

# IMPACT

FALL 2014



AMERICAN ASSOCIATES  
Ben-Gurion University  
*of the Negev*



## THE ROBOTICS FUTURE

DEVELOPING  
ALTERNATIVE ENERGIES

SCIENCE CENTER  
FOR NEGEV YOUTH

SUPPORTING  
STUDENTS WITH  
DISABILITIES

# DREAMING THE POSSIBLE

BY LLOYD GOLDMAN AABGU PRESIDENT



Fueling the world with renewable energy. Creating robots that make us safer, healthier and more productive: Science fiction? Impossible dreams?

Today, BGU researchers are working intensively in both areas, targeted by the University for their global importance and because BGU has built solid foundations in these areas of research. This issue highlights the two subjects in depth, yet still showcases only a fraction of the fascinating work under way.

BGU's work on alternative fuels and energy sources began, astonishingly, three decades ago. Learn now about the progress four of the University's researchers and their teams are making toward the most tantalizing of hopes: creating hydrogen fuel by splitting water; harnessing the sun; building storage systems to hold naturally produced energy; and making nuclear fission safe and secure. Not to mention how energy from yeast and cyborg snails is being channeled—and where these experiments may lead.

Our story on robotics delves into four research paths that are moving us into newly imagined ways to diagnose and treat disease, greet travelers, help paralyzed people move, assist the elderly, pick crops, and much more. Through the new ABC Center for Robotics, BGU sets the stage for unusual collaborations geared to fast track progress. Meet four researchers who are building robots that variously crawl like insects, listen to what we say, interact responsively with human beings, and may eventually swim through the bloodstream to deliver therapies.

BGU works to foster more immediate and personal dreams, too, especially for young people who face disadvantages. I know you'll be happy to read about the new support center for students with disabilities, and how it's creating a better reality for these members of the BGU community right now.

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**ON THE COVER:** Prof. Boaz Rafaely on the right with researchers Jonathan Sheaffer (left) and Vladimir Tourbabin and Nao, a talking, walking and dancing robot by Aldebaran Robotics. The research team will work to improve Nao's hearing and interaction with humans. Photo by: Dani Machlis/BGU

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# AABGU PROVIDES \$1MILLION TO UNIVERSITY FOR STUDENTS AFFECTED BY WAR

**DURING OPERATION** Protective Edge this summer, Ben-Gurion University of the Negev was forced to close its campus to students for more than six weeks due to heavy missile strikes from Gaza. As many as 2,000 students, faculty and staff were deployed both in and around the Gaza Strip. Exams were canceled and many students lost the opportunity to earn needed income over the summer.

In response, American Associates, Ben-Gurion University of the Negev (AABGU) established a “Wartime Assistance for Students” fund to help those serving in combat, volunteering in the community and otherwise affected by the war and unable to work. Established at the request of the University’s president, the fund is now providing special scholarship assistance as the fall semester begins.

“BGU students serve in combat units in larger numbers than any other Israeli university,” explains Doron Krakow, executive vice president of AABGU. “We wanted to make sure that these students do not return in dire straits considering all that they have

already had to bear putting their lives on the line to keep Israel safe.”

While the University remained open to administrators, researchers and faculty, their work was compromised by the periodic sirens and movement back and forth to the shelters,

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**“BGU students serve in combat units in larger numbers than any other Israeli university.”**

— DORON KRAKOW

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as well as their unrelenting concerns about siblings, fathers and friends called to active duty.

During the daily influx of rockets, one BGU professor said, “BGU is safe and well sheltered, but the problem is en route—I several times had to lie on the road with my hands over my head as the only protection...everyone is

very tense and the nonstop running in and out of shelters cannot be sustained for long.”

Typical of the community spirit at BGU, hundreds of students stayed in Beer-Sheva to volunteer, providing support and assistance to people in need throughout the city and the surrounding communities. And, the University set up a special day care program on campus to provide extra support for faculty and staff without other recourse.

“In times like this,” says Krakow, “we need to shore up our support for Israel and we need to let our student-soldiers know that we have their backs. We are honored to provide the extra scholarship funds to these students and grateful for the support of our friends throughout the United States who helped make this possible.”

The \$1 million has been forwarded to BGU. However, AABGU has been informed that the need has exceeded this amount. You can help by making a donation online at [www.aabgu.org/wartime-assistance-fund](http://www.aabgu.org/wartime-assistance-fund) ■

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**Top Photo:** VIP seats were provided to IDF soldiers during a concert at BGU’s Board of Governors Meeting in May.



# FULFILLING THE DREAM

## BOARD OF GOVERNORS MEETING

**A LARGER-THAN-EVER** American delegation and friends from around the world converged on Beer-Sheva for Ben-Gurion University's 44th Board of Governors Meeting in May 2014.

The four-day annual open house kicked off with a private welcome reception for the American delegation with BGU administration, faculty and staff on the balcony of the Alon Building for High-Tech.

Overlooking the University's Marcus Family Campus, this vantage point offers a great view of Beer-Sheva's Advanced Technologies Park (ATP) across the train tracks from campus.

The ATP's first building, of sixteen to be built, is home to Ness Technologies, EMC Israel, Oracle Israel, Deutsche Telekom, and Hewlett Packard. IBM has taken up residence in the Alon Building and will join the ATP at a later date.

With the IDF's strategic intelligence units moving to a high-technology campus steps away from the ATP and BGU's campus, there is a distinct feeling that Ben-Gurion's vision for Israel's Negev region is finally being realized.

"There is a tremendous sense of momentum—of the Negev now

being at the forefront of Israel's development—and this in no small degree is happening because of BGU's leadership role in the region," said BGU President Prof. Rivka Carmi, who was confirmed for her third term at the opening plenary.

The opening plenary also included the election of new governors, including AABGU community members Dr. Rhoda Baruch, Stanley Ginsburg, Ira Ingberman, Max Javit, Douglas Krupp, and Holly Ullman.

The morning's session was capped off by the presentation of the Ben-Gurion Leadership Award to then-Israeli President Shimon Peres.

"BGU is one of the greatest triumphs of Jewish history and it's just the beginning," said President Peres.

Always an opportunity to learn from BGU faculty, researchers and guest speakers, this year's program featured several lectures on the impact of the ongoing political situation on the Israeli people:

- **Prof. Golan Shahar**, of BGU's Department of Psychology, shared his research on how exposure to terrorism affects the mental health of teens in Israel's Negev region. He estimates



**Top:** Israel's then-President Shimon Peres accepts the Ben-Gurion Leadership Award from BGU President Prof. Rivka Carmi and Alex Goren, chairman of BGU's board of governors.

**Bottom:** Rachel and Max Javit were welcomed into the Ben-Gurion Society.

that 50 percent of Israeli children in the western Negev have some form of PTSD (post-traumatic stress disorder).

- **Ethan Bronner**, former Jerusalem bureau chief for *The New York Times*, spoke about the long-term implications of the lack of contact

between Israelis and Palestinians. He observed that the ability for the two peoples to view one another as human beings is decreasing as opportunities for interaction decline.

## BUILDING FOR THE FUTURE

**THE BOARD OF GOVERNORS** featured the dedication of two new Marcus Family Campus buildings:

- **The Guzik Family Building for Biotechnology Engineering.** Thanks to a significant donation from Nahum Guzik, a Silicon Valley inventor, entrepreneur and philanthropist, the building is already under construction.

It will house the Avram and Stella Goldstein-Goren Department of Biotechnology; the new Center for Regenerative Medicine, Cellular Therapy and Stem Cell Research; and a number of much needed laboratories.

- **The Lorry I. Lokey Chemistry Building.** "The Lorry I. Lokey Building will be the most modern and 'green' chemistry building in Israel, equipped with the latest energy-saving systems and all the necessary infrastructure to carry out the most advanced research," said Prof. N. Gabriel Lemcoff, head of BGU's Department of Chemistry.

A longtime contributor to higher education in Israel, Lokey resides in San Francisco and was the founder and owner of Business Wire until he sold it to Warren Buffet's Berkshire Hathaway.

"It is tremendously important to develop great minds and great institutions [in Israel]. Education in my book is number one," said Lokey at the building's cornerstone-laying ceremony.

## CONNECTING WITH STUDENTS

**BOARD OF GOVERNORS** participants got a chance to get to know BGU students over lunch in the Zlotowski Student Center.

"I am amazed how immediately the students and supporters just 'click.' This connection is at the heart of what makes BGU so unique," said Avi Benalal, head of BGU's Student Association.

The event was sponsored by Americans Ricki and Zvi Alon, Helen and Jack R Bershad, Dvora Ezralow, Vicki and Lloyd Goldman, Arline and Ben Guefen, Maribeth and Steven Lerner, and Aileen Whitman.

An auction, co-hosted by Board of Governors Vice Chair Carol Saal, helped raise funds for student programs.

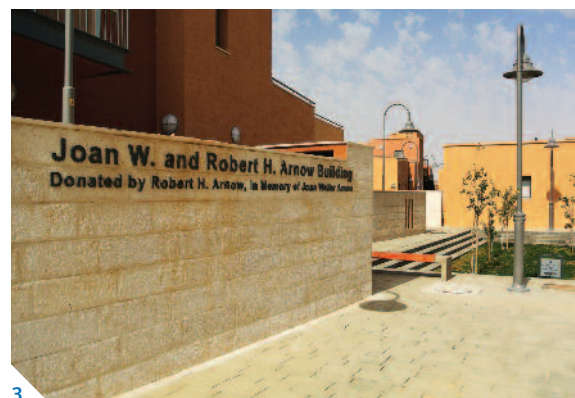
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1. AABGU's immediate past director of the Northwest Region, Daphna Noily; BGU President Prof. Rivka Carmi; Lorry Lokey and Joanne Harrington at the cornerstone-laying ceremony of the Lorry I. Lokey Chemistry Building.
2. AABGU President Lloyd Goldman accepts Pillar's award for the Joyce and Irving Goldman Family Foundation from BGU President Prof. Rivka Carmi.
3. The American Associates Village dedication showcased beautiful desert buildings, apartments, courtyards, and more, made possible by generous donors from the United States.

**Left Photo:** Brothers Jim (left) and Steve Breslauer enjoy a laugh with a trio of David Ben-Gurion impersonators at the dinner reception preceding the President's Pillars inaugural ceremony.



## INAUGURATING THE PRESIDENT'S PILLARS

**THE PRESIDENT'S PILLARS**, a new society recognizing donors who contribute \$5 million or more to the University, was inaugurated with a unique and inspirational ceremony.

Nine of the 21 American Pillars either attended the ceremony or were represented by family members, including: Arnold Bengis; Norbert and Hannah Blechner ז"ל; the Joyce and Irving Goldman Family Foundation; the Goldstein-Goren family; Nahum Guzik; Lorry I. Lokey; Ellen Marcus; the Breslauer brothers of the Samuel and Helene Soref Foundation; and Roy J. Zuckerberg.

"I feel as I imagine many of you do that we have gotten far more from our involvement with the University than the sum total of what we have given," said Alex Goren, a Pillar and chairman of the Board of Governors.



Nahum Guzik (center) receives an honorary doctorate from BGU President Prof. Rivka Carmi and Rector Prof. Zvi HaCohen.

Concert pianist Evgeny Kissin, recipient of an honorary doctorate, performed a private concert for delegates from around the world and IDF soldiers.

## HONORARY DOCTORATES

**TWO LONGTIME** members of the AABGU community received prestigious honorary doctoral degrees.

- **Jim Breslau** of Long Beach, California, was recognized for spearheading the funding and development of Israel's new Advanced Technologies Park (ATP) in Beer-Sheva.

"This is my chance to make a difference for the University, for the State of Israel and for the hundreds, if not thousands of people who will one day work there," said Breslau.

- **Nahum Guzik** was recognized for his outstanding number of inventions and patents that has enhanced technology, for his role as a philanthropic activist in the Northern California Jewish community, and for his commitment to higher education and research in Israel and the Negev.

"The way I see it, I'm happy to fund causes to help Israel. I donate because BGU is great, not me," said Guzik.

## "OPEN HOUSE" AT SEDE BOQER

**JUST THREE YEARS** ago, the American delegation to the Board of Governors gathered to lay the cornerstone for the American Associates Village at Sede Boqer.

Now the Village is home to 36 graduate students who are studying at the Albert Katz International School for Desert Studies, the academic arm of the Jacob Blaustein Institutes for Desert Research, and the Israel Studies International Program.

The first two phases of the American Associates Village were dedicated with a ribbon-cutting ceremony and an "open house" tour of several apartments hosted by the students who live there.

The complex will expand available housing for as many as 150 additional international students. This will allow 50 percent more students to study at the Sede Boqer campus, facilitating growth of the two international graduate programs. ■





# ISRAEL: WE ARE ALL STAKEHOLDERS

BY DORON KRAKOW

EXECUTIVE VICE PRESIDENT

**IN ISRAEL'S** latest war, its people's army faced off against Hamas, a terrorist Islamic fundamentalist movement dedicated to Israel's destruction. Hamas is also an arm of the growing international threat of Islamic fundamentalism that is raging across the Middle East—a threat no longer confined to that part of the world.

Beyond the conflict itself, Israel's efforts to safeguard its people from Hamas' network of terror tunnels and its arsenal of short- and medium-range rockets and missiles, elicited reactionary responses from critics of Israel across Western Europe. It was there that anti-Israel rallies, often reeking of the stench of anti-Semitism, brought together elements of the local populations reflecting not only the usual voices of protest, but also significant representation from the neo-fascist right and extreme left. Together, they found common cause in their attacks on Israel, striking fear in the hearts of local Jews who were compelled to seek refuge or go into hiding.

Here at home such protests were more muted, but in cities across the country anti-Israel rallies and events were commonplace.

