

THE MAGAZINE OF THE HEBREW UNIVERSITY OF JERUSALEM

# SCOPIUS

VOLUME 64 2017/2018



# Super Technologies Inspiring the Future

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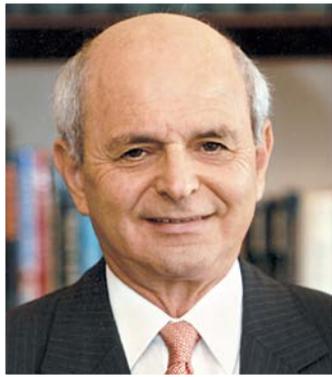
Israel's first university, is a multidisciplinary institution of higher learning and research where intellectual pioneering, cutting-edge discovery and a passion for learning flourish. It is a center of international repute, with ties extending to and from the worldwide scientific and academic community and where teaching and research interact to create innovative approaches that ensure the broadest of educations for its students.

Ranked among the world's leading universities, the Hebrew University is an institution where Israelis of all backgrounds receive a university education where excellence is emphasized; where advanced, postgraduate study and research are encouraged; and where special programs and conferences attract students and academics from around the world. At its core, the Hebrew University's mission is to develop cutting-edge research, to educate future leaders in all walks of life, and to nurture future generations of outstanding scientists and scholars in all fields of learning.

**LOCATION ON SIX CAMPUSES:** three in Jerusalem (Mount Scopus, Edmond J. Safra and Ein Kerem) and in Rehovot, Beit Dagan and Eilat

**ENROLLMENT** **23,000** students, including **11,500** undergraduates, **6,000** master's students, **2,200** doctoral candidates and **3,300** overseas, pre-academic students, postdoctoral fellows and others

**RESEARCH** **3,442** **FACULTY** **973** projects in progress in University departments and some **100** subject-related and interdisciplinary research centers



At the Hebrew University, the term “next generation” is a layered concept. It is the next generation of students who will walk our halls and enrich our campuses. It is the next generation of scientists who will cure our diseases by creating life saving technologies. It is the next generation of friends who will ensure that our University continues to thrive.

In this edition of Scopus, we are showcasing ways in which the Hebrew University is ushering in technology and leadership for the next generation. Our feature piece on “super technologies” highlights scientific advances that are on the forefront of shaping the future. Prof. Yuval Dor is in the process of developing a blood test that can detect cancer much earlier than our current methods of detection, thereby increasing the likelihood of survival. Prof. Yaakov Nahmias has replicated the properties of the human liver on a micro-sized chip, changing the way we test medications, and Dr. Meital Reches has developed a ground-breaking coating to prevent deadly MRSA infections.

We invite you in this issue of Scopus to celebrate the next generation of leaders being cultivated on our campuses. Programs such as Tzameret, Talpiot and Revivim foster brilliance and propel our students to push boundaries and contribute to causes greater than themselves, whether on the battlefield or in the classroom. Similarly, initiatives we have taken with ISEF and The Hebrew Youth University for the Promotion of Science Education are vital to our mission to share our resources with the communities around us so that the youth of the future also have the best possible chance at success.

In this issue, we are introducing a new “Finals” section in which we encourage you to test your knowledge of one of our founders, Albert Einstein. Looking to him as an example, we see how heavily the future is shaped by the past. This is also evident in the research taking place in the Department of Archeology, where a cutting-edge 3D scanner is providing a new window into the lives of ancient peoples through their remaining artifacts.

Next year we will celebrate the one-hundred year anniversary of laying the first cornerstone of Hebrew University on the Mount Scopus campus. Back then we looked forward to what the future had to offer and took pride in the Hebrew University’s ability to shape the leaders of the next generation. Today, we are advancing these dreams while contending with technological tools that were only dreamed about in the last generation—to lead us towards the edge of tomorrow.

**Michael Federmann**  
Chairman, Board of Governors

**Menahem Ben-Sasson**  
President

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Design & Production: **Studio Rami & Jaki**

Cover & Feature Art: **Michelle Klein**

Photography: **Flash90**

Printed in Israel ISSN 0334-7591

Published by the Division for Advancement & External Relations

The Hebrew University of Jerusalem

Mount Scopus, 91905 Jerusalem, Israel

[www.support.huji.ac.il](http://www.support.huji.ac.il)

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10-C  
9-B  
8-B  
7-C  
6-B  
5-C  
4-B  
3-B  
2-C  
1-C

Einstein  
Quiz  
Answers:

# SUPER TECHNOLOGIES



Hebrew University  
Scientists Are  
Transcending the  
Boundaries of Our  
Imagination and  
Creating A Future  
with Life-Changing  
Innovations.

by Sara Toth Stub



Science fiction has traditionally provoked the human imagination. Superheroes populate our movies and books with their magical superpowers that heal the sick, protect the weak, and have seemingly endless technological tricks to save the planet and humankind. But what if these fantastic, extraordinary and unbelievable technologies are bordering on the edge between imagination and reality? What if some of the greatest challenges humans face in everyday life, such as illness, limited natural resources, and security, are on the dawn of a new era in which they will no longer be threats to our well-being?

Hebrew University scientists, in superhero fashion, are applying the latest scientific breakthroughs to solve some of these global problems in surprisingly new ways, fundamentally changing the way the next generation will live.

Their “super” technologies are on course to cure cancer, put real meat on our dinner plates without actually harming animals and create invisible cloaks *à la* Harry Potter.

Underlying many of these technologies is the advancement of nanoscience and an emphasis on interdisciplinary research. But it is not simply the technological progress of the last decade and the academic accomplishments of these researchers that result in these super technologies, but also their belief that innovation can result in a world beyond one’s wildest dreams. As Hebrew University founder Albert Einstein once famously said, “The true sign of intelligence is not knowledge, but imagination.”

### The ‘Teflon’ Solution: Eliminating Hospital-Borne Infections

Every year close to one million Americans end up spending weeks-and-even months-in hospitals as a result of antibiotic-resistant or “superbug” infections they picked up in the very institutions that were supposed to improve their health. About 100,000 of those people will die each year from these methicillin-resistant *Staphylococcus aureus* (MRSA) infections.

A Hebrew University chemistry lab, led by Dr. Meital Reches, has recently developed a ground-breaking solution that would prevent infections like these, saving countless lives and lowering healthcare costs. Bacteria-prone surfaces like hospital floors, walls and medical equipment could simply be coated in a transparent spray that would prevent bacteria from taking root, explains Reches from her office at the Institute of Chemistry on the Edmond J. Safra Campus. Reches recently developed and patented this solution which will soon be available through the start-up, NanoAF.

NanoAF’s non-toxic and inexpensive coating lasts at least one year, which is considerably longer than the application of cleaning products. Just as significantly, it does not contribute to the growth of antibiotic resistant bacteria, a problem with many germ-killing cleaning products, and one of the reasons so many superbugs exist today. The basis of NanoAF’s coating is a simple molecule developed in Reches’s lab that sticks to surfaces and creates a smooth Teflon-like layer that repels bacteria, says Reches.

### Winning the Cancer Battle

“Cancer will become a chronic disease in the near future, rather than an oft-fatal condition,” predicts Dr. Ofra Benny, a Senior Lecturer in the School of Pharmacy and the Institute for Drug Research. Benny is among several researchers at the Hebrew University developing new approaches to cancer treatment and detection.

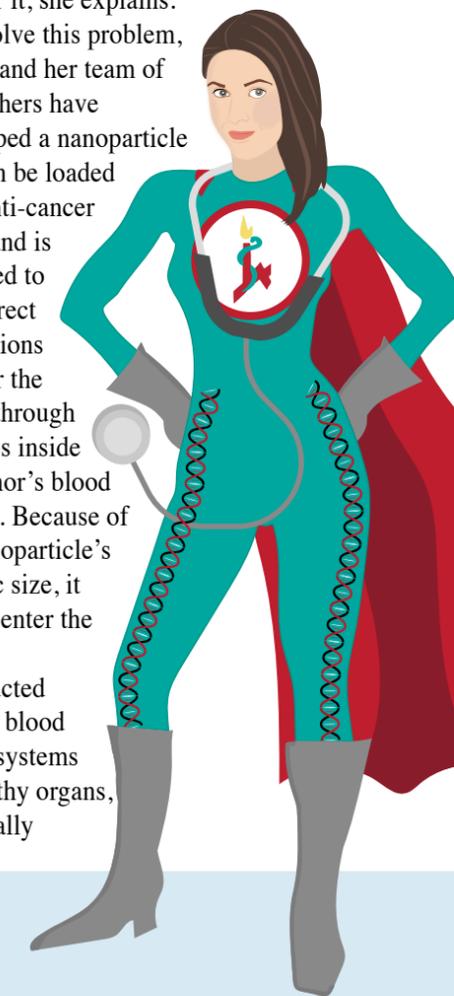
In the fictional Star Trek universe, the medical tricorder is a scanning device used by doctors to help diagnose disease and collect bodily information about a patient. Benny’s colleague, Faculty of Medicine’s Prof. Yuval Dor, has recently developed a blood test that could be compared to a modern-day tricorder in that it can detect the early stages of diseases such as diabetes or Alzheimer’s, and especially cancer, says Dor, who is a member of the Institute for Medical Research Israel-Canada (IMRIC). Building on the groundbreaking genetics work of HU Prof. Howard Cedar, and in collaboration with methylation expert Dr. Ruth Shemer and Prof. Benjamin Glaser from Hadassah Medical Center, Dor explains that the test detects the signs of cell death which occur in the body long before other symptoms of cancer appear.

“It’s really a window into the human body and into tissue dynamics,” says Dor of the test, which is still in the laboratory phase of development, but might soon be commercially available as an annual diagnostic tool for the general population.

Such early detection of disease –although extremely important- is not always a guarantee for effective treatment, especially when dealing

with cancer. In one of the most devastating challenges in medicine today, cancer often does not respond to treatments that were proven effective in labs, Benny explains. Medicines that were successful in labs frequently cannot penetrate the actual tumor due to the tumor’s micro environment and the network of blood vessels that are unique to tumors. To illustrate her point, over a coffee in the Belgium House café, she quickly sketches a tumor on a notepad showing how the blood vessels that support cancers are less tightly constructed than normal blood vessels due to their rapid and erratic growth. This, in turn, causes the blood vessels to leak fluid, leading to a high-pressure system inside the tumor, rendering it mechanically impossible for drug molecules in the blood stream to enter it, she explains.

To solve this problem, Benny and her team of researchers have developed a nanoparticle that can be loaded with anti-cancer drugs and is designed to the correct dimensions to enter the tumor through the gaps inside the tumor’s blood vessels. Because of the nanoparticle’s specific size, it cannot enter the tightly constructed normal blood vessel systems of healthy organs, drastically



“Cancer will become a chronic disease in the near future, rather than an oft-fatal condition,” Dr. Ofra Benny

# BRAVE NEW WORLD

## CYBERSECURITY IS FRONT AND CENTER IN THE RACE TO PROTECT DIGITAL INFORMATION

With our trusted safety methods of old—a locked filing cabinet with important papers—long gone in the age of digital information, crucial sectors in our society such as banking, healthcare, and government services, are almost wholly dependent on open networks like the Internet. Keeping their information safe is a chief and pressing challenge for cybersecurity experts.

For two decades, cybersecurity experts have warned that the only way to fully protect online information is to change the basic, underlying protocols that are the backbone of the Internet, governing how messages are sent and how computers communicate with each other, explains Prof. Danny Dolev, the Hebrew University Berthold Badler Professor of Computer Science.

Developed in the 1980s, these protocols were designed long before their designers could have predicted how the Internet would advance or how it could be used as a weapon against us. As such, they were designed primarily to provide connectivity between users and not to ensure that the information sent across the Internet is secure against malicious behavior.

New protocols have been proposed, but replacing the entire infrastructure now would “be impossible,” says Dolev. It would require changing every connected device, server and router.

Dolev, who heads the HUJI Cybersecurity Research Center jointly with Professor Michael Schapira, also a researcher in the Center, has developed industry-changing technologies for securing Internet protocols. These novel solutions to an age-old problem circumvent the obstacles to adoption facing past proposals as they do not involve replacing today’s infrastructure and are remarkably effective even in very partial adoption, explains Dolev. He and Schapira are currently working with the Israeli National Cyber Bureau on examining the manner in which these technologies can protect Israel from cyberattacks.

Other researchers at the HUJI Cybersecurity Research Center are working on repelling other modes of dangerous cyberattacks. Dr. Aviv Zohar, for example, is working on solutions to attacks in which hackers lock personal computers and demand ransom to unlock them. Dr. Matan Gavish is focusing on protecting critical national infrastructures, such as nuclear reactors and power grids.

Many of these efforts are part of the Fraunhofer Project Center for Cybersecurity at the Hebrew University, which is a joint effort of the University and the Fraunhofer Institute for Secure Information Technology (SIT), the leading institute for applied cybersecurity research in Germany. This center is well on track to become a leading institution for applied cybersecurity research worldwide.

reducing the side effects of cancer medicines, Benny says while adding to her sketch a row of arrows penetrating and attacking the tumor.

“Our approach differs from basic biology,” she says. “We use engineering models.”

### Tumor-on-a-Chip

Along these same lines, Benny’s lab has incredibly developed a model in which they use cell samples from patients with cancer to replicate their cancerous tumors outside the body on coin-sized chips. These chips allow scientists to understand the vascular make-up of the individual tumor and

select the best nanoparticle to use for effective drug delivery—with the aim that medicines which work on the chip in a lab will also be effective for the patient.

“It’s personalized nanomedicine.” says Benny. “Controlling and treating tumors this way is similar to the way medicine approaches other treatable conditions like arthritis and asthma.”

