JCT
LEV ACADEMIC CENTER

Cyber Security –
The New High-Tech Frontier

Chazal's rationale for reading the curses at the end of *Sefer Devarim* before *Rosh Hashanah* is: *Tichle Shana Ve'Klaloteha; Ta'chel Shana U'birchoteha* – may the curses of the current year come to an end and may they be replaced by the New Year's blessings. The assumption that what is new will necessarily be a blessing does not always work out, but there is an undeniable excitement that accompanies innovation. Taking on new challenges and dealing with new opportunities is part of what keeps both individuals and organizations vibrant.
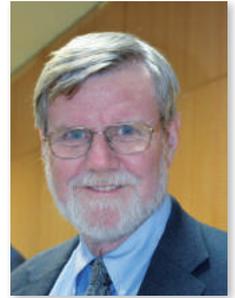
This issue of Perspective touches on some of our new programs:

- New Masters degrees: M.Sc. in Electro-optics and M.S.N. in Nursing;
- New Certificate programs in Cyber-Technology and Health Informatics;
- A Magen David Adom-certified program for paramedics;
- New Entrepreneurship Centers on both the Lev and Tal campuses.

These innovative educational activities are happening alongside construction projects that will create new facilities including two new floors on top of the Israel Henry Beren Science and Torah Institute, the new Tannenbaum Dormitory and most exciting, the Tal Campus.

What next? What is our vision for JCT and wherein lie the challenges?

Firstly, we hope to preserve the "brand" and continue delivering high quality undergraduate and graduate student degrees in hi-tech engineering, management and health science. The clearest diagnostic for our success will be the success of our students.

We expect to continue adding Master's degree programs so as to provide new research and training opportunities for our faculty and students. This growth is essential and we intend to do it while fully preserving the unique character of JCT.

We are proud of our outreach to populations who have had limited involvement with academia (e.g. Ethiopians and Haredim); we must find a way to attract these students, providing terms with which they will be comfortable, while preserving the rigor of our academic offerings.

We will continue to expand our degree programs for English speakers (currently a B.A. in business and a B.Sc. in computer science). The caution here is not to grow too fast and not to compromise our ability to give each student the individual supervision they deserve.

I invite you all to come and see for yourselves the exciting events that are unfolding here in Jerusalem.

Please accept my best wishes for a New Year filled with good health and happiness for you and your families.

Shana Tova,

Prof. Chaim Sukenik, President

During its almost fifty years of existence, the growth of the Jerusalem College of Technology (JCT) – Lev Academic Center in many ways reflects the growth of the State of Israel. It has taken an active role in helping to meet many of the challenges facing Israel and it has risen up to meet these challenges in a myriad of ways, in a pursuit of awareness and social responsibility. JCT has constantly been a partner in bringing about the huge advances that we see today in the State of Israel.

With regard to empowering women, JCT continues to lead the way. According to data compiled by the Council for Higher Education at the request of the Haaretz economic daily, *TheMarker*, JCT was recently ranked first among all Israel's higher education institutions in the integration of women who are studying computer science. 20% of all women in Israel who are studying computer science are studying at JCT. Furthermore women make up 53% of the computer science students at JCT. This is substantially higher than at any other institution in Israel.

Cyber security is one of the more urgent and important issues facing the world today. Israel is one of the leaders in this area and JCT has a disproportionate number of alumni working in the defense industry cyber units.

Many of the large multi-national companies have complained that Israeli academic institutions do not teach cyber studies in the manner needed by industry. Therefore, JCT co-created its Cyber Elite Program, which will allow JCT students and alumni to be placed in some of the top companies with the proper tools to meet cyber challenges.

Israel continues to face serious challenges in properly absorbing young Ethiopians into the workplace, in general and in the hi-tech sector, in particular.

Our Ethiopian program, now in its twentieth year, established a track record of excellence. Many of our graduates have attained top engineering jobs in the army and our program continues to grow.

The health services industry in Israel suffers from a severe shortage of qualified professionals. JCT has stepped up to the challenge by expanding its Life and Health Sciences Faculty for both men and women and it now has one of Israel's largest and best nursing programs.

Israel has issues in mining big data necessary to solve the challenges of the public health sector. JCT has, therefore, established a joint program with the University of Toronto for Health Informatics. This will allow our Computer Department to cooperate with our Life and Health Sciences Faculty to solve major health issues facing Israel today.

One of the most formidable challenges facing Israel today is the rate of employment among Haredim with more than 60% of Haredim living below the poverty line and only 50% of Haredi men being gainfully employed. Israel faces an existential threat if solutions are not found. In Israel's Start Up Nation, there is a shortage of 10,000 engineers, with Haredim comprising a small percentage of hi-tech employees.

JCT has accepted the challenge and has become the leading institution in Israel for academic hi-tech education geared to Haredim. With 2,000 Haredi students studying at JCT, we are instrumental in helping Haredim attain quality and respectable employment in the hi-tech world. We have become the leading voice in Israel in the media regarding Haredim in academia.

In order to ensure that JCT continues to do its best to help meet the many challenges facing the State of Israel today, we rely on your continued support.

Wishing you and your family a *Shana Tova*,

Stuart Hershkowitz
Vice President

Contents

Smart Home on Shabbat:
The Ideal - or a Panic Button for Shabbat Observers?
by Rav Yosef Zvi Rimon

At the Jerusalem College of Technology – Lev Academic Center, much emphasis is placed on learning Torah as well as academic studies and many *shiurim* and colloquiums are held on these subjects throughout the year. During this year's Torah and Science Conference, I spoke about the use of a Smart Home on Shabbat; the following is a summary of that shiur:

When new technology is co-created, the Jewish world may worry and become concerned about its consequences. In most instances, however, technology does not go against *halacha* (Jewish law); in fact, it can even have a positive impact on the *halachic* sphere. Further to these considerations, other practical and educational aspects should be given some thought by each individual family who wishes to take advantage of various Smart gadgets, since under certain circumstances, some aspects of the Smart Home can even be useful for keeping *halacha*.

To a certain extent, most homes today are Smart Homes, but the "Smart" aspect of the home is increasing and expanding and will continue to develop in the coming years.

What is a Smart Home?
A Smart Home enables one to control the entire house via a computer, application or other form of technology. A single button can turn off the lighting, air-conditioning and all other electric devices when leaving the house. There is no *halachic* issue with these features. They operate similarly to a time switch (Shabbat Clock) and can be used on Shabbat. (In the past, the issue of *Marit ayin* [the appearance of breaking *halacha* while not actually doing so] arose regarding time switches, however today it is commonly known that they are used and therefore, this is no longer an issue).

There are additional innovations that are rarely found in private homes today, however, they will be commonplace in the future; for example, devices that can be controlled through speech and even through sight and blinking. Devices can even be operated via thought! These things should be prohibited on Shabbat, since they are considered in accepted *halachic* ruling as a human "act," even if they are performed through a different organ: speech, etc. (There is

much more to say on this topic, but we will not do so here.)

There are some inventions that can be problematic on Shabbat, the most prominent of which are motion detectors. These create the possibility that movement in certain rooms will turn on lights or air-conditioners (this technology is currently used on many street lights). If movement is not detected in the room, the lights and air-conditioners will shut off within several minutes.

Air-conditioning: The air-conditioning can change the temperature according to the body heat of those within the room, the air coming into the room when opening a door, etc. (this exists in many houses today, with units that have "inverter" technology). In addition to these, the more advanced the house, the more it will be attuned to the movements of its occupants. It will not always operate accordingly, but it will note every move and each opening of a window. It may even use the occurrences within the house to calculate scenarios in which appliances should be operating.

Volume detector, human recognition: These systems are rare in today's Smart Homes in Israel, but in the future, it is highly probable that they will become more prevalent. For instance, some people prefer an open window, while others prefer it closed. In the future, it is entirely possible that the system will recognize each individual and open or close the windows according to their preferences, know whether they prefer air-conditioning, when to turn on the air-conditioning and at what temperature.

Are these *halachically* acceptable?
In this forum we cannot bring the *halachic* sources but only the conclusions. It seems that sensors in a Smart Home can be permitted, despite the fact that they are operated through the person's movements, since the person is unaware of them and they are inconsequential to him. If they are helpful to the person, for example in the case of the air-conditioning, but he is unaware of them (or at least that the change cannot be immediately detected by him), it seems that this can also be permitted since he is doing something forbidden without intent (according to an answer provided by Rabbi Wosner).

