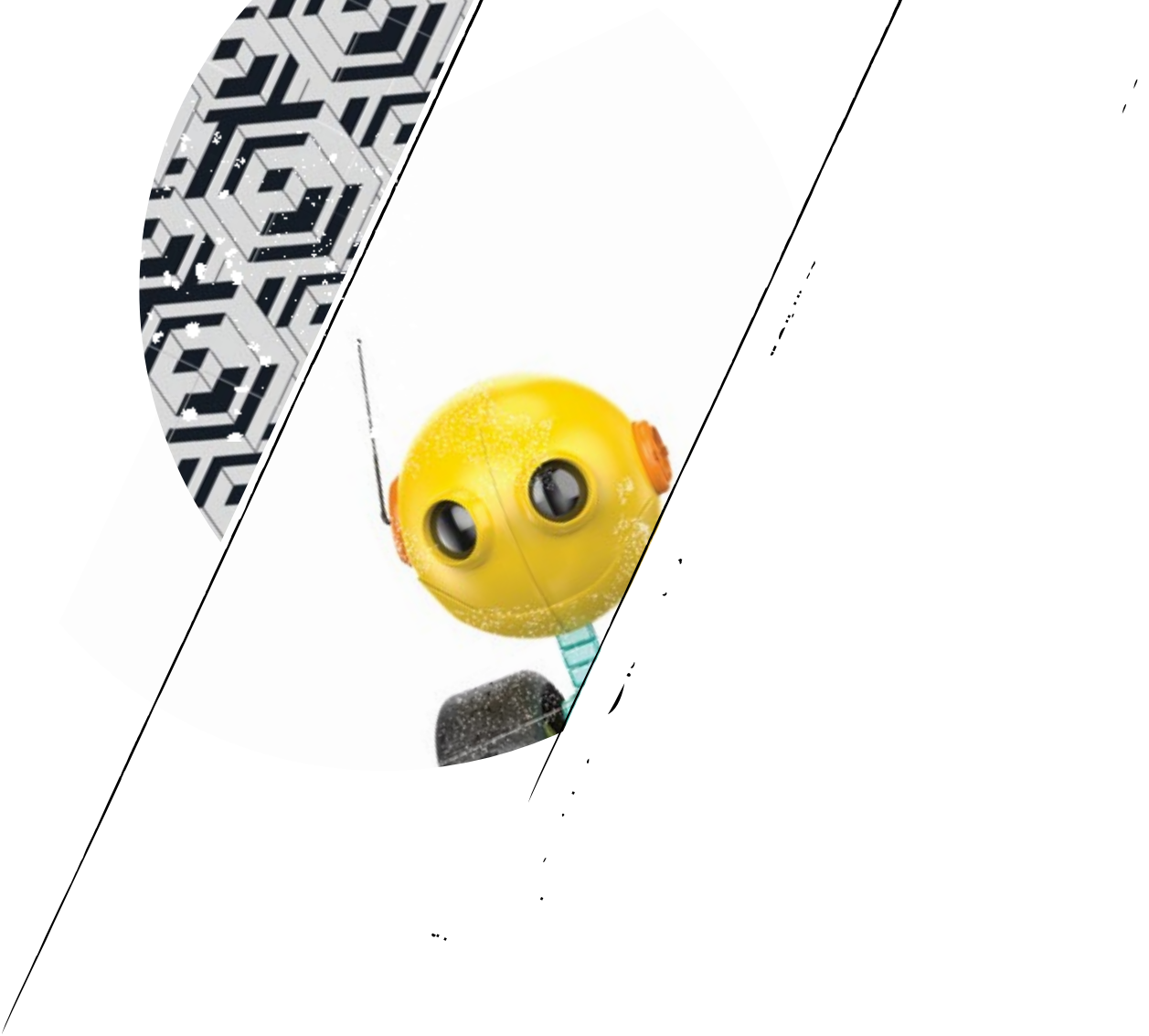
TEL AVIV UNIVERSITY
Pursuing the Unknown

City of Big Ideas ...

Tel Aviv University Annual Report **2019**



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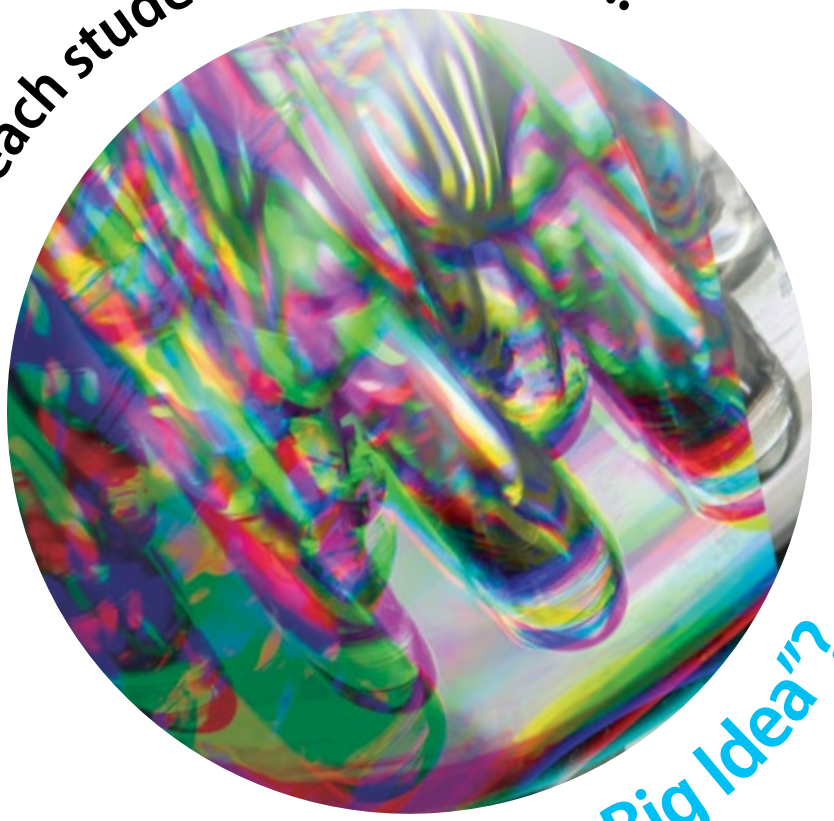
Can we teach students to recognize...



...“The Next Big Idea”?

Is it possible to nurture curiosity, persistence and creative chutzpah?

Tel Aviv University believes that everyone can bring entrepreneurial thinking into the world for the benefit of science, society and culture.

Saving a billion watts

TAU International students **Elaine Chen** from Taiwan, and business development partner **Michael Blattner** from Congo, are utilizing AI to optimize the harvesting power of solar power plants.

Elaine and her family's companies, Billion Electric and Billion Watts Technologies, already distribute Israeli solar energy solutions in Taiwan. Now she's spinning off her smart monitoring software as a new start-up, Pixel View. At TAU, Elaine is learning how to pitch her new company to strategic investors and create financial modeling and revenue forecasts. Michael, who has made Aliyah, is honing his investment savvy in the Israeli business ecosystem.

Program: Sofaer Global MBA at the Coller School of Management

AI NATION

Israel is poised to become a world leader in artificial intelligence (AI) and machine learning (ML). TAU intends to lead the way.

- Jewish studies MA student **Mattan Segev-Frank** (Humanities) integrates natural language processing, ML and GIS methods to tell the story of contemporary Jewry in the former "Greater Hungary."
- **Prof. Gal Oestreicher Singer** (Management) uses data science methods to provide insights on the effects of social media, consumer engagement and peer influence on electronic commerce.
- With an ERC Consolidator Grant, **Prof. Amir Globerson** (Exact Sciences) of the Blavatnik School of Computer Science and Yandex Initiative for Machine Learning advances deep learning for semantic understanding of texts and images.
- **Prof. Erez Shmueli** (Engineering) utilizes big data and ML to build computational models for analyzing, predicting and influencing human behavior, as well as for addressing privacy issues.
- Zoologist **Prof. Yossi Yovel** (Life Sciences) incorporates ML in translating bat squeaks for animal communication studies.
- Physicist **Dr. Haim Suchowski** (Exact Sciences) and team employ a deep neural network approach for the design and characterization of new optical elements for sensing, imaging and integrated spectroscopy applications.
- **Dr. Noam Mizrahi** (Humanities) collaborates with computer scientists in ML to analyze textual variations of ancient Jewish writings.
- Prof. **Rami Haj-Ali** (Engineering) received a grant from the Zimin Institute for Engineering Solutions Advancing Better Lives for his research on innovative AI algorithms for medical heart procedures.

- Physical therapist **Prof. Jason Friedman** (Medicine) was also awarded a Zimin Institute grant for the development of a brain-computer interface based on AI for rehabilitating motor disorder patients.
- **Prof. Colin Price** (Exact Sciences), Head of the Frenkel Initiative to Combat Air Pollution, studies how environmental data collected from cell phone sensors can be used to predict storms and monitor climate change.
- TAU alumnus and new recruit **Prof. Elhanan Borenstein** (Exact Sciences & Medicine) of the Blavatnik School of Computer Science and Edmond J. Safra Center for Bioinformatics, develops computational methods inspired by ML to model the human microbiome.
- **Prof. Hayit Greenspan** (Engineering) applies deep learning to medical imaging for improved cancer and heart disease diagnostics software.
- **Dr. Dovi Poznanski** (Exact Sciences) develops ML algorithms in astronomy research for anomaly detection among 2.5 million galaxies.
- **Dr. David Burstein** (Life Sciences) combines tailored ML and genomics methods to discover the genes that make bacteria dangerously resistant to antibiotics.

Planet Earth under the microscope

The newly amalgamated Porter School of the Environment and Earth Sciences, headed by **Prof. Shmuel Marco** (Exact Sciences), is devoted to the disciplinary and interdisciplinary study of every aspect of our planet, from its deepest interior to the outer reaches of the atmosphere and beyond, from how it sustains or threatens life, and to how Earth and human systems interact. The school brings together three academic units – the Department of Environmental Studies, the Department of Geophysics and the Department of Geography and Human Environment, with a combined student body of some 400 students.

Saving the world with … seaweed?!

Bioplastics, the organic alternative to plastic, can help save our planet, but present their own problems because they require lots of fresh water and arable land to be produced. The Porter School's **Dr. Alexander Golberg** and nano-chemist **Prof. Michael Gozin** (both of Exact Sciences) have developed an alternative production method using single-celled marine microorganisms that require nothing more than seawater and seaweed. The tiny organisms produce a polymer that can be used to manufacture a rapidly degradable and non-polluting bioplastic. This could revolutionize the world's efforts to stop plastic waste.

Predicting and countering the effects of nature

Prof. George Weiss (Engineering) is leading a €4 million, EU-funded research network called Conflex, which includes 10 collaborating universities throughout Europe and several industry partners. The research focuses on the control of flexible structures and fluid-structure interaction, for example, stabilizing the blades and tower of a wind turbine against the forces of wind, or a floating platform such as a turbine or aircraft carrier against big waves. The Conflex network will train a new generation of experts to use and further develop such novel techniques.

A project in India that trains women to promote water sustainability is just one way TAU pursues Tikkun Olam, or "repairing the world," in Asia and Africa

A little shot of Israeli technology can make all the difference for relieving the hardships of millions of people in the developing world. In a project led by **Profs. Rafi Nachmias** and **David Mioduser** (Humanities), both of the Jaime and Joan Constantiner School of Education, TAU is collaborating with Amrita University in South India to teach rural women to monitor the levels, quality and usage of the drinking water supply. Additional projects spearheaded by researchers and students across the TAU campus are testing affordable solutions for water recycling and modernized agricultural practices – all involving site fieldwork and local partners.