Benny’s research comes on the heels of the highly successful “liver-on-a-chip” technology developed by one of the global leaders in human chip development. Hebrew University bioengineer Prof. Yaakov Nahmias is growing living liver tissue, complete with the liver’s complex system of blood vessels on a coin-sized chip, to test the safety of medications more accurately, a process that drug companies often spend years and millions of dollars to complete. Nahmias and his team at the Alexander Grass Center for Bioengineering, which he founded and runs, integrate tiny sensors—no larger than the width of a strand of hair—into the chip to measure levels of oxygen and other indicators that measure the toxicity of drugs.

The chip mimics human physiology which lets pharmaceutical developers see in real time how their drugs affect liver function, rather than having to perform arduous tests on animal and human subjects. “This is a transformative technology,” says Nahmias, whose lab has raised millions of dollars, and recently launched the biotechnology company, Tissue Dynamics, which has in place commercial agreements with pharmaceutical and cosmetic

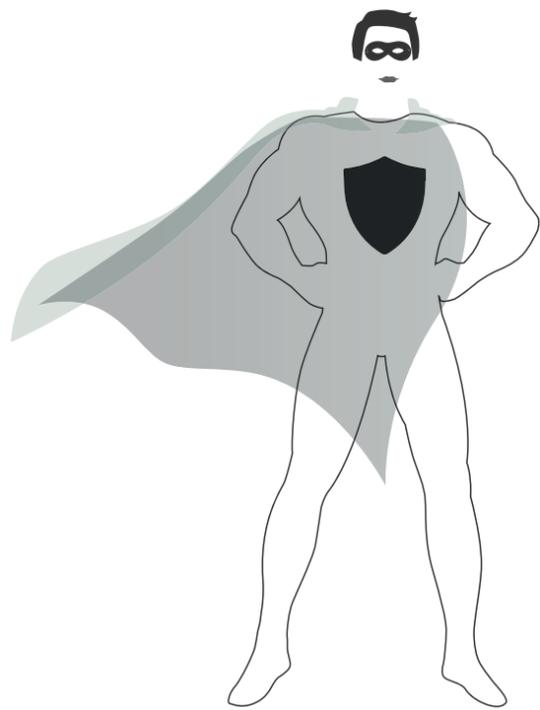
companies already benefiting from the revolutionary technology.

### Beyond Our Wildest Imagination

Diamonds have long captivated humankind. They have been the catalyst for wars and been worn on the fingers of royalty for centuries, but for Assistant Professor of Applied Physics Nir Bar-Gill, these jewels can replicate magnetic resonance imaging (MRI). Bar-Gill is actually interested in the small defects in diamonds—what might appear as a pinkish hue to the naked eye—but are known as nitrogen-vacancy centers to physicists. In what defies our imaginations, Bar-Gill, who is also a member of the Racah Institute of Physics, is using those tiny defects to develop a handheld medical-imaging device that produces images with a much higher resolution than our current full body MRI machines—and at a fraction of the cost.

These “defects” act as isolated quantum systems, meaning they can respond to the natural magnetic forces in the body and help create high-quality optical images, Bar-Gill explains. The lab model of this system looks like a jumble of camera parts and wires to the untrained eye, but Bar-Gill predicts it could be a working hand held MRI within the next five years.





Across the hall from Bar-Gill's office, Applied Physics Prof. Uriel Levy is also stretching the limits of human imagination: he is making objects invisible. "What nature isn't doing for you, you can now do yourself," says Levy, who is the Director of the Harvey M. Krueger Family Center for Nanoscience and Nanotechnology and who has successfully manipulated the physical structure of silicon so that light travels around it, rather than reflecting off of it, rendering it invisible to the human eye.

If these experiments can be replicated outside the lab, they can have tremendous implications for the military by making personnel and even airplanes invisible, explains Levy. But the technology could also be used in everyday life. "Suppose you are at a concert, but seated behind a pillar, so you can't see the stage," Levy offers. "We could wrap that pillar in this material and you would suddenly have a clear view."

## A Better Way to Feed the World

One of the more salient technologies that has the potential to completely upend the way we look at our food sources today is also emerging from Prof. Nahmias' lab - the same lab that is growing human organs on chips.

One of the challenges on Nahmias's mind is that it is predicted by 2050 that the world will need to double its food supply to feed a growing and more affluent population. The safety of our food, however, is already endangered by the sheer scale and industrialization of agriculture which is needed to meet the current demand. Salmonella contaminated chicken sickens close to a million people a year in the U.S. alone.

"This is the first decade in which simply eating food, even healthy food like chicken, can lead to hospitalization," notes Nahmias. "If I want my three children to continue to eat the Nahmias Family Schnitzel, then it's imperative to do something to change the way we produce meat."

Nahmias is using his expertise in growing tissue cells to develop an inexpensive and simple kit that will allow ordinary people to grow their own chicken meat. His startup, FutureMeat, is developing a "meat machine" that can be fed cells taken from a chicken and combined with plant-based nutrients to produce a sizeable piece of raw chicken meat within the span of a few weeks. "It's a bit like a bread maker," Nahmias says.

Although this revolutionary idea is still under development, FutureMeat has already raised half of its funding target in an ongoing crowdfunding campaign. Should it come to fruition, it will offer the world an affordable and

safe way to eat meat without having to raise or slaughter animals, a process that raises ethical concerns and is taxing our limited resources.

## Super Technologies and the Future

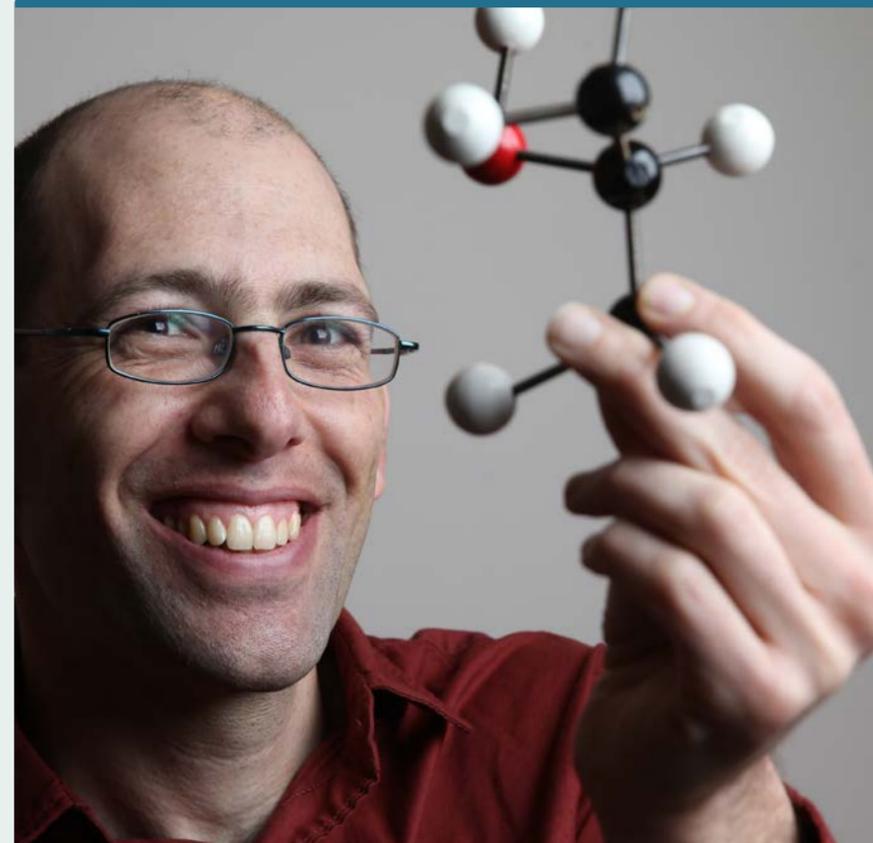
Many of these incredible super technologies will ultimately succeed—but even those that don't will impact our future in innumerable ways. The scientists working on these projects are part of a larger group of Hebrew University scientists pushing the edge of our boundaries as we know them to make our world cleaner, more humane and disease free.

Through their remarkable advancements in medicine, physics, chemistry and engineering, they have shown us time and again that the science and technology exist for us to revolutionize our world. Now it is up to us to cultivate the superheroes of today to lead us into the next generation and the promise of tomorrow.

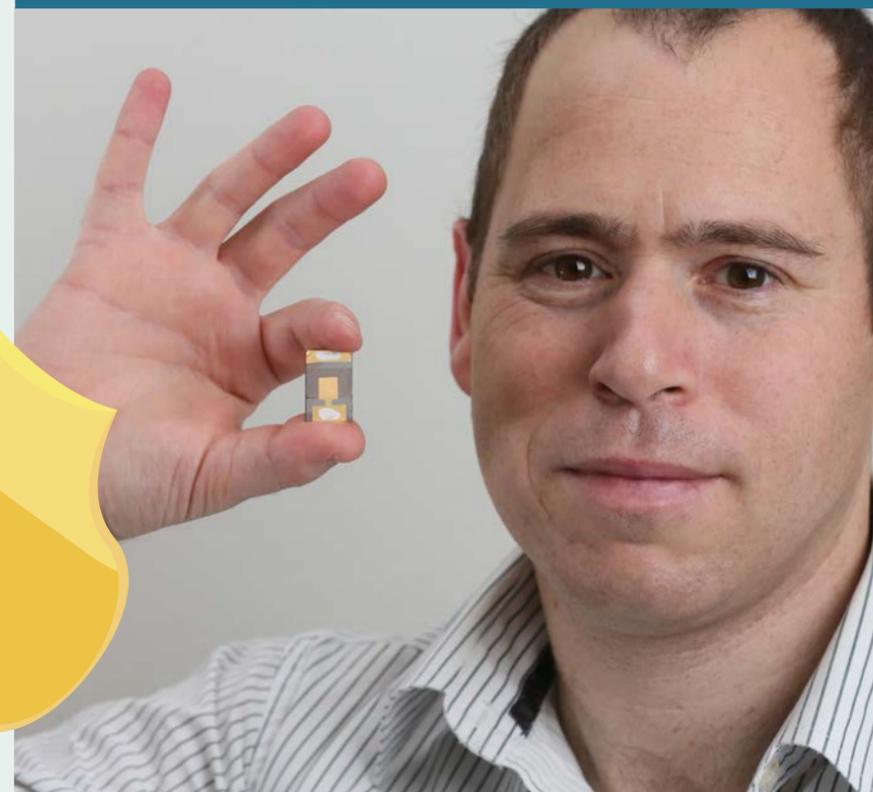


"This is the first decade in which simply eating food, even healthy food like chicken, can lead to hospitalization," Prof. Yaakov Nahmias

DR. ELAD GROSS



PROF. LIOZ ETGAR



Dr. Elad Gross is developing new ways to turn biomass—plant and plant byproducts—into usable fuel. A Senior Lecturer in the Institute of Chemistry, Gross develops catalysts—substances that can efficiently transform organic materials into high added value chemicals. He is especially focused on the development of catalysts that will be able to transform methane—a natural gas resource that was recently found under the sea floor next to the seashores of Israel—into methanol, a useful energy source that can be used to power cars and fuel other industrial processes. The development of new catalysts will help to make this process greener and more economically viable.

Using the sun for energy has long been an aspiration of humankind, but mass solar electricity production often requires financial investment and major infrastructure changes. Prof. Lioz Etgar, at the Institute of Chemistry, has developed a solar panel that could make producing energy from the sun less costly and more efficient. Traditional solar panels are made from silicon, but Etgar's is made from a newly discovered material called "perovskite," a crystalline substance that efficiently absorbs light. "We have the sun," Etgar says. "And we need to take advantage of it."

# WORDS OF WISDOM

We asked the Hebrew University community how they envisioned future generations – in terms of **technology and leadership**.

**Here is what they said:**

The next generation of leaders will have to possess an international mindset—to have an understanding of global processes. The challenge will be to use technology in the right context and ensure we use it for the right goals while simultaneously understanding its limitations and the price we pay to let technology take over our lives. We must ensure that technology won't replace our ability to think.

*Dr. Osnat Cohen, Director, Hebrew Youth University for the Promotion of Science Education pg. 28*

The basic qualities of leadership do not change from generation to generation. Whatever our future will look like, we will still need leaders with a deep sense of justice, commitment to social welfare, modesty, and the ability to know when to ask advice, and the intelligence to know whom to ask. The one thing that has become more critical is the ability to learn and adapt quickly to new forms of interaction that change how leaders interact with and influence the public.

*Dr. Netta Barak-Corren, Lecturer in the Faculty of Law pg. 25*

One thing I can say for sure is that future technology can still surprise us a lot. The future is for us to see and enjoy. No one can really know what it will hold.

*Prof. Danny Dolev, the Berthold Badler Professor of Computer Science pg. 8*

The most useful leadership is a leadership that thinks strategically—using the best lessons from the military struggles and tragedies of the past—instead of leadership which is self-righteous, absorbed and into victimization, identity politics and morality plays.

*Dr. Danny Orbach, Senior Lecturer of History and East Asian Studies pg. 25*

We will see more quantum computing, deep-learning, artificial intelligence, and big data. The theories and underlying concepts of these fields are old news, but quantum technologies have advanced immensely and computers have become so fast, that these ideas will actually become useful in many applications, such as personalized medicine, cryptography and research.

*Dr. Nir Bar-Gill, Assistant Prof. of Applied Physics, member of the Racah Institute of Physics pg. 9*

The leaders of the next generation will have to acknowledge the different people in our society—to know them, to understand them and to be aware of their differences. They will need to be able to navigate those differences with communication and negotiation. They will need to inspire people to come together and do something greater together than apart."