Therefore, a Smart Home and all appliances operating within it with the use of time switches that have been pre-programmed, can be used. Sensors, that turn on lights or immediately bring about noticeable and visible action, should be shut off prior to Shabbat. Sensors that operate in a manner that is not visible and does not bring about immediate noticeable and visible action, can be kept on on Shabbat.

It is important to note that some aspects of a Smart Home can be helpful to those who keep Shabbat. In principle, a program can be created that will prior to Shabbat, set the fridge so that it automatically shuts off the light within as well as perhaps other aspects of the fridge and will automatically turn them back on after Shabbat. The blinds can be automated to open and close according to preference and, in the future, perhaps according to the weather. A switch that neutralizes all light switches can be made, to avoid turning lights on and off by leaning against switches.

Jewish sources can also be used in order to improve upon the Smart Home. As of today, in most Smart Homes the electric blinds can be set according to the hours of the day. The problem is that sunrise and sunset times change every few weeks, requiring the owner to reset the operation of the blinds. Times for prayers are based on proportional hours, which already appear in the *Mishna* and *Gemara*. These calculate the hour according to sunrise and sunset. Thus, the clock can be set to open the blinds according to a proportional hour, which will negate the need for resetting.

In conclusion: In a Smart Home some devices should be neutralized before Shabbat. However, there are many others that can be used on Shabbat and may even help in keeping Shabbat. There are even ways in which the Jewish calendar can help improve the Smart Home!

Rav Yosef Zvi Rimon is the Rabbinic Head of the Jerusalem College of Technology – Lev Academic Center and the Head of its Batei Midrash. He is the community Rabbi of Alon Shvut South in Gush Etzion and teaches at Yeshivat Har Etzion and Migdal Oz Girls Seminary as well as lectures in communities in Israel and abroad. Rav Rimon is a prolific author of Halachic works that take the reader from the sources to the practical application of Halacha in modern times. He is Founder and Chairman of the Halacha Education Center which develops innovative educational curricula for Jewish studies, using state-of-the-art, cutting edge technologies. He also founded JobKatif shortly after the disengagement from Gaza to help Gush Katif evacuees re-integrate into the work place and today continues to serve as its Chairman.

Cyber Security – The New High-Tech Frontier

By Lisa Samin

Israel is a global powerhouse in cyber security. In order for the country to continue its groundbreaking work in cyber security and defense, and maintain its competitive edge in this field, there is a critical need to train Israel's new generation of cyber leaders. JCT stands at the forefront of this training.

In 2017, headlines around the world screamed that a massive ransomware cyber-attack had hit nearly 100 countries. The International Edition of the Guardian reported that there have been "more than 45,000 attacks recorded in countries including the UK, Russia, India and China."

In January 2016, the Times of Israel reported, "Iran launched a cyber-attack targeting Israeli army generals, human rights activists in the Persian Gulf and scientists". The goal: "espionage or other nation-state interests".

A cyber-attack hit England's National Health Service (NHS) in May 2017 locking staff out of their computers and forcing some hospitals to relocate patients. In Los Angeles, a hospital paid $17,000 in bitcoin to ransomware hackers, after a cyber-attack locked doctors and nurses out of their computer system for days.

"Cybercrime is on the rise and no corporation or government agency is immune to data breaches. Healthcare institutions are wise to take preventive cyber medicine or the hacks will likely get worse," wrote Forbes magazine in May 2016.

"There have been increasing numbers of cyber-attacks reported in recent years within all industries and it is costing the United States an absolute fortune in cyber security…In 2016 there were widely reported attacks on PayPal, Twitter and Spotify to name just a few of the big companies which have been targeted. The number of cyber-attacks throughout the world is increasing and businesses are spending more and more money in deterring the crime," Wall Street.com reported.

From healthcare to financial services to the military, government, manufacturing and transportation systems, cyber-attacks are becoming increasingly more frequent and dangerous and governments and businesses are seeking more advanced cyber-defense strategies to protect their assets from constantly evolving threats.

This is exemplified in a piece written for *The Cipher Brief* by **Michael Eisenstadt** of the Washington Institute. He writes about Iran's weapon of choice for imposing its will on domestic and foreign threats alike — cyber-attacks.

"Eisenstadt, as well as experts contacted by **Business Insider**, say that Iran has a weak conventional military that couldn't possibly hope to push around stronger countries. For that reason, cyber-attacks represent the perfect weapon."

"Cyber-attacks are cheap, ambiguous, hard to pin on any one player and almost completely without precedent when it comes to gauging a military response."

"Cyber-attacks allow Iran 'to strike at adversaries globally, instantaneously and on a sustained basis and to potentially achieve strategic effects in ways it cannot in the physical domain,' writes Eisenstadt.

So, what exactly is a cyber-attack?

"A cyber-attack is deliberate exploitation of computer systems, technology-dependent enterprises and networks," according to Techopedia. "Cyber-attacks use malicious code to alter computer code, logic or data, resulting in disruptive consequences that can compromise data and lead to cybercrimes, such as information and identity theft. Cyber-

attack is also known as a computer network attack (CNA)."

These attacks can take the form of fraud, extortion, malware, viruses, breach of access, system infiltration, website defacement, intellectual property theft or unauthorized access.

Israel is a country that deals with a multitude of daily cyber-attacks on its national infrastructure and government databases. According to Israel's Ministry of Industry and Trade, defending these assets has become an existential priority.

In response to this, in 2014, Prime Minister Benjamin Netanyahu announced the establishment of a national cyber complex CyberSpark. Cyberspark is a joint venture of The National Cyber Bureau (NCB) in the Prime Minister's Office, government institutions and leading companies in the cybersecurity industry.

This has come to fruition as multinational businesses with a strong cyber orientation such as **DellEMC**, **Deutsche Telekom**, **IBM**, **PayPal**, **Cisco** and others join the affiliate club of the CyberSpark high-tech center of excellence.

"Israel's strategic need combined with its highly developed tech ecosystem has led to the creation of a world-renowned hub of cyber-security innovation. It is estimated that sales of Israeli cyber-security technology are around five to seven percent of global cyber sales. Israeli cyber products are used by almost all of the Fortune 500 companies," reports the Ministry of Industry and Trade. "It is clear that in today's networked world, cyber-criminals, cyber-terrorists and state-sponsored hackers are increasingly able to gain access to critical data belonging to businesses and countries alike."

In order to continue Israel's groundbreaking work in cyber security and defense and maintain its competitive edge in this field, there is a critical need to train Israel's new generation of cyber leaders. JCT stands at the forefront of this training.

David Leichner, Chairman of the Israeli Friends of JCT, a member of the Board of Trustees and a global consultant in cyber-security explains, "As internet access spreads worldwide, the danger from hacktivists, state sponsored criminals and individual hackers is growing rapidly. As companies move to digital business models, the threat of cyberattacks has become one of the most critical risk factors facing organizations today."

In Israel, the army's intelligence unit produces a cadre of

cyber innovators who have created wildly successful cyber security companies in civilian life and power many of Israel's cyber defense systems. But with the growing need for cyber experts, this small group of highly trained young people is not enough.

"The hackers are winning the war today and there is a shortage of qualified professionals in the market to take up the battle," says Leichner. "It is imperative to train the next generation of cyber experts who will not only be able to detect attacks in progress, but will be able to prevent them from happening to begin with."

Four years ago, JCT pioneered its academic cyber track in the Computer Science Department. According to **Dr. Ariel Stulman**, PhD, senior lecturer and researcher at JCT's Department of Computer Science, this track is breaking down barriers for religious men and women to enter the cyber field. "This is a very difficult and demanding field," says Stulman, "and until recently religious people have been greatly underrepresented."

Following the introduction to computer security, a class open to all, 30-35 students on each of three JCT campuses continue to more advanced cyber courses. This includes software security, network security and cryptography. A major added-value in the JCT course is that it combines theoretical learning with hands-on laboratory work.

"The entrance level for cyber learning is very high," says Stulman. "Combining theoretical and practical learning is

David Leichner

demanding and difficult. But the students who choose this track are determined and motivated."

As a result, these JCT graduates have a qualitative edge in the competitive job market.

Leichner agrees, noting that cyber professionals need to have a background in computer science, basic coding, computer engineering, information security and a deep understanding of the vulnerabilities that allow cyber-attacks to be carried out. "This is a constantly changing field and cyber experts must know the latest tools and techniques available to stay one step ahead of the hackers," says Leichner. "JCT students and graduates are ready to face this challenge."

The cyber track is given for men and women, on the Lev, Tal and Lustig campuses. Stulman says the demand among the men is much higher, but women are beginning to be more interested in this field as well.

