

My Dear Friends,

It is with the greatest pleasure that I present you with my first report as President of the Technion. In the following pages I shall provide you with a glance at what the past year has been like for the Technion as well as a glance at what I hope to achieve in the coming years.

I am extremely proud to be able to write these words and to express to you, the Technion extended family, the extent of my gratitude at being provided with the opportunity to steer this great university to even greater heights and in so doing to truly impact the future of the State of Israel.

One of the great assets of the Technion is the wonderful group of people who have made it their purpose to make the Technion a priority and to help maintain its leading status both globally and in Israel. I am always amazed at the dedication of this group and those of you reading these pages most probably belong to this astounding collection of individuals. Over the years the Technion has faced its share of challenges and I have no doubt we shall face some major ones in the future. However, as was the case in the past, anytime the Technion has an obstacle to overcome its many friends and supporters rally around us, and help to overcome whatever obstacle we are facing. There is no doubt in my mind that this will be the case in the future and it is a source of great encouragement to me.

My friends, I promise you that together we shall take the Technion to even higher plains. We shall make sure that the Technion continues to be the powerhouse that it is, for the sake of all the people living in our beloved country. I hope that the vision that I share with you in the following pages will inspire you and motivate you as much as it does me.

With the warmest regards,

A handwritten signature in black ink, appearing to be 'P. Lavie', written in a cursive style.

Professor Peretz Lavie
President

My "Affair" with the Technion

As many of you may know, my road at the Technion began when I was a young faculty member recruited in 1975. I was finishing my Post-doctoral training in the University of California in San Diego when the Technion contacted me. Until this day I do not know who thought of me as a possible recruit to the Technion but needless to say, I am grateful. As I joined the Technion I became a lecturer at the Unit of Behavioral Biology at the Faculty of Medicine and through the years I climbed through the ranks. In 1981 I became the Head of the Unit of Behavioral Biology as well as the Head of the Technion Research Center for Work Safety and Human Engineering. Over the years I advanced in my professional field as well as a Technion administrator. In 1993 I was elected as Dean of the Rappaport Faculty of Medicine, a position I served in for 6 years. As you all know, when Professor Apeloig became President of the Technion in 2001 I became his Vice President for Resource Development and External relations, a position I held for 7 years. The purpose of listing my past roles with the Technion is to illustrate that I have a unique point of view of the Technion as I am closely acquainted with the ranks as well as the workings of the Technion "machinery". My journey so far has educated me and has made me who I am today, and as such, I have a clear vision of what I wish to accomplish on behalf of the Technion. I am confident that my path at the Technion has given me the tools to make the right decisions as well as steer a course that will propel this university to greater heights.

In the bestselling book "Start-Up Nation: The Story of Israel's Economic Miracle" the authors, Dan Senor and Saul Singer, describe Israel as not just a country but a comprehensive state of mind. I totally agree with this statement and I am very optimistic both about the future of the Technion and that of the State of Israel. There is absolutely no doubt in my mind that even though there will be hardships along the way and the ride will not always be smooth, the outlook is good and promising!

My Goals for the Technion

The Technion overall vision is clearly defined and is a statement that I wholly embrace:

"A science and technology research university, among the world's top ten, 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."