*Emanuel Melaku, Tzameret student pg. 21*

The leaders of tomorrow will need to have three major traits: strong moral core; highly driven; and blatantly smart. We need leaders who can inspire the people and bring back confidence in the government. The information age allows new generations to gather knowledge at lightning speed. Not only that, as automation comes into play, technology allows people to focus on creating knowledge. The new generation is going to be the extreme of that—learn quickly or be left behind.

*Elad Walach, Talpiot alumnus pg. 19*

I think it is always difficult for one generation to imagine the next one. My grandparents probably see us as hyper-connected, and constantly working, but I don't believe we are so different when it comes right down to it. Humans like to be informed; we like to gossip and enjoy our work. The tools we use to communicate and learn with may change, but we are all basically the same.

*Prof. Yaakov Nahmias, Head of the Alexander Grass Center for Bioengineering pg. 9-10*

# HUJI IN THE FIELD: REVIVIM

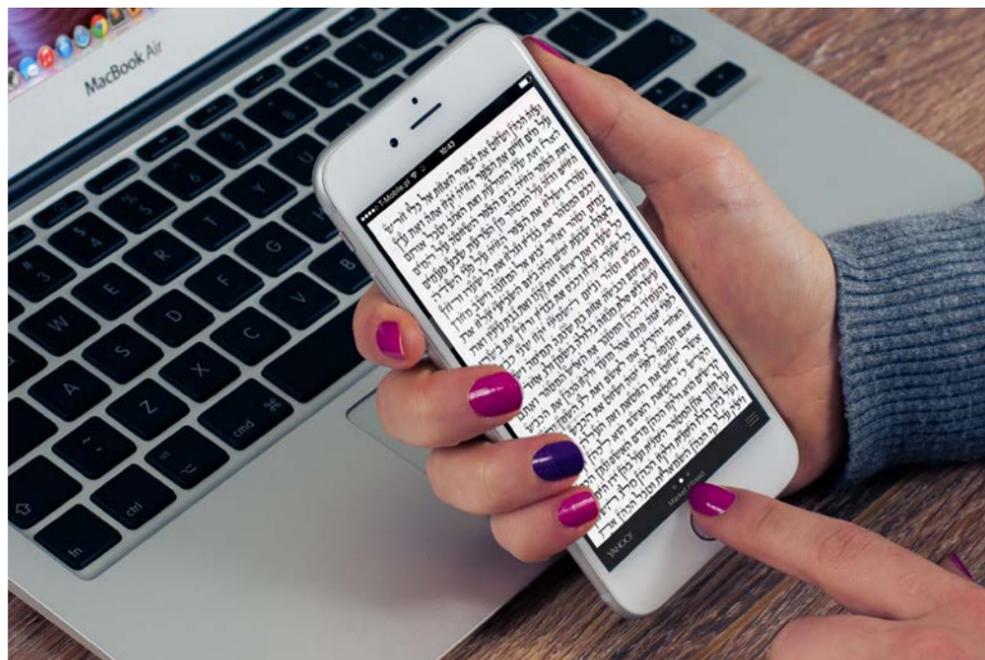
A PROGRAM STEEPED IN JEWISH PLURALISM IS SHAPING THE FUTURE OF JEWISH EDUCATION

Back in the 1990s, the Israeli government commissioned what became known as the Shenhar Committee Report to examine the state of Jewish studies in Israeli secular high schools. The results were striking. They showed a significant decrease in the number of students opting to take matriculation exams in every area of Jewish studies, a basic unfamiliarity with Jewish history and values, and a meager connection to Jewish culture and the Land of Israel.

From this looming existential crisis was born Hebrew University's Revivim program, which aims to cultivate educators who are committed to teaching Judaism within a pluralistic and sophisticated framework. Its overarching goal is for its graduates, who become teachers, to introduce Israeli youth to their rich heritage, strengthen their Jewish identity, and enable their active participation in the future of the Jewish people.

"We are trying to instill a sense of respect, understanding, and knowledge of different viewpoints in Israel society," explains Revivim's Educational Director, Dr. Howard Deitcher.

The program is rigorous. In four years, Revivim participants earn three degrees: a bachelor's and master's in Jewish studies along with a teaching diploma. They become experts in how to teach Bible, Jewish philosophy, history, and Jewish culture to high



school students. The program is unique in that it combines intense academic study with practical training. The students teach almost twice the amount of hours of a typical teaching candidate.

In exchange for full tuition, Revivim graduates commit to teaching for at least four years in Israeli public high schools. But many graduates continue long beyond their obligation. "Our retention rates are wildly successful," says Deitcher who notes that over 80% of Revivim graduates continue beyond four years—which is significantly higher than the general 45% rate of retention for new teachers in the system.

Many of Revivim's graduates rise

in the ranks in the field of education, often in leadership positions as principals, curriculum writers and policy makers within the Ministry of Education, notes Prof. Steven Fassberg, Revivim's Academic Director.

The program has graduated over 200 teachers since its inception. Today 18% of Bible teachers in National Israeli high schools are Revivim graduates who have taught 110,000 students to date.

This year, Revivim graduates are teaching over 20,000 Israeli middle and high school students in the public school system and the annual number of students taught by Revivim graduates will increase by an estimated 2,000 students every year.

*Revivim gives special thanks to: AVI CHAI Foundation, The Beracha Foundation, Crown Family Philanthropies, Edward Fein Foundation, the Simon Flegg Fund, the Leo and Julia Forchheimer Foundation, Philip Garoon, The Aaron and Cecile Goldman Family Foundation, Cari and Gary L. Gross, Israel's Ministry of Education, Advocate Daniel Jacobson, the Jesselson Family, Jewish Federation of Cleveland, the Leon Kulikovsky Family Scholarship Fund, Ruth and David Musher, David and Inez Myers Foundation, the Hirsch Nissalowitz Minnesfond, The Alvin Segal Family Foundation, the Sieratzki Charitable Fund, Nathan and Lily Silver Family Foundation, and Fred and Della Worms*

## Daniel Topaz: "Revivim Was One of the Best Decisions of My Life"

Daniel Topaz never considered pursuing a career in education when he matriculated at the Hebrew University as a first-year student. He chose to study economics and foreign relations instead, but found himself questioning how these studies would help him to play a role in improving Israeli society. By chance, he came upon a flyer for Revivim, subsequently switched his major, and never looked back.

Today he is a Revivim graduate and the Deputy Executive Director for the TALI network of schools with responsibility for 50 schools in Israel's southern region. TALI is the Hebrew acronym for "enriched Jewish learning." The schools are a unique part of the Israeli state school system

but encourage respect for every level of observance while emphasizing Jewish traditions and values within a pluralistic context.

"I had never thought that I would be a teacher," Topaz said. "But Revivim was one of the best decisions of my life. The program doesn't just educate you to be a teacher; it turns you into a teacher with a vision."

Revivim is engaging in the most important missions of our generation, he explained, noting that he believes the program is defining and preserving Jewish identity for the next generation.

After graduating from Revivim, Topaz taught Jewish Philosophy and Bible Studies to students at Jerusalem's prestigious Leyada High School, and was soon after promoted to be principal of a high school in southern Israel.

"There is nothing more gratifying than when a former pupil seeks me



Daniel Topaz in action

out to tell me that they have decided to invest in their Jewish identity after high school by pursuing further studies in college or university," he said.

## ALL GROWN UP: A HEBREW UNIVERSITY HIGH SCHOOL HAS BECOME AN INSTITUTION OF EXCELLENCE IN ITS OWN RIGHT

Since its establishment in 1935 by the Hebrew University of Jerusalem, The Hebrew

University Secondary School (also called Leyada) has focused on two fundamental ideals: excellence and community engagement. Initially founded as an educational experiment by the head of the University's School of Education, the school today offers programs in the sciences and humanities, and leads projects in the fields of robotics, sustainability and the complexities of Israel society.

Leyada continues to foster an intimate relationship with the University, says HU Political Science Prof. Avner de-Shalit and Chairman of the Leyada Board of Directors. Under a new initiative, HU professors create and teach courses specifically designed for Leyada students. Dr.

Inbal Goshen, an Assistant Professor leading an Optogenetics Laboratory at the Edmond and Lily Safra Center for Brain Sciences (ELSC) is teaching biology to Leyada students. Other HU professors are making an impact teaching, chemistry, physics, and math.

Among its famous graduates are a President of the State of Israel, two Nobel Prize Laureates (in Physics and Economics), a dozen Israel Prize Laureates, the Governor of The Bank of Israel, the former President of the Supreme Court, the Commander in Chief of the Israeli Air Force and many other notable alumni, who excelled in various fields of the sciences and humanities.



# TEACHER-SCHOLAR

## A REVOLUTIONARY PARTNERSHIP ADVANCES SCIENCE EDUCATION IN ISRAELI SCHOOLS

The performance of Israeli schoolchildren in international assessment tests in science and mathematics has been slowly declining since the early 1970s, with the sharpest drop in scores occurring since 2000. Additionally, the education system is facing a critical teacher shortage as many of the current science teachers, immigrants from the Former Soviet Union, will soon be retiring en masse, says Hebrew University Physics Prof. Eran Sharon. As a result, the Central Bureau of Statistics estimates that the Israeli school system will be short hundreds of science teachers in the coming years, further impairing the teaching of science.

In response to this upcoming crisis, the Hebrew University launched in 2013, in a joint partnership with the Jerusalem Municipality, the Teacher-Scholar Program, an out-of-the-box plan that benefits both PhD graduates with science degrees as well as high school students in the city of Jerusalem.

Many Hebrew University graduates with appropriate science backgrounds for teaching are drawn to the high salaries of the private hi-tech sector in comparison to the much lower ones in education, says Teacher-Scholar Co-Founder, Sharon. This is compounded by the lack of postdoctoral and tenure-track positions available in Israel.

The Teacher-Scholar program,

however, aims to take advantage of the vast teaching experience these graduates have amassed during the course of their studies – often six or more years of teaching including lab training and mentoring of younger students. The program enables PhD graduates in the sciences to teach part-time in Jerusalem’s high school, while benefitting their professional career by continuing to perform top research at the University.

The model is injecting the education system with a cadre of new, energetic, and highly qualified science teachers who are not only continually updating their own science knowledge, but also providing their pupils with access to Hebrew University’s cutting-edge

laboratories. “In addition to teaching high-level science and research approaches, the teachers are actually bringing the University into the classrooms, and reciprocally, bringing the high schools into the University,” says Physics Prof. Nathalie Balaban, the program’s other Co-Founder.

Select PhD graduates chosen for this program earn a teaching certificate at the Hebrew University’s School of Education and complete the necessary practicum hours. Upon graduation, the newly qualified teachers work in half-time teaching positions in Jerusalem high schools, while they continue as research fellows at the University producing groundbreaking research and participating in scientific conferences.

The new teachers are continuously mentored by a master teacher in their field for the first three years of teaching. The Teacher-Scholars initiate enrichment activities for their students while helping to cultivate a relationship between their school and the University. To avoid the common phenomenon of teacher drop-out after the initial years, the University commits to maintain each teacher-scholar position for a minimum of ten years, with an option for extension.

This win-win collaboration with the city of Jerusalem is improving the quality of teaching in local schools while helping the University fill essential non-tenured research positions. The University aims to grow the Teacher-Scholar program to become a model for a potential national program. Currently, the program is supported by the Hebrew University, the Faculty of Science, the Jerusalem Municipality and the Trump Foundation.

“Eventually we would like to expand researchers’ involvement in high schools and show that researchers care about how their research is understood by kids all over the world,” says Balaban.

## UNIVERSITY STUDENTS FOR A DAY

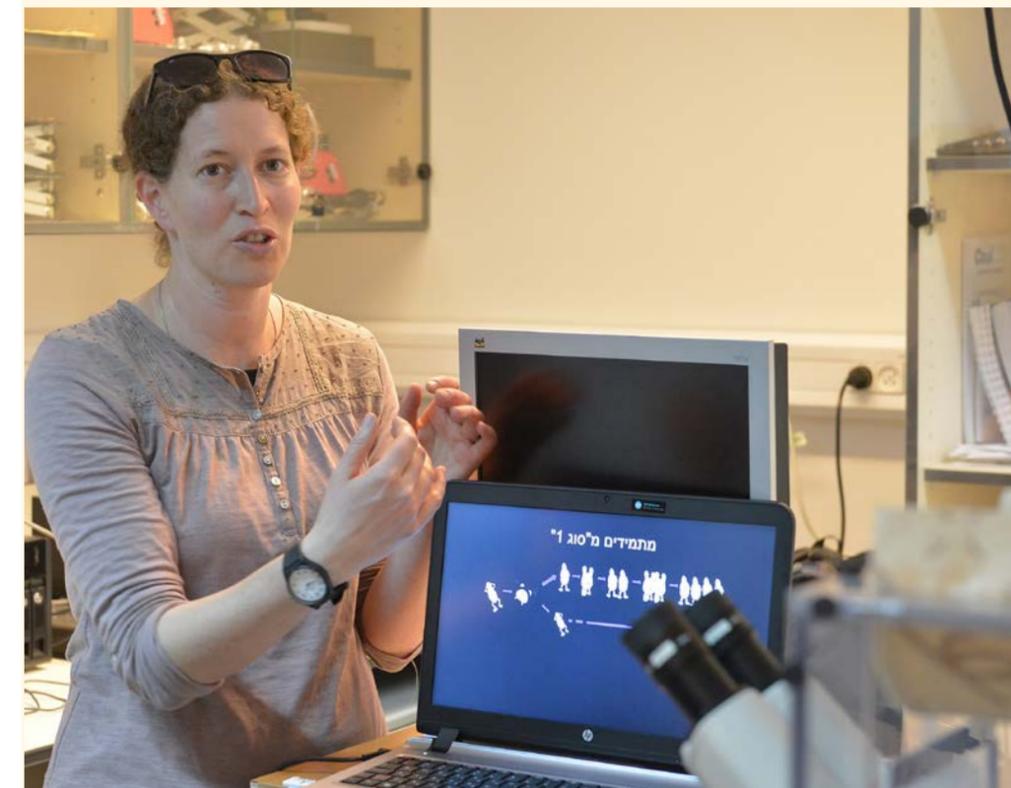
Dr. Orit Gefen grew up in Jerusalem and received her doctorate in Physics in 2010 from the Hebrew University of Jerusalem. In 2006 she completed a teaching certificate, and has since been teaching Physics in a girls’ school in the Ramot neighborhood of Jerusalem. Her example was one of the inspirations for the creation of the Teacher-Scholars, she is also working as a research fellow in a biophysics lab.