High tech and cyber security companies look to Stulman to recommend outstanding graduates for their companies. Over the past three years Stulman has recommended nine of the best and the brightest students to cyber companies. All of these students were hired.

Stulman recalls a young woman who graduated the cyber track and started interviewing at different companies. Although she was brilliant and dedicated she found it hard to get a job in what is still a male-dominated field. Stulman introduced her to a cyber company, which hired her. She has been working at the company for 18 months. "The company is so pleased with her work," says Stulman. "All she needed was that first break."

JCT Cyber Elite Lev Campus Students

"We are meeting market needs," says Stulman. "And still this is not enough."

Two of Stulman's students completed their final year project and were chosen to present their demo at the prestigious 2017 Symposium on Access Control Models and Technologies (SACMAT) held in the United States in June. This is the premier forum for the presentation of research results and experience reports on leading edge issues of access control, including models, systems, applications and theory. It provides researchers and practitioners with a unique opportunity to share their perspectives with others interested in the various aspects of access control.

The topic of the demo was Authorization Enforcement Detection. JCT funded the two students to travel to the US, but they were unable to process their visas in time for the symposium. Stulman presented instead.

A number of JCT students are in the army's *Atuda* (pre-military) study program. They defer their army service to get their undergraduate degree, then go on to serve in the army in their field of study.

Tomer (not his real name for security reasons) is one of these students. He grew up in Rehovot and excelled in computers in high school. He was accepted to the *Atuda* program and decided to major in software engineering at JCT. When he heard about the cyber track, he immediately signed on. "I learned a lot during these courses and got great background. But I also had the freedom to learn on my own and to do practical work," says Tomer.

During his senior year at JCT, before going into the army's most elite intelligence unit, Tomer worked for a cyber defense company. He developed a cyber defense system to help developers find vulnerabilities before they put their sites on line.

"It was an amazing experience to actually work at a company even before I graduated," says Tomer. "I worked four days a week. I feel that this, combined with my upcoming army service, where I will be doing cyber research, will give me invaluable experience. Both will accelerate my career path and help me to contribute to the country's defense."

Now, JCT is taking cyber education a giant leap forward with the establishment of the **Cyber Elite Intensive Cyber Security Training Program** for engineering and computer science graduates. Working in partnership with the **Cyber Education Center (CEC)** and cyber industry leaders, this one-

Orlee Guttman

year program for outstanding graduates of BSc programs in software engineering or computer science is expected to be tested in the upcoming academic year.

Cyber Elite is answering the need for highly skilled cyber security employees. JCT, with its proven excellence in computer science and engineering is a natural partner in this unique initiative.

Orlee Guttman, Director of Strategic Partnerships at JCT, who has been instrumental in creating and moving Cyber Elite forward with the partners and industry says, "There are simply not enough highly skilled cyber professionals in Israel. We need to encourage outstanding computer engineering graduates, men and women, from the Orthodox and ultra-Orthodox sectors to enter this field."

The cyber security curriculum is being developed by the Cyber Education Center of the **Rashi Foundation**. This center's current cyber training programs include the recognized *Magshimim*, *Gvahim* and *Nitzanim* programs that serve as pipelines to military intelligence units. The Cyber Education Center also works, inter alia, with the military, the Ministry of Defense and the Prime Minister's Office.

"The Cyber Education Center and Israel National Cyber Bureau have been phenomenal partners in this endeavor," says Guttman. "This is a true partnership with each side providing the maximum in their areas of expertise."

Some 23 partnership companies - multinationals, defense and start-ups - who are leaders in the cyber field, were significantly involved in the planning stages of the program. This is to ensure that the training responds to the industry's specific needs.

"We want to open doors of opportunity and provide entry into a field that previously seemed closed to the religious and ultra-Orthodox," says Guttman. "This is a training program that will bring cyber training to a new source of highly-skilled employees who will then bring their special talents to the field."

The participants, who survived a grueling screening process which began with hundreds of candidates, will spend two days a week in intensive cyber study at JCT, with an industry-focused curriculum. They will work three days a week in cyber companies or cyber departments of international or defense-related companies.

The program will combine both theory and practice, with the intensive "hands-on" component taught in the training program, plus practicums in industry, hand-in-hand with the cyber security needs of host companies.

Participating companies receive highly-skilled employees who are simultaneously participating in intensive cyber training.

"This is a unique program in Israel; there is nothing like it outside of military intelligence." says Guttman. "Companies can recruit the participants as long-term full-time employees upon completion of the program. These employees can 'hit the ground running' without down-time for cyber training."

Cyber Elite's high-level training program for future cyber personnel, which has been generously supported by **Cherna Moskowitz** and other donors, will be instrumental in helping Israel reach its national objectives.

"Today, the hackers are winning the cyber war," says Leichner. "We need to make sure that we train the right people to keep up with and stop, the new attacks."

In Israel, the pace of cyber-attacks is accelerating faster than the pace of investment in cyber safety, the Calcalist newspaper reported. This makes it essential for Israel to be vigilant in training cyber professionals.

*According to a report released by the **Israel Venture Capital (IVC) Research Center**, there are currently 173 companies in Israel big enough to be backed by venture capital companies and other major investors. That does not include the hundreds of others that are bootstrapped or relying on other sources of funding; altogether, there are 430 cyber companies currently operating in Israel, with an average of 52 new cyber startups established annually since 2000.*

In 1999, 30 years after the establishment of the Jerusalem College of Technology – Lev Academic Center, the idea evolved to integrate women through the establishment of Machon Tal – the Hebrew acronym for Technology for Women. Tal Campus far exceeded our expectations both in the number of students (currently 1,700) and the success of its graduates.

Tal Campus has earned worldwide recognition as a place of excellence and a place of Torah. It has led to significant changes in the national religious and Haredi sectors, by offering degrees such as computer engineering, industrial management and bioinformatics. There is no other place in the world with over 800 religious women studying engineering. The Tal Campus Nursing School is among the largest and best in the country with close to 100% success in the Ministry of Health's certification exams and the CPA department earned the highest grades in Israel in the national accreditation exams.

Until today, Tal students have been managing with limited rented space in Givat Shaul, but now, after more than a decade of working towards this goal, a permanent home for our female students is about to be established.

Mayor Nir Barkat and Stuart Hershkowitz with JCT supporters- Rori Cassirer, Ruth Brandt-Spitzer and Mark Berenblut

The new campus will be state of the art and will fit into **Mayor Nir Barkat**'s plan to make Jerusalem *the* city for academia. The new campus will be constructed on an area of 9.5 dunam in Zion valley. The project will consist of 30,000 sq.m., with four 4-floor buildings and a 13-floor tower that will be constructed at a later stage. The campus will include advanced laboratories with up to date equipment. The first building to be constructed will be the Faculty of Life and Health Sciences and will include simulation labs with highly advanced equipment, lecture halls and a library. Construction is set to begin in approximately two years, after the rezoning process is completed and planning permits have been obtained.

The Tal and Lev campuses will be at the crossroads of one of Jerusalem's main gateways with the building of Route 16 which will meet the Begin Highway, next to JCT.

The campus will also feature a unique art project ***The Garden of Tehillim***, by **Ofra Friedland**, one of Israel's leading artists. Ofra has very strong ties to Jerusalem in general and to JCT in particular, as her son is a proud graduate of the college. This magnificent project will comprise a display of stained glass windows representing the 150 chapters of the Book of Psalms. These windows, which will eternalize the values represented by JCT's vision, are available for dedication.

Jerusalem Day Groundbreaking Ceremony

This past Jerusalem Day, a groundbreaking ceremony for the new Tal Campus was held on the site of the future campus. The event was attended by Jerusalem Mayor **Nir Barkat**, Minister of Jerusalem Affairs **Ze'ev Elkin**, Knesset Members **Avraham Neguise**, **Moti Yogev**, Jerusalem Foundation President **Johanna Arbib**, Deputy Mayors and members of the Jerusalem City Council: **Meir Turgeman**, **Yael Antebi**, **Ofer Berkowitz**, **Hagit Moshe** and **Moshe Leon**. Also attending were friends and supporters from Israel and abroad including Chairman of the American Friends of JCT **Rori Cassirer**, **Howard Millendorf**, **Ruth Brandt-Spitzer**, **Helene** and **Robbie Rothenberg** and **Ruth and Robert Epstein**.

