and Qatar. Salam believes that connecting Israeli Arab youngsters to other cultures "makes them more confident and excited about building a better future for all."

A man in a white shirt is shown in profile on the left, looking towards a red brick wall. On the right, another man's face is visible through a hole in the wall, looking back at the first man. The text 'When is a copy not a copy?' is overlaid on the wall in large black letters.

# When is a copy not a copy?

Newly minted **PhD Omri Rachum-Twaig** (Law), of TAU's Zvi Meitar Center for Advanced Legal Studies, contends with the problem of copyright in the digital age. He makes a distinction between merely copying someone else's work of art, for example a musical passage, and using it as a springboard for a new, creative work that enriches the sphere of artistic expression. In his dissertation, which was partially supported by TAU's S. Horowitz Institute for Intellectual Property in memory of Dr. Amnon Goldberg, Rachum-Twaig argues for redesigning laws governing derivative work to allow for greater creative flexibility while still protecting the original artist's rights. Rachum-Twaig is a former Doctoral Fellow of TAU's Edmond J. Safra Center for Ethics and, as an undergraduate, trained in percussion instruments at TAU's Buchmann-Mehta School of Music.



BETTER SOCIETY...

## Jury still out on class action

Since the emergence of the modern American class action lawsuit five decades ago, its practice in some form or another has spread worldwide. However, class actions are still accompanied by fierce debate as to whether they help realize important goals of deterrence, or are just a chance for abusive litigation and opportunistic financial awards. **Prof. Alon Klement** and **Dr. Shay Lavie** (both of Law), together with Prof. Samuel Issacharoff of NYU, organized an international conference, "Fifty Years of Class Actions: A Global Perspective," which provided an opportunity for leading scholars from several countries to debate current issues. TAU's Buchmann Faculty of Law now seeks to develop this field in Israel.

## Protecting our young

Legal cases of preschoolers' maltreatment rarely achieve just closure in the courts. This is due to the lack of corroborative evidence and the dismissal of the victim's testimony as unreliable. Now, to optimize the chances for young victims to be heard, **Dr. Carmit Katz** (Social Sciences) of the Bob Shapell School of Social Work brought together social workers, prosecutors, judges, physicians and researchers in an interdisciplinary forum and a field study. Their work resulted in newly formulated instructions for conducting forensic interviews with very young children. It is hoped that this will lead to improved testimonies and more preschooler abuse cases being brought to justice.

## An ancient story retold

Ever hear the Yiddish expression, the *ganze megillah*, meaning “the whole, long story”? It comes, of course, from the Megillah (Book of Esther), which is read every year at Purim and is, basically, a long story. And what better way to tell a story than to dramatize it on stage?

In celebration of 50 years since the premiere in Jaffa of *The Megillah*, a Yiddish stage adaptation of the Biblical text by Itzik Manger, **Dr. Yair Lipshitz** (Arts) of the Department of Theater Arts in collaboration with **Prof. Dan Laor** (Humanities), head of the Cymbalista Jewish Heritage Center, organized a festive interdisciplinary event.

The full-day's activities included an international panel of scholars, interviews with those involved in the original production, and the highlight of the day – scenes directed by TAU theater students offering their contemporary, fresh and bold take on Manger's classic work. "This novel engagement with a Yiddish classic by a new generation of students is an ideal way to keep Yiddish culture alive and relevant," says Dr. Lipshitz.

## Guardians of Israeli art history

Taking the initiative to become the compilers, keepers and disseminators of the history of Israeli art, **Dr. Tal Dekel** and **Prof. Assaf Pinkus** (both of Arts), with the support of Mrs. Dorothy Cohen Shoichet and TIAF – Tel Aviv Israeli Art Foundation – are organizing the first-ever international conference dedicated exclusively to the subject. The conference focus will be "glocality, the simultaneous and somewhat contradictory global and local viewpoints on the development of art in Israel," says Prof. Pinkus.

