

TECHNIONNEWS

Newsletter of Technion Canada
Spring 2015



THOSE WHO MAKE A DIFFERENCE



THE PEOPLE OF TECHNION.



Message from
DOREEN GREEN
National Chair

On the Seder night we ask why is this night different from all other nights. I was thinking a similar thought when I began to write this message – how is this message

different from all the others I have written? After thinking back on my previous messages I realized that basically they are all the same. They are my way of sharing my pride in the students and faculty of Technion and championing Technion Canada as a way to support not only the Technion, but Israel and the world. Technion is dedicated to the creation of knowledge and the development of human capital and leadership, for the advancement of the State of Israel and all humanity.

Dream it, Do it. That has been the mantra of Technion this past year. Technion students, faculty and graduates have done just that for close to 90 years. Dreams of using a 3D scanner to develop an advanced inhalation mask for infants and children; dreams of improving targeted chemo drug delivery; dreams of creating a wearable device that slows brain tumour growth; dreams of using nanotechnology to create personalized cancer treatment that may save countless lives; dreams of a robotic snake that could save thousands of lives in the wake of natural and human disasters; dreams of a phone so smart it sniffs out cancer; dreams of developing 'smart' substances that will change their shape, color and other properties in response to environmental situations; dreams of a global outreach to New York, to China and beyond. Dreams that have become reality because of Technion.

This is the source of my pride - this incredible institution that Technion Canada is committed to supporting. I would like to invite you to become part of the Technion Canada family and to join me in supporting the next generation of young minds in Israel in their pursuit of outstanding innovations in science, technology and application.



Message from
MARVIN OSTIN
National President

For over 70 years Technion Canada has provided support for Technion - Israel Institute of Technology. We have been able to do this because of the many

men and woman who provided leadership, volunteerism and donations over the years. This support has resulted in a wide range of buildings, residences, faculties, institutes, programs, fellowships and scholarships at Technion.

Technion Guardians have made the highest level of commitment to the Institute. There are eleven Canadian individuals or families who have reached this pinnacle in the past and this year we thank and congratulate Honey and Barry Sherman and our Past National President, Gary Goldberg and his wife Linda for reaching that level of commitment.

Technion Canada is fortunate to have individuals who have been a part of the Technion Canada Family for most of their adult lives. Stalwarts like Harry Sheres, who while living in Montreal and then Toronto has given his time, his leadership and his financial support.

People like Harry Bloomfield who are carrying on a family tradition of philanthropy and who this year will be recognized by Technion when an Honorary Fellowship is conferred upon him.

Looking towards the future, we have the next generation of leadership developing in our Generation NEXT group. Our 4th Generation NEXT trip to Israel and Technion will take place in June and we know from our past participants that a visit to Technion creates a passion for this outstanding institution making them want to engage their colleagues and friends in supporting Technion. Seymour Schulich and Jane and Hershel Segal are among those who believe that these trips are an invaluable tool in guaranteeing the future of Technion Canada and Technion itself, and we thank them for their foresight.

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A strong supporter of Technion and Israel NERI BLOOMFIELD Z"L

1925-2015

Technion Canada was saddened to learn of the passing of Neri Bloomfield, a remarkable woman who leaves a great legacy. An

ardent and proud Zionist, whose grandmother was a delegate to the second Zionist Congress in Basel, Switzerland in 1898, she began her lifelong dedication and service to Israel as the youngest ever President of Canadian Hadassah-WIZO. Later Neri was National President of the Canadian Zionist Federation and as the first female President of the Jewish National Fund of Canada. She was a member of many Boards of Governors and Directors including the Jewish Agency for Israel and the World Zionist Organization, the Technion, the Hebrew University of Jerusalem, Ben Gurion University of the Negev, the Jerusalem Foundation, the Jewish General Hospital in Montreal and the J.G.H's Lady Davis Institute for Research. She was Chair of the Women's division of the Combined Jewish Appeal Campaign in Montreal, Honored as Ne'eman Yerushalayim by Mayor Teddy Kollek in 1992. She championed forests, reservoirs, and the creation of a sports stadium in Jaffa that carries the family name. Upon the death of her husband, Bernard Bloomfield, Neri became Chairman of the Lady Davis Trust.

