TECHNION

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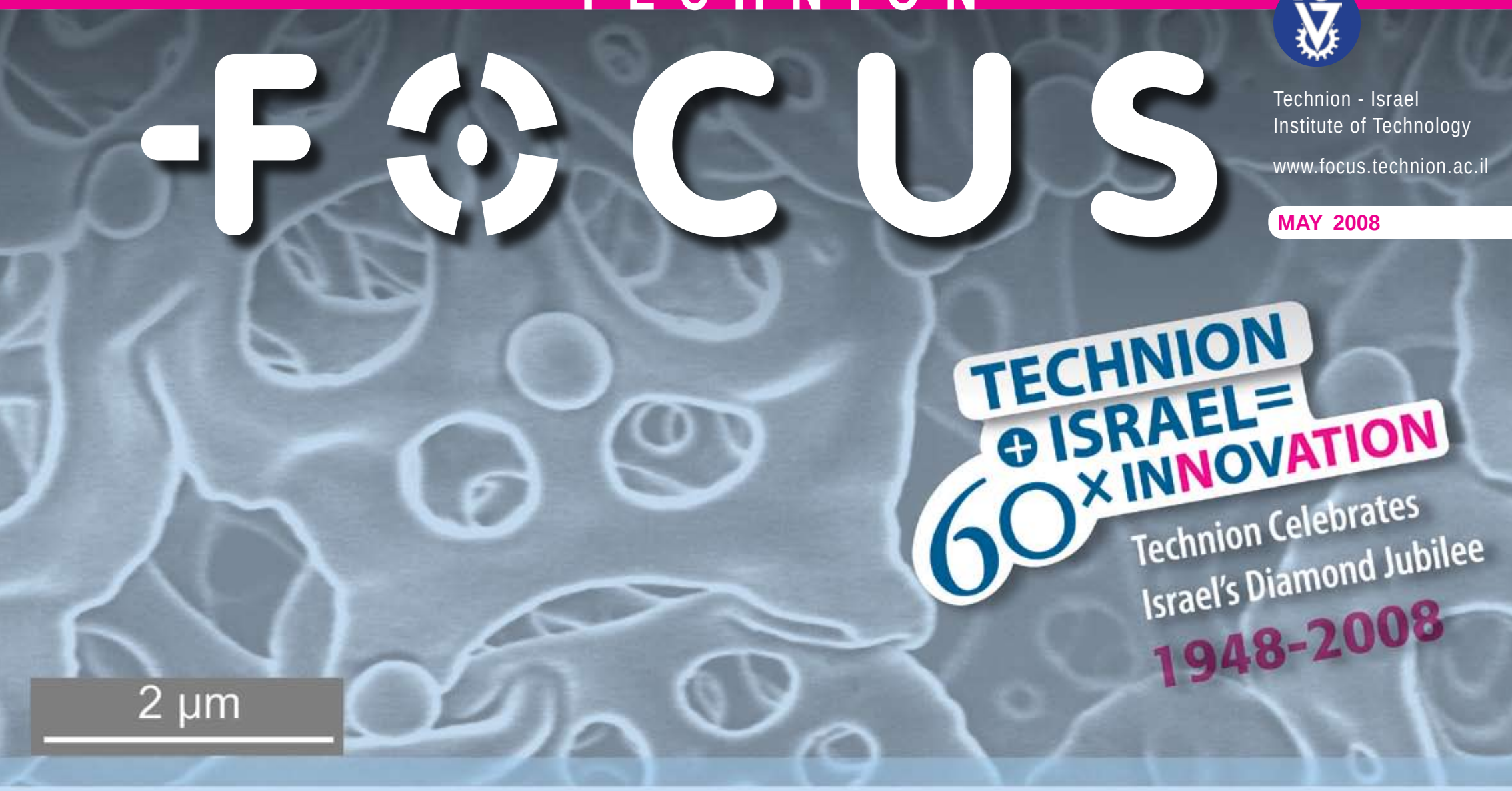

A polyHIPE containing a biodegradable polymer.

Future Matter

by Amanda Jaffe-Katz

Using a novel technique he calls emulsion templating, Materials Engineering Prof. Michael Silverstein is creating PolyHIPE: a new generation of porous materials that are lighter, greener, more versatile, and potentially cheaper than others on the market. The prospective applications are many—from tissue engineering to fuel cells, water decontamination to contamination sensors, and drug delivery to electric conductivity.

PolyHIPE are cross-linked, highly interconnected porous polymers with unique multiscale, open-pore structures that are based on high internal phase emulsions (HIPE). According to Silverstein, their unusual porous structures can serve as a "canvas" for novel materials.

Freons—gases now implicated in the greenhouse effect—are typically used in manufacturing

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Nobel Mentor

At the initiative of the Italian Friends of the Technion (Associazione Italiana Amici del Technion–AIAT), Senator Prof. Rita Levi-Montalcini, the world's oldest living Nobel laureate, visited Technion in March 2008 along with a 30-person delegation including representatives from the Italian National Academy of Sciences. Led by AIAT President, Pierro Abbina, the distinguished visitors came as a show of support for Israel at a time when Europe called to boycott Israeli scientists. Neurologist Levi-Montalcini

Prof. Rita Levi-Montalcini shares insights with young and aspiring Jacobs Graduate School students.

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Therapeutics 4 U

by Amanda Jaffe-Katz

Pharmaceutical companies develop drugs using a one-size-fits-all paradigm that caters to a hypothetical Mr Average. But a given drug does NOT always suit everyone, and sometimes the results are devastating. "We need to solve the problem of adverse drug responses before they happen, along with poor responsiveness to medications," says Prof. Ariel Miller, a senior

Made-to-measure meds for the right dose of the right medicine at the right time.

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In this issue…

President's Message

Prof. Yitzhak Apeloig

In December 2007, the International Monetary Fund (IMF) published the best report any leading international body ever wrote about Israel's economy. "The economy is performing exceptionally well," begins the concluding statement of the report. Israel is one of the smallest countries in the world, with less than 1/1000th of the world's population—about the size of Belgium or New Jersey. Yet despite its small size, and despite the absence of any natural resources of any significance, and despite the fact that the country is in an ongoing state of constant war and conflict with its neighbors, Israel is today recognized as a world leader in science and technology, second only to Silicon Valley in California.