Programs: Science and Technology Education Center; Boris Mints Institute for Strategic Policy Solutions to Global Challenges; Moshe Mirilashvili Institute for Applied Water Studies; Fleischman Faculty of Engineering; Manna Center Program for Food Safety and Security

Empowering women while protecting the environment

Cleaning up groundwater

TAU alumna **Dr. Ines Zucker** (Engineering & Exact Sciences), after completing her post-doctoral studies at Yale, has returned to TAU where her lab team won a Euro Research Grant for their work on a chemical process that cleans up petroleum-contaminated groundwater. In collaboration with the Technical University of Munich (TUM), Zucker will develop a novel ozone-based oxidation process that will effectively remove organic contamination from water and soil, and will evaluate the feasibility of this process as a viable alternative to current groundwater remediation practices.

Learning by doing

The Porter School of the Environment and Earth Sciences is offering an MSc in Environmental Innovation, initiated and headed by **Prof. Colin Price** (Exact Sciences), Head of the Frenkel Initiative to Combat Air Pollution. In a project-based learning approach, students will pursue 6-week projects aimed at reaching high impact solutions to environmental problems affecting water, food, energy and other areas. Small groups of students from diverse backgrounds will work together, learning the process of problem solving through a variety of tools and disciplines, and equipping themselves to deal with future environmental issues.

Detecting earthquakes using … smartphones!

New faculty member **Dr. Asaf Inbal** (Exact Sciences), who recently arrived at TAU following post-doc work at UC Berkeley, is studying seismology and the mechanics of earthquakes. Based on observation and theory, he seeks to better understand the processes that control earthquake generation and interaction, fault slip, and rupture dynamics. He is also developing techniques for earthquake identification using observational platforms such as smartphones.

Designing the future of urban transportation

The Industrial Engineering Department has established a new laboratory focused on the development of advanced transportation systems. The Analytics for Urban Transportation & Operations Laboratory (AUTO Lab), headed by **Dr. Mor Kaspi** (Engineering), is creating better tools for the planning and design of networks. The lab works in collaboration with TAU's Shlomo Shmeltzer Institute for Smart Transportation along with practitioners in the field to ensure well-grounded research into such areas as mass transportation, semi-flexible systems combining on-demand and scheduled services, vehicle sharing systems, autonomous vehicle services, and others.

Smart sustainable cities

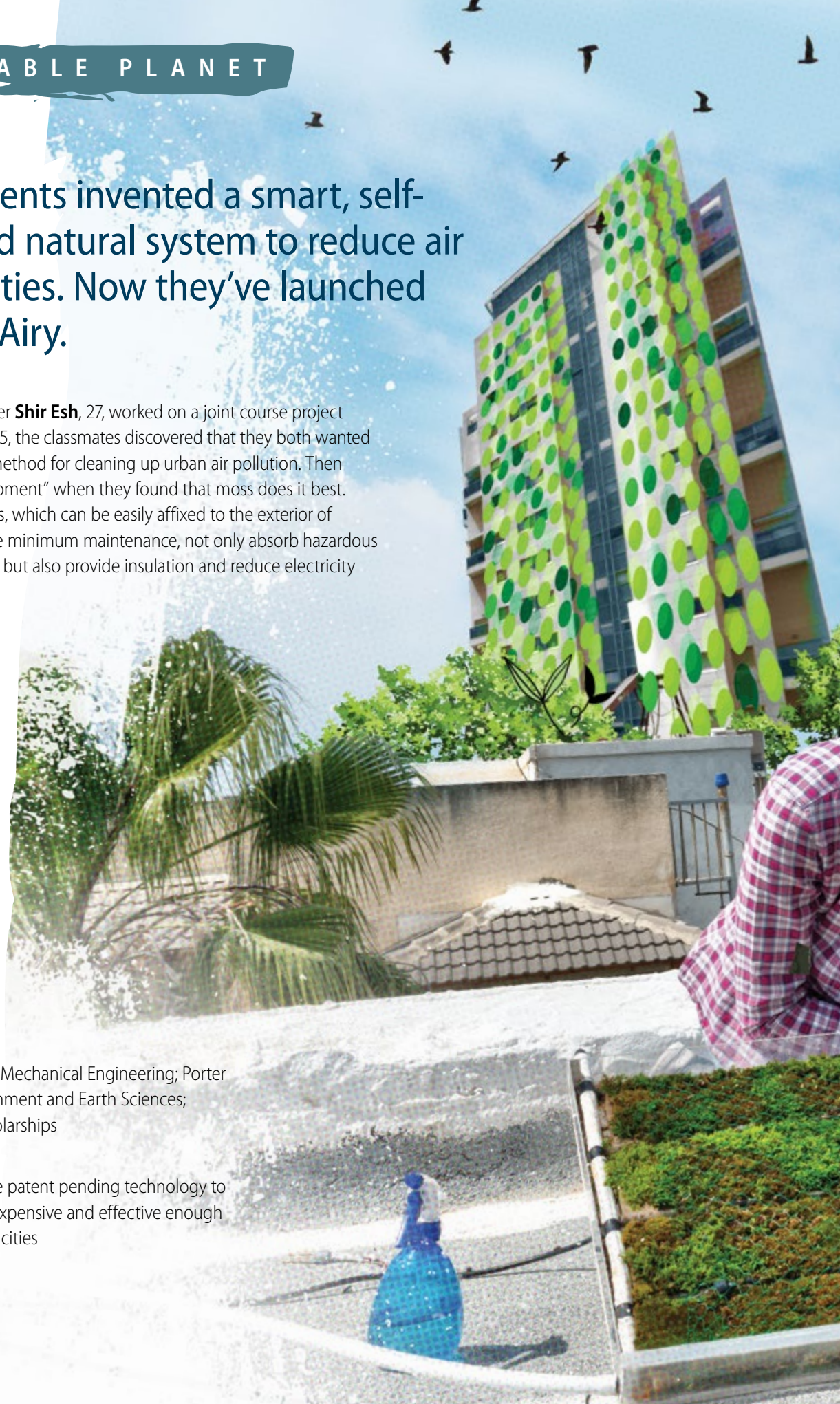
The Shlomo (Cheech) Lahat Institute for Local Government, headed by former government minister **Ophir Pines-Paz** (Social Sciences), has embarked on two initiatives with the Tel Aviv-Yafo Municipality aimed at keeping Israel's cities technologically savvy, sustainable and effective, with residents enjoying the best possible services. CityZone, a smart city lab, promotes startups that keep cities senior-citizen-friendly, clean, safe, cyber-secure and mobile. Complementing these activities, CityZoom is creating a database of municipal challenges and needs around the world. Other partners include the TAU co-owned Atidim Industrial Park, the Israel Ministries of Economy and Interior, the Digital Israel Initiative, and the Peres Center for Peace and Innovation.

Making your pasta safe and nutritional

PhD candidates **Raz Avni** and **Jasline Deek**, working in the laboratory of **Prof. Assaf Distelfeld** (Life Sciences), developed the genetic materials that enabled an international team of scientists to crack the DNA code of durum (pasta) wheat. Findings included the discovery of a gene that reduces toxic cadmium levels in durum grain, ensuring their safety. The ground-breaking work, carried out at TAU's School of Plant Sciences and Food Security and newly dedicated Yehuda Naftali Botanic Garden, paves the way for production of durum wheat varieties better adapted to climate challenges, with higher yields, enhanced nutritional quality, and improved sustainability.

Two TAU students invented a smart, self-sustaining and natural system to reduce air pollution in cities. Now they've launched their startup, Airy.

When Schulich Leader **Shir Esh**, 27, worked on a joint course project with **Liron Simon**, 25, the classmates discovered that they both wanted to find a biological method for cleaning up urban air pollution. Then came the "eureka moment" when they found that moss does it best. Their novel moss tiles, which can be easily affixed to the exterior of buildings and require minimum maintenance, not only absorb hazardous particles from the air but also provide insulation and reduce electricity consumption.



Program: School of Mechanical Engineering; Porter School of the Environment and Earth Sciences; Schulich Leader Scholarships

Goal: To develop the patent pending technology to the point that it's inexpensive and effective enough to scale up for entire cities

Purifying the air with…moss?

Searching for lost treasure

In a unique seminar led by **Prof. Assaf Pinkus** (Arts), students discovered medieval artworks hidden away in the storage facilities of Israeli museums and churches.

Prof. Assaf Pinkus heads the Multi- and Interdisciplinary Programs in the Arts and is the 2018 recipient of the Kadar Family Award for Outstanding Research.

Museums in Israel hold many medieval objects, but their provenance and authenticity are not always known. After training in the laboratories of the Cloisters Museum, New York, and at Princeton University, students learned how to touch, see and analyze medieval objects first hand. Each young researcher then wrote a scientific article for publication. Among the enigmatic items explored were Romanesque and Gothic sculptures and paintings, and even a rare masterpiece – a work by renowned 15th century painter Friedrich Pacher.

Program: Prof. Yossi and Dalia Prashker Workshops in Art History

Goal: To prepare the next generation of art experts and explorers

Alabaster figure of a mourner, whose origin was found to be in the royal tomb of the kings of Aragon in the Cistercian abbey in Poblet, Spain

Deciphering the Gothic Code: A 14th century Madonna found to be a 19th-century forgery

Can life imitate art?

Students of the TAU Department of Theater Arts hope that the answer is "Yes." They took a major part in the Cultural Dialogue Playwriting Competition for plays devoted to Jewish-Arab encounters and coexistence organized by the TAU Office of the Vice President and the Arditi Foundation of Switzerland. Undergraduate students of acting and directing performed three staged readings of the winning entries in what proved to be an exciting event.

When Japan opened its doors to the West

The Department of Art History, together with the Israeli Association of Japanese Studies (IAJS), organized and sponsored a three-day conference: "The West in Japanese Imagination/Japan in Western Imagination: 150 Years to the Meiji Restoration." The largest Japanese studies conference ever to be held in Israel, it was attended by 125 people from over 85 countries who discussed subjects ranging from Japanese opera, literature, contemporary art and photography, to racial issues, technologies and ideologies. Additional support came from the Japan Foundation, Embassy of Japan in Israel, TAU East Asian Studies Department, and the TIAF Foundation.

Muse, news and schmooze at the Steve Tisch School

- The Steve Tisch School of Film and Television launched an English-language international MFA in Documentary Cinema, a genre gaining increasing exposure in film festivals, movie houses and TV networks worldwide. Headed by **Prof. Reuven Palgi-Hecker** and **Ran Tal** (both of Arts), the four-semester program, open to both Israeli and overseas students, provides a theoretical and practical grounding in every aspect of filmmaking from script writing, producing and directing, to lighting, editing and interacting with world-renowned filmmakers.
- Among the 75 award-winning film students and alumni this past year was TAU graduate **Yona Rozenkier**, whose film *The Dive*, produced by the School's in-house Gaudeamus Productions and supported by the Tisch Foundation for First Feature Films and Blavatnik Student Film Production Fund, won four top prizes at the Jerusalem Film Festival. Another TAU graduate, **Maya Zinstein**, won the News and Documentary Emmy Award for her film *Forever Pure*, which tells the story of Beitar Jerusalem football fans.
- The 20th Annual Tel Aviv International Student Film Festival, the world's largest showcase of student films, was held by the School this past June, screening over 250 films from 70 schools. The weeklong festival featured a variety of film competitions, symposia and master classes, including Next Step, in which leading movie distributors discussed how to encourage influential audiences to view student films, and Speed Dating, focused on helping young filmmakers during their first contacts with producers.