At Technion, where Neri received an Honorary Doctorate, the generosity of the Bloomfield family has been demonstrated by the creation of the Lady Davis Mechanical and Aeronautical Engineering Centre, the Bloomfield Centre for Graduate Studies in Industrial Management, the Lady Davis Chair in Experimental Aerodynamics and the Lady Davis Fellowship for Visiting Professors, Post-Doctoral Researchers and Doctoral Students from abroad.

Neri's greatness truly lay in her unbridled passion and support for Israel and her belief that a leader leads by example and actions - not only by words.

For more than 65 years, the Bloomfield family name, has been closely associated with the development of the State of Israel and today Neri's children, Evelyn and Harry, are continuing the family tradition of support for Israel.

She was a true community leader in every sense of the word and a great inspiration. A great loss to our community.

THE BLOOMFIELD
BUILDING HOUSING
THE FACULTY
OF INDUSTRIAL
ENGINEERING AND
MANAGEMENT



Harry Bloomfield QC to receive an Honorary Fellowship

An Honorary fellowship will be given to Harry Bloomfield QC by Technion - Israel Institute of Technology at the Technion Board of Governors Meetings in June.

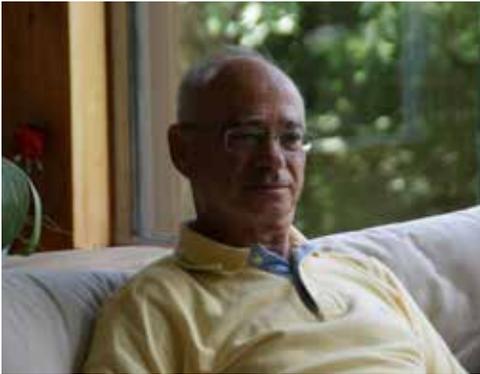
As President of the Eldee Foundation of Canada, together with his sister Evelyn Schachter and their late father, mother and uncle, he has originated and contributed gifts to Israel from the foundation. These include the Lady Davis Fellowship Trust in partnership with the Technion and the Hebrew University, the Bloomfield Building for the Faculty of Industrial Management, the Lady Davis Chair and the Bernard Bloomfield Chair at Technion and many other philanthropic gifts both in Israel and in Canada. Harry is a member of the Board of Directors of Technion Canada as well as of the Board of Governors of Technion.
Kol Ha'Kavod Harry.

TECHNION ALUMNI

During the 2014 Technion Canada Annual General Meeting, Technion Alumni from across the country gathered for a post meeting discussion on recruiting and finding the best way forward to involve Canadians who graduated from the University. This initiative is led by Technion Canada, Alberta Regional Director, Ronnie Kaplan, Nir Rikovitch of Waterloo, Sasha Bimman of Toronto, Benny Kritzer of Toronto, Paul Radacanu of Montreal and Devorah Livneh of Windsor. Over the next short while, the Technion Canada Alumni Committee will chart out a course for how they can build strong Alumni "clusters" across the country. If you are an Alumnus and are interested in playing a role in developing a strong Technion Alumni presence in Canada, please contact Ronnie Kaplan at kaplanr@shaw.ca.



TECHNION FOR LIFE



Paul Radacanu graduated from the Faculty of Electrical Engineering in 1971. From 1972- 1974 he worked at Elbit Systems in Haifa as a Design Engineer. Paul's career spread from Haifa to Montreal and Toronto. He worked as a Project Engineer in Data Acquisition and Control Systems for Electrical Power Utilities at CAE Electronics from 1974 -1980. In 1981 he was with Infomart in Toronto as a Software Engineer. In 1982 he began working on industrial research projects at the National Research Council of Canada and he remained there until his retirement in 2010.