# Hailing from top schools: A new faculty sampler

## Stanford University

**Dr. Adi Barzel** (Life Sciences), cancer immunotherapy

## New York University

**Dr. Noam Ben-Eliezer** (Engineering), biomedical engineering of novel methodologies for non-invasive MRI

## City University of New York (CUNY)

**Dr. Katy Borodkin** (Medicine), language acquisition

## Princeton University

**Dr. Omer Bromberg** (Exact Sciences), massive super-computer simulations in astrophysics

## University of Lugano

**Prof. Michael Bronstein** (Exact Sciences), mathematics for machine vision and big data

## Stanford University

**Dr. Yaron Carmi** (Medicine), cancer immunology

## MIT

**Dr. Johann Elbaz** (Life Sciences), synthetic biology and nanotechnology

## University of Texas at Austin

**Dr. Yakir Hadad** (Engineering), electrodynamics, artificial materials and wave physics

## Princeton University

**Dr. Reut Harari** (Humanities), history of modern Japan and of medicine

## UC Berkeley

**Dr. Roni Ilan** (Exact Sciences), condensed matter, nano-materials and superconductivity

## Columbia Law School

**Dr. Eliav Lieblich** (Law), public international law

## University of Chicago

**Dr. Ilanit Loewy Shacham** (Humanities), changes in second-millennium South India

## University of Chicago

**Dr. Tamar Mayer** (Arts), art history

## Princeton University

**Dr. Doron Puder** (Exact Sciences), theoretical mathematics, combinatorics and geometry

## Stanford University

**Dr. Avinoam Rabinovich** (Engineering), complex flow processes

## University of Washington in Seattle

**Dr. Moran Rubenstein** (Medicine), genetics of epilepsy and autism

## University of Texas at Dallas

**Dr. Dor Salomon** (Medicine), antibacterial treatments

## Columbia University

**Dr. Amit Sitt** (Exact Sciences), chemistry, tissue engineering and smart drugs

## University of Pennsylvania

**Dr. Jonathan Stavsky** (Humanities), medieval English literature

## Max Planck Institute of Economics and University of Nottingham

**Dr. Ori Weisel** (Management), organizational behavior

## Musical career in Russia, Ukraine and Azerbaijan

**Dmitry Yablonsky** (Arts), cellist and conductor

## Princeton University

**Dr. Dan Zeltzer** (Social Sciences), gender disparity in the workplace

## University of Florida/A native of Budapest

**Dr. Peter Pal Zubcsek** (Management), marketing and the role of social network structure in consumer interactions

# Chairman's Message



In an era when empirical “facts” have become subjective, we need precise and verifiable facts. In times of rising populism, we need to keep fostering an academic, economic and civic leadership. And when anti-globalization sentiments rise, we need to strengthen the web of worldwide connectedness.

Tel Aviv University takes seriously its duties as a global academic leader; we see the current geopolitical instabilities not just as a threat, but as an opportunity.

First, we are fortifying basic science capabilities by recruiting outstanding researchers from leading schools around the world. To attract the best you have to provide the best: state-of-the-art equipment, modern buildings and a nurturing environment. TAU has also almost doubled the number of post-doctoral fellows in the last five years. They bring expertise in fields as diverse as drug development, particle physics, linguistics and law. Increasing numbers are arriving from China and India – a welcome development for TAU-Asia ties.

Along with bolstering basic science, the University is continuing as a dynamic force for innovation – and bringing in more and more global partners into the process. These range from universities in Canada, Australia and Russia to multinational corporations and philanthropic foundations. The spark of inventiveness lights all our campus activities, including student social involvement.

Third, Tel Aviv University is reinforcing the Jewish people’s historic role as preservers and investigators of culture and heritage. Students are encouraged to think creatively about humanism in times of rapid, unpredictable change – and to build cultural bridges.

In our mission of academic leadership, we are fortunate to have supporters and donors on all continents. We look forward to widening this network under the banner of TAU’s Capital Campaign, and bringing TAU and Israel’s global contribution to new heights.

A handwritten signature in black ink that reads "Jacob Frenkel".

**Prof. Jacob A. Frenkel**  
Chairman, Board of Governors  
Tel Aviv University

# President's Message



Last year we celebrated the 60th anniversary of Tel Aviv University, which began as a small local college and grew into a world-class research institution with academic, cultural and business ties across the globe.

As we look ahead, we must decide what to develop next. Should we embrace and promote our “Tel Aviv-ness” – our identity as the innovation wellspring for Israel’s startup culture? Or should we bolster our global collaborations in the effort to solve universal problems such as economic inequality, racism, pollution, food security and cyber terrorism?

I believe the answer is both. We’ll go “glocal” – emphasizing our local primacy and global ambitions. And the springboard is TAU’s newly launched \$1 billion Capital Campaign. The Campaign will enable TAU to bridge between the innovative spirit on campus and the many urgent issues facing the world today. It will provide the optimal conditions for our researchers and students to reach further and dare harder in pursuit of the unknown.

The response by our Israeli and international donors has been inspiring. Transformative gifts this year include renewed

support for the Sagol School of Neuroscience and the new Sagol Center for Regenerative Biotechnologies; the Azrieli School of Architecture Building; and the Sylvan Adams Sports Institute. Other major donations are boosting TAU capabilities in communication, humanities, law, engineering, life sciences, cancer research, public policy, cognitive science and entrepreneurship.

We’re also excited about the upcoming opening of the Steinhardt Museum of Natural History, Israel Center for Biodiversity Studies – a monumental addition to the campus and the State of Israel.

Our growth and evolution as Israel’s most influential university, both locally and globally, depends on the commitment of our supporters. For their vision and generosity, we are deeply grateful. For the shared mission we face together, we are profoundly hopeful.

A handwritten signature in black ink that reads "Joseph Klafter". The signature is fluid and cursive, written in a professional style.

**Prof. Joseph Klafter**  
President  
Tel Aviv University

## Lay Leaders



**Prof. Jacob A. Frenkel**  
Chairman of the Board of  
Governors



**Dr. Giora Yaron**  
Chairman of the Executive  
Council



**Dr. h.c. Karl-Heinz Kipp**  
Deputy Chairman of the Board of  
Governors



**Ms. Dafna Meitar-Nechmad**  
Co-Chair of the TAU Capital  
Campaign



**Mr. Robert Goldberg**  
Chairmen Emeriti of the Board of Governors



**Mr. Harvey M. Krueger z"l**



**Dr. Raymond R. Sackler**



**Mr. Michael H. Steinhardt**

Dr. h.c. Josef Buchmann, Dr. h.c. Stewart M. Colton, Mr. James Dubin, Prof. François Heilbronn,  
Dr. h.c. Raya Jaglom, Dr. h.c. Adolfo Smolarz, Dr. h.c. Melvin S. Taub  
Vice Chairpersons of the Board of Governors