Literature in the corporate world

Prof. Shirley Sharon-Zisser (Humanities), in a collaborative workshop with Dr. Christine Eastman of the School of Business at Middlesex, argues that literature need not be just a revered art form like a painting hung in a museum, but should be seen as a body of knowledge about life to be analyzed and applied to our own daily situations and conflicts. Through the workshop, students of literature had their eyes opened to the concept of literature as a corporate coaching tool along with other career possibilities they had not previously considered.

Exploring humankind's past, present and future

Two unique units at TAU are offering scientists from Israel and abroad boundless opportunities to investigate the biological development of early man.

- The Dan David Center for Human Evolution and Biohistory and its related Human Evolution Gallery, "What Makes Us Human," opened at TAU's Steinhardt Museum of Natural History. Headed by **Prof. Israel Hershkovitz** (Medicine), the Center operates several research and technical laboratories and houses TAU's unique Biological Anthropology Collection.
- The newly installed Micro CT lab of TAU's Shmunis Family Anthropology Institute, also directed by Prof. Hershkovitz, enables scanning and 3D reconstruction of large objects. This state-of-the-art facility underpins efforts to elucidate the microstructure of fossils as well as to construct a digital bank of all Israeli fossils for worldwide access.

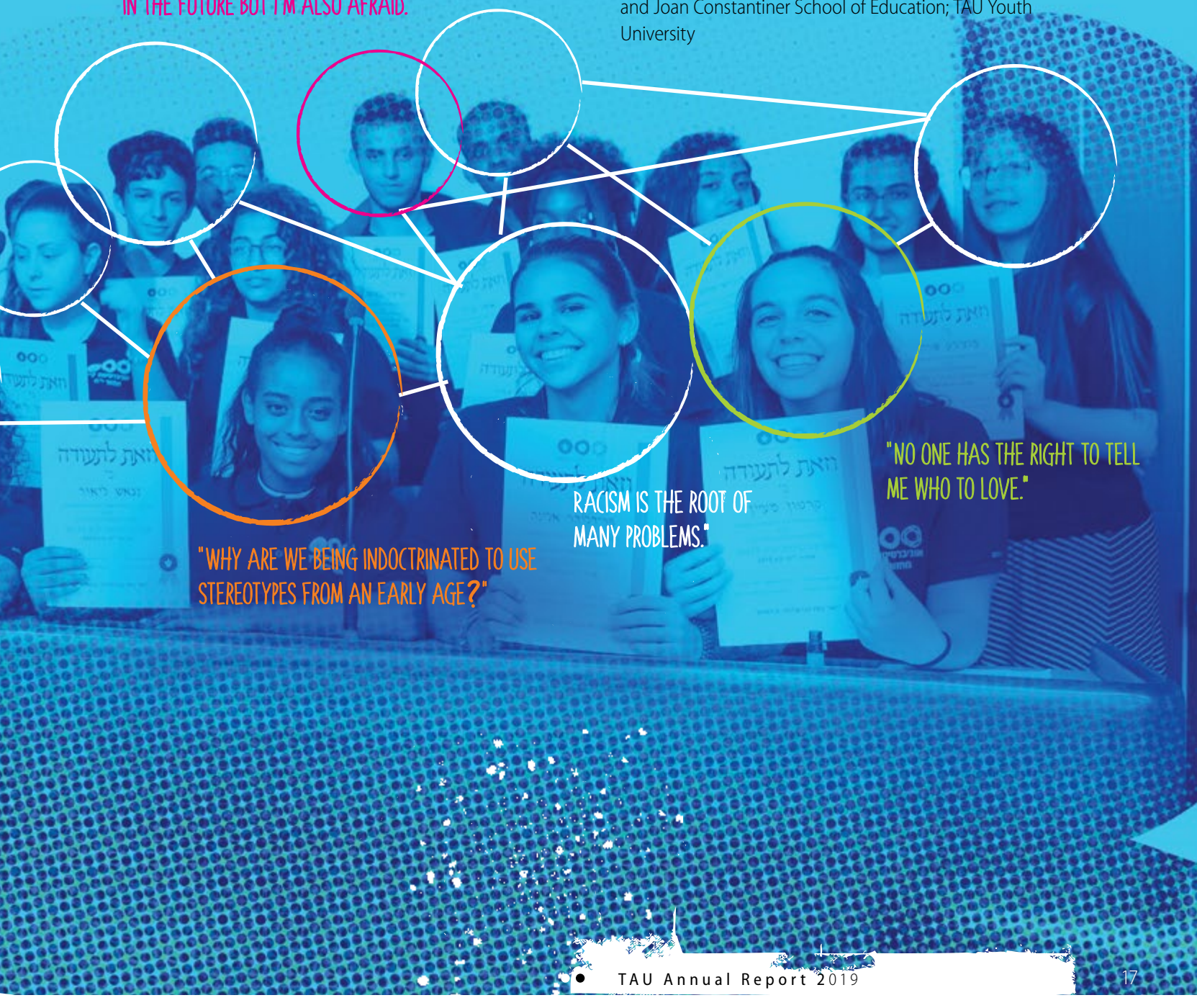
Schoolkids today live more online than offline – sometimes to the despair of their parents and teachers. Now, a TAU project gets them actively engaged as caring citizens in the digital society.

Giving voice to our young people

Young people believe that the future will be much better if their voice is heard by decision makers, reveals **Dr. Tal Soffer** (Humanities) based on research findings. She put the idea to the test by involving high school students attending TAU's Summer Youth University in WYRED, an eight-country EU project for youth civic participation through digital technologies.

The pupils first explored pressing social issues in Israel such as income and education gaps and Arab-Jewish relations, and then developed practical tools to express their opinions, engage with large audiences and reach decision makers, including officials at the Israeli Ministry of Education. Products were creative and inspiring: One team designed a mobile app to promote social tolerance among teens based on common hobbies and interests, while another created a video about including refugee children in modern Israeli education. Following the success of the project, Soffer is offering it to other schools in Israel.

Program: Unit for Technology and Society Foresight, Jaime and Joan Constantiner School of Education; TAU Youth University



Getting entrepreneurial about social unity

As the promoter of Israeli President Reuven Rivlin's Israeli Hope initiative at TAU, **Avi Benalal** at the Student Services Division coordinated the Kol Koreh ("Open Call") project, aimed at bringing together diverse populations within and outside of the campus through various art forms. Among the five projects chosen was a theater performance by Jewish and Arab students based on discussions of their respective gathering points on campus, while another created a musical dialogue between students from different ethnicities, cultural backgrounds and fields of study. Students acted as the impresarios of their projects from initial organization to completion.

Discovering America

TAU's new interdisciplinary Center for the Study of the United States, directed by **Dr. Yoav Fromer** (Social Sciences & Humanities), is the first – and only – academic research center in Israel exclusively dedicated to this subject. It aims to promote awareness and in-depth understanding of the impact of US economic, political, social and cultural ideas and institutions on all facets of Israeli life. Insights will be shared through academic symposia, public forums, cultural activities and various interactive online platforms aimed at opinion-shapers, policy makers and educators, as well as the general public, particularly from the country's periphery. The Center enjoys the generous funding and support of the Fulbright Program in Israel.

Defining the tipping point from average to exceptional

What is normal? How do societies define less or more normalcy along the spectrum of social types from charismatic leader to psychopathic criminal? The Exceptional Individuals Lab uses insights from historical materials to better understand how communities create norms and deviate from them. This lab is among several new virtual research labs established at the Zvi Yavetz School of Historical Studies headed by **Prof. Aviad Kleinberg** (Humanities). They represent an innovation in the Humanities by bringing together researchers at different stages in their careers, with varying methodologies and research interests, in an interdisciplinary collaborative effort.

Making repair shops extinct

Is it possible to design computers and smartphones that never break down?

It's hard to imagine the world without advanced electronics, yet devices and components remain prone to production flaws, wear and corrosion over time. Now, **Dr. Yakir Hadad** (Engineering) and US research colleagues have found a creative, interdisciplinary solution. Drawing on the mathematical field of topology combined with materials science, they have designed electrical circuits that are largely immune to wear and failure – even if defects are intentionally introduced into the structure. This unique property may be controlled by various means, including the intensity of the electrical current flowing in the circuit.

Program: School of Electrical Engineering

Goal: A new world of dependable, defect-resistant devices

Going smaller and deeper

New faculty recruit **Dr. Ilia Kaminker** (Exact Sciences) is a leading expert in techniques for elucidating atomic and molecular structure, in particular nuclear magnetic resonance (NMR) that yields the most atomic-level information. He is working on developing a new technique that will greatly boost the NMR signal. The ability to see much deeper into the workings of materials will help bring such advances as more efficient and clean ways of removing pollutants from power plants and car exhausts. Dr. Kaminker, whose new lab is being built with a major private donation, is the only person in the world working on this breakthrough technology.

The chemistry of collaboration

The new Mark Ratner Institute for Single Molecule Chemistry, headed by **Prof. Michael Urbakh** (Exact Sciences), supports collaborative and interdisciplinary research among scientists from chemistry, physics, medicine and the life sciences. Built on, and poised to strengthen, the University's standing as Israel's leading institution in this emerging field, the Institute will further the study of areas drawing on single molecule chemistry, particularly molecular electronics, DNA sequencing, optical imaging spectroscopy and biophysics. Findings could have major and far-reaching ramifications for national security, disease detection, nanotechnology and other spheres.