Despite his very busy timetable on the eve of 50th anniversary of the unification of Jerusalem, **Mayor Nir Barkat** spent over 90 minutes at the event, meeting and greeting staff, friends and supporters. He addressed the audience for over 20 minutes outlining his vision for Jerusalem. Mayor Barkat stated that along with other projects for the revitalization of Jerusalem, with the construction of Campus Tal, "We

Prof. Chaim Sukenik, Mayor Nir Barkat and Stuart Hershkowitz

Chairman of the Committee for Immigration, Absorption and Diaspora Affairs **MK Avraham Neguise** focused on JCT's contribution to the Ethiopian-Israeli community, noting that "the program that exists at JCT for the integration of the Ethiopian community…proves that JCT is leading the integration of populations on the boundaries of society and pushing them into the center of Israeli society through academia." He spoke from his experience as an immigrant and added that "education is the most important key to integrating and promoting all of Israel's populations."

President of the Jerusalem College of Technology – Lev Academic Center, **Prof. Chaim Sukenik**, stated: "Building the campus will serve to advance groups which are considered to be underprivileged in society, such as the Haredi and Ethiopian-Israeli sectors. It will open new opportunities for people who were formerly unable to access academia and the workforce and will enable us to produce engineers, high-tech and management personnel who will lead the Israeli high-tech industry. "

During the event, an exhibition of student projects was presented, which included an autonomous noninvasive computerized diagnostic system for identifying early signs of stroke combining the use of system analysis, artificial intelligence and information mining. Another project presented was the ROADZ project - an application that calculates and displays the levels of risk on Israel's roads and alerts drivers before entering and leaving dangerous areas.

are laying cornerstones for academic institutions that will expand the nucleus of young people in Jerusalem, leading to the creation of jobs and developing high-tech, technology and health sciences." He added that JCT's Tal Campus is paramount to keeping the younger population in Jerusalem and "is especially important in order to strengthen the economic sector and the underprivileged populations in the city."

The **Minister Ze'ev Elkin**, added: "The Jerusalem College of Technology – Lev Academic Center is one of the country's leading academic institutions in bringing the ultra-orthodox public into the high-tech and engineering professions, [and has been doing so] long before the country began to place emphasis on Haredi advancement." He also pointed out that JCT encourages "the growth of the entire economy and especially in Jerusalem, since many of the graduates of this institution choose to live and work in Jerusalem."

Prof. Chaim Sukenik and MKs Ze'ev Elkin, Avraham Neguise and Moti Yogev

JCT Holds Fifth Annual Mathematics Education Researchers' Conference

The annual Mathematics Education Researchers' Conference took place at JCT in early March. Over 200 researchers and educators from around the world participated in the two day conference, which dealt with issues related to educational methods for mathematics. Over the years the conference has become a meeting place for researchers to present their findings, initiate cooperation and has strengthened their sense of belonging to the research community.

"The most important thing in math is to develop analytical and creative thinking among the students," said **Prof. Noah Dana-Picard**, President Emeritus of JCT and Chairman of Education, Mathematics and Judaism at JCT and one of the initiators of the conference. He added, "mathematics education is constantly evolving and adapting to the technological age. Exams from 10 years ago are not the same as those today and we must not make the same mistake as Europe by lowering the GPA in order to increase overall achievements."

JCT Holds First Digital Job Fair

Dozens of Israel's leading hi-tech and engineering companies and close to 500 students and graduates, both men and women, participated in Israel's first Digital Job Fair which was held on JCT's Lev Campus in early June.

The revolutionary fair utilized an app designed specifically for the event by ICV. Students and graduates created profiles on the app and immediately received a list of companies and organizations most applicable to them in accordance with their specified preferences. Potential employers were ranked according to the compatibility with the job seeker's preferences. The app also assessed favorability of each company for the applicant according to travel time via private and public transportation, factoring in morning traffic,

as well as their qualifications and additional professional demands. Using the app, applicants were able to focus on companies for which they were most compatible, increasing their potential of finding employment.

Employers received applicant stats in real-time and could thus arrange interviews for the applicants with a push of a button. This saved wasted paper both for the employers and applicants, while enabling employers to receive all relevant information and served as an effective filtering and communication tool for the employers.

Director of the Placement Department at JCT, **Yael Gandman**, stated at the event: "There is no reason for high-tech professionals in Israel to spend six months looking for work when the demand for employees is so high. The recruitment process should take closer to two weeks."

Companies and start-ups seeking employees at the fair included **Exlibris**, **ORCAM**, **Quickode**, **Kenshoo**, **Experis Software**, **Ness**, **Israel Aerospace Industries**, **John Bryce**, **Gav Systems**, **Log-on** and **INNITEL**, as well as CPA companies **BDO Ziv Haft**, **KPMG**, **EY**, **Ernst and Young**, **BDSK**, **Tzur Management** and **Bank Mizrahi Tefahot**.

Members of British Parliament Visit JCT

A delegation representing the **Conservative Friends of Israel** (CFI) comprising of members of the British Parliament visited the Lev Campus in order to learn about JCT's role in advancing the Haredi (ultra-orthodox) community in Israel, men and women alike, specifically with regards to the hi-tech field.

Members of the delegation included **Baroness Liz Redfern, Scott, Rt. Hon. Esther McVey, Lord Stuart Polak, Stuart Andrew MP, Conor Burns MP, Maria Caulfield MP, Philip Davies MP, Rebecca and Jonathan Djanogly MP, Mike Freer MP, John Glen MP, Philip Hollobone MP, Nigel Huddleston MP, Andrew Percy MP, Rebecca Pow MP, Michael Tomlinson MP, Lance and Rene Anisfeld**.

24th Annual Torah and Science Conference at JCT

The 24th Annual Conference for Torah and Science was held at JCT in April. The Conference, under the joint auspices of **JCT, Bar-Ilan University and Yeshiva University**, has become a mainstay of all Torah-Science related content in Israel and focuses on the combination of Torah and Scientific knowledge in various fields of science, from earth and technology, to sociology and humanities and its effects on everyday life. In a series of short lectures, the speakers addressed questions such as kashrut status of meat from stem cells.

Recipient of the Lev Prize for Torah and Science, Prof. Ely Merzbach and President of JCT, Prof. Chaim Sukenik

JCT's Rabbinic Head, **Rav Yosef Zvi Rimon**, discussed the potential halachic issues related to a Smart Home. During the event the Lev Prize for Torah and Science was presented to **Prof. Ely Merzbach** from Bar Ilan University for his research and unique contribution to Torah and Science. Those previously awarded the prize include **Rabbi Yisrael Rosen, Dr. Yitzhak Nebenzahl, Rabbi Dr. Eliyahu Zini** and **Nobel Prize winner Prof. Yisrael Aumann**.

Physics Olympics

Over 150 boys and girls from religious high schools competed in the annual Physics Olympics held at JCT in collaboration with the State-Religious Education Board. During the competition, students were questioned on various subjects including gravity, kinetics, dynamics and mechanical energy.

As part of the Physics Olympics activities, contestants participated in a "Science Day" attending physics lectures and experimenting in JCT's laboratories. At the end of the day, the winners were announced and awarded an academic scholarship for one year at the college.

First place winners were **Shaked Ezra** from Ulpanat Horev and **Eliya Finkelman** from Yeshivat Torah U'Mada (adjacent to the Jerusalem College of Technology).

Photo credit: Michael Arenburg

Jerusalem Science Contest Winners Visit JCT

The finals of the 13th annual Jerusalem Science Contest took place in March in Chicago, sponsored by the Walder Science Center in partnership with JCT. Thirty high school juniors and seniors from across North America took part in the competition, which this year focused on Astronomy.

The winners received a week-long trip to Israel, during which they visited JCT together with **Rabbi Heschel Weiner,** who heads the Walder Science Center. This year, two competitors tied for first place, **Jonah Eliyahu Lawrence** from the Fasman Yeshiva High School and **Aaron Singer** from the DRS High School for Boys, each won $1,000 and a four-year tuition scholarship to JCT.

95% of Foreign Students at JCT Remain in Israel

JCT has been running special programs for new immigrants for over two decades. Some 130 immigrants and tourists from across the globe participate in the program each year. Currently the largest group comes from Francophone countries. Upon completing the program, many participants enlist in the IDF, serving in their fields of study, particularly in the high-tech field.

Surveys show that 95% of program graduates make Aliyah and continue to live in Israel and that 93% of JCT immigrant graduates find work in Israel, similar to the general placement rates of JCT graduates.