Gefen is the brainchild behind the exceptional day that brought 100 high school students from around the city to visit HU’s Edmond J. Safra Campus. The students came from diverse neighborhoods all over Jerusalem, but what they had in common was that their science teachers are all a part of the Teacher-Scholar program. The day at Hebrew University offered them insight into the research of their

teachers, and let them experience what it is like to learn on a campus in state-of-the-art labs. Students participated in hands on experiments in 3D Printing, Nanotechnology, and Physics.

“It was so inspiring to watch my students explore the University– entering the labs, engaging, showing interest and enthusiasm. The initiative of the researchers to host the high school students in their labs shows that academia wants a connection with high schools and is willing to invest in it,” says Gefen.

The students were equally impressed with Gefen’s lab. “We are exposed to the entire world of science from different perspectives, not only through study material, but also through observing experiments and meeting researchers,” explains Yarden, Dr. Gefen’s student from Ohr Torah Stone – Midrasha. “There is simply no comparison.”



Dr. Orit Gefen shows off her lab to students

# MISSION IMPOSSIBLE

## THE MILITARY'S MOST ELITE PROGRAM IS DRIVING CUTTING-EDGE TECHNOLOGICAL INNOVATIONS

When it was first inaugurated in 1979, the Israel Defense Force's new top level military program was so secret that even many of its early recruits did not fully grasp the enormity of its potential. Today, Talpiot is one of the most elite military programs worldwide, harnessing the human creativity of the country's most brilliant minds to create cutting-edge technologies for the IDF. Conceived by Hebrew University professors, Felix Dothan and Shaul Yatziv after the Yom Kippur War revealed painful gaps in the IDF's military technology, Talpiot is located on Hebrew University's Edmond J. Safra Campus, which

provides the educational infrastructure for the program. Today Talpiot is administered by MAFAT (The IDF Administration for the Development of Weapons and Technological Infrastructure), and the Israeli Air Force with its academic studies managed through the Hebrew University. Each recruit must major in either math, physics or computer science—mastering highly complex topics in just three years as opposed to the four years given to traditional students. “HU has the best math faculty in the world and offers the best package when it comes to teaching all three majors, which is why our cadets study

here,” says T, a graduate of Talpiot and the current Chief Instructor. (T is still on active duty and cannot be identified by name). From the beginning of the program, the founders of Talpiot wanted to ensure that its cadets were an army unit, not merely students in the army, so cadets undergo rigorous military training starting with basic training in the paratrooper unit and then participating in field training designed to familiarize them with all the branches of the IDF including the armored corps, artillery corps, the navy and the engineering corps. “It is important for them to understand what



it means to sit in a tank for hours at a time before they actually develop technology for that tank,” explains T who spent four and a half years working on classified projects with the Ministry of Defense after he graduated Talpiot.

The recruitment process for Talpiot is legendary and widely acknowledged to be one of the cornerstones of its success. The application pool starts with 10,000 of the top high school test scorers. Based on their high school grades as well, 3,000 are invited to attend a full day of testing covering physics, math, common knowledge and even creative physics. The 200 candidates with the highest scores from these exams are then required to attend a two-day series of exercises which examine their character, team building and leadership skills. “We need people who can make a difference in a short amount of time and who have the ability to work well in a team,” explains T. “Not only must they understand what the right thing is to do, they must also be able to convince the people around them—many of whom might be senior to them, which is much harder to do.” Ultimately, only an average of 50 candidates will be accepted into a new class.

Those who are accepted into the program embark on a three-year program, pushing them to intellectual heights, constantly taking measure of their character and reinforcing values consistent with an IDF officer. Cadets graduate with a Bsc and the rank of First Lieutenant, and are then integrated into top R&D positions within the IDF and Israel's military industries. Obligated for at least six years, they will develop and work on Israel's most advanced technologies ranging from cybersecurity, detection of enemy tunnels into Israel, as well as the revolutionary Iron Dome missile defense system.

## ELAD WALACH: A TALPIOT ALUMNUS BRINGS ARTIFICIAL INTELLIGENCE TO MEDICAL IMAGING ANALYSIS

Talpiot graduates are some of the most highly trained innovators in Israel, and they often bring their skills to the hi-tech industry after their service honing Israeli military technology officially ends. Elad Walach graduated Talpiot in 2009 with a Bsc in Computer Science and spent the next six years developing algorithms for the Israeli Air Force. After returning to serve as the class commander of Talpiot, he and two of his fellow graduates, Michael Braginsky and Guy Reiner founded a startup, Aidoc, to help radiologists analyze complex medical scans and improve their workflow processes. Using technology rooted in Artificial Intelligence, Aidoc's product spots and highlights visual abnormalities in medical imaging scans for radiologists who today must contend with a proliferation of CTs and MRIs, which have more than doubled their workload. “A scan contains hundreds of images

and a full body scan could contain over 2,000 images,” Walach explains. “Looking through these scans can take quite a bit of time, and there is only so much today's radiologists who are under increasing demands can do with the manual tools at their disposal.” Walach and his co-founders employed a newly developed tool known as deep learning “to train” Aidoc technology to review scans the way a radiologist would. “We collected data on 10,000 different medical scans to create a system that can identify high-level visual abnormalities and give the physician a preview of what is most relevant for interpretation,” explains Walach. It is not by chance that Walach and his fellow graduates chose to focus on the medical industry. “One of the fundamental lessons we learned in Talpiot was the importance of doing something beyond ourselves,” he notes. “This was a key factor in choosing to move forward with this technology over other options.”



Talpiot alumni and Aidoc Founders: Michael Braginsky, Elad Walach and Guy Reiner

# MILITARY MEDICINE

## TZAMERET IS ON THE FRONT LINES OF SAVING LIVES AND TREATING BATTLEFIELD INJURIES

Recognizing the strategic importance of military medicine in saving lives both on the battlefield and in response to homeland terror, the Israel Defense Forces (IDF) partnered with the Hebrew University in 2009 to create Tzameret, the country's only elite Military Medicine Track. Tasked with alleviating the shortage of military physicians in Israel, Tzameret seeks to integrate a uniform and high-caliber level of military medical training into the standard medical school curriculum.

Tzameret students enroll in the Hebrew University-Hadassah Medical School where they undergo seven years of rigorous medical studies, including the standard rotating medical internship, but with an additional 300 hours of training in military subjects such as aviation medicine, naval medicine, military leadership, disaster management, military psychiatry and military forensics along with regular, physical training. "The idea is that when Tzameret students are studying, for example, anatomy or physiology, they are already thinking in terms of the relevance to treating wounded soldiers in the field," explains Prof. David Gertz, Director of Tzameret and the Brandman Foundation Professor of Cardiac and Pulmonary Diseases of the Faculty of Medicine. LTC Dr. Adi Leiba, heads the Academic Branch of the IDF Medical Corps and serves as the military commander of the Tzameret students.



Tzameret students run practice exercises in the field

Although Tzameret students have deferred their actual military service until they finish their medical training, the program requires them to complete basic training, a general officers' course, a combat medics' course, and the medical officers' course. "The opportunity to study medicine at HU and serve in the IDF medical corps is a great privilege, and the motivation of our students to contribute is exceptional," notes Prof. Gertz. "When you look at our students, you know that

because of them, the quality of life for many will be improved, pain will be eased and lives will be saved."

Tzameret students, who receive their medical training at The Hebrew University tuition-free, serve, upon graduation, for five years as physicians in the IDF. To date, Tzameret has admitted eight classes with a total of more than 460 students. Tzameret's first class will receive their MD degrees this summer and begin their army service.

### OR SHABTAY A PROFESSIONAL BASKETBALL PLAYER RETURNS TO HIS ROOTS

Or Shabtay dreams of working in orthopedics in a third-world country someday. A graduate of a military boarding school in Haifa, Shabtay spent 12 years playing professional basketball. Despite this semi-detour, the 23-year-old athlete has known almost his entire life that he wanted to be both a doctor and an officer in the IDF. For Shabtay, Tzameret is a natural fit. He was born into a military family which includes an aunt who served as a military physician, and he is now in his sixth year of the program.

"Tzameret is the best opportunity for me to combine two things that I love and that are very important to my family – medicine and the army," he says.

Shabtay is drawn to orthopedics because "it's the kind of the profession that makes it very simple to help others without requiring a lot of resources," he explains.

### GAL PURIS VOLUNTEERISM INSPIRES A CAREER IN MILITARY MEDICINE

Gal Puris recently spent two weeks in a paratrooper battalion as part of an elective course open to sixth-year Tzameret students like herself. "I was the only woman on the medical staff in a combat-ready unit," she says, noting the uniqueness of her situation. Such diverse experiences are part of Puris' ethos in life—she seeks exposure to human diversity and multiculturalism as an essential part of a well-rounded education. The third of five sisters, she has also volunteered in an Ethiopian orphanage for HIV-positive children as well as in the psychiatric ward at Hadassah Ein Kerem.

Puris chose a career in medicine so that she could realize these goals and give back to the State of Israel. "I want to be a doctor in the IDF, a military doctor," she explains. "It is the best way for me to contribute to my country."

### EMANUEL MELAKU AN EXTENDED HOSPITAL STAY AS A TEENAGER LEADS TO AN INTEREST IN PATIENT CARE

At the age of 16 in his first year of high school, Emanuel Melaku underwent surgery to treat his pronounced scoliosis. It was during his extended stay in the hospital that he decided to pursue a career in medicine.

Raised in Jerusalem by a single mother from Ethiopia, Melaku has opted to join Tzameret because he believes in the value of treating soldiers. "I will be gaining significant experience and my service will be very meaningful," he notes.

He believes that military medicine, in particular, offers a rare opportunity to focus on the less emphasized part of medicine, but one that Melaku understands well from his time in the hospital—patient communication and bedside manner.

"An important part of medicine that not too many people pay attention to is the communication with patients," he explains. "I think having soldiers as patients will help to improve that."

For Melaku, who hopes to enter into pediatrics in the future, such tools will also serve him and his littlest patients well.

"When you look at our students, you know that because of them, the quality of life for many will be improved, pain will be eased and lives will be saved," Prof. David Gertz



# ISEF: CELEBRATING 40 YEARS OF BRINGING HIGHER EDUCATION TO ISRAEL'S UNDERPRIVILEGED STUDENTS

After 40 years at the helm of the ISEF Foundation, Nina Weiner continues to be inspired by her lifelong drive to ensure that Israel's underprivileged children receive a higher education. Founded from a deep moral imperative to eliminate injustice, ISEF creates opportunities through scholarships, social advocacy and leadership training for young Israelis from under-served and immigrant communities to earn degrees from undergraduate through a post-doc. Today the organization also actively counters Israel's brain drain.

Born in Egypt to Israeli parents, Weiner returned to Israel with her family at the onset of the State in 1948. Although Weiner's family had accommodations with other family members, many immigrants from North Africa and the Middle East who arrived in the same period often landed in the harsh conditions of the *Ma'abarot* (temporary housing set up for their absorption). It was on a visit to these absorption sites during the mid 1950s, as a member of a European research team, that Weiner first encountered North African and Middle Eastern refugee children. "My heart went out to them. I knew that because of negative stereotypes and their much lower socio-economic status, they were ill-equipped to assimilate into Israel's economic and social mainstream."

It was in the 1970s, however, when she again witnessed the deplorable conditions and the "ethnic gap" in Israel's development towns, that she knew "we could no longer tolerate a

situation where we have two kinds of Jewish children in Israel," she explained. "We needed to find a way to bring equality to the situation."

With some luck, she was introduced to the late Lebanese-born Jewish banker, Edmond J. Safra, and his wife, Lily Safra, and with their support, ISEF was born in 1977. The three founders strongly believed that the key to renewal lay in developing Israel's intellectual capital rather than projects which sought to physically rehabilitate Israel's poorest peripheral areas.

The Safras and Weiner together dreamed of narrowing Israel's socio-economic gap by providing higher education to gifted students from disadvantaged backgrounds. Moreover, they believed that empowering students through high academic expectations, and through leadership and social advocacy training, would

have reverberating effects.

Lily Safra, today the Honorary Chairwoman of the foundation and a great humanitarian in her own right, has continued her generous support of ISEF since she helped to co-found it.

The 400 students who receive scholarships from ISEF annually are also required to donate time to their communities each week and to undergo leadership training. It is a methodology that has yielded staggering success. Since 1977, ISEF has granted more than 20,000 annual scholarships to students living in Israel's poorest regions and enabled more than 6,000 young Israelis to earn degrees from Bachelor's to PhD, often in prestigious programs overseas. They return to Israel and become leaders in government and medicine, academia and technology.