Israel's achievements in high technology and science-based industries are a direct result of the presence of world-class research universities, primarily the Technion, that provide the knowledge, the highly qualified scientists and engineers, cutting-edge research, personnel, and initiative to succeed in a global marketplace. It was the universities that pioneered "incubators" for developing technology, allowing talented entrepreneurs to turn innovative ideas into products. They have also set up "spin-off" industrial firms for the commercialization of specific products based on their research, often in partnership with local and foreign firms. The large number of patents issued by Israel's universities also indicates the effectiveness of the interactions between the universities and industry.

Israel looks toward Technion to guarantee the nation's economy and industrial strength.

Israel looks toward the Technion in particular to guarantee the nation's economy and industrial strength. Technion graduates constitute the core and driving force behind Israel's high-tech and science-based industries. The market value of Israeli companies headed by Technion graduates has reached an estimated $30 billion.

Successive Israeli governments have reduced public funding of universities by no less than 25 percent over the past six years—the deepest cut of any sector in the country. This is a real, long-term, strategic threat to Israel's ability to grow and thrive. Without world-class research universities, and a leading technological university like the Technion, Israel will not be able to maintain a modern, technologically oriented vibrant economy.

In speaking before the Technion's Board of Governors meeting in 1959, Prime Minister David Ben-Gurion remarked, "The progress of man is built on three things: Knowledge, energy, and raw materials. Of the three, knowledge is the greatest for on it depends the discovery and utilization of the other two. Since the day when we began to build our new culture as an independent people in our ancient homeland, we have zealously striven to foster science, both pure and applied." As Israel's marks its 60th year of independence, we look toward the future with confidence in our abilities and the strength of our nation.

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The Innovation Nation

Viewpoint by Shlomo Maital

Thirty years ago, science historian James Burke and the BBC produced a wonderful 10-part documentary series called *Connections*, which demonstrated how various discoveries, scientific achievements, and historical world events built off one another in an interconnected way to bring about particular aspects of modern technology. Here is my suggestion for a new *Connections* episode about Technion and Israel, the innovation nation, as it turns 60.

Question: How are three young intellectuals (none over 30), a tea merchant, Einstein, a Romanian immigrant, the American Midwest, a French General, and an Egyptian president linked closely together, over many decades, to create Israel's high-tech miracle?

Answer: In July 1902, a pamphlet was published by Martin Buber, 24, philosophy student, Berthold Feiwel, 27, editor, and Chaim Weizmann, 28, chemistry student, urging establishment of a Technikum (Technion) in Israel, to "train young people for technical, agricultural and engineering professions." Funds were provided by the estate of Kalonymous Wissotzky, a Russian tea merchant. Strong support came from Albert Einstein. Einstein visited Technion in 1923, just two years after winning the Nobel Prize for Physics. Technion opened its doors in Haifa in 1924 with 16 students majoring in civil engineering and architecture.

In 1941 a 16-year-old Romanian immigrant named Osias Rolling came to Israel, on a rusting ship named Dikla. He chose a Hebrew name, Uziah Galil, graduated with an electrical engineering degree from Technion, fought in the War of Independence with the 7th Brigade in the Galilee, and in 1952 went to Purdue University in Indiana for graduate studies. There he encountered American industrial Research and Development and saw clearly, as Arnold Sherman observed in *High-tech in Israel: A Dream Realized,* that "the key to Israel's economic success is the link between university research and new industry based on that research," something America was rapidly building. While still a faculty member in Technion's Physics Department, Galil started a company, in February 1962, which he called Elron (from the letters of Electronics). He got funding of $80,000 each from Discount Investments and from the Rockefeller family. Galil and Elron would became a role model for Israeli entrepreneurs.

In May 1967 Gamal Abdel Nasser expelled UN forces from Sinai, closed the Straits of Tiran to Israeli ships and sent 100,000 soldiers into Sinai. French President Charles de Gaulle announced an arms embargo on Israel, even though Israel's front-line Mirage, Ouragon and Vautour aircraft depended crucially on French parts. Israel was forced to improvise and produce its own electronics. Elron led the way. Stef Wertheimer's Iskar did the impossible and produced jet engine turbine blades. In a real sense, de Gaulle was the father of Israel's high-tech industry.

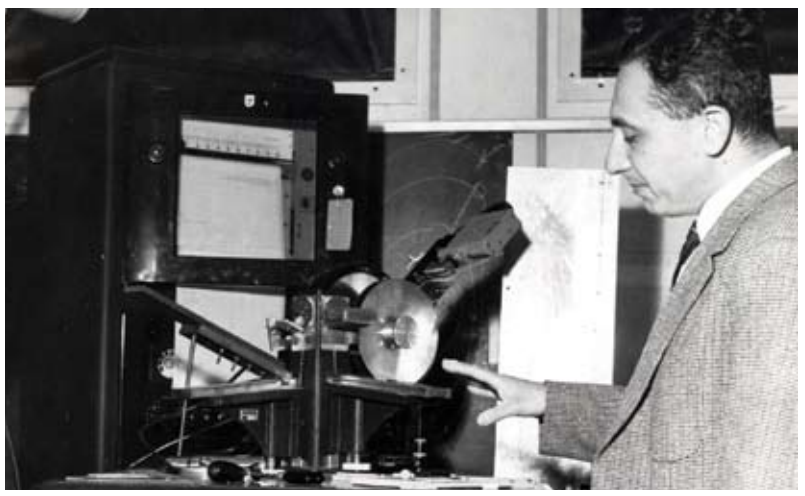
Israeli innovativeness has given to the world: Centrino chipsets, designed at Intel's R&D center in Haifa; disk-on-key—popularly known as memory sticks—invented by M Systems; the chip that enables cell phones to take digital photographs (Zoran, Silicon Valley-based company founded by Israelis); the tiny video camera that travels through our intestines in a capsule (Given Imaging); and amazing stents for heart patients. Many startup entrepreneurs, the CEOs who guide them, and the engineers who drive their success, are Technion grads.

From 2003 to 2007, Israel achieved 5 percent GDP growth annually, with 40 percent of growth driven by high-tech exports.

And it all began in 1902 with a pamphlet.

Prof. Shlomo Maital is Senior Researcher at S. Neaman Institute for Advanced Studies in Science and Technology.