In February, a delegation from JCT completed a marathon of students recruitment events for young Jews living in France who are interested in academic studies in Israel. The delegation participated in events in Marseilles and Paris, Lyon and Antwerp (Belgium), where they presented members of the Jewish community with information on Israel and JCT's unique programs. During the events, 140 participants expressed significant interest in coming to Israel and studying at JCT.

The Heller Family Foundation Prize for Outstanding Entrepreneurial Final Projects Award Ceremony

The Heller Family Foundation Prize for Outstanding Entrepreneurial Final Projects Award Ceremony took place in March. During the ceremony, eight prizes for outstanding final projects in the field of Business Administration (BA as well as MBA) were awarded to students on all three of JCT's campuses. The winning projects included the branding of a new government office at the Ministry of Social Equality; expanding activities of a library for children with learning disabilities in Bnei Brak; a plan to increase retention of employees in the *Yad Ezra and Shulamit* non profit organization; and the effect of a manager's gender and friendship with employees on salary increase and promotion potential.

Halachic Medical Symposium

This September, JCT held a symposium for doctors, community rabbis and halachic authorities on the Yom Kippur fast from a halachic-medical perspective. The event focused on the effect of fasting for octogenarians, during pregnancy and fertility treatments and for those suffering from kidney disease and diabetes.

It's Official! JCT Ranked First Place in Integrating Women in to Computer Science

According to figures compiled for the Council for Higher Education at TheMarker's request, JCT ranked first among all higher education institutions in Israel in respect of the integration of women in the computer science field. 53% of the students in its computer sciences department are women, thus JCT leaves others far behind with 18% between us and Bar Ilan University and the Hadassah Academic College, which tied for second place. Despite being a modest sized institution relative to the big universities, JCT has approximately the same number of computer science students as the Technion and its 543 students account for nearly a fifth of all female students studying in the field. This, combined with JCT's placement rate of nearly 90%, puts us among the top producers of hi-tech professionals in Israel.

JCT Graduates Achieve Top Scores on CPA Exams

The grades for the final winter 2016 exam in advanced finances of the CPA board revealed that JCT attained first place among all academic institutions in Israel. Students from JCT's Lustig Campus achieved 93% success on the final CPA exams, compared to a national passing rate of 76.52%.

100% Success Rate on Health Ministry Licensing Exam

JCT graduates continue to achieve top scores in the Health Ministry's Nursing licensing exam, with another year of 100% success compared to the national average of 70.5%. All 102 graduates are employed in medical facilities in Israel, maintaining the college's 100% placement rate for nursing and contributing to the alleviation of the severe shortage of nurses in Israel.

Two JCT Students Win Prizes from the CHE

In early February, two JCT students received the **Shosh Berlinski Prize for Social Involvement in the Community** from the Council for Higher Education (CHE). This prestigious annual prize is awarded to only ten students from all institutions of higher education in Israel. The students won the prize, as well as a scholarship of NIS10,000, for their endeavors as part of JCT's **Lev Bakehila** social project.

Loui Orka is an immigrant from Ethiopia, the second oldest from a family of 12. Loui has been volunteering at the Jewish Institute for the Blind in Jerusalem for two years. He taught the visually impaired children to swim and ensured their safety while in the pool. However, he provided them with much more than that by conducting one-on-one conversations, providing support and giving encouragement and unconditional love to the children who were eager to share their feelings with Loui and to learn new physical as well as life skills.

Shaul Horwitz, a *Haredi* nursing student, volunteers with two people with special needs: a young autistic man who lives alone and a 55 year old with cognitive and emotional disabilities. He managed to gain their trust and friendship and was able to communicate with them in a way in which no one, including professionals, had previously managed to do.

When granting these two students with the prize, **Prof. Chaim Sukenik** stated that "together with success and significant academic achievements, we believe it is important to introduce our students to the outside world and to connect with the community."

"We view people with disabilities as deserving of equal rights and treat them as equals," explains Program Manager **Zvika Orr**, "and we do everything in our power to help them feel fulfilled and bring their unique contribution to Israeli society."

Lev Bakehila (Lev in the Community) is JCT's flagship civic engagement program focusing on the promotion of human rights of people with disabilities, such as housing rights, education, employment, accessibility, due process and equality. Over fifty students and faculty participate in the program each year.

Students undergo practical and theoretical-academic training. Lectures are provided by professionals in each of the areas of activity of the center. Students assist individuals, communities and even work towards changing and creating policies on a municipal and national level.

President of JCT Prof. Chaim Sukenik, Shaul Horwitz, Loui Orka and Zvika Orr

In June, **Colonel S**, a graduate of JCT's Electro-Optics department, was awarded the 2017 Israel Defense Prize for his contribution to the **Arrow (Hetz) 3 Interceptor Missile Project**. Colonel S is the Head of the Upper-Layer Systems Department at the Homa Administration at **MAFAT** and has been a member of the project from its inception. The project was executed in collaboration with Israeli defense industries including **Israel Aerospace Industries**, **Rafael Advanced Defense Systems** and **Israel Military Industries**, as well as the **Israeli Air Force**. The prize and a commendation were awarded to the developers of the Arrow 3 air defense system during an event held at the Israel's President's residence which was also attended by Minister of Defense, **Avigdor Lieberman**, IDF Chief of Staff, **Gadi Eizenkot** and the Director General of the Ministry of Defense, **Maj. Gen. Udi Adam**.

The project has received much praise from Israeli and American officials. According to Colonel S, the Head of the American Missile Defense Agency, **General Patrick O'Reilly**, gave a statement to Congress in which he said "the planning of this interceptor is more advanced than anything that they [the Americans] were doing in their anti-missile program in the United States." Although America has several interceptors that bear similarities to this interceptor, according to Colonel S, even the Americans realize that "what this interceptor does is beyond anything they could have imagined."

However, this confidence in the project wasn't there from the very beginning. When the project was first initiated, "there was significant skepticism in the American Congress as well as in certain areas in Israel. Doubts were raised regarding the physics behind the project, with some saying

the challenge "was simply impossible." However, after eight years of hard work, several months before receiving the award, a Member of Congress who had been one of the most adamant against the project told Colonel S "'I was wrong and I'm very happy that I was wrong.'"

The Arrow 3 is part of Israel's multi-layered solution for the defense of Israel, which consists of the **Iron Dome**, **Magic Wand**, **Arrow 2** and **Arrow 3**. Arrow 3 aims to provide a solution against missiles with a longer range, which are faster and more difficult to intercept. Colonel S stated that "our goal with the Arrow 3 interceptor is to intercept higher, farther, faster and more accurately" than Arrow 2. Unlike the Arrow 2, Arrow 3 does not include a battle-head, but strikes "iron with iron" in order to destroy its target. Colonel S explained that the operation of Arrow 3 is similar to a situation wherein "someone pulls a gun and shoots a bullet in your direction and, without pause, you pull your gun and shoot a bullet that hits the one that was shot towards you." When it comes to its effects on the defense of Israel, Colonel S added "there is no doubt that Israel is much safer in the era of Arrow 3 than it was without it." Colonel S quoted the Director General of the Ministry of Defense who stated that "the sky is not the limit" to which he added that "when it comes to Arrow 3, which intercepts outside of the atmosphere, 'the sky is not the limit' is an extremely apt description."

In addition to being devoted to the defense of Israel, Colonel S is also a father of twelve and a *Talmid Chacham* who regularly gives Torah classes in his community. He credits his success to the incredible support he receives from his wife and family: "I am privileged to be a part of an amazing family that wants to strengthen and defend Israel."
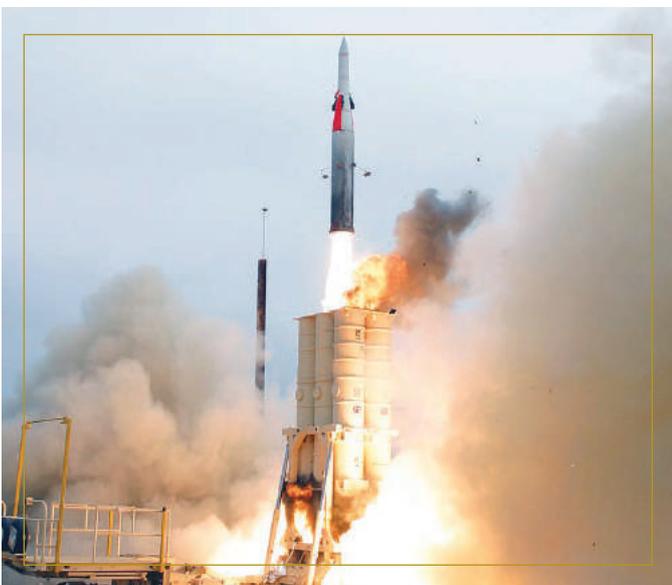
Congratulations to Our New Graduates

Mazal Tov to the 756 students – 481 men and 275 women – who received their bachelor's degrees and to the 56 students – 19 women and 37 men – who received their master's degrees this past academic year.