Paul was a participant in the Alumni Breakfasts in Montreal held in the early 2000s. Paul and his wife Mala, both members of Technion Canada's Montreal Council, have been supporters of Technion Canada since 1999. At the 2014 Technion Canada Annual General Meeting Paul was elected to Technion Canada's Board of Directors.

"Working for the Board of Directors of Technion Canada and for the Alumni Committee, I feel I could give back a little of the generosity that Israel continuously bestows to the new generation of students at Technion. From my first weeks at Technion I met fellow students from many Israeli backgrounds. I felt their spirit of camaraderie and readiness to help. What united us was our determination to study and graduate as engineers.

Today, we, alumni of Technion, experience the social networking phenomenon that can bring us back together to enrich our social life and once again contribute in a meaningful way to our family traditions."

Paul Radacanu

TECHNION CANADA GENERATION NEXT



GENERATION
NEXT

Shaping the Future of Technion Canada

From the beginning, in the early 1940s, when the Canadian Technion Society was founded, the goal has remained the same – to create awareness of and raise funds in support of the Technion. The change that has occurred has been in the leadership and their creative ways of connecting to Israel and Technion. From a group of young engineers and architects who met with the aim of sending technical books to Technion, to major fundraising initiatives to support the building of the Canadian Graduate Student Residences, each generation has found a way to support Technion. Technion Canada's Generation NEXT is your direct connection to Israel in the 21st Century.

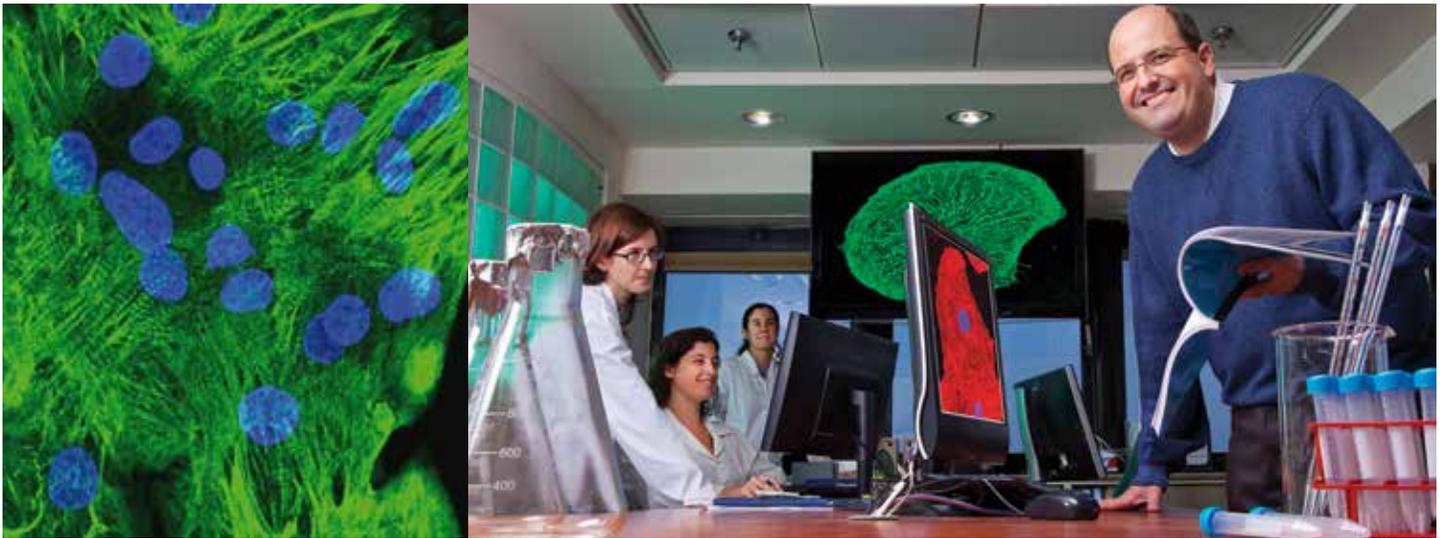
Generation NEXT connects young leaders, ages 25-45 across Canada right to the heart of Israel's High-Tech sector. For over 101 years the Technion has been forward focused and has helped propel Israel in to the 21st century.