Uzia Galil, Physics Department, 1961



Prizewinning Start-up

Regentis Biomaterials that develops biomedical materials for cartilage repair was chosen as the Best Incubator Company of 2008 by the Israel Ministry of Industry, Trade and Labor. Established in Technion Seed (the Technion incubator company), Regentis raised $7.5 m. in the past year from VC Vitalife, one of Technion Seed's partners, and other investors. Founded by Dr Dror Seliktar of Technion's Faculty of Biomedical Engineering and Technion graduate Yehiel Tal, CEO, Regentis develops biomedical materials based on Seliktar's technological platform Gelrin™ —an implantable biodegradable matrix designed to promote healing of focal tissue defects. "There's no doubt that the company's success wouldn't have been possible had it not been for the excellent science and research done and developed by Dr Dror Seliktar in his laboratory at Technion," says Benjamin Soffer, manager of T³—Technion Technology Transfer. "However, it is possible that the technology wouldn't have emerged and reached the same achievements if it hadn't been for entrepreneurial decisiveness, such as Yehiel Tal's. We are pleased with this kind of combination between a first-class entrepreneur and a first-class inventor."

Technion Technology Transfer
Excellence Applied.

Good Energy

by Amanda Jaffe-Katz

Technion consolidates its energy-related efforts and recruits new faculty.

According to Prof. Gidi Grader, who heads the Technion Energy Program (TEP), Technion has consolidated its energy-related efforts, and, he says, "TEP will draw many more faculty who work on energy-related problems, and recruit new faculty."

TEP is a broad program representing the energy activity on campus. Its activities are related to research, projects, and will also eventually cover study programs and student support. "You can steer the activity in a certain direction when you support that activity," says Grader, "—for that you must generate funding."

To this end Grader says, "Our target is to raise on the order of $50 m. which will be a combination of donations, government funds (Israel and U.S.), and the private sector. You need that kind of funding level to put together major projects."

Grader describes what he calls "the Technion Energy Team," which numbers eight representatives of the different fields in which Technion is active. "We asked for a submission of proposals. Based on these proposals, we are now writing the TEP project, with each team member responsible for writing a chapter." Topics include diverse research areas such as Photovoltaic Energy Generation, Advanced Combustion, and Zero Energy Buildings. Several involve "green" energy.

"Some foci address renewable energy sources," says Grader, "others do not." For example, there is focused activity on solar cells and wind power—both of which are renewable—while other researchers look at fuel cells, which is rather an energy conversion scheme, or advanced combustion which is aimed at increasing the efficiency of existing processes.

Another major activity targets Alternative Fuels. "The focus is fuels that are not based on carbon—a wonderful solution for today's carbon-based fuel," Grader says.

Yet another area is energy saving related to more efficient use of energy, and also energy storage—how to store energy generated during the day for use at night. In some cases, the storage of energy is more costly than its generation.

The Technion-wide program was established at the initiative of President of the Technion, Prof. Yitzhak Apeloig, and VP for Research, Prof. Moshe Eizenberg. There are currently more than 60 faculty members involved in TEP activities, spanning the faculties of Aerospace, Biotechnology and Food, Chemical, Civil and Environmental, Electrical, Materials, and Mechanical Engineering, and the science faculties of Chemistry and Physics.

Expanding beyond the confines of the Technion campus, Grader is also forming an alliance with the National Renewable Energy Lab (NREL), and has submitted a proposal for joint collaboration now being discussed with the U.S. Department of Energy (DOE).

Prof. Gidi Grader, Arturo Gruenbaum Chair in Materials Engineering

High Hopes

A breakthrough product in the field of solar energy.

SunHopes, developed by Dr Pini Gurfil of the Faculty of Aerospace Engineering and Dr Joseph Cory from the Faculty of Architecture and Town Planning, harvests solar energy using lightweight, thin-film photovoltaic cells attached to large helium balloons whose interiors are treated to prevent helium loss and to maximize maintenance-free operation. Electricity generated by the cells is conducted to the ground using electrical cables, designed to minimize transport losses. The initiative promotes diversification of energy resources while satisfying a growing need for a sustainable environment.

Requiring no ground surface area—a scarce resource in urban areas—SunHopes offers a cost-effective, lightweight, mobile, modular and adaptable means for generating solar energy. Potential uses include electric car recharge units, off-grid electricity generation for recreational activities, secondary electrical units for residential consumers, and scientific applications. A prototype of the system, runner-up in the U.S. 2007 RE:Vision Design Competition, was built and successfully deployed in Israel during November 2007.

Personalized Medicine
PHARMACOGENETICS

Therapeutics 4 U

(l-r) Profs. Ron Pinter, Ariel Miller, Eli Sprecher, Dan Geiger and Dr Tamar Paperna discuss the latest progress of the Technion Pharmacogenomics Consortium (PGx).

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neurologist at the Rappaport Faculty of Medicine and head of the Multiple Sclerosis and Brain Research Center at Carmel Medical Center. "The solution—which would lead to the development of 'Personalized Medicine'—requires implementation of pharmacogenomics." This science examines the genetic variations and cellular processes that dictate drug response and predicts how patients will react.

Capitalizing upon Technion's multifaceted capacities, equipment, and patient pool at 12 affiliated hospitals, a multidisciplinary team of experts that includes scientists, engineers, and physicians has created a Technion Pharmacogenomics Consortium, dubbed PGx. The Technion-wide initiative spans five faculties, nine faculty members, their PhD students and research staff. The researchers chose to focus on two diseases—multiple sclerosis (MS) and psoriasis—which have lifelong morbidity and unsatisfactory existing treatment-choice protocols. In the long-term, the PGx team plans to build a generic research platform to study any disease and any treatment modality.