Among the graduates were 23 students from the Ethiopians for Education (EFE) program, 274 students (83 men and 191 women) from the Haredi community as well as many new immigrants from all over the world.

JCT Graduate Wins Marketing "Oscar"

Yair Schrader, a graduate of JCT's Business and Management Faculty, was awarded the "Oscar" for marketing and media activation at the "Festival of Media Global" held in Rome for "Best Sponsorship Activation".

The award is considered the "Oscar" for marketing and media activation, in which hundreds of campaigns from around the globe compete annually. His campaign, which was the only Israeli campaign to reach the finals, beat other international brands including **Coca-Cola**, **Google** and **Unilever**.

Yair received the award for his "New Head Coach" campaign for Head & Shoulders' branding in Israel. The campaign had a timely release last year with Maccabi Tel Aviv's basketball team when, following a loss at the semi-finals, the team's coach was fired. The campaign was launched immediately after his dismissal so that an article about the coach being let go included ads in which the coach's anticipated replacement, NBA's Teddy Brown, announces what all the players really need is the brand's shampoo. The campaign also included distribution of hats to fans during the game which indicated whether or not the fans had dandruff.

Yair began working at Head & Shoulders as an intern several years ago after presenting his CV to the company during a job fair organized by JCT's Placement Department. Upon completing his studies, he was promoted to Brand Manager, a position which he has held for over a year.

Rachel Agama

Rachel came from Ethiopia in 1994. Her parents are divorced and her mother, who works as a cleaner, was the sole supporter of her four children. Rachel completed her high-school studies in Bat-Yam and served in the Education Corp. After the army, she enrolled at the Tal Campus **in the**

Reuven Surkis Program for Students from the Ethiopian Community. Rachel is currently employed as a nurse and is studying towards a master's degree in nursing.

Bezalel Lenzizky and Yakov Slushtz, co-founders of WishTrip

WishTrip is a unique platform that uses live mapping to dynamically record the user's travel experience, creating a travel diary that combines moments shared with a map of the trail. Its navigational tool also guides users throughout the trek, emphasizing points of interest. The company currently has 20 employees.

Bezalel and Yakov met in Ponevitz Yeshiva, one of the leading Haredi yeshivas in Bnei Brak. They attempted to study computer programming and English on their own but when they began learning mathematics, they discovered that there were gaps in their education that they simply could not overcome on their own. Yakov was married with a family to support, but Bezalel managed to convince him to come and study with him at JCT. After completing the pre-academic program, and with strong autodidactic abilities and a drive to succeed, they discovered a love for mathematics and decided to study towards a degree in electro-optics, considered to be one of the most difficult academic fields.

In collaboration with a commercialization company, Startup Nation 2 Enterprise (SN2E), JCT's researchers are bringing their innovative ideas to the world.

Prof. Michael Manevich together with researchers at Kent State University and the Kiev Institute of Physics of National Academy of Sciences has received grants from **NATO** and the **Rosenfelder Family** to carry out research on "Ultra-fast adaptive optical elements based on stressed liquid crystals". These products can have both military and civilian applications (night vision,tracking and guidance systems micromachinery, gadget cameras, endoscopy, beam steering, optical routers and switches, etc.).

Revolutionary Laser

An innovative laser, developed by JCT researcher and lecturer, **Dr. Salman Noach**, together with two JCT students, has a compact design that yields 3.5 times more energy than current designs. The laser has a variety of uses in the medical and defense industries. Such applications include targeted removal of tumors without damaging the surrounding tissue and applications in the field of plastic fusion. The laser was presented at the prestigious international Oasis 6 Conference which took place in April 2017.
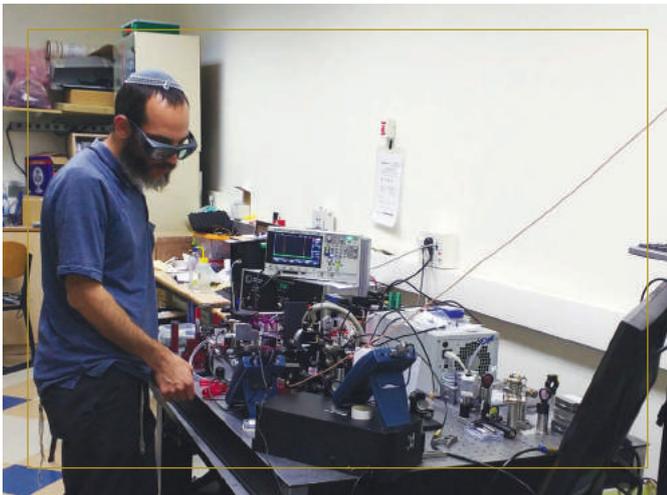
Efficient and Cost Effective Alternative Energy

JCT researcher **Dr. Alexander Rosin** has found a solution to our energy needs which is not only two to three times more efficient than solar panels but can also be easily and cheaply mass produced. This alternative energy method based on new technology in the antenna field (Reactance) is both more efficient and more cost effective than solar panels. To date, others have attempted to produce such results with this method but were either unable to find one that yielded sufficient energy or could not suggest solutions that could be mass produced within less than 20 years.

A Breakthrough in Bandwidth Efficiency

Dr. Yoram Haddad, one of JCT's leading researchers has developed a method that utilizes a novel communication technique to double available bandwidth. *Despite the increasing demand for* bandwidth, it is currently considered finite. Therefore, the maximization of bandwidth efficiency (or spectrum efficiency) becomes increasingly important. The current method for increasing spectrum efficiency enables transmission and reception to occur simultaneously on the same frequency. However, this method for simultaneous transmission and reception of signals was until now only possible through even numbered stations. Dr. Haddad's patented 5G SpectruMax™ enables transmission and reception of signals on uneven numbered frequency stations without necessitating infrastructure changes.

Placing Emphasis on Innovation

In April, JCT's Student Union invited Siftech's investment fund *Fresh.Fund* to speak with the students of Lev Campus about innovation and entrepreneurship. The event was one of several technology events in which students were encouraged to participate by the Student Union, including a Data-hack, a Hackathon organized by JDC and of course, JCT's own Hackathon held earlier in the year. The Student Union is currently working on establishing an Entrepreneurship Center at JCT, which "will provide mentoring and lectures from the best and brightest in the field and will strongly connect the students to the Jerusalem Technological Ecosystem" says **Tomer Ashtar**, Vice Chairman of the Student Union.

Fresh.Fund is an investment fund for student entrepreneurs, run solely by students, which aims to train the future generation in the field of entrepreneurship. JCT's own **Brayna Kuperman**, a student at Tal Campus, is a member of the managing team of the fund. During the event, the head of Siftech activities **Nitzan Adler** and the Managing Partner at *Keren Hazvi*, **Zaki Djemal** spoke about the investment fund and its benefits and advantages as a specialized program for student entrepreneurs.

JCT Holds First Hackathon

Last Chanukah, JCT's student union held its first Hackathon, in which dozens of students competed for 48 hours straight, creating technological solutions for challenges facing companies and organizations.

Students were presented with several 'problems' for which they were to provide solutions. These included developing a system to help children in electric wheelchairs avoid crashing into objects or walls; preventing injuries on construction sites; sharing information with customers in real-time regarding the availability of products in automated machines, retail chains and stores; and providing a solution for emergency services whose personnel have difficulty treating injured people due to language barriers.

After three sleepless days and nights, awards were presented by judges from the top accelerators in Jerusalem (**MassChallenge, Siftech/fresh.fund, OurCrowd**) as well as from **Cisco**. The judges, as well as those in charge of the hi-tech ecosystem in Jerusalem, were very impressed with the creativity of the students and their advanced ability to solve problems quickly. The judges included: **Doron Ish Shalom** (MassChallenge), **David Wachtfogel** (Cisco

Systems), **Nitzan Adler** (Siftech/fresh.fund), **Pini Lozowick** (OurCrowd) and **Zaki Djemal** (Tzvi.vc). Organizations who participated in the event included **Safeguard, Alyn, United Hatzalah of Israel, Quickode, Shalva, Audyx**, and **Glide**.