Oiling the wheels of the future

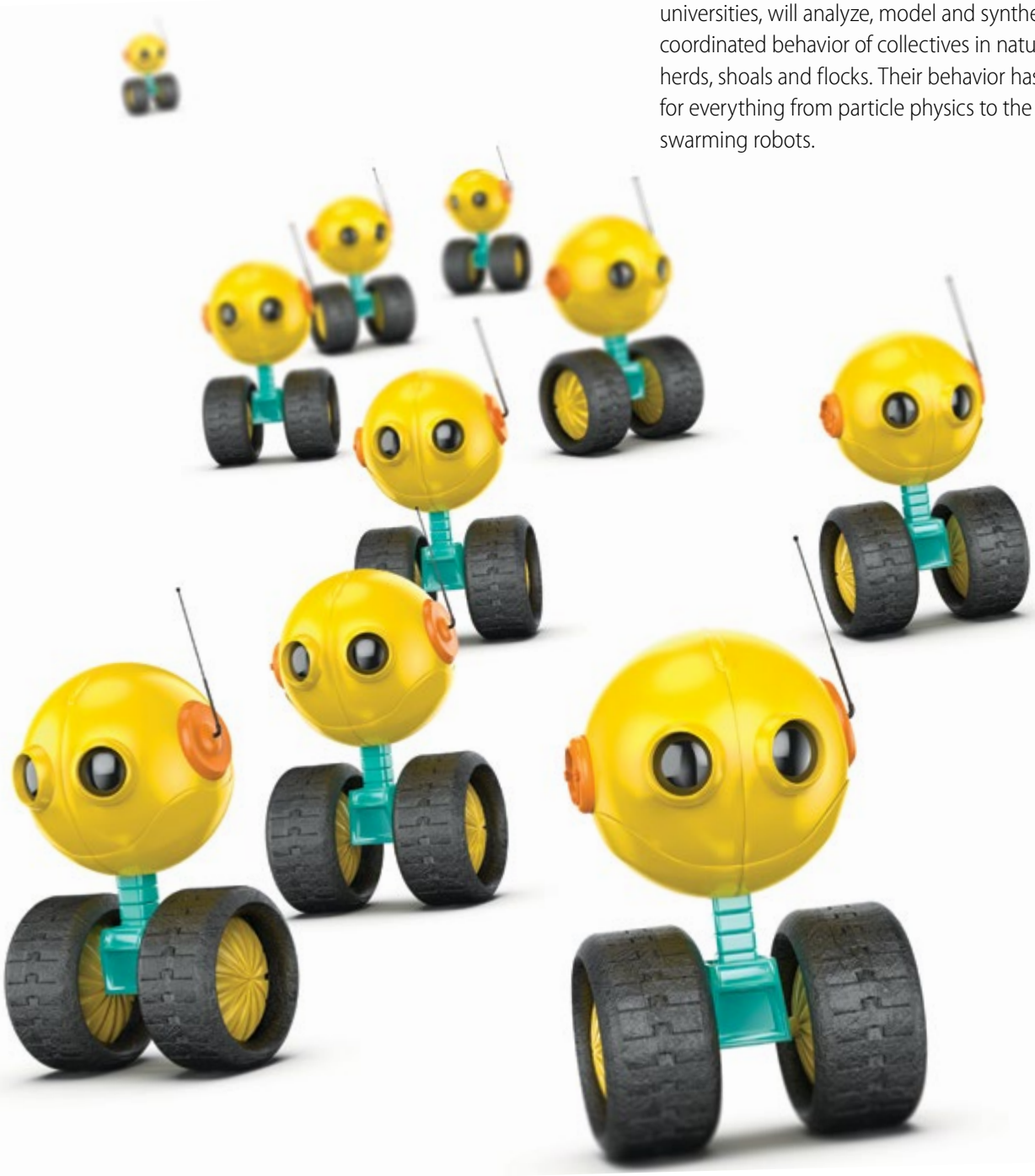
With Profs. Quanshui Zheng and Ming Ma of Tsinghua University, Beijing, TAU 2017 Kadar Award recipient **Prof. Oded Hod** (Exact Sciences) and **Prof. Michael Urbakh** (Exact Sciences), both of the TAU Center for Nanoscience and Nanotechnology, have discovered a novel way of achieving robust ultra-low friction (called "superlubricity") in nano-scale structures, potentially resulting in huge energy savings and wear prevention. Their findings may lead to a new generation of computer hard disks with greater storage capacity and speed, and represent an important milestone for future applications in the space, automotive, electronics and medical industries.

Giving Startup Nation a restart

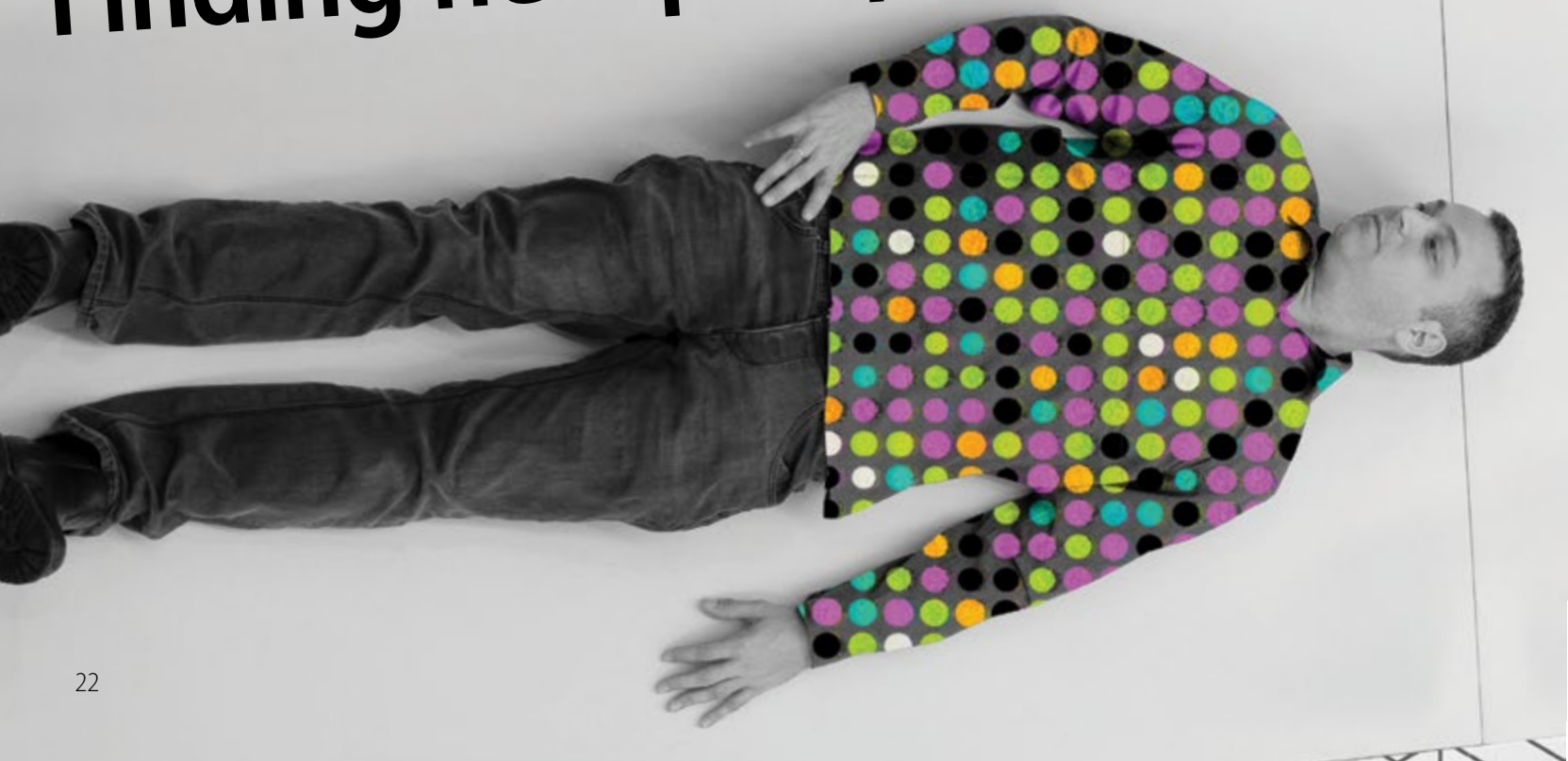
Helping Israel's high-tech industry meet a severe need for manpower, **Prof. David Mendlovic** (Engineering), Head of the Zimin Institute for Engineering Solutions Advancing Better Lives, has spearheaded an innovative BSc program called "High-Tech Plus." This double-major track prepares outstanding undergraduate and graduate students from any field of study at TAU to navigate through today's cutting-edge technologies. Students can "study what they love" while receiving training that opens up employment opportunities in the high-tech world, and industry can look forward to workers with the multidisciplinary skills and multi-dimensional approach it is looking for.

Learning from swarm smarts

Imagine small, cheap machines that can support search & rescue, clean oil spills, perform security surveillance along borders, and even replace bees in pollinating fruit orchards. In a recently founded Israel Science Foundation Center of Excellence, zoologist and locust expert **Prof. Amir Ayali** (Life Sciences), working with computer science colleagues at other Israeli universities, will analyze, model and synthetically replicate the coordinated behavior of collectives in nature such as swarms, herds, shoals and flocks. Their behavior has implications for everything from particle physics to the development of swarming robots.



Finding new perspectives at…



Pictured, from left: Tal Avidov, Jonathan Mendels and Raz Eitan Coocks of TAU Online–Innovative Learning Center. They and the rest of the team, headed by Yuval Shraibman, are completely reimagining how to teach and learn in the digital age.

. . .TAU's Entrepreneurship Center

A new campus-wide center will provide students with the tools, strategies and opportunities to turn their big ideas into successful ventures

Tel Aviv University ranks among the top 10 schools in the world – and the only one outside the USA – for producing successful, VC-backed startup founders. Now, with seed funding from a NIS 15 million ($4 million) competitive government award, TAU is launching a center that will allow every student to discover their inner entrepreneur. The center will focus on both business and social innovation, say Head **Prof. Yuval Ebenstein** (Exact Sciences) and Managing Director **Yair Sakov**. It will integrate diverse communities from Israeli society into the entrepreneurial world, including women, minorities, the Ultra-Orthodox and students from the periphery. As the nexus of a robust innovation ecosystem, the new Entrepreneurship Center will serve thousands each year as well as generate the next world-changing startups expected from the State of Israel.

Sample Programs:

Coller School of Management: Entrepreneurship research and studies, internship opportunities and startup competitions – along with training in English for international students and business executives.

Minducate: A practically oriented R&D framework in the science of learning, jointly run by the Sagol School of Neuroscience and TAU Online–Center for Innovative Learning, with additional support from the Dr. Garry Rayant and Dr. Kathy Fields-Rayant Minducate Learning Innovation Fund.

MinDDoor: "Escape Rooms for Learning," headed by Minducate post-doc and TAU alumna Dr. Limor Radozkowicz, that transform complex course material into an enjoyable team game.

BrainBoost: Workshops, hackathons and projects advancing discoveries of the Sagol School of Neuroscience together with industry mentors and partners.

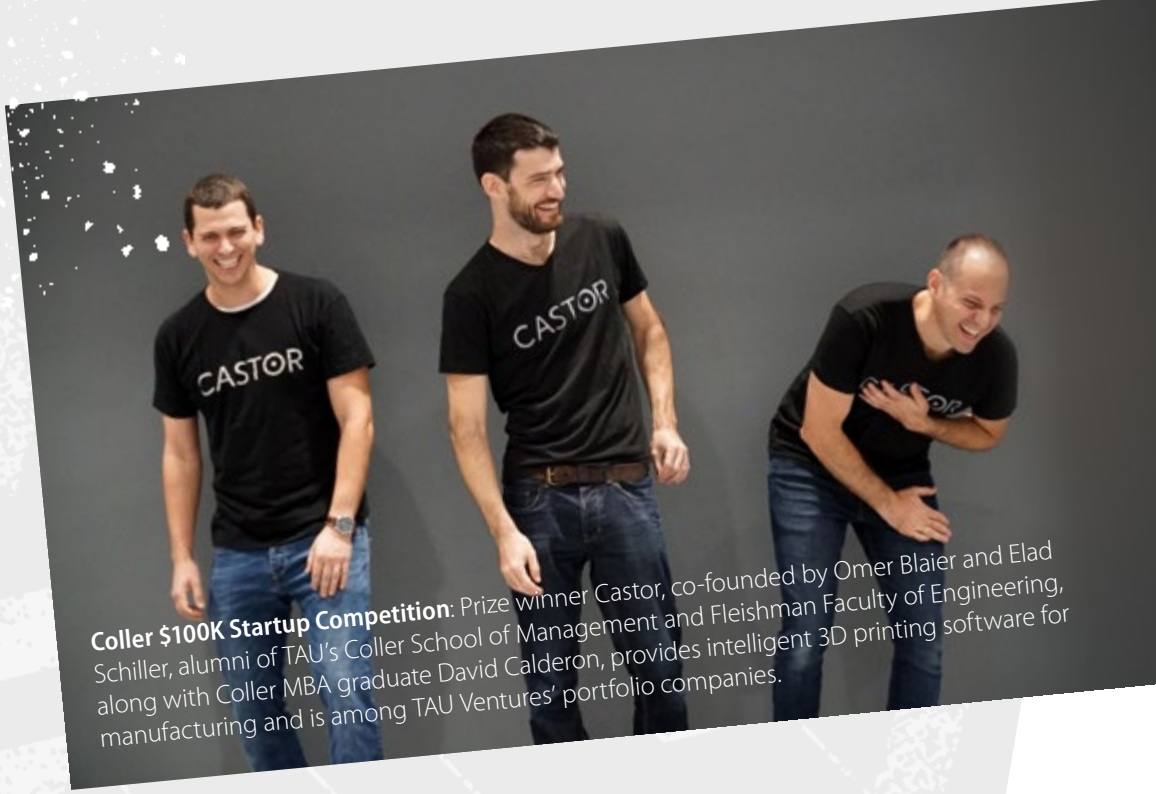
SPARK: A translational medicine initiative in association with Stanford University to fast-track drug candidates into clinical trials at TAU-affiliated hospitals.