To ensure that Israel benefits from



Nina Weiner (bottom row, 2nd from the left) and Lily Safra (bottom row, far right) with ISEF International Fellows at a benefit gala in New York

With reporting by Helena Flusfeder



ISEF/HU students and children work together on a neighborhood rehabilitation project (2014)

the intellectual capital of these scholars, students who choose to remain abroad are obligated to return the financial support they received from ISEF.

According to Weiner, however, more than 90% return to Israel.

One scholarship recipient from a family of six children who received an

ISEF scholarship along with two of her siblings recently told Weiner, "It is as if we were in the desert. ISEF gave water to the three of us and we bloomed; I became a professor, my sister is a social worker and another is a doctor."

Weiner doesn't allow herself too much credit and notes that she has gained as much from the success of ISEF as she has put into it through the years.

"My mother empowered me, I empower the students, the students empower their children, and finally their success circles back to empower me, so that I can continue to empower more students," explained Weiner.

## DR. INBAL RACHMIN: AN EARLY LOSS INSPIRES A REMEDY FOR HEART DISEASE

As one of six children, Dr. Inbal Rachmin was still required to keep her textbooks in good shape so that her mother could donate them to charity afterwards. Her parents supported the family with only high school educations, but Rachmin's mother always upheld the same world view as ISEF founder, Nina Weiner—one in which community service is mandatory.

At 16, Rachmin lost her mother to breast cancer, an experience that inspired her decision to pursue medical studies. Today, with support from ISEF for her post-doctoral research, Rachmin heads a laboratory at Harvard University specializing in cardiac research. She focuses specifically on potential treatments for ischemic heart disease, which is characterized by reduced blood supply to the heart muscle, and which is the primary cause of heart disease throughout the world.

Rachmin previously completed her doctoral research at the Hebrew University under the supervision of Prof. Ehud Razin and Dr. Sagi

Tshori, where she discovered a protein called Erbin which acts to stop the pathological growth of the heart muscle. Patients suffering from heart failure are often lacking the Erbin protein, and Rachmin and her colleagues demonstrated that damage to this protein leads to excessive growth of the heart muscle, and a decrease in its function.

This groundbreaking research had profound implications for breast cancer research. Over 30% of breast cancers are treated with the Herceptin drug, which carries a serious risk of causing heart abnormalities. Rachmin's discovery that Erbin has the ability to combat heart disease in Herceptin-treated breast cancer survivors has garnered international acclaim.

In 2015, Inbal received the Kellerman Young Investigator Award for Excellence in Research from The Israel Heart Society. Her other honors include the Henry N. Neufeld Award for Most Notable Publication from The Israel Heart Society (2014), and the Presidential Excellence Award from

Hadassah College, to name just a few.

Despite her multitude of achievements, Rachmin donates her time as a professionally trained medical clown in local hospitals and it was this commitment that caught the eye of Weiner—and for that Rachmin is grateful both to Weiner and to the legacy of her mother.

"My family isn't able to offer us any financial support, so it is because of the ISEF fellowship that my husband and I are able to make it here," she said.



# Humans of HUJI: Student Ambassadors

GET READY! YONATAN AVRAHAM JUST MIGHT BE THE CEO OF THE NEXT BIG IDEA

Yonatan Avraham is a third-year student at the Hebrew University pursuing his Bsc in Physics, and he is a co-founder and CEO of two startup companies as part of HUstart, the Hebrew University Entrepreneurship Center.

In his second year of studies at the Racah Institute of Physics, Yonatan took part in the seminar, Startup Science Innovation, which he attributes to giving him the motivation to found his own startup. He is currently working on an endeavor that creates a platform for ecommerce sites to give users the ability to shop with their friends virtually.

"Physics is like studying the edge of human knowledge, but

entrepreneurship is like a drug. It's addictive and fun; its peaks are high and its valleys are low. I'm really optimistic about the possibilities for the future," he said.

Previous to his studies at HU, Avraham was a combat paramedic in the IDF. After completing his military service, he founded his first startup, a tutoring business which still supports him to this day. He also founded a rock band, calling it "one of the coolest things I have ever done."

Avraham is a Hebrew University Student Ambassador which takes him all over the world representing the university and the State of Israel. He is also a Schulich Leader alumnus and currently donates lessons from his tutoring business to children from low socio-economic backgrounds.



TAMAR HOFNUNG IS SHOWING US A NEW WAY TO LOOK AT OLD SOCIAL PROBLEMS

Tamar Hofnung, a 32-year-old Jerusalemite, was completing a two-year fellowship at Kyoto University researching Japan's organized crime syndicate, the Yakuza, when she witnessed a public display of domestic violence that caused her to reevaluate her course of study. Today, as a doctoral candidate in the Advanced Research-Studies Program ("Telem") of the Department of Political Science at the Hebrew University, she researches the state response to the phenomena of domestic violence.

Specifically, she examines how social issues, mainly human rights issues such as domestic violence and affirmative action, come to be understood as

problems deserving of state response.

"With regards to domestic violence, the state response in the United States, for example, focuses on treating the abuser through the criminal justice system, rather than helping the women who have been abused—hence the state is only treating a fraction of the problem while overlooking many other factors influencing the problem," she notes, describing the focus of her research.

Hofnung is a HU Student Ambassador offering those both familiar and unfamiliar with Israel a new perspective on the country and its people. She is also a member of the first cohort of the Human Rights Under Pressure joint interdisciplinary doctoral program with Free University of Berlin.

# Focus on Young Faculty

DR. DANNY ORBACH: A HISTORIAN OPENS OUR EYES TO MILITARY DISOBEDIENCE

Dr. Danny Orbach is a military historian with a keen interest in the "uncanny and unusual corners of history." He specializes in military revolts and violent disobedience and one of his most recent publications highlights clandestine anti-Nazi operations carried out within the unlikely pockets of conservative German society. Orbach's 2016 book, *The Plots Against Hitler*, details, in part, the relatively unknown rescue of Jews by German officers serving in military intelligence and engaging in underground resistance.

His latest book, *Curse on This Country: The Rebellious Army of Imperial Japan*, is based on his doctoral dissertation and post-doctoral research at Harvard University. Published this year by Cornell University Press, it examines Japanese military disobedience and the ways in which Japan was pushed into the Pacific War.

Orbach, who also spent two years on a Monbusho Scholarship at Tokyo University is more than thrilled to assume a position at Hebrew University as Senior Lecturer of History and East Asian Studies. "The Hebrew University is a very distinguished place; a place of history and tradition," he notes.

Although Orbach feels he greatly

expanded his intellectual horizons through his study abroad, he never considered accepting a permanent position at a university overseas. "Coming back here is also a way of showing gratitude and giving something back to Israel where I was educated and where I grew up."



IN PURSUIT OF JUSTICE: DR. NETTA BARAK-CORREN OFFERS BEHAVIORAL INSIGHTS INTO THE LAW

Dr. Netta Barak-Corren is a Lecturer in the Faculty of Law with a focus on empirical and behavioral analysis of public law, in particular in the areas of law and religion, equality, and conflict resolution. Her current research focuses on how people make decisions in moral conflicts and on law's diverse and sometimes unexpected impact on discrimination.

Since arriving at the University, Barak-Corren has spearheaded a new undergraduate program in law and psychology to help students consider the significance of combining these two fields. "This is a natural combination, as law is primarily interested in guiding human behavior for the common good," she explains.

A former student of Computer Science,

Barak-Corren consults on a voluntary basis for Israel's Ministry of Finance and Ministry of Economy on how to motivate women to pursue STEM education, using behavioral insights.

"Equal opportunity is a topic that has long been close to my heart. I hope that through my work with the ministries, I will be able to assist in the formulation of research-based policy that will get women and minorities into STEM fields," she says. "I would consider it a success if the government would increase its use of evidence in policymaking as a result of this project. This is perhaps the single most important quality of good governance in our times after honesty, fairness, and accountability."

A graduate of the Hebrew University, Barak-Corren received her LLB and her BA in Cognitive Science. After clerking for then-Supreme Court President Dorit Beinisch, Barak-Corren

did her LL.M. and SJD at Harvard Law School, with her doctoral dissertation entitled *When Law and Religion Conflict: A Behavioral Examination*.

Barak-Corren is the winner of numerous grants and awards, including the Next Generation Award, the Sinclair Kennedy fellowship, and the Howard Raiffa and Fisher-Sander prizes.



With reporting by Helena Flusfleder

# All in the Family: How the Next

ARI BROJDE: AN ENTREPRENEUR FINDS HIS INSPIRATION AT HU

When Ari Brojde decided to make the leap from employee to entrepreneur, he drew his inspiration from the Hebrew University, its students and researchers.

“You have a different type of student at HU than you typically find in Canadian universities,” explains Brojde, who at 41 is the youngest person to serve as President of the Montreal Chapter of the Canadian Friends of the Hebrew University, a position he has held since 2011.

“They are a bit older and typically more mature because they have already served in the military,” he observes. “They have a more entrepreneurial mindset and they inspired me to say, ‘life is short: take some risks, because the rewards can be great.’”

Brojde co-founded Onist in 2014, leaving a position as portfolio manager at one of Canada’s established banks. Onist, a cloud-based platform, offers a virtual space for clients to bring together their various financial advisors with their portfolio information to create an optimized and holistic portal for generating financial plans and decisions.

He compares the collaboration and innovation that characterize Onist with the values and skills that are emphasized at HU. “Hebrew University — with its multidisciplinary focus — is an ideal incubator for innovative solutions,” he notes, referencing HU’s highly successful BioDesign program and its Institute for Medical Research Israel-Canada (IMRIC), both of which bring together experts across a variety of disciplines

to increase knowledge and innovation.

As a second-generation supporter of Hebrew University, Brojde may also have inherited some of his entrepreneurial spirit from his father, Peter Brojde. The elder Brojde co-founded both Micom Data Systems and Eicon Technology Corporation which grew to become one of the leading global innovative connectivity companies.

The Brojde family first became involved with the University when searching for a meaningful avenue to sustain and commemorate the legacy of Peter, who passed away in 2005. Initial support for a student scholarship soon became a robust scholarship fund. In 2008, the family, with Ari’s mother, Anna Brojde leading the initiative, established the Peter Brojde Center for Innovative Engineering and Computer Science (PBC) at the Hebrew University.

“She’s very committed to ensuring that our family’s resources are allocated to projects that help move

**“HU students have a more entrepreneurial mindset and they inspired me to say, ‘life is short; take some risks, because the rewards can be great,’” Ari Brojde**

the needle forward,” Brojde says of his mother. It’s a philanthropic style that Brojde intends to adopt when the time comes for him to take a larger role in managing the family legacy.

Because of Anna’s personal interest in and generous support for projects at the Hebrew University, she is receiving an Honorary Doctorate from the Hebrew University in 2017. To commemorate the event, Ari and his



wife, Robyn, plan to take their two children — Bryson, 8, and Brigitte, 5 — to Israel for the first time this

summer. It’s a chance, he says, to introduce his children to their family’s philanthropic values—and to a wonderful country. “We’ll have this fantastic celebration, and Grandma will get to show her grandchildren the Hebrew University, Jerusalem and Israel. It’s pretty exciting for everyone.”

*With reporting by Helena Flusfeder*

# Generation is Stepping Up to Support HU

CAROLE BERMAN AND ANGELA SORKIN: A FAMILY HISTORY STIRS THREE GENERATIONS OF SUPPORT FOR HU

Carole Berman is an acclaimed artist who has devoted her life’s work to her passion for art — paralleled only by her devotion to the Hebrew University.

Carole, and her sister, Angela Sorkin, are both trustees of The Kennedy-Leigh Charitable Trust, which has been a magnanimous supporter of the Hebrew University for over 50 years. The sisters are third-generation members of the Kennedy-Leigh family and their grandfather, Michael Kennedy-Leigh, is considered an icon of the Hebrew University.

His “rags-to-riches” life story inspires and drives both sisters and very much informs the purpose and work of the family trust. Michael grew up in the poverty-stricken East End of London in the early 1900s. As a Baden-Powell scout volunteer, he left England at age 16 to volunteer on a farm in Australia. Although he subsequently earned a scholarship to attend school, his parents insisted that he pursue employment.

Following WWI, he created a business buying up surplus army supplies. His proven entrepreneurial skills soon helped him to build a successful real estate business.

In response to the tragic death of his young son, Raymond, in 1964, Michael liquidated his business and decided to dedicate the rest of his life to supporting causes within Israel. Together with his wife, Adelaide, they focused their efforts on supporting humanitarian, educational, science and medical projects in Israel including the Hebrew University, Yemin Orde Children’s Village and Sha’are Zedek

combines her career as an artist with her role as Chair of the Kennedy-Leigh Family Trust.

“I was imbued with a sense of importance for my Jewish identity, for Israel, and for recognizing that we have the resources to help make the world a better place because of the example set by grandparents,” Carole explained.

Today the trust supports many significant agricultural and horticulture projects at HU’s Robert H. Smith Faculty of Agriculture, Food and Environment. It has promoted the advancement of higher education through The Kennedy-Leigh Centre for

**At the very moving ceremony, I felt the strong presence of my late grandfather who I felt would be comforted by the knowledge that the family’s commitment to the Hebrew University is central to our connection to Israel,” Carole Berman**

Medical Center to name a few.

Michael was particularly keen to ignite passion and support for Israel in his children and grandchildren, taking them on frequent trips to explore and learn about the country. Today, Carole

Horticultural Research, the Kennedy-Leigh Central Library of Agricultural Science, and the recently established Kennedy-Leigh Research Complex for Ecosystem Services in Agriculture.

Angela accepted her grandfather’s Honorary Doctorate from the Hebrew University which was awarded post-mortem, and in 2016, Carole was conferred an Honorary Fellowship.