## Campus Leaders

**Prof. Joseph Klafter**  
President

**Prof. Yaron Oz**  
Rector

**Mr. Mordehai Kohn**  
Director-General

**Prof. Raanan Rein**  
Vice President

**Prof. Yoav Henis**  
Vice President for Research and  
Development

**Mr. Amos Elad**  
Vice President for Resource  
Development

**Prof. Eyal Zisser**  
Vice Rector

**Prof. Aron Shai**  
Pro-Rector

**Prof. Moshe Zviran**  
Dean of the Coller School of  
Management

**Prof. Leo Corry**  
Dean of the Lester and Sally Entin  
Faculty of Humanities

**Prof. Sharon Hannes**  
Dean of the Buchmann Faculty  
of Law

**Prof. Yossi Rosenwaks**  
Dean of the Iby and Aladar  
Fleischman Faculty of Engineering

**Prof. Daniel Chamovitz**  
Dean of the George S. Wise Faculty  
of Life Sciences

**Prof. Tammie Ronen**  
Dean of the Gershon H. Gordon  
Faculty of Social Sciences

**Prof. Ehud Grossman**  
Dean of the Sackler Faculty  
of Medicine

**Prof. Zvika Serper**  
Dean of the Yolanda and David Katz  
Faculty of the Arts

**Prof. Michael Krivelevich**  
Dean of the Raymond and Beverly  
Sackler Faculty of Exact Sciences

**Prof. Tova Most**  
Dean of Students

# DISTINCTIONS

**Prof. Noga Alon**, Exact Sciences, 2016 ACM Fellow; 2016 Edsger W. Dijkstra Prize

**Dr. Roey Amir**, Exact Sciences, American Chemical Society Division of Polymeric Materials: Science and Engineering (PMSE) Young Investigator

**Prof. (emer.) Joseph Bernstein**, Exact Sciences, EMET Prize

**Dr. Shiri Chechik**, Exact Sciences, 2017 Krill Prize for Excellence in Scientific Research of the Wolf Foundation

**Prof. Nili Cohen**, Law, 2017 Israel Prize in Law

**Prof. Nachum Dershowitz**, Exact Sciences, CIE Best Paper Award of the 12th International Conference on Comparability in Europe

**Prof. Menachem Fisch**, Humanities, 2016 Humboldt Research Award

**Prof. Amit Gefen**, Engineering, 2017 Fellow of the European Alliance for Medical and Biological Engineering Sciences

**Prof. Illana Gozes**, Medicine, 2016 RARE Champion of Hope Science International Prize by Global Genes

**Prof. Hayit Greenspan**, Engineering, Intel Award

**Dr. Joseph (Sefy) Hendler**, Arts, Member of the Israel Young Academy of Sciences and Humanities

**Prof. Jeff Hausdorff**, Medicine, Fellow of the Gerontological Society of America

**Prof. Joshua Jortner**, Exact Sciences, Inaugural Prize of the Israeli Council of Higher Education

**Prof. Alexandra Kalev**, Social Sciences, 58th Annual Harvard Business Review McKinsey Award

**Prof. Liat Kishon-Rabin**, Medicine, 2017 Graham Fraser Memorial Lecture by the British Cochlear Implant Group (BCIG)

**Prof. Michael Krivelevich**, Exact Sciences, American Mathematical Society (AMS) Fellow

**Mr. Arie Kutz**, Humanities, Order of the Rising Sun of Japan

**Prof. Yossi Leshem**, Life Sciences, Honorary Fellow of the Technion

**Prof. (emer.) Malka Margalit**, Humanities, 2017 Israel Prize in Education Research

**Prof. Bilha (Billie) Melman**, Medicine, Member of the Israel Academy of Sciences and Humanities

**Prof. Gil Navon**, Exact Sciences, 2016 Gold Medal of the International Society for Magnetic Resonance in Medicine

**Prof. Nathan Nelson**, Life Sciences, Honorary Doctorate from Ben-Gurion University

**Dr. Yuval Nir**, Medicine, Member of the Israel Academy of Sciences and Humanities; 2016 Adelis Award for Brain Research

**Prof. Dan Rabinowitz**, Environmental Studies, Life and Environment Green Globe Lifetime Achievement Award

**Prof. Gideon Rechavi**, Medicine, Member of the Israel Academy of Sciences and Humanities

**Prof. Raanan Rein**, Humanities, 2016 title of Comendador in Spain's Order of Civil Merit, granted by King Felipe VI; Honorary Doctor of UNSAM, Buenos Aires

**Prof. Mooly Sagiv**, Exact Sciences, Microsoft Research Outstanding Collaborator Award

**Dr. Wojciech Samotij**, Exact Sciences, George Polya Prize of the Society for Industrial and Applied Mathematics

**Prof. Uri Shaked**, Engineering, Israel Prize in Engineering Research

**Prof. Ron Shamir**, Exact Sciences, 2016 RECOMB "Test of Time Award"

**Dr. Eilon Shani**, Life Sciences, 2017 Krill Prize of the Wolf Foundation

**Prof. Roded Sharan**, Exact Sciences, 2016 RECOMB "Test of Time Award"

**Dr. Assaf Sharon**, Humanities, Oxford Studies in Political Philosophy Prize

**Dr. Amit Sitt**, Exact Sciences, 2016 Azrieli Faculty Fellowship

**Prof. Inna Slutsky**, Medicine, MetLife Foundation Award for Medical Research in Alzheimer's Disease

**Prof. Zahava Solomon**, Social Sciences, 2016 EMET Prize in Social Work

**Prof. Ran Spiegler**, Social Sciences, 2017 Yrjö Jahnsson Award in Economics

**Prof. David Steinberg**, Exact Sciences, Shewhart Medal of the American Society of Quality (ASQ)

**Dr. Yael Sternhell**, Humanities, Member of the Israel Young Academy of Sciences and Humanities

**Prof. Marc Teboulle**, Exact Sciences, 2017 Fellow for the Society of Industrial and Applied Mathematics (SIAM); SIAM Optimization Prize

**Prof. Tamir Tuller**, Engineering, 2016 Juludan Research Prize

**Prof. Arie Vardi**, Arts, 2017 Israel Prize in Music

**Prof. Shulamit Volkov**, Humanities, Humboldt Research Award

**Prof. Haim Wolfson**, Exact Sciences, 2016 Fellow of the International Society of Computational Biology (ISCB)

**Prof. (emer.) Amotz Zahavi**, Life Sciences, Israeli Society for Ecology and Environmental Sciences Lifetime Achievement Award