Generation NEXT offers young leaders the chance to get engaged by offering speakers, special events and trips to Israel supporting the Technion in Haifa.

On June 9th the fourth Technion Canada Generation NEXT trip will leave for Israel.



TECHNION PROFESSOR LIOR GEPSTEIN HAS FOUND A WAY TO TURN PATIENTS' SKIN CELLS INTO HEART MUSCLE CELLS TO REPAIR THEIR DAMAGED HEARTS



Dr. Lior Gepstein of the Technion's Rappaport Faculty of Medicine, obtained his MD and PHD from Technion-Israel Institute of Technology.

Dr. Gepstein has discovered a way to create beating heart cells using human skin cells reprogrammed to become stem cells. The discovery could make it possible to clinically repair damaged human hearts. Dr. Gepstein takes skin cells from heart failure patients and reprograms them to transform into healthy, new heart muscle cells capable of integrating with existing heart tissue. The

research opens up the prospect of treating heart failure patients with their own, human-induced pluripotent stem cells (hiPSCs) to repair their damaged hearts.

Using skin cells from a patient with an inherited heart disease to help test treatments for that disease, Dr. Gepstein also offers a glimpse at the future of personalized medicine, where a person's own cells can be used to determine which treatments might work best — or should be avoided — for a particular condition.

DR. LIOR GEPSTEIN



Dr. Gepstein obtained his MD at the Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel and conducted his PhD thesis at the same institute. During this period he was involved in the development of a three-dimensional electroanatomical mapping techniques, which became the state-of-the-art method for the treatment of complex cardiac arrhythmias.

Currently, he is Professor of Physiology and Medicine (Cardiology) at the Technion's Faculty of Medicine and holds the Edna and Jonathan Sohnis Chair in Tissue Engineering and Regenerative Medicine. More recently he was appointed as the Director of the Cardiology Department, at the Rambam Hospital. Dr. Gepstein's research activities focus on the areas of basic and clinical cardiac electrophysiology, stem cell biology, studying of inherited cardiac disorders, and establishment of novel gene and cell-based strategies for the treatment of different cardiac disorders. Dr. Gepstein's group was among the pioneers in developing unique cardiomyocyte differentiation strategies from human embryonic stem cells and human induced pluripotent stem cells. He was awarded a number of prestigious awards for his achievements in cardiology. More recently he was elected to the Israeli Young Academy of Science.

CANADA WELCOMES DR. GEPSTEIN

Dr. Lior Gepstein, a pioneer in the study of stem cells and their therapeutic potential in the cardiovascular system, will lead the Technion team in the joint venture. Dr. Gepstein is spending a sabbatical year in Toronto at the University Hospital Network, working alongside Dr. Gordon Keller, to help develop new stem cell therapies and mechanical devices to treat patients with heart disease; to carry out meticulous clinical trials to assess the ability of PSC-derived cells, engineered heart tissue and novel mechanical

devices to treat patients with heart disease and to accelerate the translation of promising new therapies for heart disease to the marketplace in collaboration with industrial partners.

Dr. Gepstein was the guest speaker at the Technion Canada Annual General Meeting in November. On April 30th and May 1st, Dr. Gepstein will be in Montreal visiting with community members and speaking at a series of events.

TECHNION'S GRADUATES AND RESEARCHERS HAVE DRIVEN ISRAEL'S TRANSFORMATION FROM AN ECONOMY OF JAFFA ORANGES TO SEMICONDUCTORS.