American Jews have generally responded with vocal support, powerful demonstrations of solidarity and proactive engagement with our elected leaders to underscore America's steadfast support for Israel and for the forces of freedom and democracy. While most of us have been taken by surprise by the nature and extent of the problem overseas, having now been confronted, none can afford to ignore it.

As supporters of Ben-Gurion University of the Negev and of the State of Israel, we give expression to our passionate commitment to Israel's development and prosperity through our philanthropy, among other avenues. We take great satisfaction in Israel's achievements, its progress and its growth.

Our chests swell with pride over Israel's contributions to technological advances, its breakthroughs in the

treatment of illness and disease, its remarkable dedication to liberal values, to equal rights and to freedom of choice. And we never fail to remind those around us of Israel's rapid response to calls for assistance from around the world following disasters, both manmade and natural, wherever they may take place.

Israel's accomplishments are, in some small way, our accomplishments. And we feel proud. And Israel's losses, its tragedies, also belong to us. We mourn together with Israel over the horrors inflicted on the victims of terror and the casualties among Israel's sons and daughters who fall in her defense.

This is a reflection of kinship. But there is more to it than that. What happens in Israel and what happens to Israelis mean more to us as American Jews than a simple sense of fraternity. Our future, our safety and security, our link both to the past and to what is yet to come for the Jewish people are inextricably tied to Israel's long-term safety, security and prosperity. We are stakeholders. What happens to Israel has implications not only for us, but for our children, our children's children, and for countless generations yet to come.

Israel's latest war and the world's response to it is a reminder of our need to view our stake in her future as an active one. The future we desire for our people cannot be taken for granted. It must be secured through our actions. And we must transmit the importance of our stake to those who will inherit it.

Ben-Gurion University proudly embraces its role as the engine for developing the Negev. Through AABGU, we help provide the fuel. And with the region's development and the continuing and expanding fulfillment of David Ben-Gurion's vision to "make the desert bloom," we enhance the long-term safety and security of the State of Israel and its people, strengthening our stake in Israel's future with every step. ■



# OUR TRIP TO THE BALKANS

BY CAROL AND HARRY SAAL

Carol and Harry Saal from Palo Alto, California chaired AABGU's "East Meets West: A Journey through the Jewish Balkans" in May 2014. Here are the highlights of the sold-out tour.

**THERE ARE ENDLESS** adjectives we can ascribe to this extraordinary trip: enlightening, educational, wondrous, and exploratory are a few that come to mind.

Our first stop was Sarajevo, the capital and largest city in Bosnia and Herzegovina. The striking setting of the city was unique. Surrounded on all sides by verdant, dramatically ascending mountains, we realized that they were both a blessing and a curse during the three-year Balkan War that began in 1992. We were struck by the glaring evidence of the ravages of war on the buildings we passed on our way into town. Bosnia and Herzegovina was the hardest hit and the toll on the population was enormous.

Amidst the tragedy of the recent history, we found a small but vibrant, proud and committed Jewish community. We spent Shabbat together and celebrated a Shabbat service in their beautiful synagogue and community center, where we ate and were entertained by the voices of their fabulous choir. It was inspiring to see how determined this small community of 1,100 is to maintain their commitment to Judaism under ongoing difficult circumstances.

We learned that the city's enormous pride rested in owning and protecting the *Sarajevo Haggadah* for centuries through the many periods of turmoil in that region. It was explained that it was under four layers of security designed to ensure that no one person could walk away with it. BGU's Prof. Katrin Kogman-Appel, an expert in the haggadah's illuminations, accompanied us into the National Museum which has been shuttered for a year due to lack of funds and political wrangling. Because of the extreme security, we were able to enter the "holy of holies," but allowed to only see a replica, disappointing but understandable.

We had the good fortune to be accompanied throughout our trip by Dr. Eliezer Papo, head of the Sephardic Studies Research Institute at BGU, a brilliant and talented academic as well as an exciting human being. He regaled us non-stop with stories of his earliest days as a resident of Sarajevo, and each day of the 11-day trip, he continued to be informal and accessible to the group. His energy infused the participants to the point that we all felt like "Eli Papo groupies."

Our second stop was Dubrovnik, Croatia. Surrounded by centuries-old

city walls and situated on the turquoise waters of the Adriatic, the setting is one of the most beautiful in the world. The Jewish community, numbering about 100 members, maintains a small but intimate and handsome synagogue that can be found up a flight of stairs on a narrow street off the city's main promenade. We thoroughly enjoyed our resident tour guide, a lovely young man who had made *aliyah* and then decided to return to his homeland and work to keep the small Jewish community alive. We all admired his perseverance, courage and charm.

After a quick trip to Montenegro, we traveled to Split, Croatia and toured the imposing Palace of Diocletian, one of the last Roman emperors.

We think we can speak for all the participants who joined AABGU on this tour that it was a not-to-be-missed trip, masterfully organized and intensely educational. The collegiality among the members was memorable and the knowledge of the accompanying BGU faculty simply stunning.

We consider ourselves well-traveled and yet we would not miss an AABGU-led tour. If you want to experience an extraordinary trip and learning adventure, join us on AABGU's next tour in 2016. ■

**FOR SISTERS** Donna Weiss Lam (sitting) and Rochelle Handy, supporting BGU is a family affair.

Enthusiasm for Ben-Gurion University began with their parents, Anita and Henry Weiss ז"ל. As Donna tells it, about eleven years ago, her father's accountant told him that his business—owning and managing affordable housing in the Los Angeles area—was doing very nicely. And he would do well to think about a charitable donation because his finances would allow for it.

"Never could you see a more excited man!" Donna recalls. "His two life passions were real estate and Israel." Until then, her father had been a loyal, but modest, contributor to AABGU for 15 years. "Immediately, he went to a building in LA that houses Jewish charities and found AABGU. He believed Israel's future was in the Negev and he was so in synch with BGU and its vision."

Henry Weiss learned that funding for nanotechnology was then the University's biggest need. "He was interested in science and this resonated with him on many levels. It was a needed, cutting-edge project he could be part of," Donna says. "He believed nanotech and high-tech would help put BGU on the map—and we already see that happening."

In 2006, the Henry and Anita Weiss Family Building for Advanced Research and the Weiss Family Laboratory for Nanoscale Systems were dedicated on the Marcus Family Campus. Donna and her husband, Cantor Nathan Lam, and Rochelle and her husband, Bill Handy, then became involved in the University and AABGU.

"AABGU did a fabulous job of sharing everything with us and making it a family affair," Rochelle says. "Whenever someone from the University spoke at a meeting, everyone was invited and it was always inspiring. It was a wonderful way to work with your family and keep the dialogue going. The more we found out about BGU the prouder we felt to be associated with it. You see so much progress, so many things they do for Israel and the world."

At the same time as the dedication, BGU surprised Henry, surrounded by his family, with an honorary doctorate. "The University was so much more than we expected. It was awe inspiring," Rochelle says. "It's still young and growing, so we're proud to be involved.



**DONNA WEISS LAM AND ROCHELLE HANDY**  
LOS ANGELES, CALIFORNIA

## IT'S ALL IN THE FAMILY

It gives our family the opportunity to grow with the University."

Henry and Anita later pledged additional funding for nanotechnology, but the trip for the dedication was Henry's last to Israel and the memories are particularly special to the family.

The younger generation is assuming the mantle. In 2011, Donna joined AABGU's board of directors. The following year so did Bill Handy, Rochelle's husband. Donna's son, Michael, became an AABGU Zin Fellow this past year. Rochelle's son, Alex, hopes to join the young leadership development program.

"We're carrying on Henry and Anita's dream and the next generation is quite secure, as well," Donna says. "You can't coerce or orchestrate young people's interest. Children learn what they live. The truth of what they see just resonates and it's exciting to be part of watching something important grow."

Donna, Rochelle and their brother, Jeffrey, partner to run the real estate business founded by their father. The sisters each manage one of the two offices in the Los Angeles area and Jeffrey deals with issues in the field. "We're trying to grow the business, too, as a legacy for the family," Donna notes. "We're very much engaged in carrying on the two passions of our father's life."

The family contributions were recognized with a special ceremony on campus inaugurating the new President's Pillars this past May. Seeing her parents' names on the pillars was a revelation for Donna. "It was a moment where we really understood the magnitude of what our family has done. And that we're part of that. It took my breath away and made the importance very concrete. Things can be bigger than you ever imagine and have a resonating effect."

Donna feels a special mission in participating on the AABGU board. "I want to find ways to share BGU and let more people know about it."

This past summer, she and her husband led a group to Israel and took 40 people to BGU. "Most of them said it was the highlight of their trip. They were so proud to see where the future of the country lies. And we were all blown away by the demonstrations of what you can do with nanotech!" ■

**TONI YOUNG** became acquainted with Southern Israel about 15 years ago. She was instrumental in creating a partnership between Arad, a Negev development town, and her home state of Delaware. “The first time I saw Arad I fell in love with it,” she says.

Established in 1962, Arad was a planned community intended to become the gateway to the Negev. However, it failed to attract the large population envisioned.

Stuart, of blessed memory, was drawn in by Toni’s enthusiasm and became equally engaged. “It’s such a beautiful, expansive place. It still has such potential. Anything we can do to give it a boost, we’re interested in,” said Stuart, just a few weeks before his untimely passing.

The region’s issues became an abiding passion for the Youngs and they actively participated in the Negev Coalition when it was established in 2006. “On my trips to Israel, I saw that the engine driving the Negev was BGU,” Toni recounts. “It’s a magnet. And it’s uniquely important—created not just to provide a great education, but to help develop the Negev.

“So our interests in education, cultural development and the Negev all came together.”

Stuart was at that time still engaged in his legal practice, and Toni became active in AABGU. She joined the board in 2011. This September, she was elected a vice president.

Toni appreciates that while BGU excels in the sciences, it is equally committed to the liberal arts. “Literature is a wonderful way to understand people and if more people knew the literature, they would understand Israel better.”

Recently, an intriguing idea emerged. “The University was looking for a place for a community literature program and knew of our involvement with Arad and that we wanted to bring people there to see what a wonderful community it is. And Amos Oz [renowned Israeli author and BGU professor emeritus] lived in Arad until recently and often describes how the desert inspires him. So there was a wonderful confluence.”

The Amos Oz Literature and Cultural Initiative was born. With the Youngs’ generous support, an annual conference on literature and culture with a special creative writing seminar will be held in Arad. The multi-year program will enrich the community’s engagement with literature and



TONI AND STUART B. YOUNG  
WILMINGTON, DELAWARE

## A PASSIONATE ENGAGEMENT WITH THE NEGEV

culture by offering opportunities for the area’s young people, and providing a forum for faculty and students to connect with the town and region. A seminar series will encourage residents’ interest in literature and foster connections with the University.

BGU will also award an Amos Oz Prize for outstanding writing to both students of Hebrew literature at the University and to promising young writers from Arad’s local schools. BGU’s Department of Hebrew Literature and *Heksberim*: The Research Institute for the Study of Jewish and Israeli Literature and Culture will implement the programs.

Toni is committed to a daunting array of good causes reflecting her interests in the arts, history, education, and Israel. Stuart was, as well.

He served as a member of the board of governors of Bezalel Academy of Art and Design in Jerusalem, and as chairman of the Delaware State Arts Council and the Delaware College of Art and Design.

Toni serves on boards that include the Delaware Historical Society, Goucher College, *Sheatufim* (the Israel Center for Civil Society), and

American Friends of NATAL (Israel Trauma Center for Victims of Terror and War). She has also served as a vice chair of United Jewish Communities, and was the first woman president of the Jewish Federation of Delaware.

Toni, a historian and author, is now writing a new book that will be more personal than her previous work. These include *Becoming American, Remaining Jewish: The Story of Wilmington Delaware's First Jewish Community* and *The Grand Experience: A History of the Grand Opera House*.

The Youngs have always been passionate about philanthropy. Toni believes that “society can’t pay for all the important things that need to be done. You have to contribute and volunteer. It doesn’t have to be on a major level. On trips I lead, I like to show people what a difference even a small gift can make.”

Stuart agreed. “When you have a passion and ask people to contribute, they hear you, understand and get involved. But it’s always best to see what giving produces: to see how a child’s life is changed, to see a building and what’s inside.”

Stuart B. Young will be sorely missed. May his memory bring blessings to Toni and all who mourn his loss. ■

# THE ABC CENTER INSPIRES INTERDISCIPLINARY ROBOTICS RESEARCH

**ROBOTS ARE RAPIDLY COMING** closer to playing integral roles in our lives. In less than 10 years, they may monitor our health, treat disease, find the lost, assume major defense roles, allow paralyzed people to move, take care of crops, make and bring us our morning coffee, and help with children, the elderly and the infirm.

But before these dazzling possibilities are achieved, a host of problems ranging from basic science to practical applications remain to be solved. Useful robots need to see, hear, understand, analyze, and respond. They must be able to move and speak in a natural manner and manipulate objects. They must learn, adapt to changing situations and interface comfortably and intuitively with humans.

Most challenging of all, they must be reliable and inexpensive.

Research institutions worldwide are working on the huge array of scientific and practical challenges. And because Ben-Gurion University of the Negev had a strong core competency in robotics research, three years ago, BGU leaders chose

robotics as a key research focus. With support from the Leona M. and Harold B. Helmsley Charitable Trust, the Agricultural, Biological and Cognitive (ABC) Robotics Center was established.

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**“We assembled a committee of leading researchers from across campus to look at research trends and set goals...We want the teams to spark new ideas and research directions.”**

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— PROF. Yael EDAN

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Already leaders of robotics research in Israel, BGU scientists and administrators envisioned a center of excellence in an important scientific realm. They saw in robotics a special opportunity for Israel: The small country might once again take the world by storm as it did in the 1980s, when it shot to the forefront in electronics and computer science.