PGx Team Members	Contributing Area
Computer Science / Profs. Ron Pinter and Dan Geiger, and graduate students	Novel approaches to using genetic linkage analysis for individual participants and the integration and elucidation of drug response pathways, leveraging a powerful grid infrastructure
Industrial Engineering and Management / Prof. Paul Feigin and two PhD students	New statistical methodology for analyzing genomic data
Biomedical Engineering / Prof. Isak Gath	Feature selection of pharmacogenetic data
Biotechnology and Food Engineering / Prof. Yechezkel Kashi	Polymorphic microsatellite DNA sequences
Medicine /	
• Prof. Ariel Miller, Drs Tamar Paperna, Nili Avidan, Izabella Lejbkowicz and PhD student Noa Tzunz	Genetic underpinning of the response to the treatments of Multiple Sclerosis
• Prof. Eli Sprecher, Dr Ofer Sarig and Janna Nousbeck	Genetic underpinning of the response to the treatment of psoriasis
• Prof. Karl Skorecki	Genetic characteristics of diverse Israeli populations
• Dr Stavit Shalev	

Disease	Incidence	Response	Research Goal	Genetic Cues
Psoriasis	Systemic disease 2% of world's population; in U.S. may be 4.6% Rare in Africa. Highest in Caucasians	Can be quantified	To identify genetic determinants of response to phototherapy in psoriasis	HLA-C (connected to immune system); corneodesmosin; α-helix coiled-coil rod homolog
Multiple Sclerosis (MS)	Chronic disease Most common neurological disease of young adults, and 3 times more prevalent among women Rare across the Equator. More prevalent in N. Hemisphere	There are good, poor, and adverse responders	To identify genetic determinants of response to immunotherapies in MS	TCR (connected to immune response)

Equipment includes the state-of-the-art Illumina BeadStation 500GX® integrated system for SNP genotyping and gene expression profiling—the only one in Israel. "One of our challenges is to optimize statistical methods for the Illumina system," says Prof. Paul Feigin.

The PGx genetic analysis facility is housed in the Center for Translational Genetics. "This new facility was recently established by the Rappaport Family Institute for Research in the Medical Sciences to promote translational research in genetics," explains its head, Prof. Eli Sprecher. "Apart from pharmacogenetic projects, our members conduct research focused on population genetics, complex traits genetics, and single-gene inherited disorders."

Miller and colleagues from the Weizmann Institute of Science and Teva Pharmaceutical Industries were among the first to show a certain genetic fingerprint associated with good response to an MS-specific drug, Copaxone®. Their findings were published in the medical journal *Pharmacogenetics & Genomics* in August 2007.

Diagnostic kits to determine which treatments are beneficial and which should be avoided.

Upon approval in September 2006 from the National Supreme Helsinki Committee for Genetic Studies, the clinical teams began recruiting patients and healthy control subjects. Simultaneously, PGx members have been active in four workgroups to refine the tools for data analysis at all levels: genetic, clinical, and personal.

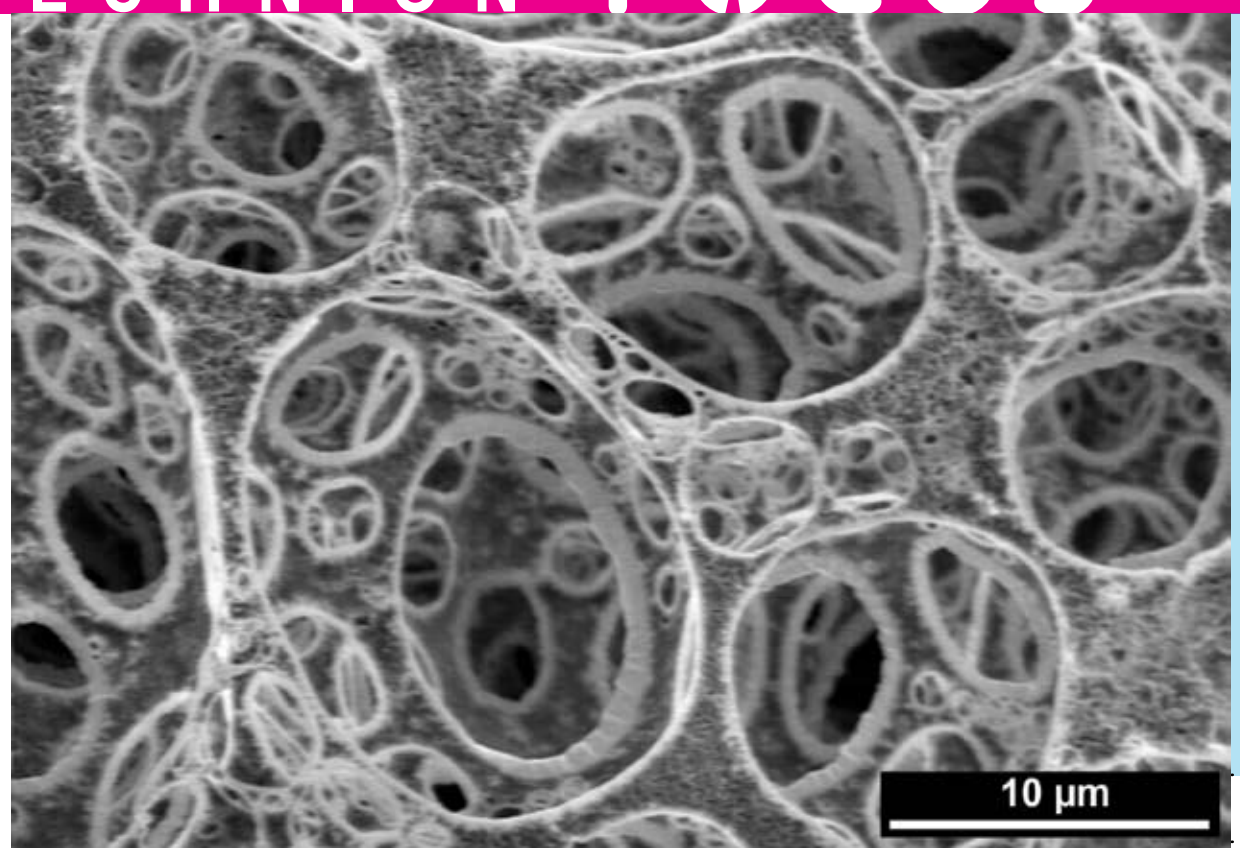
Further common infrastructure takes the form of a database management system to retrieve both the raw measurement samples collected by the clinical teams and the results of computational analyses performed on these data. "We are facing the challenge of setting up a system that will be secure, powerful in its ability to process complex queries that produce valuable knowledge, and user-friendly at the same time," says Prof. Ron Pinter.