Industrial Affiliates Program (IAP): A framework for involving multinational and Israeli high-tech companies in TAU engineering studies.

TAU Innovation Conference: An annual international meeting and start-up competition organized by students with over 6,000 participants each year.

TAU Impact: Over 60 courses, with intriguing names such as "Ethics & Algorithms" or "The Concept of Attention," embedding civic entrepreneurship into TAU's required undergraduate curriculum in partnership with 100 NGOs.

High-Tech Plus: An innovative BSc double-major program that opens up employment opportunities in the high-tech world for students from any field of study, even Humanities or Social Sciences.



Coller $100K Startup Competition: Prize winner Castor, co-founded by Omer Blaier and Elad Schiller, alumni of TAU's Coller School of Management and Fleishman Faculty of Engineering, along with Coller MBA graduate David Calderon, provides intelligent 3D printing software for manufacturing and is among TAU Ventures' portfolio companies.

Jack, Joseph & Morton Mandel Center for STEM and the Humanities:

A pioneering teaching program for nurturing well-rounded technological leaders with a broad humanistic grounding.

Discovery Partners Institute, Chicago:

A $500 million innovation center established by the University of Illinois in which TAU is the founding international partner.

TAU-TBSI Center, Shenzen: *A new collaboration between TAU and the Tsinghua Berkeley Shenzhen Institute (TBSI) for research, startup acceleration and incubation, and China-Israel business relations.*

Academic Cities: A first-of-its-kind program adopted by the Israeli Ministry of Education for integrating TAU digital courses into high schools – 160 so far – run by TAU Online–Center for Innovative Learning.

Ramot: The technology transfer and business engagement arm of TAU, with 60 startups currently in operation and 200 active license agreements.

TAU Ventures: Israeli academia's first venture capital fund directed specifically at student, alumni and community startups, housed at the Miles S. Nadal Home for Technological Innovation and Entrepreneurship.

Does dark matter matter?

Astrophysicist **Prof. Rennan Barkana** (Exact Sciences) published a paper in *Nature* proposing that radio wave signals from the earliest ever stars may be giving us the first direct clues on the nature of dark matter, the mysterious building blocks of the universe. This work was chosen by *Physics World* as one of the Top Ten Breakthroughs of the Year for 2018.

Developing an invincible shield for computer chips

In an Intel-funded project, **Dr. Adam Morrison** (Exact Sciences) of the Blavatnik School of Computer Science and Blavatnik Interdisciplinary Cyber Research Center, in collaboration with Profs. Josep Torrellas and Christopher Fletcher of the University of Illinois at Urbana-Champaign, has been working on a solution to the fundamental security flaws inherent in the design of computer chips. The chips' vulnerability has become ever-more apparent since recent cyberattacks such as Spectre and Meltdown set off alarms throughout the computational world. While massive industry efforts have led to patches of vulnerable points, Dr. Morrison and team are working on providing a more permanent fix that retains highest performance.

Drumming up business for the biomed-computer interface

In partnership with Harvard's Department of Biomedical Informatics chaired by Prof. Isaac Kohane, **Prof. Ron Shamir** (Exact Sciences) and **Prof. Noam Shomron** (Medicine) have established the Biomedical Informatics Entrepreneur Salon as part of TAU's Edmond J. Safra Center for Bioinformatics. In a bi-monthly forum, academics, industry leaders, entrepreneurs and venture capitalists are afforded the opportunity to meet, interact and network, with the goal of promoting entrepreneurship at the convergence of biology, medicine and computing. The first meeting was attended by 100 participants from business and academia.

Imagine a robot that can self-replicate through 3D printing, figure out how to move through unpredictable terrain, and remain light and pliant like an ivy vine. It could look for survivors in a collapsed building, for example, or perform testing at a contaminated site. Now, the futuristic technology needed for such a machine will be developed by a €7 million, nine-partner, EU-funded consortium integrating botany, neuroscience, computer science and engineering. At TAU, Dr. Meroz is responsible for studying how plants respond to their environment, and then mathematically modeling the "brain" of the growing robot so that it can decide the best route to take in chaotic conditions. In a related project, Dr. Meroz and an interdisciplinary team won a TAU Breakthrough Innovative Research Grant to study decision-making by plant roots, with partial funding by Schmidt Futures.

Program: School of Plant Sciences and Food Security

Goal: Robots that will help people in tight spots

CREATING ROBOTS THAT GROW

GLOBAL EDGE

Plant behaviorist and TAU alumna **Dr. Yasmine Meroz** (Life Sciences) is developing an entirely new class of robots inspired by climbing plants.

Students for regional entrepreneurial networking

Coller Ignite, under the academic supervision of **Dr. Eyal Benjamin** (Management), is a student-led club that helps its members access the Coller School of Management's extensive entrepreneurial resources, network with local company founders, and share ideas. With special emphasis on including women, Israeli-Arab and Palestinian students, the club encourages participants from every TAU department and personal background to engage with the entrepreneurial world and offers them the opportunity to connect with Israeli business leaders.

Women in STEM

There is a crisis-level paucity of women in science, technology, engineering and mathematics (STEM). Now, in a grassroots effort, female TAU researchers who see themselves as role models are establishing frameworks for encouraging young women in STEM. **Prof. Shiri Artstein** (Exact Sciences) initiated weekly WoMath meetings, providing a supportive study environment and lectures by female researchers on their work and personal experiences as mathematicians. Similarly, the first Women in Chemistry Forum, headed by **Prof. Yael Roichman** (Exact Sciences), was held at TAU, providing a collaborative atmosphere for female research students and an opportunity for networking between women in academia and industry.

A laboratory tool made of light

Dr. Alon Bahabad (Engineering) and his team have upgraded a 2,300 year old technology to create something akin to an Archimedes Screw (a mechanism for raising water) made out of light. Two laser beams in a DNA-type helix arrangement can capture tiny light-absorbing particles and move them with or against the direction of light flow in the beam. This will allow the positioning of particles in front of measuring devices for detection of air pollutants, as well as for analysis of very small biological specimens.

The dawning of a new industrial revolution

Blockchain, a financial tool that enables secure online activity without an intervening managerial entity, is said to be ushering in the fourth industrial revolution. The Boris Mints Institute for Strategic Policy Solutions to Global Challenges (BMI), headed by **Prof. Itai Sened** (Social Sciences), held a conference in Montenegro bringing together academia, government and industry to explore Blockchain's potential for global development and protection of human rights. TAU also launched the Hogeg Blockchain Research Institute, a first for Israel, headed by **Prof. Dan Amiram** (Management).

Under construction now! In a perfect convergence of industrial excellence and academic innovation, TAU's new Susan and Henry Samueli Engineering Building will house the R&D center of giant chipmaker Broadcom alongside labs, classrooms and offices for the Fleischman Faculty of Engineering.

CHAIRMAN'S MESSAGE

With the conclusion in 2019 of TAU President Joseph Klafter's 10-year tenure, I would like to take this opportunity to express the entire University community's gratitude and esteem for his outstanding stewardship during an exciting decade.

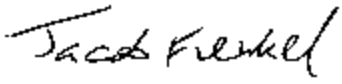
Prof. Klafter brought the University to new peaks of achievement. He dramatically broadened the international network of partnerships, collaborations and affiliations with leading organizations all over the world. He unified the campus in the common aspiration toward interdisciplinary innovation coupled with technological, scholarly and social entrepreneurship.

Translating his own passion for science into a passion for academic excellence, Prof. Klafter traveled the world over to secure the financial resources for the University's sensational development and growth. Not least, he was a courageous warrior for academic freedom, an essential pillar of Israel's democratic and pluralistic society, as well as for the intellectual boldness and creativity for which TAU is so well known.

With achievements and progress come inevitable challenges, and the next phase of TAU leadership will be addressing two main issues. The first is the boycott, divestment and sanctions movement against Israel, known as BDS.

Their anti-Semitic and anti-Israel messaging has a direct impact on TAU's faculty and students, as well as on the Israeli economy and society in general. The country and the University need the broad and active engagement of our TAU friends and supporters to fight BDS.

The second challenge is competition – Tel Aviv University is competing for talented faculty members and students, for academic and industry partnerships, and for financial resources. The goal now is to enlarge our network of champions and benefactors around the world who will actively join the TAU mission. With conviction and determination, we will renew our commitment to bring the University to ever new summits and ever new Big Ideas.



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

PRESIDENT'S FAREWELL MESSAGE

Like many organizations, Tel Aviv University must reinvent itself every now and then to ensure its continuing relevance and leadership role in an ever-changing, competitive global arena. This requires creativity and an entrepreneurial spirit.

My mission as university president for the last 10 years was to champion creativity and entrepreneurship in *every field*, sow fertile ground for them to grow, and nurture "academic chutzpah." All along the way I sought to closely involve faculty, students, staff, alumni and supporters. I kept an open door. I learned to embrace what seemed impossible dreams. I gave people in the TAU community "permission to fail" and resolute backing on their path to success. Mostly, I endeavored to humanize this large university – this City of Big Ideas – sprawled on a Ramat Aviv hillside. *When people meet people, sparks ignite.*

Among the highlights of my tenure, I would like to share a number of trends that defined the growth and evolution of the University:

Removing Barriers: Interdisciplinary Culture

TAU has always been the Israeli pioneer for novel interdisciplinary research and study programs. Building on this foundation, TAU added some 50 major research centers, institutes and study frameworks, mostly in partnership with visionary donors, in areas ranging from neuroscience to ethics, evolutionary history to cyber security, and sports performance to smart cities – to name a few. Likewise, a vigorous faculty recruitment drive emphasized rising stars who could bring interdisciplinary know-how to TAU and Israel. Since 2010, TAU absorbed 420 talented new faculty members at an overall cost of $88 million.

Taking Flight: Globalization

Just as academic disciplines are borderless, so too are the challenges facing scientists. Developing more effective drugs, ensuring food security, protecting the environment, fighting poverty – these and many more universal challenges require a concerted global effort. Over the last decade, TAU has expanded ties and founded joint innovation centers with leading institutions across 6 continents, with a particularly dramatic push eastward into China and India. A globalized campus also meant attracting more international students, and we increased English-language degree programs from 2 in 2009 to 17 today.

Demonstrating Confidence: Strategic Moves

Along with looking outward to global opportunities, TAU looked inward at its own structure and brand identity and managed to rejuvenate both. We reorganized 125 academic departments into 31 schools to further encourage interdisciplinary excellence. And while already a super-brand in Israel, TAU nonetheless underwent a branding process to reposition itself as a bold, curiosity-inspiring research university that frees researchers, students and alumni to "pursue the unknown."