# NEW PROJECTS

## Academic Development

- Support for Institute for National Security Studies – Agman Management LLC, USA
- Support for Alrov Institute for Real Estate Research – Alfred Akirov, Israel
- Support for Moshe Dayan Center for Middle Eastern & African Studies – Anonymous, USA
- Research and Scholarship Support – AMN Fund for the Promotion of Science, Culture and Arts in Israel, Mexico
- Argentina Fund for the Direct PhD Program in Life Sciences – Various donors, Argentina
- Support for EMEA University Workshop at the Sagol School of Neuroscience – Broadcom Foundation, USA
- Support for The Steinhardt Museum of Natural History – Charles Bronfman, USA
- Support for Minerva Humanities Institute – Barbara B. and Bertram J. Cohn, USA
- Support for Institute for National Security Studies – Crown Family Foundation, USA
- Support for Zvi Yavetz School of Historical Studies – Dan David Foundation
- Support for Yoram Dinstei Chair in International Law – Leo David, USA
- Support for Tel Aviv Berkeley Executive LLM in Commercial Law – Davis Pol & Wardell LLP, Israel
- Support for Tel Aviv Berkeley Executive LLM in Commercial Law – Davis Pol & Wardell LLP and Naschitz Brandes Amir & Co., Israel
- Support for Institute for National Security Studies – Diane P. and Guilford Glazer Donor Advised Fund of the Jewish Community of Los Angeles, USA
- Gold Startup Prize – Stanley Gold, USA
- General Support – Estate of Anna Havas, USA
- Support for Institute for National Security Studies – Jacobson Family Foundation, USA
- General Support – Samuel Langberg, USA
- Support for Institute for National Security Studies – Sidney Lapidus, USA
- General Support – Lorry I. Lokey and Joanne Harrington, USA
- Jack, Joseph & Morton Mandel Program for the Humanities in Engineering – USA

- Support for Zvi Meitar Center for Advanced Legal Studies – Meitar family, Israel
- Boris Mints Institute for Strategic Policy Solutions to Global Challenges Annual Prize – Russian Federation
- Support for Institute for National Security Studies – Ambassador Alfred H. Moses, USA
- Support for Institute for National Security Studies – Joseph Neubauer and Jeanette Lerman Neubauer, USA
- Support for Institute for National Security Studies – Robin Chemers-Neustein, USA
- Support for Ofakim (Horizons) Program: The Study of Judaism as Culture and Teacher Training in Schools – Posen Foundation, UK
- Support for Institute for National Security Studies – Ruderman Family Foundation, USA
- Support for Sagol School of Neuroscience – Sami Sagol, Israel
- Shmunis Family Anthropology Institute – Vlad and Sana Shmunis, USA
- Support for Moshe Dayan Center for Middle Eastern & African Studies – Richard Sincere, USA
- Support for Sofaer International Case Competition Program – Michael Sofaer, USA
- Support for Whitman Family Center for Coexistence – Martin Whitman, USA
- Support for Program for the Humanities in Engineering – Yad Hanadiv, Israel
- Zimin Foundation Law Fund – Russian Federation
- Mortimer B. Zuckerman STEM Leadership Program – USA

## Research

- Adelis Brain Research Award 2016 to Dr. Nir Yuval – Adelis Foundation, Israel
- Research Grant for Dr. Johann Elbaz – Adelis Foundation, Israel
- Research Grant for Prof. Ehud Gazit – Adelis Foundation, Israel
- Research Grant for Dr. Oded Rehavi – Adelis Foundation, Israel
- Research Grant for Dr. Noam Shomron – Adelis Foundation, Israel
- Research Fund for Prof. Yossi Shiloh – Sheldon Adelson, USA
- Research Fund for Prof. Isaac Witz – Sheldon Adelson, USA
- Research Fund for Prof. Ilan Tsarfaty – Breast Cancer Research Foundation, USA
- Support for Diabetes, Cancer and Alzheimer's Research – Estate of Albert Dalva, USA

- Fund for Researching the Origins of Modern Humans in the Levant – Dan David Foundation
- Support for Research Scholarships and Lab Equipment for the Medical Faculty – Foundation for Development and Progress, Israel
- Goldstein-Goren Center for Mind, Cognition and Language – Italy
- Research Fund for Prof. Yoel Rafaeli – Joan & Irwin Jacobs Fund, USA
- Fund for Researching Crop and Wheat Resistance – Anonymous estate through JNF, Australia
- Morris Kahn 3D Printing for Cancer Research Initiative – Israel
- Eva Lester Zoological Research Fund – Bermuda
- Research Fund for Sciences, Humanities and Arts – Estate of Claire Maratier, France
- Research Fund for Dr. Carmit Levy – Melanoma Research Alliance, USA
- Research Fund for Prof. Chaim Pick – Partner Communications Co. Ltd., Israel
- Porter Dead Sea Research Institute for Life Under Extreme Conditions – Porter Foundation, UK
- Research Fund in Nuclear Military Science – Estate of Marvin Reinstein, USA
- Research Fund for Prof. Eran Perlson – Israel Roizman, USA
- Sagol Center for Regenerative Biotechnologies – Sami Sagol, Israel
- Research Fund for Prof. Danny Michaelson – Sami Sagol, Israel
- Research Fund for Prof. Orna Elroy-Stein – Nyree Saxby, Australia
- Research Fund for Dead Sea Scrolls – Schmidt Family Foundation, USA
- Miles S. Nadal Home for Technological Innovation and Entrepreneurship – Canada
- Lobby Renovation in the Recanati Building – Recanati Family, Israel
- Engineering Renovation Fund – Danielle Rubinstein Estate through Australian Friends of TAU (Vic.)
- Yosef and Farang Shahery Family Foundation Lobby at the Checkpoint Building – Yosef and Farang Shahery Family Foundation of the Iranian American Jewish Foundation, USA
- Support for The Steinhardt Museum of Natural History, Israel National Center for Biodiversity Studies – Michael H. Steinhardt, USA
- Upgrading the Alfredo Federico Strauss Center for Computational Neuro-Imaging
- Martin and Lois Whitman Lecture Hall at the Lorry I. Lokey Graduate Center – USA
- Equipment for Natural Gas Extraction Research – Wolfson Family Charitable Trust, UK