“I accepted the fellowship on behalf of all the Kennedy-Leigh Trustees and family. At the very moving ceremony, I felt the strong presence of my late grandfather who I felt would be comforted by the knowledge that the family’s commitment to the Hebrew University is central to our connection to Israel,” she said.

“The fourth generation is waiting in the wings to step up to the plate,” she added.



Angela Sorkin (L) with sister, Carole Berman (R)

# THE HEBREW YOUTH UNIVERSITY FOR THE PROMOTION OF SCIENCE EDUCATION IS GIVING ISRAEL'S YOUTH A HEADSTART

Albert Einstein once famously noted “that all our science, measured against reality, is primitive and childlike -- and yet it is the most precious thing we have.” His wisdom lives on at the Hebrew Youth University for the Promotion of Science Education which promotes the wonders of science to thousands of school children through high school each year.

One of the most expansive initiatives in all of Israel, The Hebrew Youth University is on a well-directed mission to bring scientific and technological awareness to young people. Its far reaching research experiences and activities develop creative and analytical thinking specifically in the scientific disciplines.

It is a mission that is carried out with passion and a sense of greater purpose.

“We believe that an investment in science will upgrade the whole of one’s education and make these students better citizens of Israel,” explained Dr. Osnat Cohen, the Director for The Hebrew Youth University. “In such a small country as ours, our human resources—our brains—are one of our greatest treasures.”

The Hebrew Youth University operates as a centralized umbrella for a variety of programs that offer hands-on research and high level courses to the country’s most outstanding students as well as development courses for teachers. Through a dedicated effort to reach out to minority groups including female students, ultra-Orthodox and Arab students, as well as students living in the periphery, The Hebrew Youth University’s activities draw the participation of 23,000 students and their teachers annually.

Its success is due to a number of successful partnerships including the Ministry of Education, the Ministry of Science and Technology, and other top research institutions, and companies in Israeli industry. The Belmonte Science Laboratories Center, a unique model for partnership between the Hebrew University, the Jerusalem Municipality, and the Jerusalem Foundation, has been imitated in cities worldwide.

Belmonte, located on the Edmond J. Safra Campus is committed to bringing state-of-the-art research experiments to high school students and their teachers which focus on meeting the requirements of the Israeli national

curriculum in chemistry, biology and computer science.

The Hebrew Youth University places a priority on reaching out to the top science and math students in Israel and in the past five years has more than doubled the number of Excellence Programs it offers. Participation in these programs is selective, and highly motivated students of physics and chemistry undergo a series of rigorous exams to be admitted and can receive academic credit for their participation.

The Hebrew Youth University also offers a wide variety of programming to engage students of all ages in the relevance of science to our everyday lives. Touching on “non-academic” topics, sessions might examine the physics of juggling; the evolution of music from vinyl records to today’s digital forms, or how science impacts sports (think: the art of throwing an American football).

“As this is one of our few nonacademic programs, we are really able to deal with topics with which the kids can easily identify,” explained Cohen.

## ASAPH ZYLBERTAL: A NEUROBIOLOGIST IS USING THE LATEST TECHNOLOGY TO INSPIRE HIGH SCHOOL STUDENTS

Asaph Zylbertal, a doctoral candidate in Hebrew University’s Department of Neurobiology, sets aside time each week to mentor young students in various science projects as a matter of principle.

“I strongly believe that graduate students have an obligation to be involved in elementary and high school education because science evolves quickly, and we are on the cutting edge of innovation in a way that high school teachers cannot always be,” he explained.

This past year, Zylbertal worked with middle and high school students in The Hebrew Youth University’s Da Vinci program. Twice a week, he taught two groups of ninth grade students from all over Israel in such endeavors as learning to code the Python Programming Language and then building electronic circuits to interact with their newly built codes. The students were able to use Raspberry Pi, a relatively new computer platform developed for educational purposes and no larger than the size of a credit card to develop their codes.

The projects yielded highly imaginative and innovative results: an automatic irrigation system that turns on when it senses sunlight; and a model parking lot that lets users know through the Internet the number of available parking spots.

Zylbertal’s doctoral research focuses on the brain’s accessory olfactory bulb and the role it plays in processing information related to social interaction in mammals. He completed his master’s in the same lab under Prof. Yosef Yarom from the Edmond and Lily Safra Center for Brain Sciences and Prof. Shlomo Wagner from the University of Haifa, after earning his Bsc in life sciences.

Zylbertal has long abided by his philosophy to be involved in youth education. He previously worked with teenagers in a psychiatric hospital to excite them about science and most recently taught a weekly science course to gifted disadvantaged youth.



Zylbertal demonstrates an experiment

## DR. TAHANI MALA’BI: A CHEMIST FINDS HER PASSION IN BRINGING SCIENCE TO YOUNG WOMEN

Dr. Tahani Mala’bi was a chemistry student at The Hebrew University with dreams of pursuing a profession in a similar field when she first started teaching in The Hebrew Youth University’s, Girls for Excellence program run out of the Belmonte Science Laboratories Center. As their teacher, she had assumed that she would influence the groups of tenth-grade girls who arrived every Sunday from East Jerusalem to conduct research under her guidance in biology and chemistry.

What she didn’t expect was that the experience would ignite in her a previously undiscovered passion for education and ultimately change the course of her chosen career path. Today, Mala’bi is the head of the Center for Excellence You-niversity” in Beit Hanina, established in cooperation with the Jerusalem Municipality and the World ORT Kadima Mada. The Center, which opened in 2014, provides scientific and technological enrichment courses to girls in middle school.

“I am supporting these students by helping them to realize the beauty of science, but it’s more than that,” she explains. “I show them how to present themselves and their research and I give them the confidence to identify with science and technology.”

Mala’bi gained valuable experience working in the Belmonte Center where she eventually rose to manage the “Girls for Excellence” project. She worked with the young students not only on high level scientific research projects, but also tutored them in English and Hebrew, and helped prepare them for their college entrance exams.

Despite her many achievements in education, Mala’bi hasn’t left behind her original passion—she is still writing research articles for her doctoral studies under the supervision of HU Organic Chemistry Prof. Israel Agranat.



Mala’bi is leading young girls into science

With reporting by Helena Flusfeder

The small animal surgery department is home to four board-certified surgeons who perform surgeries on many different types of animals including dogs, cats, and exotic animals. The facility includes three surgery-designated rooms furnished with state-of-the-art equipment, and an anesthesiology department with four doctors and three technicians.

# CAMPUS TOUR

The Koret School of Veterinary Medicine (KSVM) is Israel's sole veterinary school, and the accompanying Veterinary Teaching Hospital (VTH) is the only modern facility of its kind in the Middle East. The School and Hospital are building bridges to peace by providing animal care across Israel's diverse populations, and through joint research projects with veterinarians and scientists around the world. The School is situated in the Robert H. Smith Faculty of Agriculture, Food and Environment, and the KSVM-VTH is located on a separate campus in Beit Dagan.



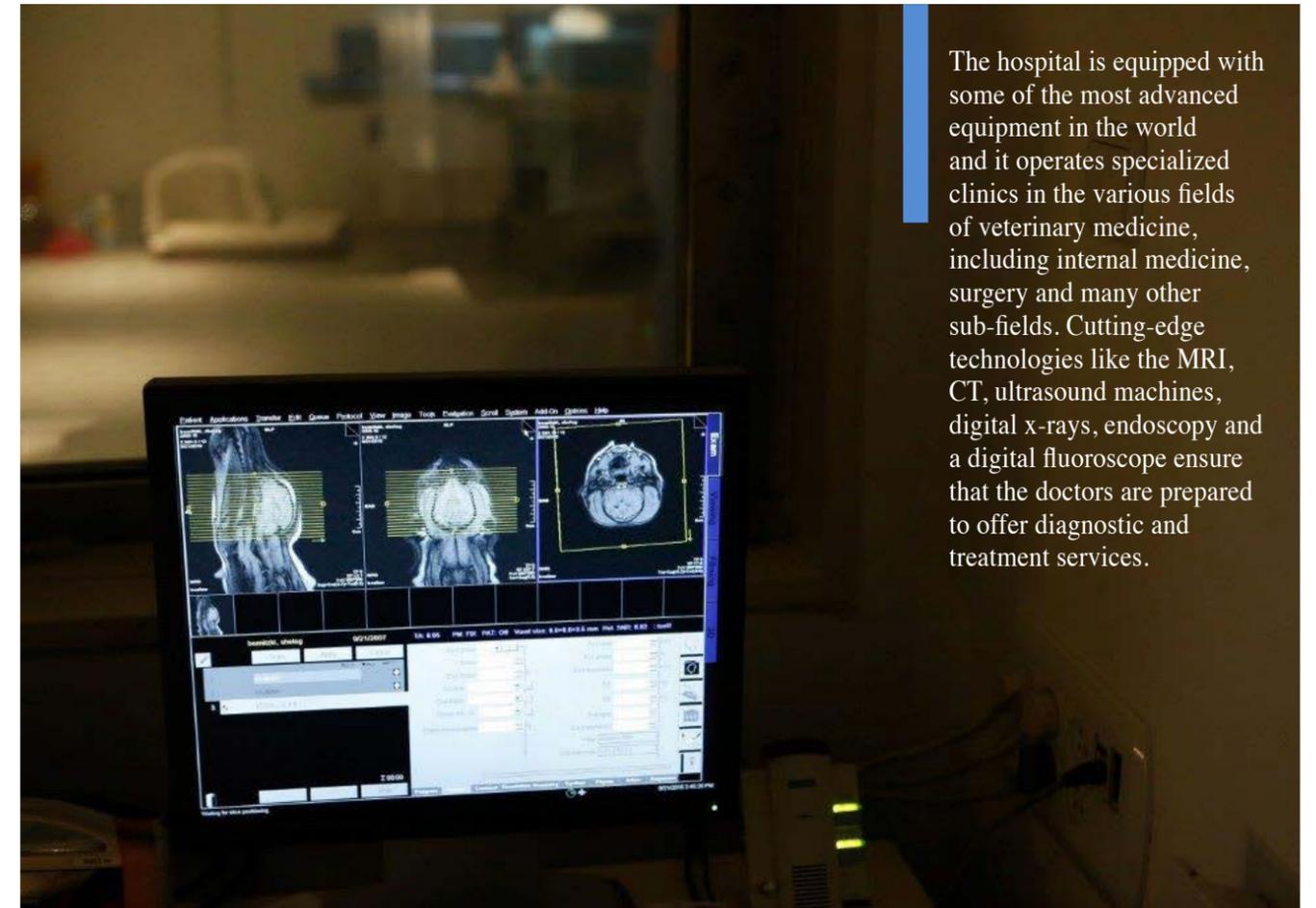
The KSVM-VTH treats 650 horses a year and is the sole intensive care unit in Israel for horses. The hospital sees 100 neonatal cases and 150 colic cases annually as well as other orthopedic injuries and infectious diseases. Horses from around Israel, the Palestinian Authority, and Jordan receive treatment.



When dogs and cats are in need of expert care, private clinics from around the country refer them to the KSVM-VTH. 13,000 dogs and cats visit the Beit Dagan campus each year, with 6,500 of these beloved pets cared for in the George Emergency Center in Memory of George and in Honor of Jacob Rimer Donated by Heidi Rothberg.



Kiji is a 6-year-old African Jacko parrot receiving treatment for vision problems that he incurred after he was attacked by a cat. The attack left Kiji thin, quiet and depressed. After beginning treatment, he began to eat eagerly again and behave like a much younger chick than his age would suggest, showing daily improvements. Exotic animals like Kiji come to the KSVM-VTH from zoos and safaris across the country.



The hospital is equipped with some of the most advanced equipment in the world and it operates specialized clinics in the various fields of veterinary medicine, including internal medicine, surgery and many other sub-fields. Cutting-edge technologies like the MRI, CT, ultrasound machines, digital x-rays, endoscopy and a digital fluoroscope ensure that the doctors are prepared to offer diagnostic and treatment services.

Students are always present and learning the most innovative and compassionate methods to treat animals at the Veterinary Teaching Hospital. Students receive clinical training in the VTH through their entire course of study, actively participating in rotations in their fourth year. The KSVM-VTH employs 200 individuals, including a team of 50 doctors, 60 technicians as well as administrative staff.



# World of Friends



The Hebrew University's supporters and Friends Associations are integral partners in our development. In these pages you will meet some of the individuals who actively support the University and its mission across the globe.

## AMERICAN FRIENDS OF HEBREW UNIVERSITY

**01. Palm Beach Scopus Award Gala honoring John and Andrea Stark**  
Palm Beach residents Andrea and John Stark (*right*) accepted American Friends' National Scopus Award from Ambassador Yossi Gal during a festive "A Night in the Courtyard" themed gala in Palm Beach. Larry and Mickey Beyer (*left*) were the 2017 Grand Chairs. Proceeds from the Gala benefited AFHU and the construction of the Palm Beach Courtyard at the Edmond and Lily Safra Center for Brain Sciences.

**02. 90th Anniversary Scopus Award Gala honoring Stanley and Dr. Marion Bergman, Henry Schein, Inc., and Kenneth and Nancy Stein**  
AFHU's Northeast Region honored the generous contributions and leadership of Stanley and Dr. Marion Bergman, Henry Schein Inc., and Nancy and Kenneth Stein at the "Leading Global Change" themed 90th Annual Scopus Award Gala at the New York Public Library.

The event raised more than one million dollars in support of faculty recruitment at The Hebrew University.