Pursuing the Unknown: Innovation and Entrepreneurship

Out of fearless questioning on the one hand, and interdisciplinary thinking on the other, emerges wonderful innovation – those new ideas, products or services that transform our lives. Over the last 10 years, TAU has flourished as a world recognized hub for generating discoveries and startups in every sphere. Among the factors contributing to this success are robust industry ties, venture capital backing, and the move to embed both technological and social entrepreneurship into the curriculum.

Serving the Community: Social Responsibility

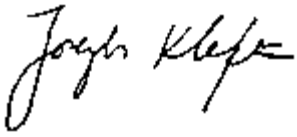
Along with translating knowledge into practical solutions, TAU significantly widened access to its rich offerings for the benefit of Israeli society. TAU students work with about 100 NGOs on vital civic projects. Scholarship programs target underrepresented groups in higher education such as the Ultra-Orthodox, minorities, and young people with disabilities. At the same time, we're diversifying and expanding our future student body with a unique program for teaching TAU online courses – for full university credit – in periphery high schools.

Expanding Capabilities: $1 Billion Global Campaign

TAU's heightened contribution and impact would not have been possible without the dedication and generosity of the University's supporters. Donor funding has enabled the construction of 12 buildings for a total of 60,000 sq. m. (645,000 sq. ft.) in new, state-of-the-art facilities. Moreover, through the tireless activities of our Friends Associations in 26 countries, TAU's reach is more extensive than ever before. We leveraged this heightened visibility to kick off, in 2013, the largest fundraising campaign of any Israeli university – $1 billion in 10 years – aimed at ensuring TAU's growth momentum and fostering the Next Big Ideas. This year we reached $600 million in cash and pledges.

Today, after 3,600 intensive days and nights as President, I look back with satisfaction and forward with confidence. Mine has been a fascinating job at the apex of personal fulfilment and public service, philanthropy and private investment, and national priorities and global concerns. It has reinforced my deep belief in the singular importance of the University to Israeli society and to freedom and progress everywhere.

Most of all, I leave my position as President incredibly grateful for the help and support I received from my TAU family every step of the way. I extend heartfelt thanks for the noble and inspiring teamwork that has placed TAU firmly on the map of the world's leading universities.



Prof. Joseph Klafter
Outgoing President
Tel Aviv University

TAU OFFICERS

Lay Leaders

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

Mr. Eli Gelman
Chairman of the Executive Council

Dame Shirley Porter
Deputy Chairperson of the Board of Governors

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

Dr. h.c. Josef Buchmann
Vice Chairman of the Board of Governors

Mr. Sylvan Adams

Dr. h.c. Marcus Besen

Dr. h.c. Boaz Dotan

Mr. James Dubin

Dr. h.c. Sami Sagol

Vice Chairmen of the Board of Governors

Mr. Robert Goldberg, Mr. Michael H. Steinhardt
Chairmen Emeriti of the Board of Governors

Dr. h.c. Jeremy Coller, Deputy Chairman-Elect; **Dr. Anita Friedman**, Vice Chairperson-Elect

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Incoming President

Prof. Yaron Oz
Rector

Mr. Gady Frank
Director-General

Prof. Raanan Rein
Vice President

Prof. Yoav Henis
Vice President for Research and Development

Mr. Amos Elad
Vice President for Resource Development

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Vice Rector

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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. Abdussalam Azem
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. Roey Amir, Exact Sciences, 2018 Israel Chemical Society (ICS) Prize for Outstanding Young Scientist

Dr. Ayala Arad, Management, Kadar Family Award for Outstanding Research

Prof. Dorit Aram, Education, Reading Hall of Fame

Dr. Iair Arcavi, Exact Sciences, Alon Fellowship

Prof. Karen Avraham, Medicine, Ernest and Bonnie Beutler Research Program of Excellence in Genomic Medicine Award from Rambam Hospital

Dr. Liron Barak, Exact Sciences, Alon Fellowship

Prof. Sivia Barnoy, Medicine, Founder Award for Research from the International Society of Nurses in Genetics

Prof. Nir Ben-Tal, Life Sciences, NATO Science for Peace and Security Programme (SPS) Prize

Prof. Yoav Benjamini, Exact Sciences, 2019 Karl Pearson Prize

Prof. Eyal Benvenisti, Law, Member of the Israel Academy of Sciences and Humanities

Prof. David Bergman, Exact Sciences, President of ETOPIM

Prof. Nittai Bergman, Social Sciences, France Israel Foundation Young Economist Award

Dr. David (Dudu) Burstein, Life Sciences, Alon Fellowship

Prof. Ran Canetti, Exact Sciences, 2018 RSA Conference Award for Excellence in Mathematics

Prof. Danny Cohen-Or, Exact Sciences, Kadar Family Award for Outstanding Research; 2018 Computer Graphics Achievement Award, presented by ACM SIGGRAPH

Prof. Ruth Defrin, Medicine, Special Award from the Israeli Pain Society

Prof. Guy Deutscher, Exact Sciences, Fellow of the Israel Physical Society

Prof. Ora Entin-Wohlman, Exact Sciences, Foreign Fellow of the American Academy of Arts and Sciences

Prof. Michal Feldman, Exact Sciences, 2018 Amazon Research Award

Prof. Talia Fisher, Law, Fattal Prize for Excellence in Law Research

Prof. Emilia Fridman, Engineering, IEEE Award

Prof. (Emer.) Mordechai Akiva Friedman, Humanities, 2019 Israel Prize in Jewish History

Prof. Ehud Gazit, Life Sciences, 2019 Rappaport Prize for Excellence in Biomedical Research; Foreign Fellow of the Indian Academy of Sciences

Prof. Uri Goldbourt, Medicine, Life Achievement Award, Israel Public Health Medical Organization

Prof. Uri Gophna, Life Sciences, Israel Sarob Prize

Prof. Daphna Hacker, Humanities, 2018 Herbert Jacob Book Prize

Prof. Yitzhak Hadari, Law, Zeltner Prize

Prof. Dan Halperin, Exact Sciences, ACM Fellows for 2018

Prof. Sefy Hendler, Arts, Knight of the Order of Arts and Letters of the Minister of Culture in France

Prof. Tamar Herzig, Humanities, Kadar Family Award for Outstanding Research

Prof. Hanna Herzog, Social Sciences, EMET Prize in Sociology

Prof. David Horn, Exact Sciences, Fellow of the Israel Physical Society

Dr. Yuval Jobani, Humanities, 2018 Gideon Doron Best Book Award

Dr. Micha Katz-Leurer, Medicine, 2018 Excellence Award from the Israeli Physiotherapy Society

Prof. Silvia Koton, Medicine, International Fellow of the American Heart Association (FAHA); Paul Dudley White International Scholar Award of the American Heart Association

Dr. Michal Kravel-Tovi, Social Sciences, 2018 Jordan Schnitzer Book Award, Association of Jewish Studies

Prof. Noga Kronfeld-Schor, Life Sciences, Gwinner Prize

Dr. Kinneret Lahad, Humanities, Israel Young Academy of Sciences and Humanities

Dr. Ori Lahav, Exact Sciences, Alon Fellow

Prof. Gil Markovich, Exact Sciences, 2018 Tenne Family Prize for Nanoscale Sciences

Dr. Moshe Morad, Humanities, Award of the Society of Ethnomusicology

Prof. Guy Mundlak, Law, Zeltner Prize

Prof. Hagai Netzer, Exact Sciences, Fellow of the Israel Physical Society

Prof. Abraham Nitzan, Exact Sciences, 2019 Earle K. Plyler Prize for Molecular Spectroscopy & Dynamics

Dr. Hannah Pollin-Galay, Humanities, 2018 Alon Fellowship; 2018 Colton Fellowship

Prof. Dina Porat, Humanities, 2018 Bahat Prize for Outstanding Academic Manuscripts

Prof. Oded Rechavi, Life Sciences, Kadar Family Award for Outstanding Research

Prof. Dana Ron, Engineering, Fellow of the European Association for Theoretical Computer Science (EATCS)

Prof. (Emer.) Eugene Rosenberg, Life Sciences, 2018 Karl August Mobius Prize

Prof. Orit Rozin, Humanities, 2018 Jordan Schnitzer Book Award

Prof. Shmuel Safra, Exact Sciences, Best Paper Award in FOCS 2018

Prof. Ronit Satchi-Fainaro, Medicine, 2019 Israel Cancer Research Fund (ICRF) Professorship Award

Prof. David Schmeidler, Exact Sciences, Honorary Doctorate from University of Paris Pantheon-Sorbonne

Prof. Gil Segal, Life Sciences, Member of the American Society of Microbiology (ASM)

Dr. Elad Segev, Social Sciences, Best Paper Award, International Communication Association

Dr. Amit Sever, Exact Sciences, 2018 Krill Prize

Prof. Doron Shabat, Exact Sciences, 2018 Israel Chemical Society (ICS) – Adama Prize for Technological Innovation

Dr. Hila Shamir, Law, Member of the Young Israel Academy; Hashin Prize for Young Researchers

Prof. Michal Shamir, Social Sciences, Israel Political Science Association Lifetime Achievement

Dr. Eilon Shani, Life Sciences, Israel Young Academy of the Israel Academy of Sciences

Prof. (Emer.) Micha Sharir, Exact Sciences, Member of Israel Academy of Sciences and Humanities

Prof. Amiel Sternberg, Exact Sciences, Scientific Member of the Max Planck Society in Germany

Prof. Marcelo Sternberg, Life Sciences, RAICES 2018 Prize from the Argentinean government

Dr. Ravit Talmi-Cohen, Humanities, Distinguished Manuscript Award from Open University

Prof. Marc Teboulle, Exact Sciences, SIAM Optimization Prize

Dr. Yofi Tirosh, Law, Gorni Prize for Public Law

Prof. Moshe Tur, Engineering, Optical Society of America (OSA) Lifetime Achievement Award

Dr. Roy Tzohar, Humanities, Toshihide Numata Prize in Buddhism

Prof. Lev Vaidman, Exact Sciences, Charter Honorary Fellow of the John Bell Institute for the Foundations of Physics

Dr. Miri Yemini, Humanities, 2018 ARCHES Award

Dr. Luba Zak, Medicine, 2018 Lifetime Achievement Award at the Knesset

2019 Global Campaign Projects

Academic Development

- Tel Aviv University-Northwestern University Nano Initiative – Roman Abramovich, UK
- Aufzien Family Center for the Prevention and Treatment of Parkinson's Disease – USA
- Support for Minerva Center for the Humanities – Daniel E. Cohn and Lynn Brinton, USA
- Support for Institute for National Security Studies – Crown Family Foundation, USA
- Frenkel Initiative to Combat Air Pollution – Aaron G. Frenkel, Monaco
- Support for Institute for National Security Studies China Program –Diane and Guilford Glazer Donor Advised Fund, USA
- Support for Institute for National Security Studies – Diane P. and Guilford Glazer Fund, USA
- Support for the Kadar Family Award for Outstanding Research – Naomi Prawer Kadar Foundation, USA
- Support for the Shlomo (Cheech) Lahat Institute – Chaim Katzman, USA
- Support for the Shlomo (Cheech) Lahat Institute – Various Donors
- Support for Institute for National Security Studies – Mr. and Mrs. Ronald S. Lauder, USA
- Jack, Joseph & Morton Mandel Center for STEM and the Humanities – USA
- Institute for Promoting Dialogue through Music – Aviad Meitar, Israel
- Support for Institute for National Security Studies – Ambassador Alfred H. Moses, USA
- Support for Institute for National Security Studies Fellowships – Neubauer Family Foundation, USA
- Support for Institute for National Security Studies – Robin Chemers Neustein, USA
- Support for Institute for National Security Studies – One8 Foundation, USA
- Support for Institute for National Security Studies – Mark Rowan, USA
- Support for TAU Breakthrough Innovation Research Grants – Schmidt Futures, USA
- Support for Institute for National Security Studies – Jeffrey Silverman, USA
- Support for Academic Cities, TAU Online – Anonymous
- Support for Whitman Family Center for Coexistence – Estate of Martin Whitman, USA
- Support for Institute for National Security Studies – Ezra U. Yemin, USA