## An Unconventional Plan

“We had to think it through,” says Prof. Yael Edan, ABC Center’s director and member of the Department of Industrial Engineering and Management. “We knew we had already accomplished specific advances in agricultural, biological and cognitive robotics. We assembled a committee of leading researchers from across campus—from psychology, computer science, neuroscience, engineering, and more—to look at research trends and set goals.”

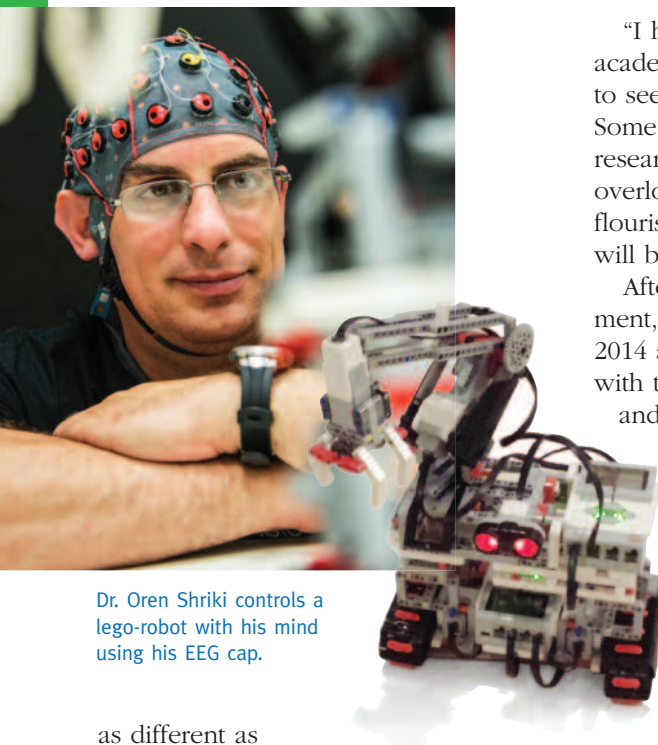
The group decided to recruit several new faculty members to strengthen capabilities in cognitive sciences and biomedical research. New critical equipment was purchased and a guiding imperative to foster new collaborations was established. Robotics’ complexity calls for interdisciplinary research.

The Center brings together senior and junior researchers from disciplines

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**Top Photo:** This robot was inspired by animal movement. The goal: improved ability to traverse varied terrain.



Dr. Oren Shriki controls a lego-robot with his mind using his EEG cap.

as different as biopsychology and computer science, engineering and neuroscience. “We want the teams to spark new ideas and research directions,” Edan explains.

To accomplish this, ABC offers support to new startup projects that include faculty from different disciplines who have never worked together. In order to ensure a sustainable program, each group is obliged to compete for grant funding from agencies such as the Israel Science Foundation, the U.S.-Israel Binational Science Foundation and the EU’s Horizon 2020.

“We then moved to a bottom-up procedure and asked researchers to come up with new ideas—not more of the same—and form new groups,” Edan says. “They met and wrote proposals. We invited a steering committee of prestigious robotics researchers from around the world to come hear their ideas and give feedback. They were very impressed.”

In some cases, competitive outside funding has already been obtained for various projects that include engineers, psychologists, linguists, biologists, educators, and medical personnel.

“I hope we’re setting a model in academics,” Edan says. “It’s exciting to see how things start to evolve. Some of our older, very prominent researchers are involved despite their overload. Young researchers are flourishing with strong support, which will be critical to them and the field.”

After intense planning and recruitment, the Center launched in April 2014 and work on projects intensified with the fall semester arrival of Ph.D. and postdoctoral students, many of whom were recruited for specific labs. A sampling of new projects follows.

### MEETING OF THE MINDS—ROBOT AND HUMAN

Dr. Oren Shriki is among three new faculty members.

Like many robotics specialists his background is unusual. He studied physics and obtained a Ph.D. in computational neuroscience. He taught physics, brain sciences and robotics to talented high school students and worked for a time in industry. But the pull of research brought him back to academia and he found BGU an ideal place to pursue his own interests and find collaborators.

“Something very unique about BGU is that it combines everything on one campus—the social sciences, the exact sciences, engineering, psychology, a hospital.”

Dr. Shriki is principal investigator of the Computational Psychiatry Lab in the Department of Cognitive and Brain Sciences. He studies the neurobiology

of mental illness, and applying his expertise to robotics, focuses on brain-computer interface (BCI).

“It’s about finding the best solutions for the brain to communicate naturally with computers,” he explains. “The aim is to have our intentions read from the brain activity and transferred to certain devices. Impaired people with ‘locked-in’ conditions like ALS, or who are recovering from stroke, could gain the ability to communicate with and control devices in a natural way. At the same time we can also learn much about the brain, how it represents information and how it learns new skills.”

In collaboration with cognitive neuroscientist and fellow-new-recruit Dr. Lior Shmuelof, who runs the Brain and Action Lab, Shriki is beginning to gain new insights into BCI. “We want to develop new approaches to read intentions from the brain and better understand the learning processes involved.

“Computers can learn to read human subjects via different algorithms, and can be trained to improve the readout. At the same time, the subject can be trained to provide for a better readout by





Prof. Yael Edan, ABC Center director (left in orange shirt), and research students with vineyard sprayer enhanced by autonomous navigation.

modifying his or her own brain activity—controlling the brainwaves to some extent—to make it easy for the computer. It's a mutual learning process."

In one set of experiments, a subject's brain activity is analyzed in real time as he sends commands to control a device, such as a robotic arm. The activity is detected by an EEG (electroencephalogram) system, which precisely measures the brain's electrical activity by electrodes attached to the scalp.

The team aims to construct a "closed-loop" learning system in which the human and robotic learning systems support each other. This setup will serve to explore the relative contributions of human and machine learning and examine how to optimize the mutual learning process.

Shriki is also enthusiastic about robots' potential to be useful in everyday life. "How can you tell a robot to bring you a glass of water, have the robot ask which glass to select and communicate your choice?"

A student monitors a robotic workstation in BGU's Integrated Manufacturing Technologies Lab.

How can the robot learn your preference? Can the robot identify your mood and act appropriately?" In another ABC study, together with investigators from human factors engineering, computer science and psychology, Shriki explores aspects of human-robot interaction to address such questions.

"This is what I love about robotics," he says. "You must make something that actually works. And this leads to breakthroughs."

## UNDERSTANDING HOW WE LEARN AND MOVE

Dr. Lior Shmuelof is based in the Department of Cognitive and Brain Sciences. He is a motor control specialist with a background in biology, psychology and neurobiology. Dr. Shmuelof was drawn to BGU by its established strength in motor control and motor skill learning and the new ABC Center.

"The ABC Center makes us sit together and think about working together. I'm collaborating in a few different exciting directions."

With Dr. Oren Shriki, he studies the brain patterns of human movement in closely calibrated experiments. "We're still at the beginning of understanding how we control very basic movement," he observes. As in many areas of robotics research, scientists work to better understand human minds and bodies so the knowledge can be applied to robots.

One set of investigations uses a newly purchased split-tread treadmill; each side moves at a different speed, requiring the user to learn how to walk in a different way. The brain patterns involved in this kind of learning can be examined

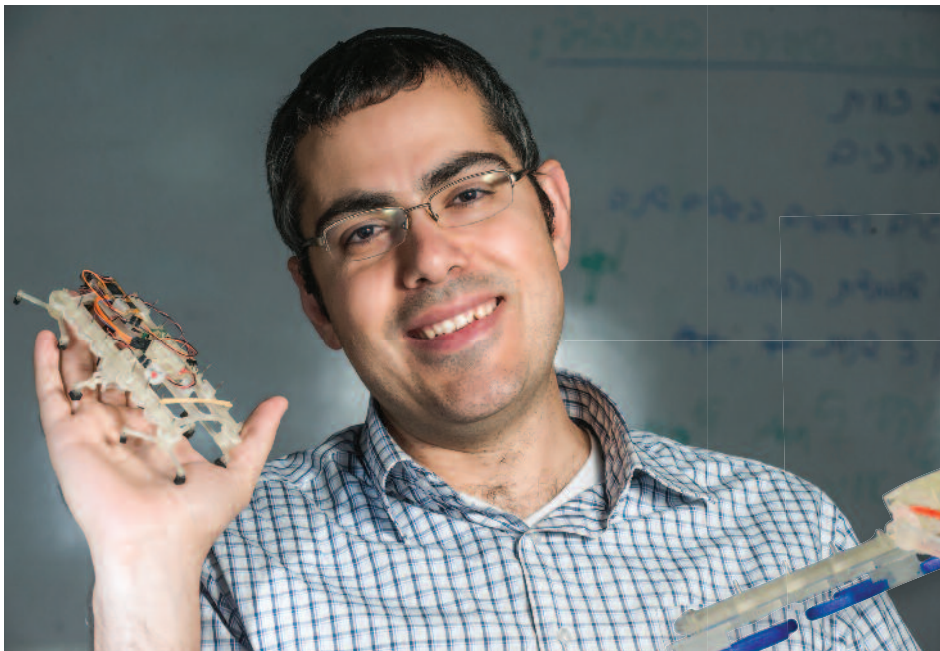


Ph.D student Efi Vitzrabin with a robot that detects the ripeness of crops, such as a pepper, and picks it from the plant without damaging the crop.

with fMRI (functional magnetic resonance imaging).

"We're asking how brain connectivity changes after what is learned on the split-tread perturbation. How do different ways of learning, such as learning from errors and learning from rewards, affect the way that someone executes and retains a movement after a stroke? How can we improve the retention and the generalization of what we learn?"

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Dr. David Zarrouk and his STAR—Sprawl Tuned Autonomous Robot. Inspired by the cockroach, it's a fast, stable robot only 11 centimeters tall.

On the split-tread treadmill, a person gradually learns to move his legs at different speeds. But when he walks on regular ground, what he learned is erased and he has to re-learn it in the lab.”

Contrary to expectation, however, Shmuelof was recently surprised to find that right after using the treadmill, some echo remained in the subject’s neuro circuitry. “Now we can ask better questions about what changes take place in the brain after learning.”

The research applies both to devising better rehab strategies and to robotics, a new field for Shmuelof. More insight into how people learn, he believes, can lead to new learning models, better human-computer interfaces, and stable walking—for both humans and robots.



Dr. Lior Shmuelof

### ROBOTS THAT CRAWL EVERYWHERE

Dr. David Zarrouk shares that he was one of those kids who broke his mechanical toys to figure out how they work and then build something else from the parts. With degrees in mechanical engineering specializing in robotics, today he does much the same thing as head of the Bio Inspired and Medical Robotics Laboratory in BGU’s Department of Mechanical Engineering.

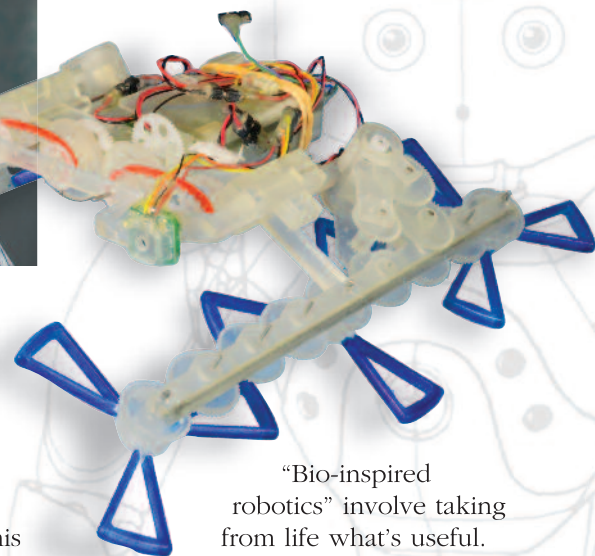
“The ABC Center came just at the right time for me,” he says. “It’s my dream job. I can work on both kinds of robotics I’m interested in—‘outdoor’ robots and medical robotics.

It takes a lot of collaboration and ABC helps us find the people to collaborate with.”

He works with computer scientists, biomedical engineers, biologists, other robot researchers, and medical

specialists at Soroka University Medical Center.

To create outdoor robots that “can go anywhere,” Dr. Zarrouk says, “I first define the problem. I try to think of my own solution and compare it to what others did.” The work includes mechanical design, modeling, simulation, and experiments. “I try to build robots more intelligently—meaning lighter, simpler, more efficient.”



“Bio-inspired robotics” involve taking from life what’s useful.

This was the genesis of his STAR (sprawl tuned autonomous robot), which mimics the cockroach in terms of number of legs and ability to flatten. But unlike the cockroach’s legs, STAR’s rotate.

An ultra-high resolution 3D printer is one of the new tools that radically speeds up experiments. “Design takes a long time but you can make a prototype very quickly,” Zarrouk says. “And you can make lots of revisions very fast.”

At BGU, Zarrouk is pushing further ahead on his earlier work at UC Berkeley, making small, lightweight robots that can be used for search and rescue, agriculture, excavation, defense, nature exploration, and more: “For search and rescue missions you can send hundreds of small robots out in a large area to find someone quickly, and if they’re cheap it’s not so bad if some don’t come back—one-time use is okay.”

Most robots are remotely controlled and can act independently only for short periods of time and in specific locations. In Zarrouk's view, this situation will persist. But new, small, intelligent controllers, and very small sensors that enable robots to see, will make it possible to build ever-smaller and more capable robots.

One goal for medical robotics is to produce minimally invasive robots that can go through the biological vessels without causing harm. "To have them travel inside the body, crawling or pushed by a manipulator through three to four millimeter vessels—I think we can do that. We're developing new mechanisms and are in the early proof of concept stage, asking: Is this a good idea? Will it work? Then we might start building something real to use with animals, then humans. So give it five to 10 years."