## Campus Development

- Sylvan Adams Sports Institute – Israel & Canada
- Azrieli School of Architecture Building – Azrieli Foundation, Israel & Canada
- Simon Benninga Lecture Hall at Lorry I. Lokey Graduate Center – Various international donors
- Rita and Chaim David Filler Garden
- Lili Botanic Garden Entrance Plaza – Foundation for Development and Progress, Israel
- Support for the Jacobs-Zang Hall at the School of Management – Donald P. Jacobs Family Foundation, USA
- Fabian-Cyril Boisson Auditorium at The Steinhardt Museum of Natural History – Nathalie Kerber, France
- Doctoral Scholarship Fund – Anonymous, France
- Brazilian Scholarship Fund – Various donors, Brazil
- Ariane de Rothschild Fellowship for Women Doctoral Researchers – Caesarea Foundation, Israel
- Crown Graduate Fellowship Program in the Sciences – USA
- Harrison-Frank Family Foundation Program for Advancing Minority Students – Richard Harrison, UK
- Doctoral Fellowship Fund – Israeli Friends of Tel Aviv University
- Support for the Kadar Scholarship for Women in Business and Entrepreneurship – Kadar Family, USA
- Eva Lester Advanced Degrees Fund – Bermuda
- Support for the Unit for Social Involvement – Paamey Tiqva Ltd. Charitable Foundation, Israel
- Ethiopian Student Scholarship Fund – Polonsky Foundation, USA
- Yosef and Farang Shahery Family Foundation Doctoral Scholarship Endowment Fund – Yosef and Farang Shahery Family Foundation of the Iranian American Jewish Federation, USA
- Scholarship Fund for Needy Students in the Medical Faculty – Luiza Tralovsky, Israel
- Support for the Ruth and Allen Ziegler Student Services Division – Ruth Ziegler, USA

Listed: Projects of \$100,000 and above, by alphabetical order within categories

# We conquered Europe. Next up: The world!

TAU dominates among 172 research organizations in European Research Council (ERC) grants and ranks 1st in Israel and 8th altogether for Horizon 2020 grants

- **Protecting privacy:** Horizon 2020 grant for helping citizens make informed decisions on privacy matters – **Prof. Joachim Meyer & Dr. Eran Toch** (Engineering) and **Prof. Michael Birnhack** (Law).
- **Improving data science performance:** ERC grant for applying geometric deep learning to data – **Prof. Michael Bronstein** (Exact Sciences).
- **Measuring pain:** E-COST grant for gauging pain intensity levels of people with intellectual disabilities who need care – **Prof. Ruth Defrin** (Medicine).
- **Facilitating uninterrupted power:** Horizon 2020 grant for an electrical power grid with improved stability – **Prof. Guy Deutcher** (Exact Sciences).
- **Catching the waves:** ERC grant for mastering THz, a type of electromagnetic wave, for security, medical and other applications – **Dr. Tal Ellenbogen** (Engineering).
- **Stopping protein mis-folding in the brain:** JPco-FuND grant for understanding how the abnormal protein amyloid spreads in Alzheimer's – **Dr. Dan Frenkel** (Life Sciences).
- **Sugar-coating against tumors:** ERC grant for understanding the interplay of cell sugars and immune response in cancer – **Dr. Vered Padler-Karavani** (Life Sciences).

- 
- **Harnessing the body's repair mechanisms:** ERC grant for DNA regulation of the lethal skin cancer, melanoma – **Prof. Carmit Levy** (Medicine).
  - **Closing the gender divide:** ERC grant for comparative research of gender inequality in the labor market of 4 countries – **Prof. Hadas Mandel** (Social Sciences).
  - **Developing super-weapons for super-bugs:** ERC grant for fighting deadly bacterial infections resistant to antibiotics – **Dr. Dor Salomon** (Medicine).
  - **Revealing the neural basis of behavioral change:** ERC grant for studying brain mechanisms that govern decision-making – **Dr. Tom Schonberg** (Life Sciences).
  - **Jetting faster and longer:** Horizon 2020 grant for improved air flow features in next generation transport planes – **Prof. Avi Seifert** (Engineering).
  - **Advancing structural biology:** ERC grant for transforming 2D microscopy images of proteins into 3D models – **Prof. Yoel Shkolnisky** (Exact Sciences).
  - **Balancing between stability and flexibility:** ERC grant for brain homeostasis and Alzheimer's disease – **Prof. Inna Slutsky** (Medicine).
  - **Finding order in chaos:** ERC grant for mathematical tools that describe the order in seemingly random events – **Prof. Mikhail Sodin** (Exact Sciences).
  - **Discovering the secret of cell differentiation:** ERC grant for how the shape of cells affects their ability to communicate during human embryonic development – **Dr. David Sprinzak** (Life Sciences).
  - **Never forgetting a face:** ERC grant for enhanced computer facial recognition through a theoretical analysis of deep neural networks – **Prof. Lior Wolf** (Exact Sciences).
  - **Respecting asylum seekers:** EU grant for exploring legal means to ensure refugees' social and economic rights in Israel – **Prof. Issachar Rosen-Zvi** (Law).