The researchers aim to develop diagnostic kits—based on blood samples—that will empower physicians to determine which treatment would be beneficial and which should be avoided, taking into account patients' genetic, demographic, and clinical information. This relates both to the efficacy of medications, and to safety.

"Altogether, the program is aimed at tailoring therapeutics to the individual and moving from the current trial-and-error mode of treatment to an informed medical decision making," says Miller.

The PGx research is supported by the Wolfson Family Charitable Trust, the American and French Technion Societies, Rappaport Family Institute for Research in the Medical Sciences and the Galil Center for Medical Informatics, Telemedicine and Personalized Medicine at Technion.

Future Matter



Nanoporosity generated within a hybrid polyHIPE using a porogen.

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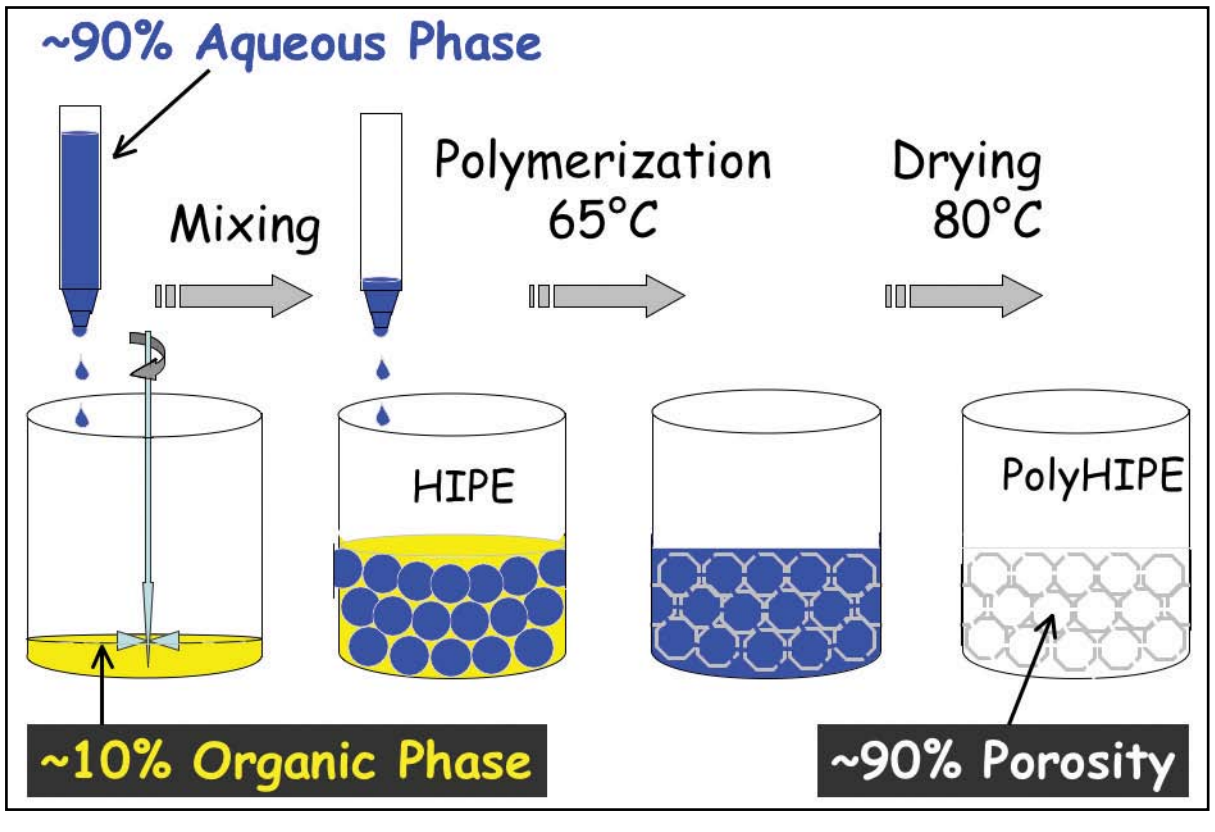
polymer foams. "In contrast, what we are doing is 'green' and uses water that can be recycled," Silverstein explains, describing how his method differs from traditional practice. "We start with monomers—the basic building blocks used to create the porous material—that can be any number of reactive liquids that hate water. We pack in as many water droplets as we can by adding a stabilizing emulsifier, getting a liquid system that is 90 percent dispersed water droplets surrounded by a thin, continuous monomer envelope. The polymer-forming reactions all take place within this envelope. When we suck out the water—which is just a place-holder—we end up with empty voids where the water droplets used to be, giving us superior materials that are essentially a whole lot of nothing. Once we have the approach, we can use the same methodology for different polymeric materials, each appropriate for a different application," says Silverstein. Thus, while he developed polyHIPE for the absorption of contaminants from water some seven years ago, his current research takes him into the realm of nanocomposite materials.

A new generation of porous materials that are lighter, greener, and more versatile.

Schematic diagram of the polyHIPE synthesis process.



Sensors were developed by covering the polyHIPE with a conducting polymer film using a simple dip-coating process. "With such a huge surface area, we should attain better sensitivities," says Silverstein. Inorganic porous monoliths were developed by heating hybrid organic-inorganic polyHIPE cubes to 1000°C. "Amazingly, under the right conditions, we lose 90 percent of the mass and volume but the porous structure and cubic shape are maintained," he says.

"We are working on super-strong lightweight materials that can make important contributions to the environment and make transportation cheaper," Silverstein says. Lightweight materials for the automotive and aerospace industries translate directly into substantial fuel savings. "Porosity is also integral to energy dissipation and thermal insulation—bonus features of the materials under development."

Using the HIPE methodology, Silverstein has joined forces with Dr Shulamit Levenberg of the Faculty of Biomedical Engineering to research a biodegradable material for tissue engineering. Tissue engineering requires pores that are larger than the voids typically found in polyHIPE. "To this end, we are purposely destabilizing these materials so that they are more appropriate for tissue engineering," Silverstein explains. "Our big challenge here was to create a cross-linked system that would eventually disintegrate."

A recent research project involves another class of biomaterials—hydrogels, found in diapers and contact lenses—that have the ability to absorb up to 800 percent of their weight in water without disintegrating. Silverstein is also combining different types of polymers: a hydrophobic (water-hating) scaffold with a hydrophilic (water-loving) filling. This approach can be harnessed for drug delivery, each phase filled with an appropriate substance. "At this point, it is just an in-vitro proof of concept study," Silverstein says.