*From left: Nancy and Kenneth Stein, Steven W. Kess, VP of Global Professional Relations for Henry Schein, Inc., and Dr. Marion and Stanley Bergman*

**03. Dedicated philanthropists Corie (left) and Michael Koss (right) received AFHU's Humanitarian Torch of Learning Award during the Western Region's September 2016 Bel Air Affaire.**

**04. Bel Air Affaire**  
Brindell Gottlieb (*left*), President of AFHU's Western Region, received an Honorary Doctorate from the Hebrew University, conferred by HU President Menahem Ben-Sasson (*right*) during the ninth annual Bel Air Affaire. The ever-popular event raised scholarship support for Hebrew University students.

**05. The Jerold S. Solovy Torch of Learning Award Dinner honoring David Hoffman**  
AFHU's Midwest Region recognized attorney David Hoffman with The Jerold

S. Solovy Torch of Learning Award in recognition of his commitment to social justice, his support for Israel, and his profound impact on the city of Chicago. The successful event raised money in support of the Hebrew University Faculty of Law's Clinical Legal Education Center (CLEC), which provides free and accessible representation to residents of Jerusalem.

*From left: James Matanky, AFHU national board member and Midwest Region President, with Torch of Learning Dinner Co-Chair, Kathleen Hart Solovy, and honoree, David Hoffman*

**06. Scopus Award Gala honoring Suzy and Robert Pence**  
Philanthropic, cultural and educational leaders, Suzy and Robert Pence, were awarded the National Scopus Award during AFHU's Mid-Atlantic Award Gala in recognition of their support of the Hebrew University.

*From left: William Kilberg, President of the Mid-Atlantic Region, Frandee Woolf, Executive Director Mid-Atlantic, honorees Robert and Suzy Pence, AFHU National Executive Director, Beth Asnien McCoy, and Gary Sinise, who served as master of ceremonies*

## CANADIAN FRIENDS OF HEBREW UNIVERSITY

**07. The Canadian Friends in Edmonton partnered with the JNF of Edmonton to honor Dr. James Shapiro, a groundbreaking diabetes researcher whose "Edmonton Protocol" is poised to radically change the way diabetes is treated. Proceeds from the event funded, in part, collaboration between Dr. Shapiro and Prof. Yuval Dor, of The Hebrew University's Institute for Medical Research Israel-Canada.**

*From left: Honorary Gala chair Norman Schayer, honoree Dr. James Shapiro and his wife, Dr. Vanessa Davis; Col. Adam Sussman, defense attaché of Israel to Canada; and CFHU Edmonton chapter President Howie Sniderman*

**08. Journalist and television personality Anderson Cooper and Grateful Dead founding member Bob Weir were two of the special guests at the Toronto chapter's Second Annual Einstein Gala. The gala honored recipients of the Jake Eberts Key of Knowledge Award, recognizing leaders**

who have bettered society through the advancement of knowledge and personal example. This year's winners included: The Azrieli Foundation, represented by its Chair and CEO, **Dr. Naomi Azrieli**; **Shuki Levy**, composer, television writer, director and co-founder of Saban Entertainment; **Jeff Martin**, Founder & CEO, Tribal Planet and Albert Einstein Foundation International Executive Committee Co-Chair; and Apotex Inc., represented by its Chairman, **Dr. Barry Sherman**. The event served as the formal launch of the Albert Einstein Foundation, attracting nearly 800 people and raising almost \$2 million in support of initiatives to nurture future Einsteins.

*From left: American journalist and TV personality Anderson Cooper, event co-chairs Sara Gottlieb and Karen Simpson-Radomski, and Grateful Dead founding member Bob Weir*



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### AUSTRALIAN FRIENDS OF HEBREW UNIVERSITY

**09.** In April, 2016, the Australian Friends said farewell to Barry Joseph, who retired as Federal Executive Director after 15 years of dedicated service.

*From left: Michael Dunkel, Harry Triguboff AO, Barry Joseph. Photo: Joslin Hartley*

**10.** The Victorian Division of the Australian Friends welcomed Hebrew University Vice-President, Amb. Yossi Gal as the keynote speaker at a Business Boardroom Lunch hosted by Josh Liberman.

*From left: Eitan Drori, Josh Liberman, Amb. Yossi Gal, Grahame Leonard AM, Dr. Rolene Lamm, Jeff Morrison*

### BRITISH FRIENDS OF HEBREW UNIVERSITY

**11. BFHU Legal Group 64th Annual Dinner**

*From left: Lord Pannick QC, Chair BFHU legal group; Michael Gee, Hebrew University Governor, former BFHU Chair; His Excellency Mark Regev, Israel's Ambassador to the UK; The Rt. Hon. Lord Dyson, former Master of the Rolls, guest speaker; Jonathan Cohen QC (whose grandfather Lionel Cohen established the annual Lionel Cohen Law Lecture at HU); Prof Michael Karayanni, Dean of Hebrew University's Faculty of Law*

**12. BFHU 90th Anniversary Dinner**

At Claridge's in London, the dinner raised funds in support of the recruitment of new faculty.

*From left: Prof. Menahem Ben Sasson; His Excellency, Israel Ambassador Mark Regev; BFHU Chair, HU Governor, Isaac Kaye; Dame Gail Ronson DBE; Gerald Ronson CBE*

### THE LATIN AMERICAN FRIENDS OF THE HEBREW UNIVERSITY

**13. New President of the Argentinian Friends**

During the 29th Summer Symposium in Punta del Este, Eng. Héctor Sussman assumed the Presidency of the Argentinian Friends to continue the work of Dr. Isidoro Kepel. Eng. Roberto Nul, former President of the Argentine Friends and Fellowship of the UHJ, led this ceremony, highlighting the performance of Dr. Isidoro Kepel.

*From left: Eng. Roberto Nul; Eng. Hector Sussman; Dr. Iche Kepel; Edu Pollak*

**14. 2017 Scopus Award**

The Brazilian Friends honored Ilan Goldfajn, President of Brazilian Central Bank, with the 2017 Scopus Award. It was a special night as it

also celebrated the Brazilian Friends 70th Anniversary. Distinguished personalities of Brazilian society and the Jewish Community were present.

*From left: Dora Brenner, Dori Goren, Ilan Goldfajn, Bruno Lascovsky, Jayme Blay*

### EUROPEAN FRIENDS OF THE HEBREW UNIVERSITY

**15.** Scopus Gala in Geneva honoring Lord Norman Foster with the special participation of Marina Abramović

*From left: Prof. Philippe Amon, Prof. Menahem Ben-Sasson, Ernesto Bertarelli, Gültin S. Ephrati, Lord Norman Foster, Lily Safra, Marina Abramović, Farah Safdie-Yarisa, Raphael Castoriano, Julie Castoriano Bugnone. Photo: David Vexelman*

**16.** More than 370 people were present at the Scopus Gala Brussels honoring Professor François Englert, Nobel Prize winner in Physics 2013.

*From left: Jacques Brotchi 2008 Scopus recipient,*

*Professor François Englert, Antoinette Grosman, President of the Belgium Friends of the Hebrew University of Jerusalem, Luc Dardenne, 2014 Scopus recipient, Radu Mihaileanu, 2010 Scopus recipient, Michael Guttman, 2012 Scopus recipient*

**17.** 415 people were present at the Brain Circle UK's Inaugural Gala held at the Victoria and Albert Museum

*Photo: Bircan Tulga*

**18.** Marc Harari, President of the French Friends, Professor Hanoch Gutfreund and Vice-President Amb. Yossi Gal together with the members of the French Friend's committee at "The World as Viewed by Einstein" Conference held at the Artcurial Auction House.

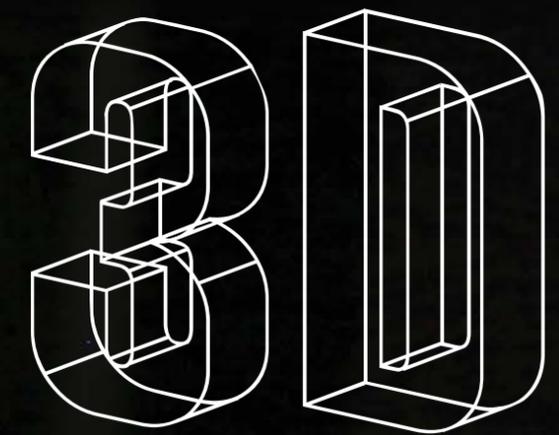
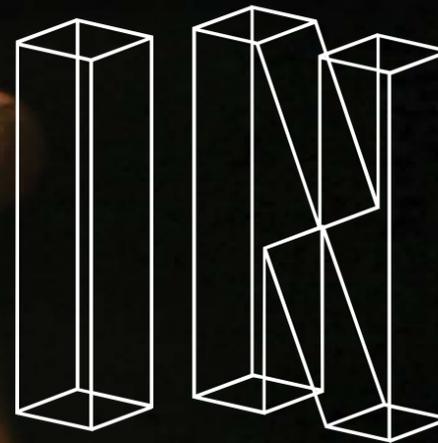
### ISRAEL FRIENDS OF THE HEBREW UNIVERSITY

**19.** Friends meeting with the Prime Minister's Economic Adviser Prof. Avi Simchon and General Herzi Halevi, Chief intelligence officer of the IDF,

pictured with Prof. Menahem Ben-Sasson (right).

**20.** Adv. Daniel Jacobson is an Honorary Doctor of the University and has contributed greatly to the advancement and strengthening of the University. Among his major donations, are scholarships to students in the Dept. of Hebrew Literature, and the renovation of a study room for doctoral students in the Faculty of Law. His personal library was graciously donated to the University and was inaugurated in January 2016. The library includes more than a thousand titles including rare books in economics, law, Jewish studies, history, Hebrew literature, Hebrew poetry and Babylonian Talmud. The library is part of the Rabin Building on Mount Scopus. The inauguration ceremony was attended by Vice-President Amb. Yossi Gal, Dean of the Faculty of Humanities, Prof. Dror Wahrman, academic staff, friends of the university and close friends of the donor.

# Archeology



The mining shafts in the Timna Archaeological Park, which houses the world's oldest copper mine located in southern Israel, are stocked with stories of intrigue. Dating back to the turn of the first millennium BC, various nomadic populations, during the time of Kings David and Solomon, exploited the mine and left their mark in the form of elaborate rock engravings near the mining tunnels. The mine has long offered a treasure trove of information to archeologists, but a revolutionary technology at the Hebrew University's Institute of Archeology is bringing these dramatic images to life and giving new insights in the lives of these ancient populations.

Researchers in the Institute's Computerized Archeology Lab are leading a hi-tech revolution that is transforming the study of ancient artifacts. Notably, they are developing methods for the analysis of 3D models that are vastly increasing our knowledge of antiquity and broadening the horizons of archeological research.

Vivid images from Timna, such as those depicted in the rock engraving, "Chariots" which illustrates Egyptian chariots, groups of local hunters and a variety of wild animals can now be examined from the perspective of the carving tools used to create them as well as the specific techniques and stylistic features of the engraving.

Led by Prof. Leore Grosman, the lab employs advanced scanning machines and develops precise algorithms and efficient methods for the documentation and measurement of artifacts and engravings. These models allow researchers to measure more precisely a host of important parameters that are crucial to our understanding of the objects from ancient life.

The analysis of these digital models can determine an object's center of mass, volume, average angles, curvature, and even surface roughness. They are replacing the less reliable manual measurements that have traditionally been used to analyze artifacts.

TODAY, MOST ARCHEOLOGICAL CENTERS IN ISRAEL USE THE HEBREW UNIVERSITY'S TECHNIQUE, AS DO UNIVERSITIES ACROSS THE GLOBE

Using these 3D models Prof. Grosman and her research team were able to ascertain that masks from Judea and possibly Samaria circa -7000 BCE during the Neolithic period were worn on the faces of living people rather than used as ritual mark of death—ascertainably in some kind of ceremony— even though the masks represent skulls rather than faces.

The technology has also allowed archeologists to differentiate between objects manufactured in two different potters' workshops from the same village and to discern the individual finger styles of different potters. One of Prof. Grosman's doctoral students, Ortal Harush is using the 3D technology to outline the learning curve of a potter's progression—an extraordinary and previously unobtainable revealing detail about these ancient vessels.

Harush is working with students at Bezalel Academy of Arts and Design on the research, presenting just one example of the large number of partnerships that the Lab has fostered.

Initially, archeologists around the world were reluctant to embrace this new technology, but their hesitations diminished as they came to appreciate the vast possibilities offered through 3D analysis. Today, most archeological centers in Israel use the Hebrew University's technique, as do universities across the globe, including the University of San Diego, the Sorbonne in Paris, the Monrepos Archaeological Center in Neuwied Germany and Russia's Siberian Federal University.

"In the beginning it was difficult to convince traditional archeology about the value of 3D analysis," Prof. Grosman said, "but now the adoption rate is 'exponential.'"

Tens of thousands of artifacts have now been scanned as researchers send their objects to the Lab to be documented. With this huge and growing repository, Prof. Grosman wants to develop an algorithm that will sort through all the data and help archeologists more easily classify their artifacts, and possibly indicate hitherto unknown relationships between different peoples in the ancient world.

"You will have an artifact. You will go to the database and you'll put in your new 3D model and you'll ask: what does it resemble, where does it fit, where does it stand when you compare it with assemblages?" she explained. "It's like searching in Google except this will be adopted for archeological objects."

# BOOKSHELF: SPOTLIGHT ON

# PROF. YUVAL NOAH HARARI



## THE COMPELLING HISTORY AND FUTURE OF HUMANKIND

Prof. Yuval Noah Harari is a renowned historian and international bestselling author. He began his studies at the Hebrew University specializing in medieval history and military history and is now a lecturer in the University's History Department.

Prof. Harari's current research focuses on macro-historical questions: What is the relation between history and biology? What is the essential difference between homo sapiens and other animals? Is there justice in

history? Does history have a direction? Do people become happier as history unfolds?