# What if... “giving” and “innovation” were the same thing?

GLOBAL EDGE





Born in the US and raised in Mexico City, TAU International student **Natalya Wallentin**, 26, is a social entrepreneur at heart. She dreams of launching an NGO that spurs innovative solutions to social problems and reduces the “opportunity gap.” After BA studies in Mexico, she looked for the right graduate program and found it halfway around the world – the Sofaer International MBA Program at TAU’s Collier School of Management. What she loves most about Sofaer is its global approach: “My classmates come from 17 countries and we’re learning as much from each other’s different cultural perspectives as from the curriculum.” Natalya, the recipient of a Peisach Scholarship, also warms to Tel Aviv’s hothouse atmosphere for entrepreneurship and is now planning to settle in Israel.

## Making engineers more competitive... with philosophy and history

Industry hungers for creative engineers who can think out of the box. In response, TAU established the Jack, Joseph & Morton Mandel Program for the Humanities in Engineering to help aspiring young scientists and engineers expand their cognitive boundaries and develop new perspectives. The four-year honors program, which is supported with significant donor funding, accepts 20 to 30 of the top undergraduate engineering students each year for specialized humanities courses, seminars and mentoring.

## Stronger science together

**Dr. Joe Taenzer** of Alberta, Canada, is among the first Zuckerman Scholars at TAU under the Zuckerman STEM Leadership Program, established by Mortimer B. Zuckerman to promote American-Israeli scientific ties and forge a new generation of science and technology trailblazers. A graduate of the University of Toronto, Taenzer brings expertise on the Higgs boson subatomic particle to a team led by nuclear physicist **Prof. Erez Etzion** (Exact Sciences). Now the researchers are looking to characterize Higgs' mass, spin, charge and interaction with other particles. "Our collaboration and the Zuckerman Program is a perfect fit," says Taenzer.

## Management on a grand scale

Preparing its students for leading roles in the global marketplace, the Coller School of Management has introduced a new MBA track in International Management. Under the direction of **Prof. Orly Yehezkel**, Vice Dean of the Coller School, the new track is a response to today's increased corporate globalization alongside sweeping geopolitical, economic and demographic changes. Courses include cross-cultural management, cross-border team management, and global leadership and strategy.

## Spotlight on young filmmakers

Students of the Steve Tisch School of Film and Television continue to win major awards. This year, alumna **Maya Sarfaty** won Best Documentary Film at the Student Academy Awards for her work, *The Most Beautiful Woman*, which was supported by the Blavatnik Student Film Production Fund. Alumna **Elite Zexer** won multiple prizes for her feature film *Sandstorm*, including Best Film at Sundance and Best Original Screenplay, Best Director and Best Feature Film at the Ophir Awards in Israel. At TAU's 2016 Tel Aviv International Student Film Festival, alumna and Best Film award winner **Dana Lehrer** was invited by competition judge Robert Lantis, a producer, to direct a film to be shot in Canada and Israel, propelling her into an international career.

## Applying algorithms to outer space

**Dr. Dovi Poznanski** (Exact Sciences) of the Raymond and Beverly Sackler School of Physics and Astronomy, together with his MSc student, **Dalya Baron**, developed a general machine-learning algorithm for anomaly detection. It gives the computer the ability to identify items, events or observations that do not conform to an expected pattern or to other items in a dataset. They recently applied their novel algorithm to data in the Sloan Digital Sky Survey of 2.5 million galaxies, and came up with the largest-ever sample of the strangest galaxies known, including several classes of galaxies never seen before. Their findings were published by the Royal Astronomical Society.

## Revealing cyber vulnerabilities

Working with **Prof. Yuval Shavitt** (Engineering) of the Blavatnik Interdisciplinary Cyber Research Center, PhD student **Nimrod Aviram** initiated a project that later became an international collaboration known as "DROWN." Demonstrating that roughly one-third of secure websites were vulnerable to attack, project members highlighted the harm caused by government regulations that deliberately weaken encryption on the Internet. At the BlackHat USA Conference, the top event in the computer security industry calendar, the DROWN project won the 2016 Pwnie Award for Best Cryptographic Attack. It was runner-up for the 2016 Facebook Internet Defense Prize presented at the 2016 Usenix Security Conference.



## In pursuit of a golden mystery

Chemists **Prof. Uzi Kaldor** and **Dr. Ephraim Eliav** (Exact Sciences) have resolved a long-standing dilemma regarding the electronic properties of the gold atom. Theoretical calculations kept producing results that differed from experimental measurements. Tackling the problem in collaboration with researchers from New Zealand and the Netherlands, the TAU scientists developed a new methodology that reconciled the discrepancy once and for all. Their work was published in the prestigious *Physical Review Letters* and reported in the American Physical Society daily online journal under the title "Gold Mystery Solved."

## Top math marks worldwide

Israeli high school and university students participate each year in international mathematics competitions. To ensure that Israel's teams are as well prepared as possible, TAU has been put in charge of selecting and training the competitors. Results have been outstanding under the direction of **Dr. Lev Radzivilovsky** (Exact Sciences), who teaches both at the Raymond and Beverly Sackler School of Mathematical Sciences and the Jamie and Joan Constantiner School of Education. Last year's competitions resulted in two silver medals in the European Girls' Mathematical Olympiad, and three silver and three bronze medals in the International Mathematics Olympiad. The Israeli team participating in the International Mathematics Competition, which included two TAU students, was ranked second in the world.