Silverstein usually has some six graduate students researching different polyHIPE materials. Sometimes undergraduate students do feasibility studies. "Our undergraduates acquire an incredible background in science as well as engineering abilities," he observes. "At an international meeting, I presented our unique undergrad program that, among other virtues, provides perfect preparation for graduate work. Other universities that don't offer this comprehensive educational experience wanted to snap up our students!"

After completing his Honours BASc in Engineering Science at the University of Toronto in 1983, Silverstein visited the Technion. Walking around the Wolfson Faculty of Chemical Engineering, he came across door signs bearing such renowned names as Prof. Moshe Narkis, whose works he had studied. Thus inspired, Silverstein sent home for his books and stayed to earn a DSc in Chemical Engineering.

Following a postdoctoral stint at the Center for Applied Polymer Research at Case Western Reserve University in the U.S., Silverstein joined Technion's Faculty of Materials Engineering in 1989. Faculty Dean Prof. Emil Zolotoyabko says, "Michael is doing pioneering research in the field of porous polymers. These materials consist mainly of empty space and at the same time remain mechanically strong. Such an unusual combination, together with chemical stability, make these materials very promising for diverse potential applications in tissue engineering, drug delivery and in specific fields in which energy absorption is a critical issue. Without a doubt, this research deserves maximum support."

"Most of my energies are presently directed towards these porous materials," Silverstein concludes. "I think there is so much more we can do with them. One day soon we'll reach a point when we say, 'This has got to be commercialized.' Right now, industry is putting out feelers. I anticipate that if you ask me in a year's time, I'll be able to tell you about some commercial applications of our research," he hints.

Watch this space!

Creative Vision

by Barbara Frank

When the Shalom Zielony Plaza was dedicated in 2002, the beautiful 300-acre Technion was transformed forever. The Zielony Plaza is located right in the center of campus and is the pulsating heart of vibrant Technion City.

The attractive waterfalls, scenic promenade and expansive central lawn provide a wonderful location for Technion's large gatherings and ceremonies. Surrounded by facilities housing Technion's central functions, several faculties and the Ullmann Teaching Center, it creates an attractive and inviting area that is the true hub of campus life. On Wednesday afternoons the Technion Student Association sponsors musical happenings attended by large audiences reclining on the expansive lawn, while merchants sell their wares in an outdoor bazaar nearby. Among the other activities taking place in the plaza are the annual Student Day, Employment Fairs, and the main graduation ceremony.

Nearby is the Student Union Building, the nucleus of student life on campus. It is a place to meet and greet, to eat, to find out information, to relax, to have fun—a place to see and be seen.

Technion Guardian, Shalom (Stanley) Zielony, designed a "debarking" machine.

"Providing others with the tools to realize their dreams."

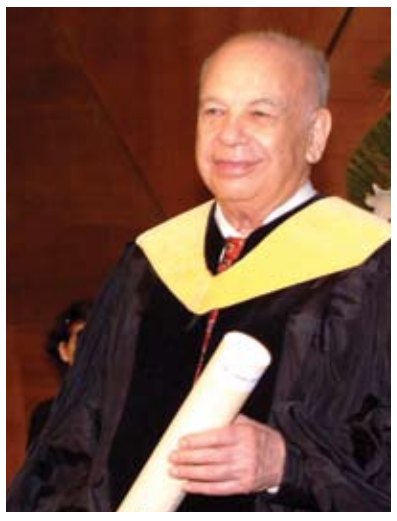
By day, the activity is service-oriented; in the evening, social and cultural happenings take precedence. Shalom Zielony has donated the leading gift to the major renovation in process to modernize the Student Union Building built in the 1960s. The building, renamed the Shalom (Stanley) Zielony Student Union Building, will well serve today's 12,500 students. Included are a new 300-seat auditorium, pub, café, restaurants, cinema, shops and an outdoor plaza and exhibition area, as well as administrative offices.

Zielony's untold generosity and modesty are legendary. His gifts to Technion include funding for the Graduate Student Village, Faculty Recruitment Program, the Russell Berrie Nanotechnology Institute and more. Zielony says that he feels privileged to have the opportunity to give, and he believes in the importance of contributing to the education of the next generation.

Born in Jerusalem and educated in Haifa, Zielony served in the communication division of the *Hagana* during the War of Independence and then in the Israel Defense Forces after the establishment of the State. He moved to North America in 1955 and settled in Canada where he became involved in the exporting of pulpwood to Europe from Eastern Canada. At the same time he found ways to improve the loading of cargo ships for transatlantic trips. According to Prof. Peretz Lavie, Vice President for Resource Development and External Relations, "Zielony is truly a self-made man. He is a visionary with a brilliantly creative mind. Early in his work in Canada in the timber industry and after moving to the United States he proved to be an innovative designer who observed how a machine worked and invented ways to enable it to function better. This ability to improve machinery transformed into the aptitude to improve processes."

In 1967 Zielony founded Publications Expediting Services (P.E.S), a New York business that distributes scientific literature throughout the world. It was the first company to use air freight and mail to import scientific journals and books from Europe for U.S. readers and also to export them to the rest of the world. The company's success is attributed to Zielony's close study of the U.S. postal service and his formulation of a system to lower the cost of airmail shipment. Today his business distributes nine tons of scientific literature a week.

Zielony has always remained close to Israel, caring for the country and interested in its progress. Upon receiving his Technion Honorary Doctorate degree in 2003, Zielony related how pleased he was that the time had come when he could share his good fortune with others. He said, "My mission in life is to provide others with the tools to realize their dreams and goals." Transforming the face of the Technion campus, improving student life, and supporting academic progress is helping to achieve this.



Shalom (Stanley) Zielony receiving his Honorary Doctorate from Technion, 2003.

Nobel Mentor

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received the Nobel Prize in Physiology or Medicine in 1986 for her discovery of nerve growth factor (NGF).

Ambassador of Italy to Israel, H.E. Sandro De Bernadin, said that Levi-Montalcini, appointed senator for life in 2001, is active in promoting the conditions of women and active in developing research in Italy, and is also "an example of the bond that can exist between Israel and Italy."

"It's a dream to be here today."