From microprocessors to medical advances, discoveries that enrich the lives of people everywhere. Technion's contributions go further than even the most visionary founders would have imagined. They can be felt every day in the lives of ordinary citizens.



"Disk on key" – or memory sticks, as they are widely known – were developed by an Israeli company called M-Systems Ltd., which was founded in 1989 by Technion electrical engineering graduate Dov Moran. M-Systems patented the first flash drive, which it sold as DiskOnChip in 1995, and the first

USB flash drive, which it marketed in 1999 as DiskOnKey. Today memory sticks are ubiquitous, found on millions of key chains and carried in millions of pockets. M-Systems was acquired by its competitor SanDisk in 2006.



Instant messaging was invented by a company called Mirabilis, which offered free downloads of I.M. software known as ICQ ("I Seek You"). The developers were young Israeli computer students who wanted to know which of their friends abroad were online so they could chat. With help from

one of their fathers – Technion alumnus Yossi Vardi, a graduate of IE&M – they formed a company and provided ICQ to anyone who wanted it. Some 12 million people had downloaded it by 1998, when America Online bought Mirabilis for \$408 million. At the time, it was the highest price ever paid for an Israeli software company.



The ReWalk is a robotic exoskeleton that allows some people with spinal cord injuries to walk upright. The ReWalk was designed by a paraplegic inventor and Technion graduate, Dr. Amit Goffer, who was seeking a better solution to life in a wheelchair. Dr. Goffer's invention was an exoskeleton that provides powered hip and knee motion to enable individuals with a spinal cord injury

to stand upright and walk. Given that he was paralyzed himself, his understanding of what he was creating was greater than anyone would have developed independently. Improvements in motion sensing technology and the advent of improved computers and batteries helped create a more natural form of motion that is not so difficult to learn for paraplegic users.



The PDF format and other graphic file formats such as GIF and TIFF were based on a data compression method called the Lempel-Ziv algorithm, which was developed

by Technion Professor Abraham Lempel (computer science) and Distinguished Professor Jacob Ziv (electrical engineering), together with a colleague, Professor Terry Welch. Data compression was crucial in the early days of personal computers, because computer memory was too limited to handle large amounts of data. The Lempel-Ziv algorithm allowed compression of a large English text file to about half its size – effectively doubling a computer's capacity. Starting with Unix systems in 1986, the Lempel-Ziv algorithm was a key element of computing worldwide for almost two decades.



WatchPAT originated in the sleep laboratory of Technion President Peretz Lavie. Named by Cleveland Clinic as one of the Top 10 Medical Innovations of 2010, WatchPAT enables ambulatory sleep testing. It's a small device that slips over the finger and attaches to a kind

of wristwatch that records signals from the body's autonomic nervous system. WatchPAT means that many apnea patients no longer need to sleep in an uncomfortable, artificial laboratory environment in order to receive a detailed diagnosis of their condition.



Dr. Hossam Haick of the Technion helped develop the technology for the Na-nose which spots the special "odor" emitted by cancer cells and can sense the presence of both benign and malignant tumors much more quickly, efficiently and cheaply than current diagnostic measures. "Current cancer

diagnosis techniques are ineffective and impractical," Dr. Haick said. "NaNose technology could facilitate faster therapeutic intervention, replacing expensive and time-consuming clinical follow-up that would eventually lead to the same intervention."



The future of Israel is in high-technology and the future of high-technology in Israel is at Technion.

TECHNION TRIUMPHS

A Phone So Smart , It Sniffs Out Disease



A research consortium headed by Professor Hossam Haick of the Technion-Israel Institute of Technology is developing a product that, when coupled with a smartphone, will be able to screen the user's breath for early detection of life-threatening diseases.

Funded by a grant from the European Commission, the SNIFFPHONE project will link Prof. Haick's acclaimed breathalyzer screening technology to the smartphone to provide non-invasive, fast and cheap disease detection.