Research

- Research Fund for Prof. Jonathan Berant in Artificial Intelligence and Natural Language Processing – Allen Institute for Artificial Intelligence, USA
- Support for Research at the Sackler Faculty of Medicine – Irmgild Suzanne Eichinger-Henke, Germany
- Richard Eimert Research Fund on Solid Tumors – Helena Eimert, Switzerland
- Support for Dean's Research Fund, Sackler Faculty of Medicine – Maurice Gowhari Estate, Ecuador
- Hogeg Blockchain Research Institute – Moshe Hogeg, Israel
- Research Fund for Prof. Dan Peer – Sheldon Inwentash and Lynn Factor, Canada
- Cosmology Research of Prof. Yoel Refaeli – Dr. and Mrs. Irwin M. Jacobs, USA
- Levi Karola Research Fund in Medicine – Israel
- Research Fund for Prof. Dani Offen – Michael Klein, USA
- Cecilia and Miguel Krigsner Personalized Medicine Research Fund for Glycogen Storage Diseases – Brazil
- Familial Dysautonomia Research of Prof. Gil Ast – Estate of Ethel Lena Levy, USA
- Project for Robust Wheat Development – Stephen Lieberman and Sandra Okinow, USA
- Research Fund for Dr. Dan Frenkel in Dementia and Alzheimer's Disease – Phyllis and Norman Lipsett Foundation, USA
- Prize awarded by Boris Mints Institute for Strategic Policy Solutions to Global Challenges – Russia

- Equipment for David and Inez Myers Laboratory for Molecular Medicine – David and Inez Myers Foundation, USA
- Peter and Naomi Neustadter Archaeological Expedition to Masada – Israel
- Dr. Garry Rayant and Dr. Kathy Fields-Rayant Minducate Learning Innovation Research Fund – USA
- Research Fund for Prof. Dror Avisar in Applied Water Studies – David Reznik, Israel
- Research Fund in the History of Zionism and the State of Israel – Ayala Sacks Abramov Estate, Israel
- Susan and Henry Samueli Engineering and Health Research Fund – USA
- Esther and Zvi Weinstadt Fund for Cancer Research – Israel

Campus Development

- Check Point Road – Check Point Ltd., Israel
- Helen and Stanley Grosman Place – Harry and Rita Perelberg, Australia
- Arline and Seymour Kreshek Practice Piano Center – USA
- Sam Moss Wing at the Trauma Studies Building – Moss Family, Australia
- Yehuda Naftali Botanic Garden – USA
- Susan and Henry Samueli Engineering Building – USA
- Ady Seidman Lobby in the Wolfson Electrical Engineering Building – Edith Simchi-Levi and Dr. David Simchi-Levi, USA
- Renovation of Laboratories in the Archie Sherman Building of Life Sciences – Archie Sherman Charitable Trust, UK
- Laboratory Equipment Fund at the Smolarz Family Building – Argentinean Friends of Tel Aviv University
- Support for Steinhardt Museum – Mr. and Mrs. Michael H. Steinhardt, USA
- Equipment for Research into High Intensity Lasers – Wolfson Foundation and Wolfson Charitable Trust, UK

Student Aid and Fellowships

- Scholarships for Medical Students – Ackerstein Industries, Israel
- Global MBA Fellowship Fund – Anonymous
- Scholarship Fund for Needy and Outstanding Students – Anonymous
- Helen and Rouhollah Barkohanai Scholarships in Management – Bahram Nour-Omid, USA
- Scholarships in Memory of Regina Brenes – Prof. Ruth Amossy, France
- Crown Doctoral Fellowships – Crown Family Foundation, USA
- Ettinger-Rudich Scholarship Fund for Outstanding Doctoral Students in History – Israel
- Feiler Family Fellowships – Mr. Jack Feiler, USA
- Scholarships for Immigrants and Needy Students – John Gandel, Australia
- Support for Lilly Geron Memorial Scholarship Fund – Elsa Geron Estate, USA
- Steve Tisch School of Film and Television Scholarships – Kirsh Foundation, USA
- Ezra Levin Family Bursaries – Daniel Levin, UK
- Magin Estate Scholarship Fund in Medicine – USA
- Yuri Milner '70 for 70' Fellowship Initiative – UK
- Israeli-Arab Career Pathways Fund – Neubauer Family Foundation, USA
- Frances and Samson Nour-Omid Scholarships in Computer Science – Bahram Nour-Omid, USA
- Support for Jaime Peisach Friendship Scholarship Fund – USA
- Support for Ariane de Rothschild Fellowships for Women Researchers – Caesarea Foundation, Israel
- Scholarships for Medical Students – Dr. Irmin Sternlieb, USA
- Dean Neer Tamir Memorial Scholarships – Vicki Tamir Estate, USA
- Tanenbaum-Spira Family Fellowship Fund for Alzheimer's Research – Canada
- Graduate Fellowship Fund in Cancer – Zvi Weinstadt, Israel
- Florence Rosenberg Wise and Naomi Rosenberg Sarlin Scholarship Fund – Estate of Florence Wise, USA

Community

- Support for the Social Involvement Unit – Rothschild Foundation, Switzerland

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

A unique tool will harness the power of machine learning to counter anti-Israel bias in social media

Contagion expert **Dr. Dan Yamin** (Engineering) realized that, just like the infectious diseases he studies, pervasive anti-Semitic and anti-Israel incitement is a social contagion that spreads virally through social media. Now, using state-of-the-art data analytics and machine learning, he is developing a technological tool to identify inflammatory tweets and posts; predict if they could go viral; assess whether counter-messaging will be harmful or helpful; and alert pro-Israel advocacy groups to quickly disseminate counter-arguments and positive messaging about Israel. Dr. Yamin believes his tool will help protect against BDS and other efforts to delegitimize Israel, especially on college campuses.

In a separate project, Dr. Yamin, whose interests range from Ebola infection to viral marketing and cyber malware propagation, is working with **Prof. Irad Ben-Gal** (Engineering), TAU students and Stanford University colleagues on a project to redress non-compliance with national vaccination programs as part of the Koret Foundation TAU-Bay Area Collaborative Initiative.

Program: Lab for Epidemic Modeling and Analysis, Department of Industrial Engineering

Developing an "Iron Dome" for Twitter

How to raise an entrepreneur

In a collaborative study, **Dr. Miri Yemini** (Humanities) of the Jaime and Joan Constantiner School of Education compared ex-pat entrepreneurial professionals in Tel Aviv, Hong Kong, Copenhagen, London and Buenos Aires. She found that entrepreneurial professionals engage in parenting strategies that give their children a competitive edge and demonstrate strong ties to their home countries, contrary to claims that such families are rootless. In a further study, Yemini is formulating a novel and inclusive entrepreneurship policy that could drive social change.

If I thrive under stress, why don't you?

In the workplace, some find stress enhancing, while others feel it is debilitating. Coller School doctoral student **Nili Ben-Avi**, with **Prof. Sharon Toker** and **Prof. Daniel Heller** (Management), conducted a novel study of these two mindsets on 971 American and Israeli employees. Those holding a stress-is-good mindset projected this onto others, making them less likely to offer help to a stressed colleague or perceive them as suffering from stress, and more likely to judge them as fit for promotion. Her findings indicate that stress-mindset is as much an inter-personal issue as an intra-personal one.

Protecting our children

In recent years there has been growing awareness among Israel's Ultra-Orthodox communities of the issue of child abuse. **Dr. Carmit Katz** (Social Work), together with the community's leading women and rabbis, established a forum for the advancement of children's safety. Among the topics raised in the forum was sexuality and the promotion of its healthy discussion between parents and children. This was a groundbreaking initiative for the Haredi community, which generally regards the subject as taboo.

Ethics, medicine and law

Bringing together divergent yet critically related fields, the Bioethics and Law Initiative was launched, headed by **Dr. Oren Asman** and **Prof. Yechiel Barilan** (both of Medicine). Through support for research and education, the Initiative aims to enrich the fields of bioethics and health law, and aid practitioners and researchers to adhere to the highest ethical standards. Among the Initiative's expanding activities are bi-weekly seminars with visiting scholars, nursing training and international workshops. Dr. Asman chaired the scientific program for the recent World Congress on Medical Law and Bioethics held in Tel Aviv and attended by 350 participants from 37 countries.

Taking public policies to the lab

Many government policies aimed at critical social problems, for example unemployment or crime prevention, are implemented without solid proof of whether they actually work. With growing awareness of the need for evidence-based policies, the Berglas School of Economics was chosen via a National Economic Council competitive tender to establish a research unit for evaluating the effectiveness of public policies in Israel. Headed by **Dr. Analia Schlosser** and **Dr. Itay Saporta-Eksten** (Social Sciences), the unit will enable interaction between academia and the public sector, promoting cutting edge scientific work and training students for effective involvement in policy evaluation.

Asking hard questions about democracies

- In a study of "Post-Liberal Democracy," **Dr. Erica Weiss** (Social Sciences) is investigating alternative forms of democracy based on an examination of grassroots social experiments. Exploring the possibility of "democratic diversity" and proposing that democracy is not a one-size-fits-all deal, she describes an alternative process that does not rely on liberal values, particularly those of individualism and secularism. The study suggests new contours of the democratic process, divorced from liberal assumptions.
- Are we witnessing the end of representative democracy or rather a vital change in its manifestations? The research of **Prof. Shira Dvir Gvirsman** (Social Sciences), Chair of the Dan Department of Communication, examines changes in the patterns of citizens' political representation during and after Israeli elections. Her study attempts to reveal the multidimensional, interactive and holistic nature of representation in the reciprocal process between citizens and the political elite.

Discovering the operating system for life

Prof. Itamar Even-Zohar (Humanities) is investigating socio-cultural entrepreneurship as a parameter of the survival and success of groups in a variety of geo-cultural settings. Looking into the ways that such entrepreneurship coincides with economic growth, he proposes that an infrastructure of socio-cultural energy, not always self-evident, is a prerequisite for the success of a group as opposed to its stagnation. Study of the way these infrastructures are formed and maintained is a suggested focus for further research.

Redefining privacy in an interconnected world

Increased use of information technology challenges notions of privacy as a social value and civil right. The Blavatnik Interdisciplinary Cyber Research Center together with the Edmond J. Safra Center for Ethics sponsored the 5th Privacy, Cyber and Technology Workshop which delved into the emerging interdisciplinary field of privacy and cyber. Sixteen speakers took part, representing TAU's Zvi Meitar Center for Advanced Legal Studies, the Privacy Protection Authority of the Israel Ministry of Justice, and universities and institutions throughout Israel and abroad. Topics included legal developments in privacy, social media and cyberbullying, big data, privacy and security in digital learning and representations of privacy in cinema.