On campus shortly before her 99th birthday, Levi-Montalcini met with a forum of Technion women faculty. She was introduced by Prof. Adi Salzberg of the Rappaport Faculty of Medicine who called her, "a great neurobiologist and developmental biologist who has inspired many women in science." Levi-Montalcini said, "I'm delighted to be here and see so many young women scientists. When I started my career it was very difficult at that time for a woman." When asked what needs to be done to encourage women to study science, she answered, "We don't need to encourage them. They know that they are capable." And her secret for a long life? "I never think about myself," Levi-Montalcini answered, "Just be entirely indifferent to your own problems—physical and social."

Inspired by Prof. Albert Einstein who planted a tree during his 1923 visit to the original Technion site, Levi-Montalcini attended a tree-planting ceremony during her campus visit. Levi-Montalcini said, "It's a dream to be here today, and I thank Technion… I'm happy to be still among the living, almost a century old. I hope the tree will grow up and I'll still see it once again."

Joining Levi-Montalcini and the Italian delegation were also Prof. Carla Buttinelli, Neurologist, Tor Vergata University; Rome; Prof. Pietro Calissano, National Research Council and European Brain Research Institute, Rome; Prof. Carlo di Castro, Chair of Physics at La Sapienza University, Rome; Prof. Alberto Chiaraviglio, Head of Civil Engineering at Politecnico Torino; Dr Guido Coen, Vice Director of Orthopedics at San Filippo Neri Hospital, Rome; Prof. Cesare Fieschi, former Head of Neurology at La Sapienza University, Rome and Member of the Italian National Health committee; and Prof. Giulio De Rossi, Chief of Haematology, Bambino Gesù Hospital, Rome.

(l-r) Italian Technion Society President, Pierro Abbina; Prof. Rita Levi-Montalcini; Technion Senior Executive Vice President, Prof. Paul Feigin; Dr Guido Coen

Leadership Q & A

Lawrence Jackier assumed office as Chair of the International Board of Governors (BOG) on October 1, 2007. Upon his 50th visit to Technion, he shared his vision with FOCUS.

Q: What is your vision for Technion and Technion's role in Israel?

A: Without Technion, Israel would be a very different place today, and without Technion, Israel will be a very different place tomorrow. Israel has become a high-tech society – not an agrarian one. The quality of life in Israel, the nature of society, maybe also Israel's survival, depends on what Technion does or does not do.

It is clear that higher education is no longer the national priority it once was, and we can't afford that. Israel will have major problems in the future if we don't fix the education system and Technion has the greatest resources to improve it.

We should take a leadership role to make this country what it needs to be in the Family of Nations. I will support this as Chair of the Board.

Q: What excites you most about your numerous visits to Technion?

A: Seeing everyone—it's like a family reunion—and talking to the students who are the energy and the future. I'm impressed with it all. As it happens, I'm walking around with four cardiac stents, the development of which was significantly impacted by the work of Rafi Beyar of our medical faculty. But, as well as the medical aspects, also water, aerodynamics, and security are all really exciting and potentially world-changing.

When I grew up, we were not that far away from events such as the Holocaust, the Birth of Israel in 1948, and the series of wars that ensued. My father was a Board member and I followed in my parents' footsteps in many senses. Both of my children and all of my step-children have been to Israel and most to the Technion, and I look forward to the involvement of their generation in the future.

Q: What are your top priorities for your term of office and do you foresee major changes?

Even as the Chair I still have a big responsibility as a fundraiser. One of my goals is to build up the largest possible endowment. Ours is relatively tiny for a science and technological research university. We need to convince people to support the endowment. It is critical to the Technion. My role is to work with the Technion management and with Societies who can contribute financially.

Technion has been forced to respond to events—partly because of the government. As difficult as it is to plan, I will work on a long-term strategic plan to prioritize what needs to be accomplished over the next decade.

TechniBiz

"From Idea to Enterprise: Making it in the Global Market"—The First Israeli National Entrepreneurship Conference—was held in March 2008 at Technion, as part of Israel's 60th anniversary events. Celebrating Israeli contributions to entrepreneurship worldwide, it was launched as a joint initiative of BizTEC– national entrepreneurship challenge, Technion's Bronica Entrepreneurship and Innovation Center, and Israel's leading financial newspaper, *The Marker*. Sharing knowledge and experience amongst entrepreneurs and innovation-oriented academics, the one-day event drew a standing-room-only audience in parallel sessions.

Dr Yossi Vardi, well-known entrepreneur, spoke on the contribution of high-tech to Israel's economy. Vardi, a quadruple graduate of the Technion bearing a BSc, MSc, PhD, and a Teaching Diploma, paraphrased Theodore Roosevelt's *The Man in the Arena* speech: "Tribute is paid not to those who sit on the sidelines and watch but to those who jump into the ring and confront the issue." Reuven Agassi, Technion alum, entrepreneur, and founder of the Technion for Life program, said "I always see in Israel a place to do Proof of Concept." A special panel on Wonder Woman addressed the issue of the glass ceiling effect for women entrepreneurs and managers.

Dr Yossi Vardi, well-known entrepreneur

Board of Governors 2008

The 2008 International Board of Governors session takes place at Technion between June 1 and June 4. The **Festive Opening of the Board of Governors** and the presentation of **Honorary Fellowships** to eight devoted **Technion** friends from Australia, Brazil, Israel and the United States will take place on June 1 at the **Historic Technion Building**. Special tribute will be paid to the students of 1948 in honor of Israel's 60th anniversary. The following evening, **Honorary Doctorates** will be conferred on seven eminent public figures.

The **Technion Medal** will be awarded to **Ben Sosewitz** and **Lewis Weston** for their unremitting service to the Technion.

New facilities to be dedicated on campus include the **Azrieli Library in the Faculty of Architecture and Town Planning**; and the **NY Metropolitan** facility in the **Sara and Moshe Zisapel Nanoelectronics Center**. There will be a festive dinner to celebrate the naming of the **Irwin and Joan Jacobs Graduate School**. The **Ruth & Stan Flinkman Genetics Network Laboratory** will be dedicated at the **Rappaport Faculty of Medicine**.