Robot building is anything but routine, Zarrouk says. "I try to build novel mechanisms and the results are often surprising. I often hear that a concept won't work and I should try something else. But I don't give up gracefully." A recent source of pride is a "single actuator" robot able to turn, despite having only one motor—a feat generally thought to be mechanically impossible.

Zarrouk has a vision. "I hope to help change people's lives—help them when they're in trouble, make life much easier with medical robots that can see diseases, deliver drugs, do biopsies. If they're simple and do no harm, doctors will use them."

He is happy to be in a position to contribute.

"BGU is an excellent place for me. And it's doing an excellent job promoting robotics here at the University and in Israel. We can collaborate and expand upon each other's skills. The people are very, very good here—we have a great team."

## BUILDING EARS FOR ROBOTS

Prof. Boaz Rafaely directs the Acoustics Lab in the Department of Electrical and Computer Engineering and is deputy dean of the Faculty of Engineering Sciences. A few years ago he realized that the acoustics research he and his colleagues undertake applies to robotics.

**"I hope to help change people's lives—help them when they're in trouble, make life much easier with medical robots."**

— DR. DAVID ZARROUK

Together with Dr. Patrick Naylor from Imperial College, London, he conceived a project to improve the hearing ability of robots. ABC enabled them to spearhead a team of international experts, and the group obtained funding for EARS (Embodied Audition for Robots) with a highly competitive EU grant.

"In robotics, the main focus seems to be on motion and vision, but audition lags behind," Rafaely explains.

"We want to develop better audition for robots so communication is possible and natural under real conditions."

This student works to improve human-robot collaboration and autonomous mobility control.

The challenges are familiar to people who depend on hearing aids. The presence of many people, noise and reverberation make it hard to hear and interpret sound. "Hearing is the first step in communication. We have to solve those problems and integrate hearing into the robot's overall action: moving its head, looking at the person and starting an interaction."

Rafaely's group focuses on sensing. The research includes microphone design and arrangement; signal processing; incorporation of movement and environment scanning; calibration between cameras and microphones; and connecting these to all tasks. They will be using a robot named Nao (pronounced "Now," he is pictured on the cover), created by Aldebaran Robotics. Concrete results are anticipated within the three years of the grant period, and because the team includes a leading robot manufacturer, results may quickly translate to application.

The intended prototype: a meet-and-greet robot for lobbies. ■

To learn more about BGU's robotic research, visit [www.aabgu.org/robotics](http://www.aabgu.org/robotics)



# THE BGU ENERGY INITIATIVE: LEADING THE WAY IN ALTERNATIVE ENERGY RESEARCH

**THE WORLD'S USE OF FOSSIL** fuels is not going away any time soon. But everyone knows that this limited and unclean resource must be replaced or supplemented in the future. What that future looks like depends on the new technologies being developed, and may, in fact, include a variety of alternative energies.

At Ben-Gurion University of the Negev, dozens of labs are examining all sorts of alternatives: solar, biofuels, wind, nuclear, hydrogen, thermal, and more. BGU's strength in these fields has garnished many prestigious government and industry grants.

The work ranges from designing alternative fuels and sources of electricity to conservation strategies, energy policy and building for desert climates. Some avenues, such as solar energy, have been explored at the University since the early 1980s. Others became possible far more recently with equipment, materials and processes that were scarcely imagined a decade ago, and by the recruitment of expert scientists in those fields.

This special section of *Impact*

introduces some of the faculty members who are working on the energy future. Only a sampling is represented, and all the researchers stress the collaborative nature of their work through partnerships at BGU and around the world.

Much of the research moves forward incrementally. But breakthroughs can occur sooner than expected because today, experiments can be done

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**“We’re BGU, so we bring basic research as well as applied technology to the table.”**

— PROF. MOTI HERSKOWITZ

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much faster with new methods and instrumentation. In many areas, practical applications may precede scientific understanding. When new materials are invented or analyzed, for example, the mechanics may be accomplished and the researchers then try to understand the basic science of why a process worked.

To its strengths in cross-disciplinary collaboration, the University adds a mix of experienced investigators and highly committed new ones to its energy initiative, plus another special element: “We’re BGU, so we bring basic research as well as applied technology to the table,” says Prof. Moti Herskowitz, who formerly headed BGU’s Research and Development Authority, and is himself developing a hydrogen-based alternative fuel process that he says will revolutionize the jet fuel industry in five to 10 years.

“We’re very optimistic and very practical.”

## CHASING THE SUN: ADVANCING SOLAR ENERGY CAPABILITIES

“We started at the real ground floor,” Prof. Eugene Katz recalls in talking about solar energy research at BGU 20 years ago. “We worked out of shacks in a terribly dusty environment without a clean room or good air conditioning.”

The Israeli government established the Ben-Gurion National Solar Center as a testing lab in 1985, but in 1991 it became part of BGU’s Jacob Blaustein

**Top Photo:** Concentrating solar collectors designed by the Solar Energy Center’s staff for a California start-up company.

Institutes for Desert Research. The Sede Boquer site offers a dry climate, clear skies and open space in the center of the Negev arid zone, and has proved to be an optimal location for solar experiments. Impressive progress was achieved in solar technology, including the design of more efficient solar panels.

Today, the Solar Energy Center and BGU's Alexandre Yersin Department of Solar Energy and Environmental Physics occupy a brand new two-story building with well-equipped labs, an expanded staff and modern equipment that facilitates more sophisticated research in basic and applied science. And, it possesses an unusual feature that extends the Center's established role as a test site for new materials.

"We have the unique capability of bringing sunlight into the lab and concentrating it to the most extreme levels nature allows," says Prof. Daniel



Prof. Jeffrey Gordon with a high-temperature, high-concentration solar furnace for the synthesis of novel nano-materials

Feuermann, a mechanical engineer specializing in optics who heads the Center and the Alexandre Yersin Department. "So we do a number of projects where light needs to be manipulated or modified, such as evaluating materials for solar industries. And the system also enables us to do

Prof. Eugene Katz with organic photovoltaic cells (OPV) printed on plastic, with a large paraboloidal solar dish in the background. He is a member of the National Solar Energy Center, the Yersin Department and the Ilse Katz Institute for Nanoscale Science and Technology. He participates in two EU groups developing OPV cells.

basic research to try to make new materials that never existed in nature."

Prof. Feuermann works on a number of projects with Prof. Eugene Katz, a physicist with a background in semiconductors. One major collaborative effort is to study photovoltaic conversion under very high concentration of sunlight. "We look at photovoltaics [solar cells] to see how they work, to study their properties," Feuermann says. "They are delicate special things and the detailed physics happening in them is not well understood. To improve their efficiency we need to understand exactly the physical phenomena occurring during irradiation."

Another research effort is to improve the stability of organic photovoltaic cells (OPV). These devices convert solar energy to electricity using carbon nanomaterials in combination with conducting polymers, rather than silicon, upon which solar panels are customarily based. Katz collaborates on this with Dr. Iris Visoly-Fisher, one of the Center's newest members.

"Recently, considerable progress has been achieved in improving the efficiency of OPV," says Katz, "which can make solar energy very cheap and easy to manufacture. OPV production doesn't need expensive semiconductor technologies and you can just print your solar device or, in the future, buy a bottle of OPV dye and make it yourself. The main problem is that the material is not stable. We investigate the mechanisms of degradation and try to understand them."

The silicon-based solar cells, now commonly used to convert light to electricity, have a lifespan of 25 years. When the team began working with OPV cells they lasted only a few days. "Now we can keep them working for a year or two and have raised their



efficiency to 11 percent [six to seven percent is required to produce electricity economically]," says Feuermann.

Katz and Visoly-Fisher represent Israel in "StableNextSol," a highly interdisciplinary European network of academic and industry researchers collaborating to develop more stable OPVs that reach lifetimes longer than 20 years.

## Channeling the sun to create new materials

A growing focus for the Center is developing novel materials.

"The best way to create nanoparticles, extremely small pieces of solid material that are a few to tens of nanometers in diameter with different unique shapes, is with very high concentrations of solar energy and at high temperatures," Feuermann says. "We have that unusual capability."

The lab houses a solar furnace that uses a heliostat—a mirror device—to channel sunlight coming directly into the building. An optical system concentrates it up to 30,000 times the normal intensity of direct solar radiation with a highly uniform quality. "We produce these interesting nanostructures as part of our basic science research. We won't know the applications until later."

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The solar furnace also makes the Center especially attractive for measuring solar devices and testing materials under concentrated sunlight for companies and research institutions all over the world.

Another problem the Center addresses is the loss of heat that occurs when solar heat absorbers radiate the energy back out during conversion of solar energy to electricity. Collaboratively with two other Israeli universities, the lab is working to reduce this loss through selective coatings that are excellent at absorbing solar radiation, and significantly reduce the thermal losses.

Much of the Center's research is done by computer simulation. "A theory and some equations to solve analytically or numerically—these are the basic tools," Feuermann explains. "We sit there and think. We take the basic laws of physics and try to apply them to radiation."

Feuermann and Katz are both optimistic about the future of solar energy. "There's no alternative," Katz says. "We use more and more electric power and there are the clean planet problems. Wind and water are limited. The sun is not, so it's logical to develop solar power."

### Solar energy challenges

But they are realistic about the obstacles. One is the supply and demand

factor. The enormous amount of fossil fuel coming now to the surface undermines interest in developing solar energy—as has happened periodically since the 1980s. Cheap products from China have reduced the incentive to commercialize solar panels in Israel and the United States in the past, and threaten to do so again.

"For me, the future is a strong motivation for this research," Feuermann says. "Even if for 100 years we don't feel the problems—the need for more fuel to produce electricity and the effects of climate warming—fossil fuel is finite and will become more and more expensive while the environment is irreversibly damaged."

The second very significant challenge is technical; a good and economical system for storing solar energy does not yet exist. "We are very near the goal of efficient solar cells that produce electricity at reasonable cost per kilowatt hour," Katz says. "The bottleneck is that you need very good electric storage. Batteries now are still expensive, and not stable or efficient."

Feuermann observes that solar installations in the U.S., England, Germany and other countries are growing, "but at a certain point, you can't feed too much energy into the grid without the storage capacity. Renewable energy can't support more than about 10 percent of the electrical supply without that."

Other scientists at the Center, notably Prof. Emeritus David Faiman, are working on the storage challenge. Faiman believes that if that can be

resolved, Israel could get 90 percent of its power from solar energy. Feuermann says

basic physics research may contribute some answers.

He finds his work with

nanomaterials especially exciting.

"Fifteen years ago I wouldn't have thought of working on nanotechnology. But in basic science you start with one thing and end up with another. We let ourselves be guided by the experiments we do. We try things and they work; then we have to understand why."

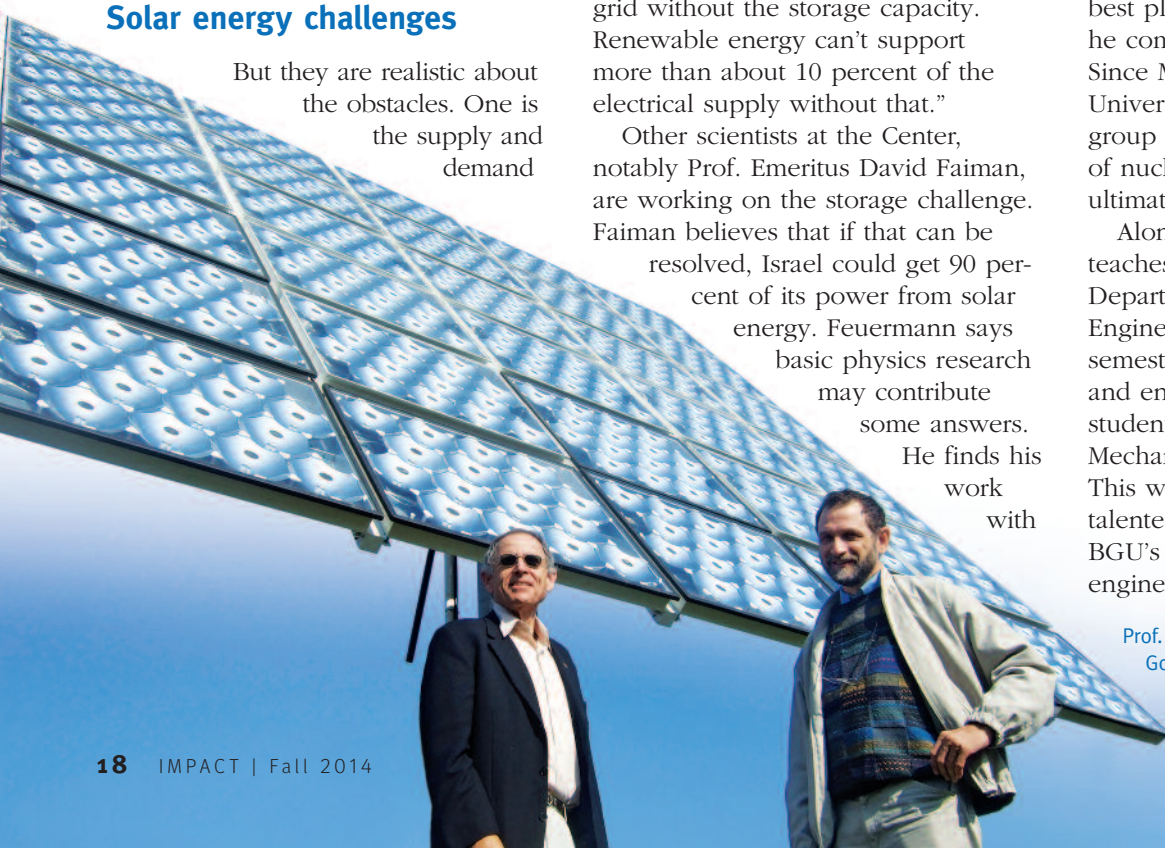
## DESIGNING TOMORROW'S NUCLEAR ENERGY RESOURCES

Dr. Erez Gilad's career as a specialist in nuclear reactor physics wasn't planned: "It just happened." He studied physics at BGU as an undergraduate and continued for Ph.D. studies, investigating complex ecological systems. During his postdoctoral studies, Gilad discovered the world of complex networks, and at the University of London, researched the spreading of viruses and rumors on social networks.