The winning projects included "Pronto," an app that eliminates the need for standing in line at supermarkets, "Unlimited Chairs," which prevents electric wheelchairs from falling down stairs or crashing into various obstacles and "In Time for Bus," an app that uses smart cameras to alert staff at a special needs program regarding the arrival of their students. MassChallenge has already approached one of the winners to develop their project and another company immediately offered a student a job.

Following the event, **David Wachtfogel**, a judge from Cisco, stated: "The Hackathon was extremely impressive. The students developed great projects and broke through technological boundaries. This is an example of how we can build technological abilities in Jerusalem and I hope that start-ups will emerge from here that will contribute to the economic development of Israel. These are practical solutions that can certainly be implemented. This has great value to thousands of people."

New Nursing Programs at JCT

In recent years the nursing profession in Israel has undergone major changes and JCT's Life and Health Sciences Faculty constantly strives to remain at the forefront. From an initial class of 48 women in September 2007, the faculty's student body has grown to 900, which represents 20% of all nursing students in Israel. The rapid increase in students is largely due to the proliferation of programs added over the past few years including a BSN program for men, a Bioinformatics department, a Nurse Practitioner program and an Orthopedic specialization course within the program.

JCT's Nursing Program for men is currently in its third year with 75 students, 26 of whom are Haredi and 6 of whom are Ethiopian-Israelis. Also in its third year of activity is JCT's Bioinformatics Department, which combines the study of mathematics, computer science and biology; in particular, molecular biology. There are currently 115 students studying in this program.

With the support of the **Samson Family**, a year-long Geriatric Nurse Practitioner's program certification course provided in partnership with Herzog Hospital was recently completed. 15 nurses, with Master's degrees and extensive experience in the field of Geriatrics completed classroom studies in the Herzog facility as well as a four month practicum. Approximately 50% of the students carried out the practicum at Herzog Hospital and the others at geriatric facilities throughout Israel. They all successfully passed the licensing examination as geriatric nurse practitioners and have all found employment in their field. These nurses are now able to take an extended role in patient care including diagnosing health states, and ordering diagnostic tests and medication.

JCT has developed Israel's first certification program in the growing field of Health Informatics in collaboration with the **University of Toronto** and support of the **Canadian Friends of JCT**. Health informatics is a broad field which focuses on managing and analyzing data to support the best treatment for patients. It utilizes the study and application of clinical, information and computer sciences, to design and deploy effective technologies that support the delivery of health care services and improve information management. The program will consist of 28 sessions and will be open to registered nurses with a bachelor's degree.

A new Biofeedback Course designed to provide knowledge and skills to broaden the professional repertoire of health professionals in their general practice to some extent, but mostly to give them a new professional avenue, is to be offered at JCT in the coming year". Biofeedback therapists treat patients on an extended term basis in the framework of private or public clinics, in hospital or in the community. Those completing the theoretical studies and the practicum will be able to sit for the exam given by the Israeli Association of Applied Psychophysiology and Biofeedback, the authorizing body for biofeedback professionals.

JCT has received approval to open an **MSc program** specializing in geriatrics and will be supported by a generous donation from the **Glickman Family**. This program will enable students to increase their employment options and responsibilities in the nursing field and will consist of 60 credits and 400 hours of practical training. The Master's program will include specialization in geriatrics, producing more professionals for a field that is in constant and increasing need of health-care providers.

With the support of the **John N. Insall Foundation**, a program to enrich the orthopedic experience of our students has been developed as part of their surgical training. This program offers a series of lectures and provides scholarships for students carrying out research projects in the field of orthopedics, with particular emphasis on the elderly. Research conducted ranges the full gamut - from anticipatory care to treating the complications of various orthopedic conditions in all age groups.

JCT is planning to open the **Schimmel Paramedic Certification Program** for nursing students in the BSc program. This program will enable students to earn certification in both nursing and paramedics simultaneously. Following an additional semester of classroom study and advanced clinical rotations, students will graduate with two professions with minimal additional time and effort.

New Master's Program in Physics/Electro-optics

JCT has received approval from the Council for Higher Education (CHE) to open a MSc program in Physics/Electro-Optic Engineering as well as a MSN in nursing.

The MSc program is to be headed by **Prof. Isaac Leichter** and will be open to graduates of engineering and science courses from all academic institutions recognized by the Council for Higher Education. The program will be divided into four clusters: biomedical optic engineering; electronics and signal processing; nano/micro-electro-optics; and optics and space observations and will include a research track (with a thesis) and a general studies track (without a thesis).

Toronto

The Canadian friends of JCT held its 2nd annual Scotch & Cigar night. The event was generously hosted by supporters **Jeff and Daniella Silver** and featured a gourmet BBQ as well as scotch tasting. JCT would like to thank **Akiva Aronson** and **Yigal Rifkind** for chairing the event. This November, the Canadian Friends plan to host their annual dinner on November 23, 2017 at the Ritz Carlton in Toronto.

Shlomo Reichmann, Jeff Silver, Simmy Zieleniec

New York

Earlier this year, the **American Friends of JCT, Cross River Bank** and the Law Firm of **Troutman Sanders** held a conference on *Fintech* (Financial Hitech) in New York. The featured speaker was **Tobias Levkovich**, Chief Equity Strategist at **Citibank** and one of the most respected people in finance, who often appears on Bloomberg and CNBC. The event also included a panel with the Head of **Blumberg Capital** (San Francisco), **Bruce Taragin**, President of **Bank Leumi** US, **Avner Mendelson**, and CEO of Cross River Bank, **Gilles Gade**. JCT would like to thank **Henry Orlinsky** for donating the catering for the event and AFJCT Chair **Rori Cassirer** and **Troutman Sanders** for their organizational work which impacted on the success of the event.

In March, the American Friends also hosted a *Women in Business & Technology Forum* at the offices of Troutman Sanders. **Anne (Chani) Neuberger**, the Operations Directorate at the **National Security Agency**, spoke about the extraordinary work that JCT is doing with its women students. The event was attended by approximately 200 participants, including women from **Google, Oracle, McKinsey, Dell, ReferWell, Sapiens, MasterCard International, Yieldbot, Johnson & Johnson and Bank Leumi USA**. JCT would like to thank **IDT Corp**., which sponsored the lunch, **McKinsey & Co**., the educational sponsor, as well as all the members

of the **Board of Friends of JCT**, including especially **Rori Cassirer, Abbe Dienstag, Rachel Berg, Itzy Silver, Howard Millendorf, and Linda Allen,** who were instrumental in making the event a huge success.

Rori Cassirer, Anne Neuberger and Dana Gibber

Prestigious International Conference Hosted by JCT

Over 100 leading mathematicians, physicists and researchers from across the globe attended the **23rd Annual Applications of Computer Algebra (ACA) Conference** at JCT in June. This is the first year that the prestigious international conference was held in Israel, following last year's selection of JCT's President Emeritus and Chair for Research in Torah, Mathematics and Education, **Prof. Noah Dana Picard**, as this year's host. Conference participants hailed from 20 countries including the UK, USA, Japan, Germany, Austria, France and Poland. Also present at the Conference were ACA Founder **Prof. Michael Wester**, Minister of Science and Technology **Ofir Akunis** and Director General of the Ministry of Science and Technology **Peretz Vazan**.

This year's Conference was dedicated to the late **Jonathan Michael Borwein**, a renowned mathematician who passed away last year.

Gendered Engineering. How Engineering became a "Masculine" Profession and Why Correcting this Situation is Crucial

by Yossi Zeira, CEO

According to recent data published by the Central Bureau of Statistics (Israel), the percentage of women studying engineering in 2016 was the lowest at 29.6%, when compared with all other fields. Women comprise the majority of students, 60.4%, studying towards a bachelor's degree. Further assessment of the data shows that even within the engineering fields, their representation differs significantly. While in the fields of architecture and industrial engineering and management, the percentage of women beginning their bachelor's degree studies is high (70% and 50% respectively), in other engineering fields, considered to be "masculine," their representation is considerably lower. For example, only 10% of mechanical engineering students are women, while in civil engineering and electronic engineering they comprise less than 20% of the students.

These statistics illustrate the gap that is still prevalent between women and the field of engineering. While, as mentioned above, in certain fields of engineering and biological sciences we see significant progress in the integration of women, there are areas of engineering that remain the mainstay of men.

The critics will argue that we have come a long way from the days in which women were completely excluded from the world of science, in general and that of engineering, in particular and that is true. However, although there has been significant progress in the integration of women in the field of engineering, the current numbers do not lie and in Israel today, where women hold senior managerial positions, they still remain in the minority, particularly in the field of engineering.