Outstanding faculty will be recognized with the **Muriel and David Jacknow Awards** for Excellence in Teaching, the **Salomon Simon Mani Awards** for Excellence in Teaching, the **Hershel Rich Technion Innovation Awards** and the **Henry Taub Prizes** for Academic Excellence. Student awardees will be celebrated at the **Norman and Barbara Seiden Family Prize Ceremony**.

Technion's research achievements will be showcased at **visits to high-tech companies** that apply Technion research and employ Technion graduates in the fields of defense, medical technology, and electronics.

Thomas Friedman, *New York Times* Foreign Affairs columnist, will deliver the **Yitzhak Modai Annual Lecture on Technology and Economics:** "Green is the new Red, White, and Blue: America's Mission in a World that is Hot, Flat, and Crowded."

All details correct to May 1, 2008

Honorary Doctors	Honorary Fellows:
Angelica Berrie, USA	Reuven Agassi, Israel
Stanley Chais, USA	J. Steven Emerson, USA
Thomas Friedman, USA	Mark Gelfand, USA
Prof. Israel Gohberg, Israel	Gen. (Res.) Shlomo Inbar, Israel
Arch. Daniel Libeskind, USA	Leon Kempler, Australia
Avinoam Naor, Israel	Cindy Sipkin, USA
Jonathan Sohnis, USA	Mariane & Sandor Szego, Brazil

FOCUS

Dutch Friends

Technion is proud to announce the latest addition to the family: the Netherlands Technion Society. Born at the initiative of Technion alumnus Kobi Kurtz, the new group is based in Rotterdam where Kurtz heads a high-technology consulting group. The Society is currently in the process of forming a board of directors and planning their first activities. For further details, KMM@euronet.nl

Scientist for Life

by Roberta Neiger

Prof. Yonina Eldar, a seasoned electrical engineer with a rich background in physics and mathematics, wants to help humanity. She has found an outlet for her altruism at the Network Biology Research Laboratories, within Technion's Lorry I. Lokey Interdisciplinary Center for Life Sciences and Engineering. Here she joined the five other members of the group: Profs. Shimon Marom and Noam Ziv from the Rappaport Faculty of Medicine; Prof. Ron Meir, who, like Eldar, belongs to the Faculty of Electrical Engineering; Physics Prof. Erez Braun; and Dr Naama Brenner from the Wolfson Faculty of Chemical Engineering.

"I realized that if I was going to be spending a lot of time working away from my three young children, it had to be for something that had great importance and impact, like combating illness," she recalls.

Seeking a vehicle for her ideals Eldar contacted Distinguished Prof. Aaron Ciechanover, director of the newly established Lokey Center. The Nobel laureate described the overriding goal: To merge engineering and mathematics with the life sciences. It was a perfect fit, and Eldar can use the tools of her field to advance medical science—in her words, "moving biology to the deeper and different level of understanding that is demanded."

"Research is not a nine-to-five occupation, it's a way of life."

While life scientists and engineers agree that mathematical know-how is needed, Eldar says that establishing a common vocabulary can take months of effort. "I formulate problems by putting them into math blocks, into equations," she says. "It's a different mindset, and it's *my* responsibility to understand the biologists' problems to see how my tools can help."

Eldar says that coming up with the right problem can be almost as hard as solving it. One project that incorporates analytical tools borrowed from signal processing promises to shed light on different neural processes.

Eldar made *aliyah at* age six from Toronto, Canada, in 1979, with her parents and seven siblings. She earned two BSc degrees from Tel Aviv University—in electrical engineering and in physics, and a PhD in electrical engineering from MIT. She joined Technion in 2002, as a Horev Fellow in the Leaders in Science and Technology Program.

(l-r) Technion President Prof. Yitzhak Apeloig presents Prof. Yonina Eldar with Haifa Municipality's Award for Women as Haifa Mayor Yona Yahav applauds.

Juggling the roles of mom and scientist is not easy, but Eldar's significant achievements belie this. In March 2008—to coincide with International Women's Day—she received Haifa Municipality's Award for Women with Distinguished Contributions, for her research in signal processing, communications, and statistics. And in June 2008 Technion will present her with the Muriel and David Jacknow Award for Excellence in Teaching, and the Hershel Rich Technion Innovation Award for "Spectrum Blind Reconstruction of Multiband Signals."

Eldar says, "Research is not a nine-to-five occupation, it's a way of life."

Nobel Faces

A collection of 77 portraits of Nobel Laureates by Peter Badge is on display at Madatech–Israel National Museum of Science, Technology and Space. Badge is the acclaimed official photographer of the Lindau Foundation, which hosts annual meetings of Nobel Laureates and young scientists from all over the world. Beyond its artistic and documentary merit, the exhibition contributes to the special atmosphere of Madatech's Nobel Café, which will allow visitors to encounter Nobel Prizewinners and discuss scientific novelties and their effects on human life.

The exhibition—a joint venture of Technion, Madatech and the Lindau Foundation, was initiated by Distinguished Prof. Aaron Ciechanover, Nobel Prize in Chemistry, 2004, who chose the portraits together with Technion President, Prof. Yitzhak Apeloig, and Physics Prof. Moti Segev.

MADATECH
THE ISRAEL NATIONAL MUSEUM OF SCIENCE, TECHNOLOGY & SPACE
DANIEL & MATILDE RECANATI CENTER (ra)
Museum activities under the auspices of the Technion - Israel Institute of Technology

Sderot Solidarity

Two classes of schoolchildren from the rocketed southern town of Sderot were hosted on campus in March 2008 by the Center for Pre-university Education. The children enjoyed a two-day science camp along with respite from the daily missile attacks on their homes. Pictured, Technion President Prof. Yitzhak Apeloig greets the youngsters at the Center.

Claim to FameLab

FameLab Israel—launched in 2007—is a science communication competition run by the British Council, created to encourage scientists to inspire and excite public imagination with a vision of science in the 21st century. Open to scientists up to age 35 who want to share their enthusiasm about science with the general public, the competition is likened to *American Idol* where contestants give a 3-minute talk about a scientific topic, and then receive feedback from a panel of judges.

Yaron Fuchs (pictured), 29-year-old Technion PhD Biology student, tied for second place at the national May finals in Tel Aviv for his talk on genetic therapy in the "bubble" children. Roey Tzezana, 2007 FameLab Israel runner-up and PhD candidate in the Seiden Nanoscience and Nanotechnology Program, coordinates the project at Technion.