He moved on to work as a senior physicist at the Israel Atomic Energy Commission (IAEC), but after five years, realized he missed doing pure academic research. Believing that the best place for this is in a university, he competed for a position at BGU. Since March of 2014, he has led the University's nuclear energy research group and specializes in the physics of nuclear reactors—perhaps the ultimate complex system.

Along with his research, Gilad teaches graduate level courses in the Departments of Nuclear and Energy Engineering, and beginning this semester, heads a new nuclear science and engineering track for advanced students in the Departments of Mechanical and Chemical Engineering. This will accelerate the recruitment of talented graduate students to support BGU's nuclear reactor physics and engineering research.

Prof. Daniel Feuermann (right) and Prof. Jeffrey Gordon collaborated on developing the optics for the solar collector shown.

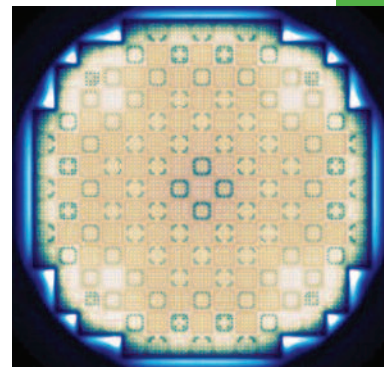
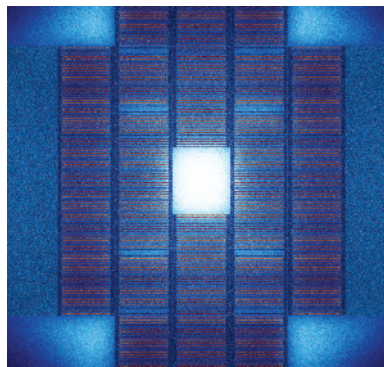
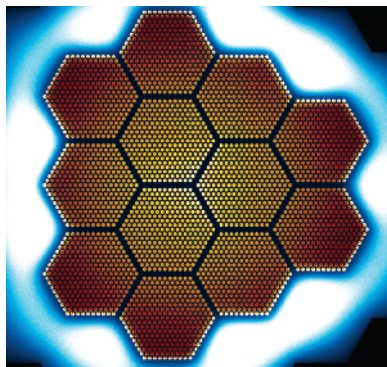


The basic nuclear fission chain reaction process is simple, Gilad explains. A reactor core is loaded with a large amount of fissile material, like uranium or plutonium (in the form of fuel rods). When a neutron (a subatomic particle) is introduced into the reactor core, it hits a fissile atom, splitting its nucleus into two lighter fragments. During this process, an additional two or three neutrons are released, which in turn induce additional fissions, and so on. The amount of fissile material required to self-sustain such a chain reaction is defined as the critical mass.

“But the faster the neutron travels, the less chance it has to split another atom. This isn’t an intuitive behavior but it is how nature works,” Gilad says. So most nuclear reactors employ the basic neutron lifecycle, where fast and energetic neutrons are produced through fission, then are slowed down by a moderator, such as water or graphite. “It is the physical characteristics of this chain reaction that we study,” he says.

“A single fission generates a small amount of energy—just enough to light a standard 40W lightbulb for a picosecond ( $10^{-12}$  second), but so many are happening and the density of atoms is so high that it can generate a great deal of energy. The energy stored in a single cubic centimeter of U235 can supply the energy demands of an average person in the United States for more than five years. This is a unique characteristic of nuclear energy that we exploit for electricity.

“A self-sustained fission chain reaction is achieved through a delicate balance between the production and loss of neutrons. This balance depends on many physical properties of the reactor core, which affect the neutrons’ interactions with matter and eventually the neutron population in the core. We always aim to make this chain reaction more predictable,



Geometric representations of reactor core configurations showing the spatial distribution of thermal neutron flux, in cold shades, and the relative fission rate (power) distribution in hot shades. Bright and dark colors indicate high and low values, respectively.

controllable and safe.”

If more fuel is added to the core, more neutrons will be produced than lost, and consequently the neutron population will grow exponentially. This state is called a supercritical state, which is how a reactor starts up and is potentially dangerous. On the other hand, if neutron absorbing materials, such as boron or hafnium, are introduced into the reactor core, more

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**“The energy stored in a single cubic centimeter of U235 can supply the energy demands of an average person in the United States for more than five years.”**

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— DR. EREZ GILAD

neutrons are lost than produced and the neutron population will decay exponentially. This state is called a subcritical state, which is how a reactor is shut down.

“A supercritical state is usually triggered by a human decision or an accident,” Gilad explains. “We focus mainly on safety-related studies.”

The goal of safety design is to ensure that small perturbations to the reactor core when in critical state are suppressed and the chain reaction remains under control. “This is achieved by the existence of negative

feedbacks,” Gilad says. “When designing a core, we think of the most probable and potentially devastating scenarios that can perturb the core and make sure that the appropriate negative feedback effects are triggered, such as restoring the reactor core to critical state or enabling it to be shut down safely. This has been a key issue since the nuclear energy era began.”

It’s even more important with the newest designs of “future reactors,” some of which have already been built. These “fast reactors” or “breeders” use different materials like plutonium, or a mix of uranium and plutonium, and do not incorporate moderators. They have a number of advantages, including the ability to produce more fuel than they consume and thus minimize radioactive waste. However, some negative feedbacks are much more difficult to achieve in these designs, which may compromise their safety. To mitigate this, some designs become highly complex.

“Our study looks at the physics governing the neutron population in the core. What exactly happens when the energy spectrum of neutrons in the core is changed? The physics of the process is not very well understood. The engineering solutions are very expensive and complicated. We largely use mathematical modeling to understand the reactions.”

While such problems can be solved, Gilad believes, “the biggest

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problem is public relations.” Twentieth century accidents at Three Mile Island and then Chernobyl brought nuclear energy development to a halt in the U.S. and elsewhere. More recently, new and safer designs promoted a “nuclear renaissance” until Japan’s Fukushima events of 2011 unfolded, in the wake of an earthquake and tsunami.

Despite the worst-case scenario, Gilad believes this “ancient” plant—designed, built and licensed in the late 1960s and poorly maintained by the utility—exhibited impressive resilience in terms of nuclear power plant safety: the reactors shut down, the melted fuel was contained and the estimated exposure of evacuees is likely to be below detectable levels.

Given today’s focus on cutting carbon emissions, Gilad is sure that “nuclear energy has a big future. There’s always a price to generating energy, whatever the source. Great efforts are continuously made by the international community to meet the scientific and operational challenges of radioactive waste management, and the state-of-the-art technology in this field is clean, safe, reliable, and mature.”

France currently derives more than 70 percent of its electricity from nuclear energy, Belgium, Slovakia and Hungary 50 percent, Ukraine and Sweden more than 40 percent, Korea, Finland and Switzerland 30 percent.

Gilad sees interest reviving in the United States and United Kingdom. But public distaste has left an unfortunate legacy. “There’s a very severe shortage of qualified engineers and scientists.

Dr. Erez Gilad

All over the world, the nuclear energy industry generation of 1960s-1970s is retiring, leaving huge knowledge gaps. For example, the U.S. no longer has the knowledge and capability to manufacture pressure vessels, which are currently manufactured in Korea, Japan and China.”



Prof. Armand Bettelheim

## WORKING FOR A HYDROGEN-FUELED BREAKTHROUGH

Prof. Eli Korin heads the Department of Chemical Engineering and partners with his colleague, Prof. Armand Bettelheim, to research electrochemical energy conversion pertaining to the photoelectrochemical production of hydrogen from water and its use in fuel cells.

Animating this unassuming description is a high-stakes goal: to split water to yield hydrogen for fuel. Researchers all over the world are working on the science and technologies to achieve this, because, Korin explains, it represents the best hope for a future based on renewable energy.

“Hydrogen is the most environmentally friendly fuel. With every other fuel you get undesirable components like carbon dioxide and poisonous materials, but hydrogen only leaves water. There are a lot of problems to solve, however, before we’re able to manufacture huge quantities of clean and inexpensive energy and store it for use when needed.”

The photoelectrochemical process, also known as artificial photosynthesis, mimics the natural one whereby plants convert light into chemical energy.

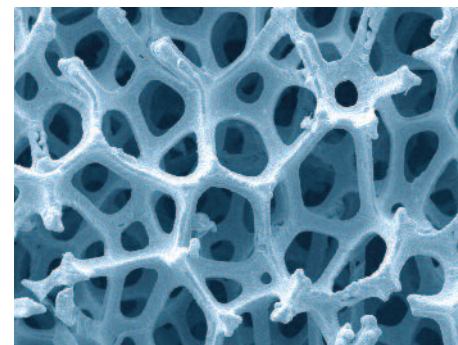


Prof. Eli Korin

Artificial photosynthesis converts solar energy into hydrogen by splitting water into hydrogen and oxygen, using simple principles of semiconductor electrochemistry.

“We are using the porous structure of iron foams,” Korin says, “which permits light penetration, and coating them with iron oxide as a catalytic layer to exploit them as photoanodes.

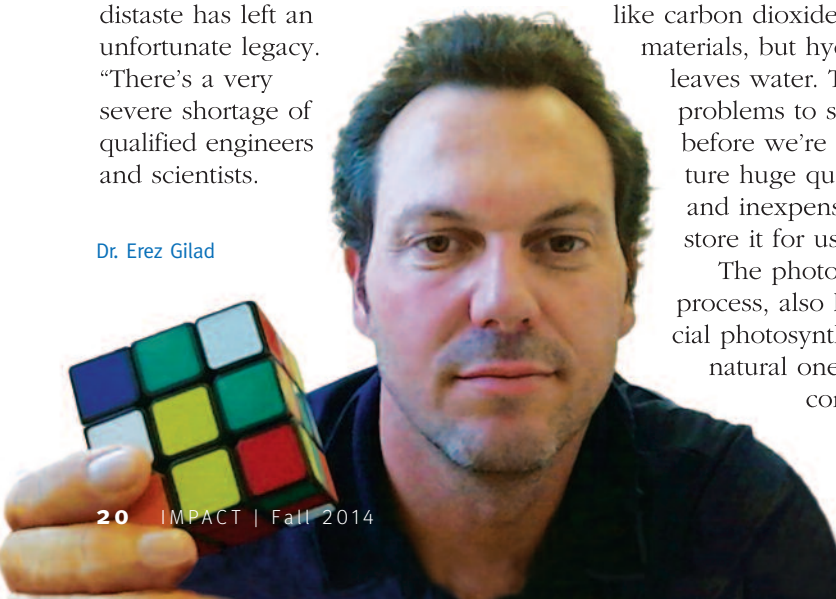
“The catalysts we’re developing are based on biomimetic molecules called metalloporphyrins. These interesting synthetic molecules have similar structural properties to hemoglobin, which transfers oxygen within living organisms. We expect that the incorporation



An image from a scanning electron microscope of macroporous iron foam, which Prof. Korin’s team treats with heat. This material may be used to create anodes for a process that splits water into hydrogen and oxygen.

of these molecules in the porous substrates is an important step toward developing simple, inexpensive, and large-scale hydrogen generation devices.” A similar approach is being adopted by the team in order to purify wastewater from organic contaminants.

Korin and Bettelheim envision a system in which hydrogen is produced by the photoelectrochemical process and transferred as a fuel to a fuel cell. However, given the current state of fuel cell technology, widespread commercialization of these



devices remains elusive. The team is working to improve the cells.

Fuel cells operate with a continuous supply of hydrogen to the anode, where it is oxidized, while oxygen (either pure or from air) is fed to the cathode where it is reduced. An electrolyte polymer membrane sandwiched between the two sides channels protons from the anode to the cathode. The cells provide efficient electrochemical energy conversion with only environmentally benign water emission.

The most important problem with these cells is high cost. Currently, the catalyst material used for both the anode and cathode is platinum, which is increasingly expensive. Moreover, since this catalyst is supported by carbon, stability issues arise because the carbon corrodes and platinum is poisoned by impurities. Together with collecting platinum particles, this corrosion can produce poisonous substances.

Korin's group is experimenting with a process that incorporates non-precious metal catalysts into conductive substrates, using simple preparation procedures followed by a thermal treatment. The result is an inexpensive, porous, foam-like catalytic fuel cell electrode. The lab is currently testing its performance.

The fuel cell's polymer membrane also offers room for improvement, Korin says. The usual membrane, Nafion, is commercially produced and has very good mechanical properties. "But it cannot be used at high temperatures because its conductivity depends on its water content. If the temperature goes up, water evaporates and activity goes down, making this a major disadvantage."

Korin's team is investigating a new kind of membrane. Its conductivity does not depend on water, but is based on ionic liquid. However, he notes, its mechanical properties must be improved compared to the currently available Nafion membrane. The group is experimenting with various additives to accomplish this.

Other recent projects the group is

involved in are the electrochemical conversion of natural gas into liquid methanol fuel and the capture of ozone-depleting carbon dioxide and its electrochemical reduction into useful fuels.

The basic research Korin's lab is developing promises applications for both big system energy production, like electrical stations, and smaller scale needs such as car engines. The team has collected impressive publication credits, grants and patents for its work thus far, but Korin doesn't underestimate the obstacles to creating, storing and using renewable energy.