## Who's the biggest brain maven?

Each year, Israel selects one high school student to join 24 others representing their countries in the worldwide Brain Bee – a competition tapping contestants' knowledge of the workings of the brain. Academic organizer and co-judge of the Israeli national competition is **Prof. Illana Gozes** (Medicine) of TAU's Adams Super-Center for Brain Studies and Sagol School of Neuroscience, aided by her PhD students, **Shlomi Sragovich**, **Gal Hacoheh Kleiman** and **Gidi Karmon**. TAU's Dov Lautman Unit for Science Oriented Youth also takes part in the proceedings.

## Gaining market savvy

Students of science and engineering in their second year of undergraduate study or higher will soon be eligible for foreign internships under the aegis of the International Association for the Exchange of Students for Technical Experience (IAESTE). The program offers paid, course-related training abroad that will make TAU grads more competitive in the global job market. Engineering students are slated for high-tech summer jobs in Germany, and German students will be arriving in Israel. The program is run by the Career Development Center of the Ruth and Allen Ziegler Student Services Division.

# Reaching for sports eminence



What makes one country reap more Olympic medals than another? Talented and determined athletes, for one. But to create a culture of sports excellence, you also need a support system of state-of-the-art facilities, training, and scientific research to back it up. At TAU's new Sylvan Adams Sports Institute, the lab team of **Prof. Mickey Scheinowitz** (Engineering) has invented a wearable chest strap that recommends intensity levels for aerobic exercise based on physiological data monitored in real time. Combined with a newly developed exercise algorithm, the device can provide accurate activity levels for professional athletes, fitness buffs and those suffering from heart conditions or other diseases. "This kind of research underpins the new institute, which aims to dramatically improve Israel's competitive edge in sports," says Prof. Scheinowitz, Chair of the Department of Biomedical Engineering at TAU.

# Looking at cancer in 3D

HEALTH & WELLNESS



In country after country, cancer is edging out heart disease as the leading cause of death. Now, under the Morris Kahn 3D Printing for Cancer Research Initiative at TAU, PhD student **Lena Neufeld**, pictured left, and Italian post-doc **Dr. Anna Scomparin**, center, are developing a pioneering approach to drug development in the lab of **Prof. Ronit Satchi-Fainaro** (Medicine), right. Neufeld contributes chemical engineering expertise to create living, three-dimensional models of tumor cells and their immediate biological surroundings. Scomparin designs substances to evaluate the anti-cancer activity of experimental drugs. “We envision the day when we can quickly print hundreds of 3D samples of a patient’s tumor and test which drugs eradicate the cancer most effectively,” says Satchi-Fainaro.

## When decision making is faulty

To study decision impairment in multiple sclerosis (MS) patients, **Dr. Dino Levy** (Management) has teamed up with Prof. Paul Glimcher, a neuroeconomist from NYU, and Prof. Pablo Villoslada, a psychiatrist from UC San Francisco. Examination of MRI scans of patients' brains taken during decision-making tasks revealed a different physiological picture compared with non-MS patients. Aiming to identify the brain lesions associated with decision-making dysfunction, Dr. Levy says, "If we succeed, we will better understand the neural networks underpinning decision making and hopefully pave the way for improved MS treatment."

## Toward earlier intervention in psychiatric disorders

In an international collaboration with colleagues from Germany, Spain and Canada, funded by the ERA-NET Neuron consortium, **Prof. Ina Weiner** (Social Sciences) demonstrated for the first time how early intervention using "neuromodulation," a new class of therapies, can prevent the progression of psychiatric disorders such as schizophrenia. "Neuromodulation modifies nerve cell activity in specific sites using mild and targeted electrical stimulation," explains Weiner, who heads TAU's School of Psychological Sciences and is a member of the Sagol School of Neuroscience. "While still not entirely understood, the therapy has great potential to restore brain function and manage symptoms."

## Living laboratory for extreme survival

Located near Masada, the recently inaugurated Porter Dead Sea Research Institute for Life under Extreme Conditions is collaborating with regional and international bodies to study one of the world's most uniquely harsh environments. According to TAU's **Dr. Mira Marcus-Kalish**, a leading initiator of the institute, "TAU researchers are working in some 30 fields of study to uncover the medicinal potential, environmental traits and historic significance of the lowest spot on Earth. We look forward to the wealth of discoveries yet to be made."

## Acknowledging the specialized role of nurses

**Prof. Sivia Barnoy** (Medicine) of the Stanley Steyer School of Health Professions, represented Israel at the Global Genomics Nurses Alliance (G2NC) retreat in Cambridge, UK. This was the first of a series of events aimed at establishing a shared global understanding of the role nurses can and should be playing in genetics and genomics, and at promoting their important contribution in this field.

## What do Israel and Kazakhstan have in common?

An Israeli professor's research funded by the government of a predominantly Muslim country – this unlikely scenario describes the work of **Prof. Zvi (Gregory) Livshits** (Medicine). His collaborative research with the Kazakh National Medical University, under a grant from the Kazakh Ministry of Education, focuses on genetic factors in rheumatoid arthritis. Prof. Livshits has also become the foreign supervisor to Kazakh PhD student **Zulfia Kachieva**, who spent three months working in his laboratory in Israel.

## Can you erase bad memories?

Sounding like the stuff of science fiction, **Dr. Segev Barak** (Social Sciences) has been investigating memory erasure and replacement as a method for treating memory-related disorders such as PTSD, phobias, and alcohol and drug addiction. Barak, who belongs to the School of Psychological Sciences and Sagol School of Neuroscience, published early promising results in *Nature Neuroscience* and *Neuropsychopharmacology*.

## The protein key to halting Alzheimer's and cancer

Neurobiologist and Sagol School of Neuroscience member **Prof. Reuven Stein** (Life Sciences) and his team have shown in the lab that destroying the multifunctional protein CD38, or preventing its enzymatic activity, results in the inhibition of Alzheimer's-related symptoms. Moreover, the same technique can slow cancerous tumor progression and metastasis. This exciting discovery could lead to a general treatment for some neurodegenerative diseases and cancer.