The problem, as in many other cases, starts with the education system. Engineering professions were classified as masculine, intentionally at first and later due to laziness, because educators used learning methods more suited to men. This created a situation in which only 30% of female high-school students chose engineering, physics or computer science courses. In undergraduate studies, as mentioned, the statistics are similar and the situation is even worse in advanced degrees.

As a person who gets to see classes filled with hundreds of female students studying towards engineering degrees, day in and day out and as a person who is constantly witnessing success stories of women who excel in engineering and computer science studies and integrate in senior positions in academia and in the high-tech industry, it is clear to me that there is another way.

In view of the consistent and increasing shortage of engineers in Israel, it is particularly necessary to understand that, in the long run, continuing with such underrepresentation of half of the population in the fields of engineering and high-tech is not a viable option. In order to generate the necessary change, it is paramount to act to change the mindset and create the conditions needed to encourage many more women to integrate into the fields of engineering.

The change in connotation and image related to the field of engineering must be created among the next generation of women at an early stage and they should be encouraged to integrate within the field. Today, most of them do not see or find themselves in the field and in order for that to happen, educators must be trained and learning strategies must be adapted. We need to hold workshops for parents, in order to remove negative comments relating to engineering professions. It is necessary to institutionalize cooperation between academic institutions and schools and to bring together female students and women who are successful in the field who can serve as role models and examples of success. In the academic field, affirmative action should be initiated in the allocation of scholarships to women who wish to enter the field of engineering and the consideration of a partial government subsidy of their tuition fees should be discussed.

We must create a reality in which Israeli society, in general, and women, in particular, view women engineers as role models and sources of inspiration. If we do not do this, it will be to our detriment.

New Dormitories for JCT Students

A new 4,000 m² dormitory is to be constructed on the Lev Campus in memory of **Joseph and Faye Tanenbaum**, thanks to a most generous gift which was received from the **Jewish Legacy Charitable Foundation**. The dormitory will comprise 6 floors and will consist of 48 apartments, of either 4 bedrooms with 1 student per room or 2 bedrooms with 2 students per room. The building will have communal rooms and laundry facilities. JCT students played a significant role in the design of the building, providing their preferences via an online survey in order to ensure maximum comfort. As a result of this survey, it was decided that each apartment will have a shared space of kitchen, dining/living room, as well as bathrooms. The new dormitory will be located at the apex of the Lev campus and will be the closest building to Route 16, which is being constructed adjacent to the Campus. Construction on the new student dormitory is expected to be completed by March 2019 and will bring the total number of dorm beds for students on the Lev Campus to over 750 in addition to 48 apartments for married couples.

Other dedications

JCT is very grateful to **Dr. Stewart Fordham** and **Ms. Marlene Weingarten** who have dedicated windows in the Beit Midrash in memory of parents and grandparents. In addition, they have generously given a donation for the Ner Tamid (Eternal Lamp) and new covers for the arc and podium in the Beit Midrash.

The Nano/Micro Instrumentaton Center has been dedicated by the **Sohacheski Family** and equipment has been generously donated by **Prof. Eliezer and Deborah Avnear (Wiener)** in memory of their beloved parents.

The Laboratory for Fast Imaging has been established by the **Walder Family** and the Communications Systems Laboratory has been bequeathed by **Lilly and Alexander Enten (née Kallos)** of Melbourne, Australia, as a contribution to the perpetuity of the State of Israel and in loving memory of their families who perished in the Holocaust.
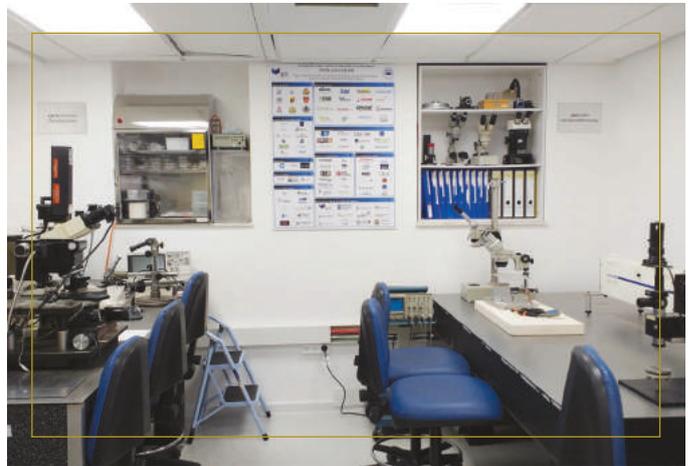
A scholarship fund in memory of **Yitzchak Jean-Jacques Newman** has been established through the estate of **Jaqueline Newman**.

Generous donations have also been received from the estates of **Jules Hosanski, Ida Sands and Elizabeth Wachsmann**.

Under the auspices of the recently established **Samson School of Continuing Education for Health Professionals**, several new programs will be opened in the coming year. This is a joint project of Herzog Hospital and JCT to expand programs offered to health professionals in order to enhance safety and quality of care. The health sciences are a field in which knowledge is continuing to grow at a rapid pace and health professionals must be life-long learners in order to remain professionally competent. The School will provide health professionals with the opportunity to expand their horizons and update their skill sets with high level courses in new and exciting fields such as Health Informatics and Biofeedback.

כתיבה וחתימה טובה
With best wishes for a Happy New Year!

The 2017-2018 Volume of B'OR HA'TORAH

BHT 25 pays tribute to Judaica artist and calligrapher Malla Carl of blessed memory, who gave us four front covers and many full pages of her work.
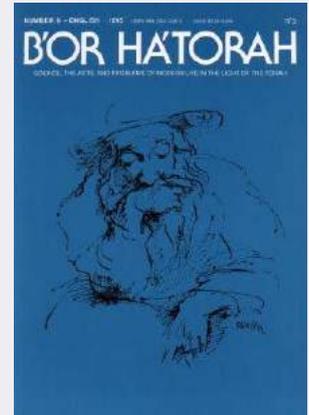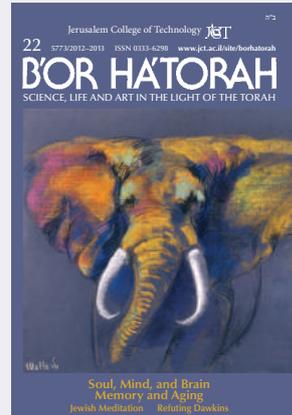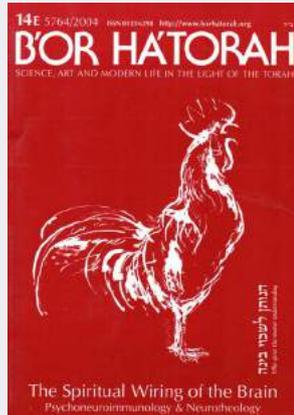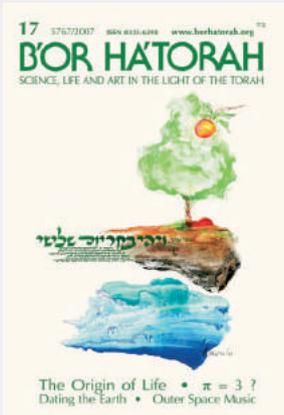
BHT 25, scheduled for 5778 (Fall 2017), features:

- Professor Yaakov Friedman (JCT), who is currently developing a new extension of Einstein's Theory of Relativity and testing it at the European Synchrotron Radiation Facility (ESRF) at Grenoble, France. Only this accelerator could be used to test his theory that can provide a new insight in understanding microscopic behavior and a breakthrough in quantum computing.

- Yeshiva University's Rabbi Professor Moshe Tendler, consultant to Congress on medical ethics, probes the halakhic implications of the revolutionary development of gene editing.

- Rabbi Professor Avraham Steinberg, MD, consultant to the Knesset on medical ethics, Israel Prize–winner and encyclopedia author, continues his investigation of who-is-the-mother in cases of the latest assisted reproduction technologies.

- Dr. Michael Szycher, designer of an artificial heart for the National Institutes of Health, examines the intersection of cardiology, organ transplantation, and Judaism.

- Mayo Clinic neurologist Daniel Drubach, MD, weaves an ancient mishnah with the newest in brain science to compare prayer and meditation.

- Weizmann Institute doctoral student Daniel Turgeman examines data from the LHC to prove that there is no such thing as "mass."

The tables of contents, abstracts, and authors' biographies of all volumes of B'OR HA'TORAH can be found at www.jct.ac.il/en/bor-hatorah-home. Both hard-copy and PDF files can be ordered.