"Twenty years ago it was predicted that fuel cells would be widely commercialized 'soon,' but it hasn't happened," he observes. "We have a long way to go in the science and the technology routes in order to achieve that."

## ELECTRIFYING YEAST AND SNAILS FOR MICRO POWER

Prof. Lital Alfonta came to BGU eight years ago with a personal vision: to combine her Ph.D. and postdoctoral work in bioelectronic chemistry and synthetic biotechnology. Many of her

lab's current projects, focusing on how to control the electrochemistry of microorganisms, depend on this unusual combination of skills.

The research may sound highly academic, but the long-range goals are practical: first, to create fuel cells made of bacteria or yeast that will remediate pollution or treat waste in highly efficient ways, and second, to create biofuel cells for implant in the

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**"We want to see if we can produce electricity from glucose levels in the blood. If so, a pacemaker could be self-fueled."**

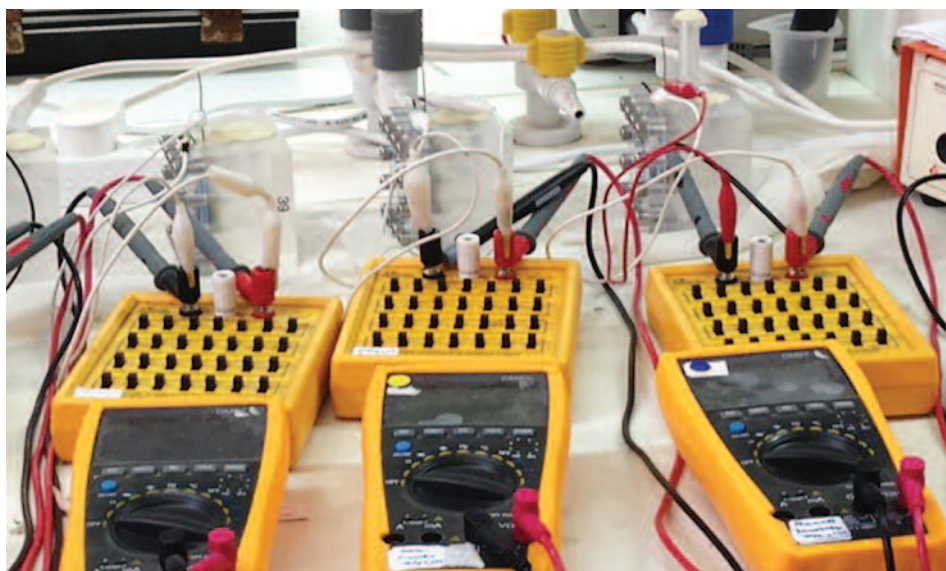
— PROF. LITAL ALFONTA

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body that operate on the glucose of the blood system.

Some experiments start with baker's yeast. "Instead of using it for baking, we genetically engineer the yeast cells to become electro-active. We force them to transfer electrons from one side to the other by plugging in engineered enzymes that are displayed on

*Continued on next page*



An array of biofuel cells using baker's yeast to generate electricity



Prof. Lital Alfonta and her husband and sometimes research partner, Prof. Michael Meijler, make beautiful chemistry together.

the yeast surface. We were the first team in the world to show that *E. coli* and yeast can be modified to do this.”

The biggest challenge, Alfonta explains, is “wiring” the yeast or bacteria cells to electrodes. This is achieved by the incorporation of amino acids that aren’t natural to the microorganism into the protein at a specific site. “It’s a system for hacking into the genetic code and encoding an unnatural trait not selected by evolution.”

Electrified bacteria cells may have a future in various environmental applications; for example, they might serve as catalysts for the energy source in devices to treat polluted water and domestic and industrial waste. When the basic science is accomplished and the system is optimized, working with environmental and electrical engineers will be the next step, Alfonta says.

Another application the lab works on is even more futuristic: micro-scale biofuel cells for implantation in the human body. “We want to see if we can produce electricity—and enough of it—from glucose levels in the blood. If so, a pacemaker or glucose-sensing device could be self-fueled by glucose to produce that energy.”

To prove the concept, she has worked with Prof. Evgeny Katz of

Clarkson University in New York to make “living batteries” of snails, and more recently, clams. Biocatalytic electrodes are implanted and electrical power, physiologically produced by glucose in the blood, is extracted and measured. “It worked very nicely,” Alfonta says. “And the snail was fine, and so were the clams—they were returned

to the stream they were taken from.”

Applications to monitor the environment and keep it secure are envisioned. Long-range prospects for using small creatures to produce sustainable electric micropower may



This snail is producing electricity through a method that may one day power small electronics. The snail was unharmed by the experiment.

move us toward the cyborgs of science fiction—creatures that are part animal, part machine, Alfonta notes.

Incorporating unnatural amino acids into protein is also a key interest for the pharmaceutical industry, and it

offers an important new research tool, as well. “It’s the only technique that allows you to modify proteins in a very specific way so you can introduce new functions,” Alfonta says.

“One of my missions is to make the technique more robust and more accessible. I’ve helped many teams in Israel use the tool, and in the future, I hope to build a kit that researchers can buy with the unnatural amino acid they choose for use in their own labs. We’re working on that.”

Alfonta collaborates with researchers in the United States and Israel, as well as China, Germany and the Czech Republic. A favorite collaborator from BGU’s Department of Chemistry is Prof. Michael Meijler—he also happens to be her husband. “There’s a lot of synergy in our work and when we overlap, we’re happy to collaborate. His lab helps me solve my synthetic chemistry problems.”

Alfonta observes that her lab’s work serves basic science well. “We’re creating something that is completely new and has useful functions, but we don’t yet understand the electron transfer mechanisms. We engineer our systems in a way that will give us better insights into the natural systems.”

She thoroughly enjoys these experiments. “It’s so exciting! I can’t stop working on it!”

**Prof. Lital Alfonta** is a member of BGU’s Department of Life Sciences and is affiliated with the Department of Chemistry, the Edmond J. Safra Center for the Study and Engineering of Functional Biopolymers, the Ilse Katz Institute for Nanoscale Science and Technology, and the National Institute for Biotechnology in the Negev. She holds the Elaine S. and Alvin W. Wene Career Development Chair in Biotechnology Engineering, and this year was named one of Israel’s 50 most influential women by *Globes*, Israel’s oldest daily financial newspaper. ■

To learn more about BGU’s Energy Initiative, visit [www.aabgu.org/energy](http://www.aabgu.org/energy)

# THE JUSIDMAN SCIENCE CENTER FOR YOUTH

**MANY YOUNG PEOPLE** of Southern Israel face a number of obstacles in achieving the kind of education that leads to a good future. Especially in science and math, schools in the region often lack the basics. Well-equipped laboratories are scarce and so are qualified teachers.

For Bedouin students, the challenges are even greater. “They don’t speak Hebrew well, and their socio-economic state is the lowest in Israel,” says Rachel Knoll. “Many live in shacks without electricity or running water.”

Another problem is a difference in educational experience. “Their schools are more traditional—children learn to listen and respect the authority of what they’re told rather than think independently.”

Knoll directs an ambitious new initiative—The Jusidman Science Center

for Youth—dedicated to remediating the periphery’s lack of technical and science education and introducing students to the pleasures and possibilities of academia.

The Center is a joint venture between the University, the Rashi Foundation, Keren Daniel (the Jusidman family foundation), the Ministry of Education, and the municipality of Beer-Sheva. It will soon occupy its own new building on BGU’s Marcus Family Campus, but already operates a number of programs on University grounds.

The goal is to provide opportunities for bright teenage students, interest them in higher education, and ultimately increase the number of science students. Beyond offering the best path to upward mobility,

this effort is considered critical to Israel. The country sees an alarming trend away from interest in technical education.

Establishing the Jusidman Center is timely given the planned relocation of the Israel Defense Force’s technology units to the Negev. Skilled employees will be needed, and job opportunities will be real for those who qualify.

“We look for the best students and give them

challenging programs they can advance in,” Knoll says. These include:

**Science Days:** Seventh to 12th graders come to BGU to learn about university life and spend time in the labs.

**The Marie Curie Program:** Outstanding chemistry students spend Fridays learning about the Negev’s chemical industry and build both technical and leadership skills.

*Continued on next page*



Rachel Knoll

Bedouin and Jewish teens participate together in the Center’s DaVinci Program. Pictured here are photography club students with their instructor.



In three years, they can complete the first year toward a degree.

- **Euler Program:** Students skilled in mathematics at the middle school level are given advanced instruction.
- **Future Scientists and Inventors:** Promising eighth graders enjoy a full day of study, one day per week, in physics, math, chemistry, and computers.
- **Robotics:** Seventh to 8th graders are exposed to programming, engineering and physics, and develop skills for teamwork and problem solving.
- **DaVinci Program:** Seventh to 9th graders are invited to choose from a number of courses given one afternoon weekly, ranging from photography to Java programming, puzzles, chemistry, and physics in motion.

Of the Negev's 550,000 residents, about 180,000 are Bedouin. Though eligible for all programs, in many cases Bedouin students are not prepared. "Future Scientists is a very prestigious program that aims to encourage the new generation of Israeli scientists," Knoll says.



Seeking to recruit girls into engineering fields, an all-female group built this "girl power" basketball-playing robot and entered it in a national competition.

"We pick students one by one through a series of tests. Last year we didn't include Bedouins because they couldn't pass the tests. So we decided it was our ambition to include them the next year."

To accomplish this, 12 students were given two intensive weeks of pre-academic training with a special lecturer following up to reinforce learning. Mentors were supplied to translate the material during the test. Three Bedouins succeeded in passing the test.

"We plan a special course in Hebrew language for them. We absolutely intend to give special attention to helping Bedouins. If you want to strengthen the population you have to create these programs.

"It's very important to them. We see how dedicated they are. They concentrate so hard, not to lose a word of the lectures."

The DaVinci Program, named for the Renaissance master of all arts, is already a success with young Bedouins. Of the 170 students in the program, 60 are Bedouins from Rahat, the largest Bedouin town in Israel and close neighbor to BGU. Enthusiastic doctoral students lecture in science, math, photography, and more.

"They teach from their own knowledge and experience," Knoll says. "We don't give them written programs. DaVinci is a real success, especially since the Jewish and Arab students do things together. This breaks barriers and builds bridges to real cooperation."

Knoll finds that the opportunities are even more important to the girls than the boys. "They concentrate more and do all the lessons—sit in the first row and write down everything. The girls in the Arab group are very interested in science and math—and very successful at it." However, the programs earmarked for the gifted draw more boys. "Usually the girls think they're not good enough even though the reality shows this not to be true," Knoll believes.

An overriding program goal is to



"Future engineers" in the Center's robotics program at a competition

transform all the young Bedouins into more active learners. "We want them to be more critical, not take everything as correct," Knoll explains. "We really work on that with those who come from a more conservative, traditional society. It takes time to break this barrier, but we see a lot of success."

One example is a Bedouin boy who took the robotics course, entered a competition with his team, and won first place. "He was so proud and excited! We made him a captain at the end of the year and gave him a party. He took the pictures home and hung them above his bed. When I asked him to mentor the younger students next year he couldn't believe it: 'Really? Are you serious! I can be there?'"

Knoll welcomes a future with many such moments.

"I believe that if you believe in young people, they will have a great future. You have to give them opportunities to grow. When you give them the right conditions they will grow—and the sky is the limit." ■

# BGU OPENS ISRAEL'S FIRST SUPPORT CENTER FOR STUDENTS WITH DISABILITIES

**FOR OSAMA ABUGANEM**, BGU's brand new Support Center for Students with Disabilities is a place "where you can't feel alone. You feel you are with many friends—other people like me, and good people you can ask for any help you need." Twenty-four year old Osama, who has learning disabilities, is studying for a master's in social work after completing his bachelor's at BGU.

For Merav Yosef-Solomon, chief of administration in the Office of the Dean of Students, the Center embodies a dream five years in the making. "We recognized that many BGU students have disabilities and weren't getting the help they needed."

So when the National Insurance Institute of Israel appealed to the universities to establish support centers five years ago and offered funding, she made sure that BGU answered the appeal. And as of one year ago the University became the first in Israel to house such a center.

Individuals with physical, mental, emotional, or learning disabilities are all served. The idea is right in line with the University's pioneering spirit, Yosef-Solomon observes, and also its ability to pursue a valuable goal over an extended period of time. In addition to building the

program, government budgeting had to be dealt with and experienced specialists had to be recruited.

"This is a project that fits us like a glove," says BGU President Prof. Rivka Carmi. "To be the first in Israel with such an initiative is extremely important and aligns with our mission to meet community needs—in this case we are providing true equal opportunity to a segment of our own BGU community."

The Center offers extensive, sustained support. The staff of seven includes psychologists, a social worker and a specialist on learning processes. Students also work at the Center, but not as volunteers, Yosef-Solomon stresses. "We select excellent students and we pay and train them."

Students are paired with coordinators for ongoing guidance. The coordinators help their charges create personalized learning plans and promote their academic, social and life skills. Each student is advised on selecting the right classes, and coordinators keep in close contact with faculty to prevent problems from developing.