An inclusive student body

The Buchmann Faculty of Law has intensified its efforts, encouraged by growing success, to integrate Ultra-Orthodox candidates into its student body. The Trailblazers Program, coordinated by PhD candidate **Galia Givoly** (Law) and open to other fields at TAU beyond law, offers flexible acceptance criteria adapted to applicants' educational background while demanding high academic standards from them as students. The program also offers support in the form of financial aid and social, academic and psychological services. Aimed at dramatically increasing the number of Ultra-Orthodox graduates entering the Israeli workforce, this program is part of Israel President, Reuven Rivlin's Israeli Hope initiative.

HEALTHY AGING CENTER IN THE MAKING

Emphasizing the health, quality of life and dignity of the elderly, TAU's new Healthy Aging Initiative, spearheaded by TAU Director of International Research Affairs **Dr. Mira Marcus-Kalish**, involves more than 40 researchers from across the campus. The broad range of research topics includes:

- Positivity and resilience by **Prof. (emer.) Dov Shmotkin** (Social Sciences), head of TAU's Herczeg Institute of Aging
- Flexibility in the labor market to older workers' needs by **Prof. Sharon Toker** (Management)
- Regenerative benefits of exercise among older individuals by **Prof. Mickey Scheinowitz** (Engineering), Director of the Sylvan Adams Sports Institute
- Improved healing of wounds and pressure ulcers by **Prof. Amit Gefen** (Engineering), now the basis for the startup, Under Pressure Medical Ltd.
- Neuroprotective compounds for Alzheimer's and other dementias by **Prof. Illana Gozes** (Medicine) of the Adams Super Center for Brain Studies and Sagol School of Neuroscience
- Tissue aging at the molecular level and its relation to chronic diseases by **Dr. Daniel Z. Bar** (Dental Medicine)
- Legal issues surrounding care of elderly parents by **Prof. Daphna Hacker** (Law), Head of TAU's NCJW Women and Gender Studies Program

Defending the right to breathe clean air

A TAU-initiated class action lawsuit seeks justice from polluters.

Together with his student team at the Environmental Justice and Animal Rights Legal Clinic, **Dr. Eran Tzin** (Law) will be submitting a first-ever mass class action regarding the excess rate of cancer in the Haifa Bay area – home to a population of 500,000 Jewish and Arab residents. The class action is being filed against the area's major industrial polluters. This will be the most substantial environmental legal case ever to be deliberated in an Israeli court. Dr. Tzin is a lawyer and holds a PhD in Geography and Environmental Development.

Program: Elga Cegla Clinical Legal Education Programs

Goal: To pioneer legal aid for the Israeli public while teaching students social responsibility

PhD student Bonnie Asher tests a baby's response to speech at the Early Communication Infant Lab of the Department of Communication Disorders

A series of "social startups" promote normal language acquisition among babies and young children

INTERVENING MUCH EARLIER

According to Head of the Stanley Steyer School of Health Professions, **Prof. Liat Kishon-Rabin** (Medicine), the earliest possible intervention for young children's language difficulties can minimize a host of future problems. She initiated a number of language and literacy programs that bring knowledge from academia directly into infant daycare centers, kindergartens and primary schools; train caregivers, teachers and parents; and prepare TAU students to be effective agents of change. The community has embraced these social startups and is asking to expand them to additional preschools and schools.

What makes us vulnerable to autoimmune attack?

According to biophysicist **Prof. Roy Beck** (Exact Sciences), of the Center for Nanoscience and Nanotechnology and Sagol School of Neuroscience, previous scientific studies have focused on the body's autoimmune response, but not on what might be enabling it. Together with doctoral student **Rona Shaharabani**, he has found that the body's internal environment, particularly salinity and temperature, can cause structural changes to the myelin sheath –the "insulating tape" of neurons – rendering it vulnerable to autoimmune attack. This discovery offers alternative methods for early diagnosis and prevention of autoimmune diseases such as multiple sclerosis.

BioMed@TAU

A collective of biomedical research hubs has been established at TAU under the direction of **Prof. Karen Avraham**, Vice Dean of the Sackler Faculty of Medicine. The hubs forge multidisciplinary teams from among the biomedical scientists across the campus and at TAU's 17 affiliated hospitals. Focusing on major areas of research, from "Disorders of the Mind and Brain," through to "Bioengineering Materials, Cells and Tissues," and "Developmental Biology and Stem Cell Research," the hubs, each run by faculty members, promote excellence, strengthen collaborative research and provide opportunities for joint grant applications.

Creating new knowledge … starting in high school

Forbes magazine added high school student and TAU researcher **Rina Sevostianov** to its list of Most Promising Youngsters under the Age of 30. Under the Israeli Alpha program for gifted students, run at TAU by the Youth University, Rina was only 15 years old when she began combining tissue engineering and nanomaterials science under the supervision of **Dr. Lihi Adler-Abramovich** (Medicine) of TAU's Goldschleger School of Dental Medicine and Center for Nanoscience and Nanotechnology. "As opposed to high school where knowledge is taught," says Rina, "the Alpha program to me meant creating new knowledge."

Predicting disease with … algorithms?

A team led by **Prof. Noam Shomron** (Medicine) and PhD student **Tom Rabinowitz** developed a simple and safe blood test that could allow parents to learn about the health of their baby as early as 11 weeks into pregnancy. The procedure involves sequencing DNA, taken from a blood sample of both the mother and father, to predict genetic mutations in the fetal genome using computer algorithms and AI. Beyond testing for Down's syndrome, the method's unprecedented resolution could detect Tay-Sachs, cystic fibrosis and thousands of other genetic disorders.

Prof. Shomron, who is Chief Scientific Officer of diagnostics startup Variantyx, a spin-off from his lab at TAU, also recently began a project on the genetic basis of breast cancer metastasis with UC Berkeley's Prof. Haiyun Huang in the framework of TAU's Edmond J. Safra Center for Bioinformatics and the Koret Foundation TAU-Bay Area Collaborative Initiative.

A new blood assay for genetic diseases could make invasive testing during pregnancy a thing of the past

MEDICAL STARTUPS = REAL WORLD IMPACT

- The startup Coronis Neurosciences received an exclusive global license from Ramot, TAU's commercialization arm, for technology developed by **Prof. Illana Gozes** (Medicine) that could treat orphan disease ADNP syndrome.
- **Prof. Hagit Eldar-Finkelman** (Medicine) has established a startup called GSKure to advance her research on a protein linked with Alzheimer's disease toward the clinical testing phase.
- Nuclear physicist **Prof. Itzhak Nelson** (Exact Sciences) and clinical microbiologist **Prof. Yona Keisari** (Medicine) are in the clinical trial phase for their startup, Alpha Tau Medical Ltd., which provides novel cancer radiotherapy treatment.
- Biotechnologist **Prof. Itai Benhar** (Life Sciences) and team have licensed their unique antibody technology to Swiss pharma and biotech company, Lonza.
- Trobix Bio is a new startup aimed at developing and commercializing the antimicrobial resistance platform developed by **Prof. Udi Qimron** (Medicine).
- **Prof. Natan T. Shaked** (Engineering) has founded QART Medical, a startup based on 8 years of research into improving the outcome of IVF treatments.

Latest Zuckerman Leaders

Dr. Gili Bisker (Engineering) is the latest rising young star to join TAU through the nationwide Zuckerman STEM Leadership Program initiated by businessman and TAU George S. Wise Medal laureate Mortimer B. Zuckerman. The Program supports future academic leaders in science, technology, engineering and math (STEM) in the United States and Israel, with a view to fostering greater bilateral scientific collaboration. Dr. Bisker, who develops optical nanosensors for targeting biomolecules within cancerous cells, is joining TAU following post-doctoral studies at MIT.

Machines that learn how to help you control your brainwaves

Neurofeedback (NF), by which a person viewing a visual representation of their brain waves learns to control them, is being used to treat a range of disorders from ADHD to anorexia, epilepsy and multiple sclerosis. **Dr. Sigal Portnoy**, **Dr. Tami Bar-Shalita** (both of Medicine) and **Prof. Amit Gefen** (Engineering), together with MSc student **Gil Issachar** and an undergraduate team, have developed a new improved NF system that can simultaneously target more than one parameter of the brain activity levels, evaluate the process, and apply machine learning for a more individually-tailored treatment adapted to each patient's characteristics.

Support for special needs students

TAU has opened its gates to students with high functioning autism spectrum disorder (ASD) with the new Yahalom project. Designed to ease the acclimatization of these special needs students to academia, Yahalom is coordinated by **Dr. Liat Sorski** (Social Sciences) and operated by the Student Services Division's Psychological Services Unit, directed by **Alberto Meschiany**. Students are eligible to receive academic tutoring and workshops for improving communication skills. The successful integration of ASD students into the university environment will also help facilitate their entry into the workforce later on.

Move – It's good for you (and profitable)!

Physical inactivity is among the main health risk factors in modern society. Specializing in behavioral economics, **Dr. Ayala Arad** (Management), recipient of the 2019 Kadar Family Award for Outstanding Research, together with her doctoral student **Eli Mograbi**, is conducting a field experiment in collaboration with Prof. Uri Gneezy of UC San Diego aimed at developing a monetary incentive scheme that will promote physical activity and encourage its subsequent maintenance. The resulting incentive schemes could then be employed by HMOs or even health ministries wishing to promote healthy behavior, and could have bearing on future studies into reducing other behavioral risk factors.

Toward more Israeli Olympic medals

Stage One of the Sylvan Adams Sports Institute, headed by **Prof. Mickey Scheinowitz** (Engineering), was launched this year with the opening of the Sylvan Adams Sports Laboratory. Scientific researchers will use the new facility to test and train triathletes with the aim of identifying limitations, providing novel solutions and improving the outcomes of elite athletes competing in international competitions. The lab is equipped with state-of-the-art bicycles, treadmills and a swim flume – all connected to sensors and monitors – for measuring the metabolic, physiological and biomechanical impact of exercise testing and training on human performance.

Global breakthrough: Printing a Heart in 3D

Biotechnologist and materials scientist **Prof. Tal Dvir** (Life Sciences), head of the Sagol Center for Regenerative Biotechnology and core member of the Center for Nanoscience and Nanotechnology, has achieved a world first: He and his team have 3D-printed a vascularized, engineered heart using a patient's own cells. Featuring all the requisite cells, blood vessels, ventricles and chambers, the 3D heart offers hope to heart disease sufferers as it may eventually replace the need for heart transplants from donors. The team now aims to develop the technology further, with the ultimate goal of having "organ 3D printers" available in hospitals around the world.

In a disaster, WHO's best to call?

The World Health Organization (WHO) has designated TAU's Department of Emergency Management & Disaster Medicine, headed by **Dr. Bruria Adini** (Medicine) of the School of Public Health, as a WHO Collaboration Center for Disaster and Emergency Medicine, Management and Research. As part of this prestigious recognition, the Department is collaborating with leading academic institutions worldwide in research and education activities aimed at mitigating the results of mass casualty incidents, public health emergencies and disasters caused by forces of nature or human-induced events.

A chemical probe that glows 3,000 times brighter than current ones could detect cancer or food contamination at much higher levels of accuracy

LIGHTING THE WAY TO HEALTH

Chemiluminescence, the chemical light that makes fireflies glow, is also used in sensitive diagnostic tools. A research team led by **Prof. Doron Shabat** (Exact Sciences) and PhD student **Ori Green** is developing a dazzlingly bright chemiluminescent probe. It is suitable for direct use in the body's cells and could produce visual images of abnormal activity, such as cancer proliferation, but could also be adapted to identify and measure almost any biological or chemical compound.

Goal: Create a range of highly effective sensors for the medical, food and other industries

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