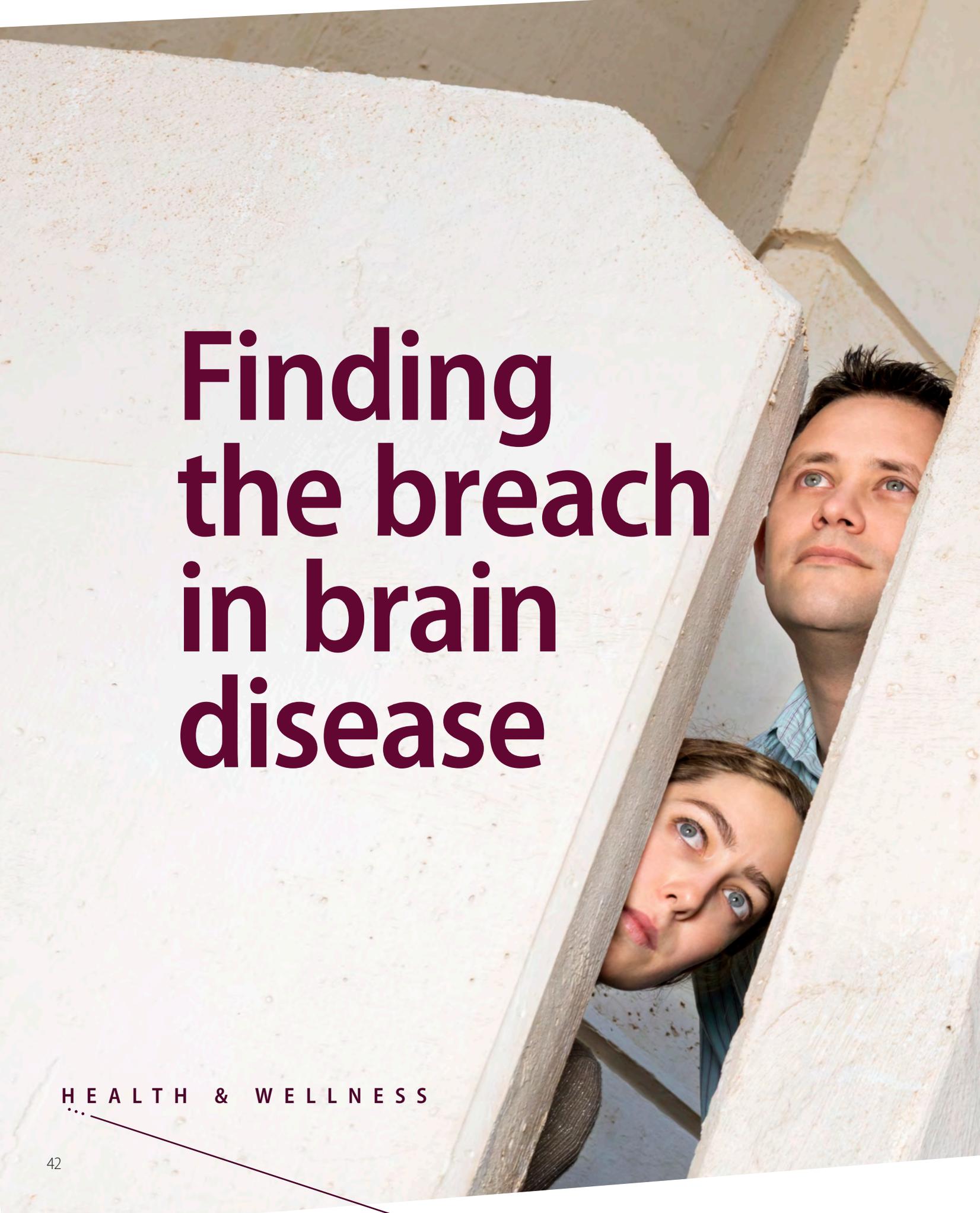
## Cure for a Jewish genetic disease?

A food supplement identified by **Profs. Gil Ast, Eran Perlson** and **Ruth Ashery-Padan** (Medicine), all affiliated with the Sagol School of Neuroscience, could potentially reverse the effects of familial dysautonomia. This rare and previously untreatable neurodegenerative disorder primarily strikes Ashkenazi Jews. Their findings were published in a recent *PLoS Genetics* paper.



## World's first custom virus

A breakthrough technology utilizing big data and synthetic biology has been developed at SynVaccine, a medical startup co-founded by **Prof. Tamir Tuller** (Engineering). The proprietary technology allows scientists to design and build viral-based products, such as vaccines or cancer-targeting viruses, for the first time. SynVaccine won second place out of 180 new Israeli startups competing at this year's Israeli Academia Show Case Start-Up Competition run by the Israeli Technology Transfer Organization (ITTN).



# Finding the breach in brain disease

HEALTH & WELLNESS



The immune system – the body’s natural defense against disease, infection and injury – can sometimes cause or even abet brain ailments. “But how to control immune malfunctioning in diseases like multiple sclerosis (MS) or cancerous brain tumors remains a mystery,” says new faculty member **Dr. Lior Mayo** (Life Sciences), pictured top. Joining TAU after a post-doc at Harvard Medical School, Mayo and his team, including Sagol School of Neuroscience MSc Fellow **Ms. Tom Meyer**, below, are unraveling the relationship between the immune system and the central nervous system. Their goal: To identify targets on the molecular level for developing cures, as part of the larger mission of revealing the brain’s secrets. The research is partially supported by the Leona M. and Harry B. Helmsley Charitable Trust and the National Multiple Sclerosis Society, both of the US.



The universe is made of stories, not of atoms.

— Muriel Rukeyser, Jewish American poet

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