Yosef-Solomon estimates that at least 2,000 students

*Osama Abuganem is both a client and employee of the Support Center. He works as a part-time consultant for its career center.*



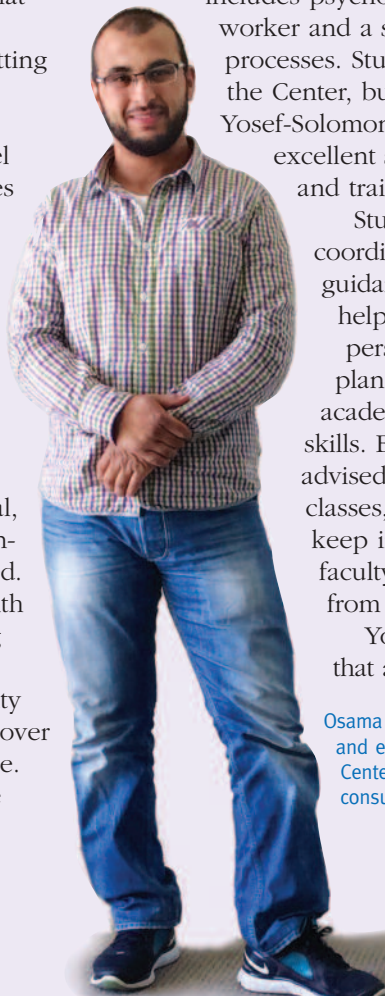
Merav Yosef-Solomon

can benefit from the Center's help. Last November—the first month it was open—200 had already visited. Getting the word out is a major challenge. "We want every man and woman on campus to know there is a Center like this and that it is here for them," she says.

Like Osama, Yosef-Solomon believes the Center's overriding value is in giving the disabled population a community. "I think this is the first time that disabled students on our campus can feel like everyone else, and not be isolated," she says. "A student who is blind or deaf, or who has cerebral palsy, may have no friends on campus."

To address that typical situation, the Center is designed to help the disabled mix with other students. "One of our goals is for other students to recognize them, become their friends, understand and be more patient with them—and we want the University staff to do that as well." She organizes meetings with the academic departments to explain the difficulties disabled students face and how they can be supported.

The Center's location in the Zlotowski Student Center on the Marcus Family Campus intrinsically promotes the goal of more mixing. "We provide a quiet place to study so even students without disabilities want to come. The technology room is a special draw, and they can use it if they're with a member. So now our disabled students have a special place and can invite others to join them!" ■



# GREAT LAKES

Larry Goodman, *Honorary Chair*  
Steven Franklin, *Director*  
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## EXPLORING THE JEWISH BALKANS

The Great Lakes Region was well represented on AABGU's extraordinary East Meets West: Journey Through the Jewish Balkans tour in May. The region's contingent included Alan and Marcia Cahn, Ernie and Judith Simon and Allen Lapporte travelling with his brother, Seymour.

## BGU'S ANNUAL BOARD OF GOVERNORS

Mort and Arline Doblin and Richard Goldstein joined Regional Director Steven Franklin in the Negev for BGU's 44th Board of Governors Meeting.

Several individuals from the Great Lakes Region were recognized among BGU's most loyal supporters at a beautiful ceremony on campus. Jerry and Gene Hankin's names were added to the Founders Wall. Thomas Pick and the Paul and Pearl Caslow Foundation were added to the Negev Society Wall.

The name of Stephan Sharf (of blessed memory), which was inscribed shortly before his passing, was on display in the Living Legacy Garden. This garden honors those who make a planned gift during their lifetime to AABGU for the University.

A highlight of the event was the inauguration of the President's Pillars, recognizing the University's most unanimous supporters, who have given gifts of \$5 million dollars or more. Their names are now inscribed on the stone pillars that traverse the Kreitman Plaza in the heart of campus.

Great Lakes Pillar Larry Goodman was unable to be in Beer-Sheva for the induction ceremony. On a visit to the U.S. shortly after the meeting, BGU President Prof. Rivka Carmi presented

Larry with his Pillar's award in the presence of his granddaughters, Lindsey Lopatin and Michele Lopatin Taylor.

## LOCAL MILESTONES AND EVENTS

June marked the first anniversary of BGU's water research collaboration with the University of Chicago (UC) and UC's affiliate Argonne National Laboratory.

To mark the occasion, UC President Robert Zimmer hosted a reception in Prof. Carmi's honor at his residence with Ernie and Judith Simon, and Rachel Goodman Sturges and Rush Sturges in attendance. An initial five promising joint research projects are

advancing as part of the collaboration.

The Great Lakes Region is anticipating more visits by BGU researchers and faculty this year. You're invited to attend these interesting and informative local events.

## GOING TO ISRAEL? VISIT BGU

A number of supporters from the Great Lakes Region have recently visited the BGU campus while in Israel on family trips or for business purposes. If you're planning a trip to Israel, contact the regional office to arrange a campus tour and meetings with faculty and researchers.



1. Alan Cahn, Marcia Cahn, Ernie Simon, Judith Simon, and Allen Lapporte on AABGU's East Meets West: Journey Through the Jewish Balkans tour  
2. BGU President Prof. Rivka Carmi recently met with renowned industrialist, philanthropist and AABGU supporter Lester Crown (left). Lester's son, Steve, and Crown Family Foundation representatives also attended. 3. BGU President Prof. Rivka Carmi presents Pillar's award to Larry Goodman in the company of his granddaughters.

# GREATER FLORIDA

## GREATER FLORIDA ADVISORY COMMITTEE

Richard N. Bernstein,  
Robert Colton, Alan Hurst,  
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## UNLOCKING THE SECRETS OF DAVID BEN-GURION'S ARCHIVES

The Greater Florida Region recently hosted Dr. Paula Kabalo, director of the Ben-Gurion Research Institute for the Study of Israel and Zionism. A cocktail reception was hosted by Richard N. Bernstein, national board member, and Greenberg Traurig in Miami.

Dr. Kabalo also met with Arthur Jaffe, founder of the Arthur and Mata Jaffe Center for Book Arts at Florida Atlantic University in Boca Raton. Jaffe knew David Ben-Gurion at the time of the founding of the State of Israel.

## CELEBRATING ISRAEL AT COMMUNITY EVENTS

BGU master's students in Israel studies, Shani and Nir Boneh, spoke at "You Are Israel Day" at ongregation Ohev Shalom in Orlando.

Shani and Nir serve as *shlichim* (Israel emissaries) at the Jewish Federation of the Palm Beaches. Their passion for BGU shined as they spoke about the growth of the Negev and the University's high-tech innovations. In attendance were longtime supporters Norman and Megan Rubenstein who recently visited BGU with their family.



1. Norman Lipoff and Dr. Paula Kabalo at the law offices of Greenberg Traurig in Miami 2. Billy Joel, Jerry Herman, Sylvia Herman and Sandra Joel with BGU students (in green t-shirts) during the Board of Governors 3. Prof. Alon Friedman, chair of BGU's Zlotowski Center for Neuroscience, Sol Freedman, Dorothy Levy, Ray Rothstein at The Chesterfield in Palm Beach 4. Al and Phylis Newman (left) of Palm Beach County visited BGU for the first time in June. They are pictured here with (left to right) Maya Panker, Ethiopian *aliyah* students coordinator; Avi Shbahat, student in the Department of Geography and Environmental Development; Merav Yosef-Solomon, chief of administration in the Dean of Students Office. 5. Norman Rubenstein with BGU graduate students Nir and Shani Boneh celebrating Israel Day in Orlando

The region also participated in Palm Beach County's Israel Independence Day celebration at City Place.

## BOARD OF GOVERNORS AND SPECIAL BGU VISITS

The Greater Florida Region was well represented at BGU's 44th Board of Governors Meeting in May. Attendees included Billy and Sandra Joel, Max and Rachel Javit, Joel Reinstein, and Lenny Roth.

Also in May, Rich Bernstein had the unique experience of spending the day conducting research at the David Ben-Gurion Archives in Sede Boqer, as well as visiting BGU's Marcus Family Campus in Beer-Sheva.

Al and Phylis Newman, Herb Siegel and Sydelle Sonkin enjoyed visiting BGU for the first time in June.

Many exciting events are planned for the winter season. The regional leadership invites you to join them at one or more of these opportunities.

# GREATER NEW YORK

Lite Sabin, *Chair*  
Kevin M. Leopold  
*Executive Director – Northeast*  
Jay Leipzig  
*Senior Philanthropic Advisor*  
Diane Romirowsky  
*Major Gifts Director*  
Dana Ben-Benjamin  
*Program Manager*  
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## AN UNFORGETTABLE EXPERIENCE IN THE BALKANS

In May, several members of the Greater New York Region joined fellow ABGU friends and supporters from around the country on East Meets West: Journey Through the Jewish Balkans. The tour was led by BGU's Dr. Eliezer "Eli" Papo, a Sarajevo native and non-resident rabbi of the Jewish community of Bosnia and Herzegovina.

Gail Billig, from Englewood, New Jersey, knew this was an experience she couldn't pass up. She recalled the time several years ago when, on a late night flight back from Israel, she looked out her window and saw the illuminated lights of the Balkans below, and thought to herself that she knew nothing about that part of the world.

When Billig learned about AABGU's trip to the Jewish Balkans, she jumped at the chance to join. "It was the perfect time to experience the history of the region, with the upcoming commemoration of the 100th anniversary of the beginning of WWI," she says.

"It was an opportunity to learn about the past and current Jewish communities under the guidance of the wonderful Dr. Eliezer Papo and the very professional organization of the trip by AABGU's Gabe Most [vice

president for programs and events].

"I was struck and heartened by the significant interaction between the various religious communities and the ease with which Muslims, Christians and Jews seem to live and communicate together," says Billig.

The group visited a variety of historic sites and was treated to exclusive access to view the famous *Sarajevo Hagaddab* at the National Museum of Bosnia and Herzegovina.

Trip participant Evelyn Kenvin, of Manhattan, adds, "The AABGU trip to the Balkans provided a unique and exciting lesson in history. Highlights included the corner in Sarajevo where WWI began; the fascinating history of the Sephardic community in the Balkans; and an introduction to the ethnic issues that have dictated so much of the history of the area."

Jay Leipzig, AABGU's senior philanthropic advisor, summed up the experience by saying, "Perhaps the best part of our journey was the people with whom we travelled.

There was warmth, sharing laughter and singing. Many dates were set for getting together once we returned to New York."

## STRONG CONTINGENT AT BOARD OF GOVERNORS

The Greater New York Region was proudly represented at this year's Board of Governors Meeting at BGU by several influential and instrumental members of the local AABGU community. One of the highlights was the inauguration of the President's Pillars, honoring those who have contributed \$5 million or more to the University.

Arnold M. Bengis, Mark Blechner and Jane Bressler, Lloyd Goldman, Alex Goren, and Roy J. Zuckerberg were recognized at the moving dedication ceremony on campus. A gala dinner celebrating the President's Pillars, at the breathtaking Beresheet Hotel in Mitzpe Ramon, featured a performance by Israeli entertainer Yehoram Gaon.



1. Gail Billig of New Jersey and Allan Lapporte of Chicago enjoy a light moment during a bus stop on AABGU's Journey through the Jewish Balkans.



2. National Board Member Carol Kimmel (right) and Susan Stock in Sarajevo



3. Roy J. Zuckerberg, chairman emeritus of BGU's board of governors, accepts Pillar's award from Prof. Rivka Carmi.

# GREATER TEXAS

Stephen Breslauer  
and Arline Guefen, *Chairs*  
Ellen Marcus, *Austin Chair*  
Deborah K. Bergeron, *Director*  
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texas@aabgu.org

## BREAKTHROUGH DIABETES TREATMENT IN SAN ANTONIO

The Greater Texas Region visited San Antonio this spring with Dr. Eli Lewis, director of BGU's Clinical Islet Laboratory.

Dr. Lewis had the opportunity to meet Zach Heffernan, an 11-year-old boy, who received the breakthrough type 1 diabetes treatment developed by his team.

The treatment uses Alpha 1 Antitrypsin (AAT), an anti-inflammatory drug generally used to treat emphysema. In clinical trials, AAT has shown promise in reducing insulin dependence in type 1 diabetes patients, and, in some cases, eliminating the need for insulin injections.

Thanks to Dr. Lewis's treatment, Zach went from receiving more than nine shots a day to virtually none in less than eight weeks. Zach's mother, Dana Green, first learned about the treatment when researching type 1 diabetes online shortly after Zach was diagnosed.

Dr. Lewis says it will most likely be two years before AAT would be approved by the FDA for widespread use for diabetes treatment.

The Heffernan-Green family has since become the first major donor to AABGU from San Antonio. Dana looks forward to helping the organization connect to more supporters in the area."



1. Dr. Eli Lewis with Dana Green, Zack Heffernan and Claire Heffernan in San Antonio 2. The Samuels-Levy family, of Houston's *Jewish Herald-Voice*, accepts the AABGU David Ben-Gurion Leadership Award, designed by internationally recognized glass sculptor Bill Meeks. 3. Ellen Marcus accepts the Pillar's award from BGU President Prof. Rivka Carmi 4. David Bergeron and Regional Director Deborah Bergeron in front of the newly dedicated Edith & Robert Zinn and Nan Zinn Haar Building in the American Associates Village at Sede Boquer

## GREATER TEXAS AT THE BOARD OF GOVERNORS

The Greater Texas Region was well represented at the 44th Annual Board of Governors Meeting, led by regional chairs Stephen Breslauer and Arline Guefen, joined by Ben Guefen.

One of the highlights was the inauguration of the President's Pillars, honoring those who have contributed \$5 million or more to the University.

Greater Texas Pillars included the Samuel and Helene Soref Foundation represented by Ben, Stephen and Jim Breslauer, and Lottie and Howard (z"l) Marcus represented by Ellen Marcus, Austin chair.

The names of those being recognized were inscribed on the pillared

walkway that traverses the central quad of the Marcus Family Campus.

Another exciting event was the dedication of the American Associates Village at Sede Boquer, an international student housing complex, which includes the Soref-Breslauer Texas Foundation Building and the Edith & Robert Zinn and Nan Zinn Haar Building.

After the dedication, the AABGU group toured several apartments where they were graciously hosted by student residents, many of whom are married with children.