The technology is supported by a recent €6 million (US\$6.8 million) grant to the consortium to expand the "electronic nose" breathalyzer technology that Prof. Haick has been developing since he joined the Technion in 2006. That technology can identify individuals from the general population who have a higher likelihood for contracting a specific disease, and treat them in advance or at an early stage.

"The SNIFFPHONE is a winning solution. It will be made tinier and cheaper than disease detection solutions currently, consume little power, and most importantly, it will enable immediate and early diagnosis that is both accurate and non-invasive," says Prof. Haick. "Early diagnosis can save lives, particularly in life-threatening diseases such as cancer."

3D Printing - the Next Hi-Tech Revolution



Billy the Blue Beetle is a 3-D printed robot

"We have in the palm of our hands, the power of a 1950s computer center," notes Prof. Nir Tessler, incumbent of the Barbara and NormaN Seiden Academic Chair

in the Faculty of Electrical Engineering. "The introduction of the personal computer in the 1980s resulted in a technological boom. Every kid could sit and write software. And we are reaping the results."

Now, according to Tessler, it is the turn of 3-D printing to undergo the kind of revolution seen with software. "With 3-D printers, we are currently where we were in the 1950s with computers," Tessler states. "I believe that the personal fabrication center is the idea of the future. I see 3-D printing being introduced as a technology for manufacturing high-tech and other devices. People will be able to sit at home and produce applications and articles. This is crowd innovation. You release an idea. You don't know what the results will be. But because so many people are playing with it, something will materialize. If some of the power currently existing with software moves to hardware, the world will never be the same."



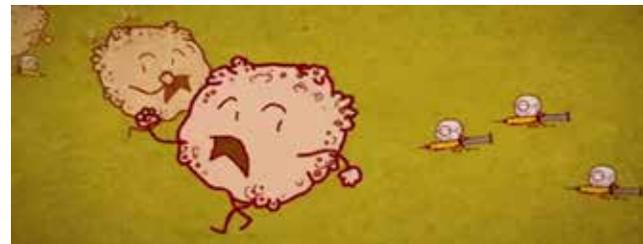
Out with pigskin, in with 3D printed football.

Stratasys, whose CEO is a Technion graduate, 3D printed a football to salute the Super Bowl.

This is not so far-fetched. Today, many athletic shoe manufacturers use soles produced by a computer printer program developed in Israel. And more and more products are being produced by 3-D printers every day.

Tessler is now initiating a Technion-wide project that aims to position Technion as a national leader in the 3-D Printing arena. He explains that this is so much more than merely the 3-D printing of artifacts. "What we are talking about at Technion," he says, "is not about manufacturing an object, per se, but something that is functional. We have the capability to incorporate all the advances we have made in micro- and nanoelectronics with 3-D printing, and this is unique. This includes electronics, optics, functional materials, and metallic wires for connectivity."

NANO Gets Personal with Cancer Treatments



Cancer rates have been steadily increasing making it the leading cause of death in the western world. Surprisingly despite scientific and medical advances more than 30% of cancer patients receive the wrong drug. Drugs that are ineffective in fighting cancer weaken the patient and may not bring the best results.

However this can change, as Prof. Avi Schroeder and his team at Technion have developed a unique nanotechnology method to explore the efficiency of different drugs before treatment begins. To test a person's response to medication, drugs need to be tested within the patient's body inside the tumour turning it into a small and safe treatment lab. Then they create nano particles each marked by a unique bar code that carries a specific medication. These nano particles are then injected into the blood and enter the malignant tissue through micro fissures that do not exist in healthy tissue. The nanoparticles then discharge the drug within the tumour cells. Following that doctors take a biopsy of the tumour and can see by analysing the bar codes which drug is most effective for treating the patient. This new development allows the drug diagnostic phase to take place within the patient's own body. This leads to clinical recommendations based on the patient's own response, being personalized medicine at its best. Such speedy answers will lead to a dramatic improvement in treating to these cancers saving countless lives one nano particle at a time.