Prof. Harari twice won the Polonsky Prize for Creativity and Originality, in 2009 and 2012. In 2012, he was elected to the Young Israeli Academy of Sciences. His books have received international acclaim, are *New York Times* bestsellers, and have been top picks for President Barack Obama, Bill Gates and Mark Zuckerberg's reading lists.



## SAPIENS: A BRIEF HISTORY OF HUMANKIND

Seventy thousand years ago, there were at least six different human species on earth. They were insignificant animals, whose ecological impact was less than that of fireflies or jellyfish. Today, there is only one human species left: Us. Homo sapiens. But we rule this planet.

*Sapiens* takes us on a breathtaking ride through human history, from its evolutionary roots to the age of capitalism and genetic engineering, to uncover why we are the way we are.

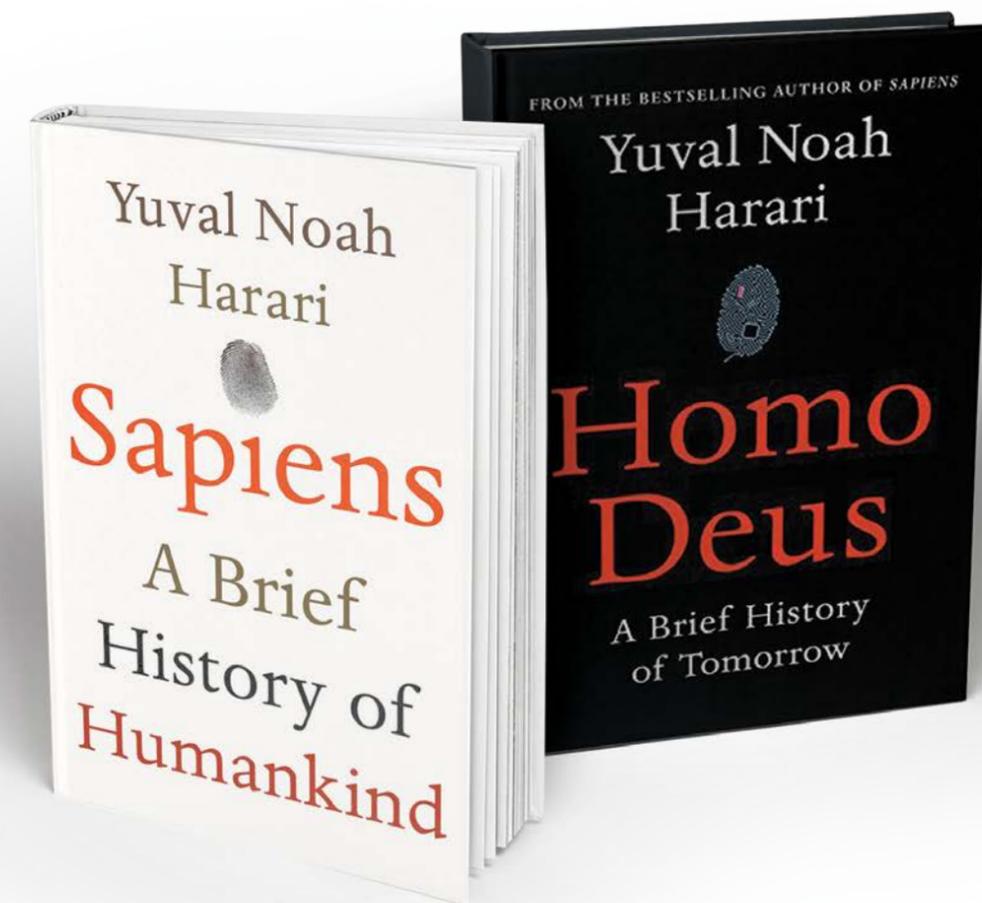
By combining profound insights with a remarkably vivid language, *Sapiens* has already acquired almost cultic status among diverse audiences, captivating teenagers as well as university professors, animal rights activists alongside government ministers. It is currently being translated into close to 50 languages.

## HOMO DEUS: A BRIEF HISTORY OF TOMORROW

*Sapiens* explained how humankind came to rule the planet. *Homo Deus* examines our future. It blends science, history, philosophy, and every discipline in between, offering a vision of tomorrow that at first seems incomprehensible but soon looks undeniable: humanity will soon lose not only its dominance, but its very meaning.

Today, more people die from obesity than from starvation; and more people die from old age than from infectious diseases. We are the only species in earth's long history that has single-handedly changed the entire planet, and we no longer expect any higher being to shape our destinies for us.

Success breeds ambition, and humankind will next seek immortality, boundless happiness and divine powers of creation. But the pursuit of these very goals will ultimately render most human beings superfluous. So where do we go from here? *Homo Deus* gives us a glimpse of the dreams and nightmares that will shape the 21st century.



# A GUIDE TO FINE WINES

A PRACTICAL EDUCATION FROM PROF. ZOHAR KEREM ON UNDERSTANDING THE ELEMENTS BEHIND A GOOD GLASS OF WINE.



To the non-connoisseur, the world and language of wine can be daunting. How can wine, a liquid, be dry? What does it mean when wine is described as sophisticated and earthy with a hint of lemon? Prof. Zohar Kerem is a world-renowned researcher in food chemistry, wine quality and olive oil. He is running Israel's first academic degree program in wine, an International MSc in Viticulture & Enology run out of the Robert H. Smith Faculty of Agriculture, Food and Environment. The two-year Master's program began this spring and gives students the same knowledge and skills as leading programs in other wine-producing countries such as France, the United States and Australia, with a special emphasis on the Israeli landscape and industry.

## What makes this program unique?

It's the first MSc level degree program to be approved by the National Council for Higher Education in Israel. We've tailored it to fit Israel's climate and soils, and it's open to students around the world.

## What is a dry wine or semi-dry wine?

It's very simple. Dry wine has no sugar in it, and semi-dry wine still has some sugar.

## What is the difference between a Merlot and Cabernet?

These are different wine grapes with different qualities and requirements in terms of soil, climate, irrigation and harvesting times. The Merlot is a wine that is softer, while the Cabernet is bolder.

## What does it mean when a wine is called sophisticated?

That refers to the number of compounds in the wine. A Cabernet Sauvignon, for example, has several hundred different compounds, while a Merlot has only between 100 and 150. Each one of the compounds in the wine makes a little difference. When you combine the compounds together, some will give the wine an earthy or nutty taste; others will hint at exotic fruits, and others may invoke a chocolate or coffee flavor.

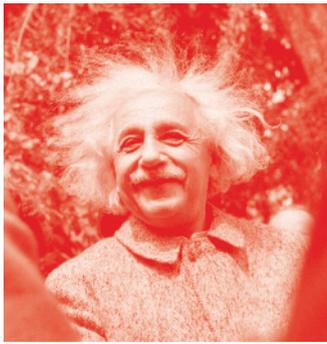
## Is it important to let wine breathe after you have opened the bottle? (what does it even mean to "breathe?")

Wines must breathe! When the wine is exposed to oxygen (after you open the bottle), everything changes. If you wait 15 minutes, it will taste like a different wine—and again in another 15 minutes.

## What's the best wine to serve with the different courses of a meal and foods such a meat, dairy or fish?

These are not things that one should look for an answer 'on the fly.' You first need to understand the wine and why some wines go well with this food or with that one. This comes from experience and knowledge that you need to develop—you can't answer it in a textbook or a newspaper. It's one of the things we are teaching in the new course.

# FINALS



## HOW WELL DO YOU KNOW HEBREW UNIVERSITY FOUNDER ALBERT EINSTEIN?

Hebrew University Founder, Albert Einstein is one of the most famous figures in the world. But how well do you really know him?

Our resident Einstein expert, Prof. Hanoch Gutfreund challenges you to test your knowledge on the man who formulated the Theory of Relativity.

Prof. Hanoch Gutfreund is a former President of the Hebrew University, Professor Emeritus of Theoretical Physics, and the current Academic Director of the Einstein Center and the Albert Einstein Archives.

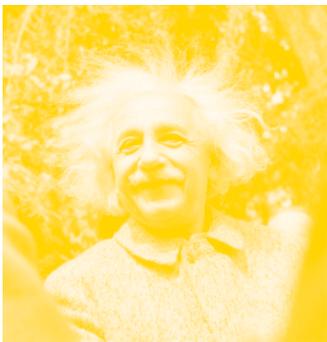
Bonus points for completing the quiz (correctly) faster than the speed of light.

**1.** Einstein's lowest mark on his high school certificate is in:

- a. History
- b. Descriptive Geometry
- c. French
- d. Geography

**2.** The goal of Einstein's 1921 Hebrew University fundraising trip to the United States was:

- a. The establishment of the Institute of Physics
- b. The establishment of the Institute of Agriculture
- c. The establishment of the School of Medicine
- d. General support for the University



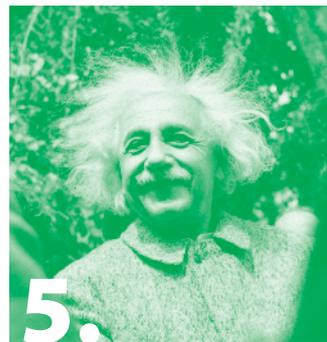
**3.** The topic of Einstein's lecture on Mount Scopus, on February 7th, 1923, was:

- a. The mission of the Hebrew University
- b. The Theory of Relativity

- c. The emerging field of Quantum Physics
- d. The Jewish community in Germany after World War I

**4.** Einstein delivered his lecture on Mount Scopus in:

- a. German
- b. French
- c. Italian
- d. English



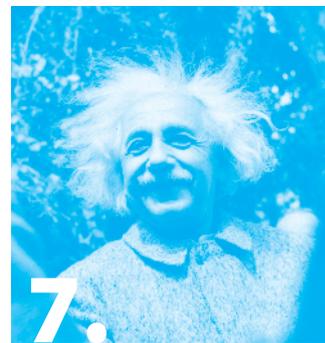
**5.** Einstein completed his general theory of relativity in:

- a. Zurich
- b. Prague
- c. Berlin
- d. Princeton

**6.** In 1922, Einstein first met the Sephardi Jewish community in:

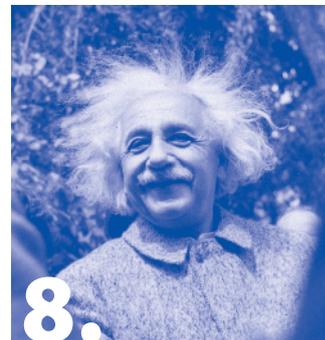
- a. Buenos Aires
- b. Singapore

- c. Paris
- d. Madrid



**7.** In the last years of his life, Einstein worked on:

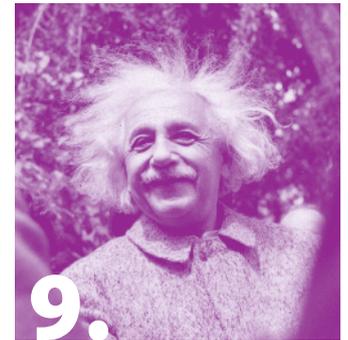
- a. Nuclear Physics
- b. Statistical Physics
- c. A theory unifying the forces of nature
- d. Cosmology



**8.** The argument that Einstein gave to Israel Prime Minister David Ben-Gurion for refusing to accept the Presidency of Israel being offered to him was:

- a. He is too old

- b. He is not fit for a position of leadership
- c. His health is deteriorating
- d. He does not want to leave Princeton



**9.** Einstein received the Nobel Prize for:

- a. Predicting the bending of light by the gravitational field of the sun
- b. Explaining the photo-electric effect
- c. Predicting the existence of black holes
- d. Providing evidence for the reality of atoms

**10.** Einstein's role in the Manhattan Project (to develop the atomic bomb) was:

- a. He was kept informed
- b. He initiated this effort
- c. He was completely excluded
- d. He was occasionally consulted

# SAVE THE DATE

## Argentinian & Uruguayan Friends

January 2018, Punta del Este - Argentinian and Uruguayan Friends' Summer Symposium

## Australian Friends

July 2017, Sydney - National Campaign Launch in Sydney, Commercialization Workshop Presented by the Sir Zelman Cowen Universities Fund at Sydney University

July 2017, Victoria and Western Australia - Events Held by the Victorian Friends and the Western Australian Friends Welcoming Prof. Oded Shoseyov, Prof. Uri Banin, and Prof. Nissim Garti

## British Friends

October 2017, London - Sir Sigmund Sternberg Memorial Event

February 2018 - Event to Mark the 100th Anniversary of the HU Cornerstone Laying Ceremony

March 2018, London - Friends' Annual Legal Group Dinner

## Canadian Friends

July 16, 17, 18, 2017 - Vancouver, Calgary, Edmonton Jerusalem of Gold & Tech: Capital of Innovation

September 10, 2017 Montreal - Dinner of the Century, Einstein Legacy Project's Launch of Genius: 100 Visions of the Future 3D-Printed Book

## American Friends

September 16, 2017, Los Angeles - American Friends' Annual Bel Air Affaire Student Scholarship Gala & Humanitarian

Torch of Learning Award Tribute Honoring the Honorable Gerald Rosen

January 13, 2018 - Palm Beach Scopus Award Gala

January 14, 2018 - Palm Beach Annual Leadership Education Forum (ALEF)

## Belgium Friends

October 15, 2017, Brussels - Brain Forum on Learning Disorders in Children: Advances in Medical Research

## Swiss Friends

September 2018, Basel - Exclusive Chagall Guided Tour at the Kunstmuseum

Fall - First Special Alumni Event

December/January 2018 - Presentation on Quantum Information Science & Nanoscience

January

November

July

October

April

June

February

March

December

September



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