## MID-ATLANTIC

Jack R Bershad, *Regional Chair*  
Marla and Dr. Robert Zipkin  
*Philadelphia Chapter Chairs*  
Claire Winick, *Director*  
Seth Bloom, *Associate Director*  
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### MURRAY H. SHUSTERMAN CONTRIBUTES TO BGU'S SECURITY

Longtime donor Murray H. Shusterman, an AABGU national board member and BGU governor, made a significant contribution over the summer that will enable the construction of a much needed enclosed and secure gate for the entrance of BGU's Marcus Family Campus in Beer-Sheva.

A prominent attorney and educator, Shusterman may be the lay leader most closely associated with BGU in the Philadelphia community.

The Murray H. Shusterman Gate and security structure will encompass 6,400 square feet, featuring an updated security detection and alert system.

It will have two covered and barrier-equipped lanes for the inspection and movement of vehicular traffic. The Shusterman Gate will also have an air-conditioned, modern lobby/entrance hall and an attractive passageway for pedestrians.

### NEW PITTSBURGH CHAPTER

Attorney Jeffrey Letwin, of the law firm Schnader, Harrison, Segal and Lewis LLP, was named the chapter's first chair. AABGU looks forward to making new friends in Pittsburgh.

### EVENTS AROUND THE REGION

- Dr. Eli Lewis visited the region for the first time this spring. New friends were made and new funds were raised for his research to develop a cure for type 1 diabetes.



1. Newly appointed Philadelphia Chapter Chairs, Dr. Robert and Marla Zipkin, participated in Philadelphia's community-wide Israel 66 celebration 2. Murray H. Shusterman with BGU President Prof. Rivka Carmi 3. Jeff Letwin, Pittsburgh Chapter chair, and his wife Roberta, with David and Meryl Ainsman 4. Seth Bloom joined the Mid-Atlantic Region as associate director. Seth brings some 25 years of experience in the areas of fundraising, strategic planning, marketing, and leadership development.

A reception was held with Dr. Lewis in the Princeton area, a first for AABGU, hosted by Laurie and Daniel Bershad, children of Helen and Regional Chair Jack Bershad.

Dr. Lewis spoke at the home of Dr. Eydie Rudman and her husband, Howard Levin. He also spoke at a regional board of directors luncheon hosted by Jack Bershad, and at the Watermark retirement community.

- With Main Line Reform Temple, the region hosted Gil Hoffman, chief political correspondent and analyst with *The Jerusalem Post*, for an Israel Independence Day event.
- Past Philadelphia Chapter Chair Ann Waldman and fiancé Robert Wolf hosted Prof. Eilon Adar, director of BGU's Zuckerberg Institute for Water Research, in their home shortly after discovering that Prof. Adar and Robert are cousins.
- The Philadelphia Chapter joined Israel Bonds and Saks Fifth Avenue for "Giving is Always in Fashion," a reception and fashion show.
- AABGU's booth was proudly on display at the community's Israel 66 event.
- BGU's Center for Women's Health Studies and Promotion leaders, Dr. Dorit Segal-Engelchin and Prof. Julie Cwikel, reported on their programs that enrich the lives of women and their families at a "Women of Vision" committee luncheon and a reception hosted by Sylvia Brodsky.
- Over 40 leaders gathered at the home of Susan Weikers Balaban and Dr. Donald Balaban to thank Connie and Sam Katz for an outstanding term as Philadelphia chairs and to welcome Marla and Dr. Rob Zipkin as their successors.
- At a "Shalom Luncheon," AABGU bid farewell to Prof. Amos Drory and welcomed Prof. Steven Rosen to the position of BGU's vice president for external affairs.

## NEW ENGLAND

Max Schechner, *President*  
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*Senior Philanthropic Advisor*  
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*Major Gifts Officer*  
 Dana Ben-Benjamin  
*Program Manager*  
 (646) 452-3686  
 newengland@aabgu.org

### EXAMINING BGU'S SOLUTIONS TO WATER SCARCITY

The New England Region returned to the Temple Emanuel community in Newton for a fabulous program co-sponsored by the temple's Israel Action Committee and various co-chairs, including the temple's Brotherhood and CJP Israel Advocacy.

The evening's speaker was Prof. Eilon Adar, director of BGU's Zuckerberg Institute for Water Research at the Jacob Blaustein Institutes for Desert Research, located on the University's Sede Boqer Campus.

Prof. Adar is a highly regarded expert in arid zone hydrology and Middle East water issues, serving as one of Israel's leading water consultants in its 1994 peace treaty with Jordan.

He delivered an impassioned overview to over 150 guests about the water-related issues facing the region and solutions Israel has implemented to overcome these challenges.

One of the most important points Prof. Adar shared was that there is cooperation among Israeli scientists and their counterparts from surrounding countries around water resources, which may not be common knowledge.

"In a region where all major water sources, rivers, streams, and groundwater aquifers cross international boundaries, water scarcity can be used as a catalyst for regional cooperation," says Adar.

### NEW ENGLAND NEWS FROM THE BOARD OF GOVERNORS

BGU's international family of friends and supporters came together in May to celebrate many exciting developments at the University.

During the opening plenary session, Douglas Krupp was formally welcomed as a new member of the Board of Governors, proudly continuing the legacy of his parents, Bernice and Philip Krupp z"l.

Also part of the meeting events, students from the Avram and Stella

Goldstein-Goren Department of Biotechnology Engineering, who competed last fall in the prestigious International Genetic Engineering Machine (iGEM) competition at MIT, showcased their impressive research for BGU's friends from around the world.

The students explained the significance and potential of their research that uses a self-destructing mechanism in "good" bacteria that releases antibiotics to treat patients.



**Above:** Northeast Executive Director Kevin Leopold and Major Gifts Director Diane Romirowsky present a limited edition lithograph signed by Prime Minister David Ben-Gurion to Debbie DeBotton and Louise Wolfe.

**Right:** Prof. Eilon Adar with Debbie DeBotton and Louise Wolfe



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# SOUTHWEST

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*Campaign Chair*  
 Philip Gomperts, *Director*  
 Andrew Hoffer, *Associate Director*  
 (310) 552-3300  
 southwest@aabgu.org

## REMEMBERING DR. HOWARD W. MARCUS

The Southwest Region is deeply saddened by the loss of Dr. Howard Marcus, a mensch and visionary philanthropist. Together with his wife, Lottie Blumlein Marcus, Howard made a significant impact on Israel's Negev region through his magnanimous support of Ben-Gurion University of the Negev.

The Marcus Family Campus in Beer-Sheva reflects Howard's commitment to the University and the fulfillment of David Ben-Gurion's vision to build a world-class institution of education and research in the Negev. The legacy he leaves to BGU signifies the largest individual gift ever given to an Israeli university and will make a dramatic impact on the University's development and growth for many years to come.

Understanding the benefits, both to Israel and the world, of producing water for drinking, agriculture, aquaculture, and the battle against desertification, the Marcuses have been steadfast in their support of BGU's Jacob Blaustein Institutes for Desert Research, endowing global breakthroughs in water research and science. In 2004, Howard and Lottie were awarded honorary doctoral degrees in recognition of their pioneering spirit, exceptional generosity and dedication to higher education.

They were also recognized at BGU's 44th Board of Governors Meeting at the inauguration of the President's Pillars, and were represented at the ceremony by their



1. Lottie and Howard z"l Marcus at BGU for the naming of the Marcus Family Campus in Beer-Sheva.

2. Andrew Hoffer joined the Southwest Region as associate director. Andrew brings some 20 years of experience in securing major gifts, as well as organizing capital campaigns and special events for a broad range of education, healthcare and social service organizations.

3. Jim Breslauer receives his honorary doctorate from BGU President Prof. Rivka Carmi and Rector Prof. Zvi HaCohen.

daughter, Ellen Marcus.

Howard will be sorely missed.

## JIM BRESLAUER RECEIVES AN HONORARY DOCTORATE

Jim Breslauer of Long Beach was awarded an honorary doctoral degree from BGU for personally spearheading the funding and development of Israel's new 16-building Advanced Technologies Park (ATP) in Beer-Sheva.

"Fifteen years ago, BGU President Avishay Braverman [currently a member of Knesset] asked me to be part of developing a new industrial park next to BGU," says Breslauer.

"I worked with the partners and developers, and provided initial funding. This is my chance to make a difference for the University, for the State of Israel and for the hundreds, if not thousands, of people who will one day work there."

At the ceremony, BGU President Prof. Rivka Carmi lauded Jim, saying that "he is a man of great foresight, a committed partner in making the Negev bloom, who understands the area's need for sustainable engines of economic growth and took the lead from the outset in promoting the building of the Advanced Technologies Park that is turning the Negev into a thriving region for the benefit of its residents and the State of Israel as a whole."

## BGU'S DIABETES EXPERT VISITS THE SOUTHWEST

A number of families who have young children with type 1 diabetes met with BGU's Dr. Eli Lewis. They learned about his new breakthrough research that could offer hope in reversing the disease in recently diagnosed patients. Dr. Lewis also spoke at meetings with local BGU supporters.

# WASHINGTON/ BALTIMORE

Edie and Art Hessel  
*Washington D.C. Chapter Chairs*  
 Keren M. Waranch, *Director*  
 David K. Speer, *Development Associate*  
 wash-balt@aabgu.org

## DR. ELI LEWIS SHARES GOOD NEWS WITH GOOD FRIENDS

BGU's diabetes expert Dr. Eli Lewis, director of BGU's Clinical Islet Laboratory, has a growing fan club in the Washington/Baltimore region. Dr. Lewis gave presentations at the homes of Emile Bendit in Baltimore and Nancy Greenspan in Bethesda. After the Bethesda presentation, Nancy Greenspan's daughter, Sarah, an accomplished opera singer with type 1 diabetes, sang two arias in Dr. Lewis's honor. He also spoke to a group of physicians and medical personnel at the Washington Nationals Diabetes Care Complex at Children's National Medical Center.

## REMEMBERING A BALTIMORE HERO

Prof. Tuvia Friling is a senior researcher at BGU's Ben-Gurion Research Institute for the Study of Israel and Zionism and the official biographer of Baltimore native Dr. Joseph Schwartz.

Dr. Schwartz was head of the American Jewish Joint Distribution Committee in Europe in 1941 on the eve of the "Final Solution." From his office in Lisbon, Portugal, Schwartz directed a rescue and relief effort that played a key role in saving tens of thousands of lives.

Prof. Friling talked about the importance and challenges of writing a biography and shared details about



1. Regional Director Keren Waranch; Dr. Eli Lewis; Nancy Greenspan, and her daughter, Sarah  
 2. Dr. Sam Halperin z"l with BGU President Prof. Rivka Carmi in August 2010  
 3. Schwartz biography supporter Jim Blum with biographer Prof. Tuvia Friling

the unique experiences of Dr. Schwartz with funders of the biography.

## SARAJEVO AND BEER-SHEVA

Eight participants from the Washington/Baltimore Region joined AABGU travelers from around the country for East Meets West: A Journey through the Jewish Balkans in May. The group toured a stunningly beautiful region of the world, while learning about the area's history, the importance of the *Sarajevo Hagaddah*, and today's Jewish communities in Dubrovnik, Sarajevo and Split. They also learned of the Jews' devastating losses during the Holocaust and viewed evidence of the 1992-1995 war.

Ira and Marcia Wagner and Dava Berkman, accompanied by Development Associate David Speer, represented the region at BGU's 44th Board of Governors Meeting in Israel. In addition, Dr. Linda Birnbaum of Chapel Hill, North Carolina, director of the National Institute of Environmental Health Sciences of the National Institutes of Health, received an honorary doctorate from BGU.

## DR. SAMUEL HALPERIN z"l

The Washington/Baltimore Region lost a dear friend in May. Dr. Samuel Halperin, a regional and national board member, passionately believed in BGU's mission to develop the Negev. Sam also played an active role in nurturing the leadership skills of young people, both professionally and through his investment in AABGU's Zin Fellows Leadership Development Program. He referred many people to AABGU and understood the importance of inspiring them to become involved.

Our thoughts and prayers are with his widow, Marlene, his children, Deena and Elan, and his six grandchildren. May they be comforted among the mourners of Zion and Jerusalem.

For information about what's happening in your area, please visit: [www.aabgu.org/getinvolved](http://www.aabgu.org/getinvolved).

For information about giving opportunities or planned gifts, such as charitable gift annuities and bequests, contact your [regional office](#) or visit [www.aabgu.org/plannedgiving](http://www.aabgu.org/plannedgiving).

# THANK YOU FOR YOUR SUPPORT

AABGU congratulates our philanthropic partners who joined BGU's most prestigious societies this year.\* Their names were inscribed on recognition walls on the Marcus Family Campus and unveiled at special ceremonies during the 44th Board of Governors Meeting in May 2014.

## **PRESIDENT'S PILLARS (\$5 MILLION+)**

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Jacob and Hilda Blaustein Foundation  
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Ben Goldgur, Rohnert Park, CA  
Myron Goldware, Mission Viejo, CA  
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Sidney Schulman, Long Beach, CA  
Marilyn and Jerome Senter, Hartsdale, NY  
Lucy Fisher and Douglas Wick, Los Angeles, CA  
In Loving Memory of my parents  
Ilona and Gyula Kürti Susanne Vamos  
Jerome H. Wenig, Boca Raton, FL

## **LIVING LEGACY SOCIETY (DESIGNATED A PLANNED GIFT)**

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Nahum Guzik  
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| 70  | 6.5%  | 72.8%     |
| 75  | 7.1%  | 75.4%     |
| 80  | 8.0%  | 77.9%     |
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| 90  | 11.3% | 84.0%     |

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we've ever done."*

— SONNY AND STEVE HURST