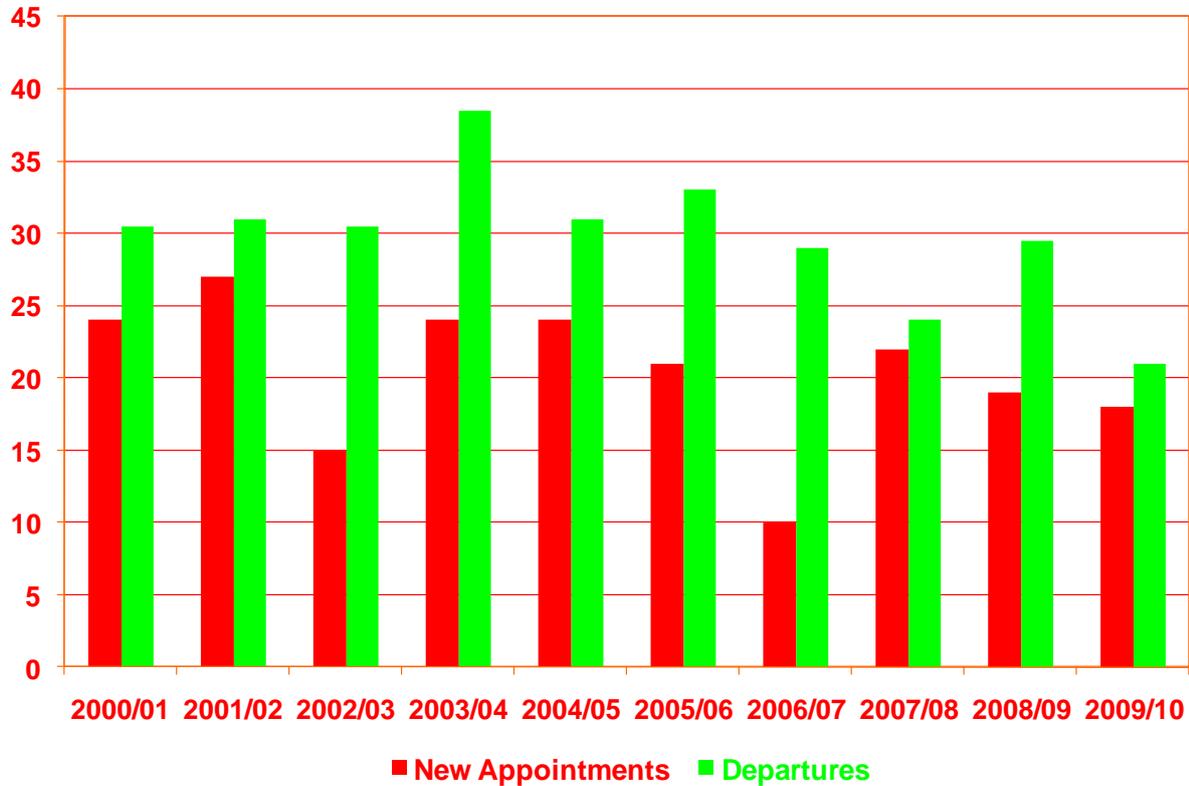
The Vision I wish to discuss with you is the practical aspect of our ideology; i.e. how we can live up to this declared Vision?

The Technion

A University is as Good as its Faculty Members

As I previously mentioned I was also personally recruited to the Technion. This means that someone approached me and met me personally with an offer and made it possible for me to return home to Israel and pursue my professional goals. I wholly believe in the above mentioned: A university is as Good as its Faculty Members. This means that we have to retain our already existing pool of excellent faculty members and we have to actively recruit new ones. Over the last 10 years we have had more retiring faculty members than new recruitments, we must close this gap. We are still below the red line in terms of our total number of faculty members. Following this you will find a graph showing the number of retiring faculty members Vs new appointments. You can clearly see that we still have a long way to go.

New Appointments vs. Retirements & Departures



The retirement of faculty members provides us with the opportunity to truly bring into the Technion ranks the most brilliant and innovative minds out there, however, we have to be in a position to be able to offer them an attractive package. The Technion is facing some tough competition both domestically and internationally in terms of faculty recruitment. In order for the most brilliant and innovative minds to join the Technion we literally have to make an offer they cannot refuse. In fact, my approach in this matter is a very hands-on approach. If I find a suitable candidate whom I wish to recruit to the Technion I believe that a personal approach to recruitment is warranted and I shall be willing to travel to the candidate and persuade him or her to join the Technion. This illustrates my conviction that this should be an utmost priority of the Technion and I shall pursue it diligently. Other steps we have taken to help in recruitment include making offers with higher ranks to start with, make offers with a built in tenure, attractive start-up packages, establishment of laboratories prior to the arrival of new faculty members, encourage our faculties to be more proactive

and involved in the recruiting process, allowing new recruits a reduced teaching and administrative load for the first 2 years, providing each new recruited faculty member with a Technion mentor, and help with the transition of new faculty members and their families like offering them on-campus housing (at the *Stanley Shalom Zielony Graduate Student Village*) for a certain period to facilitate and ease their transfer.

Our recruitment efforts are extremely focused and planned in terms of the disciplines for which we attempt to recruit. This priority of recruitment has to be in sync with another priority: to develop new and cutting-edge disciplines at the Technion. As President, my obligation is to constantly see the larger picture and steer towards our ultimate target.

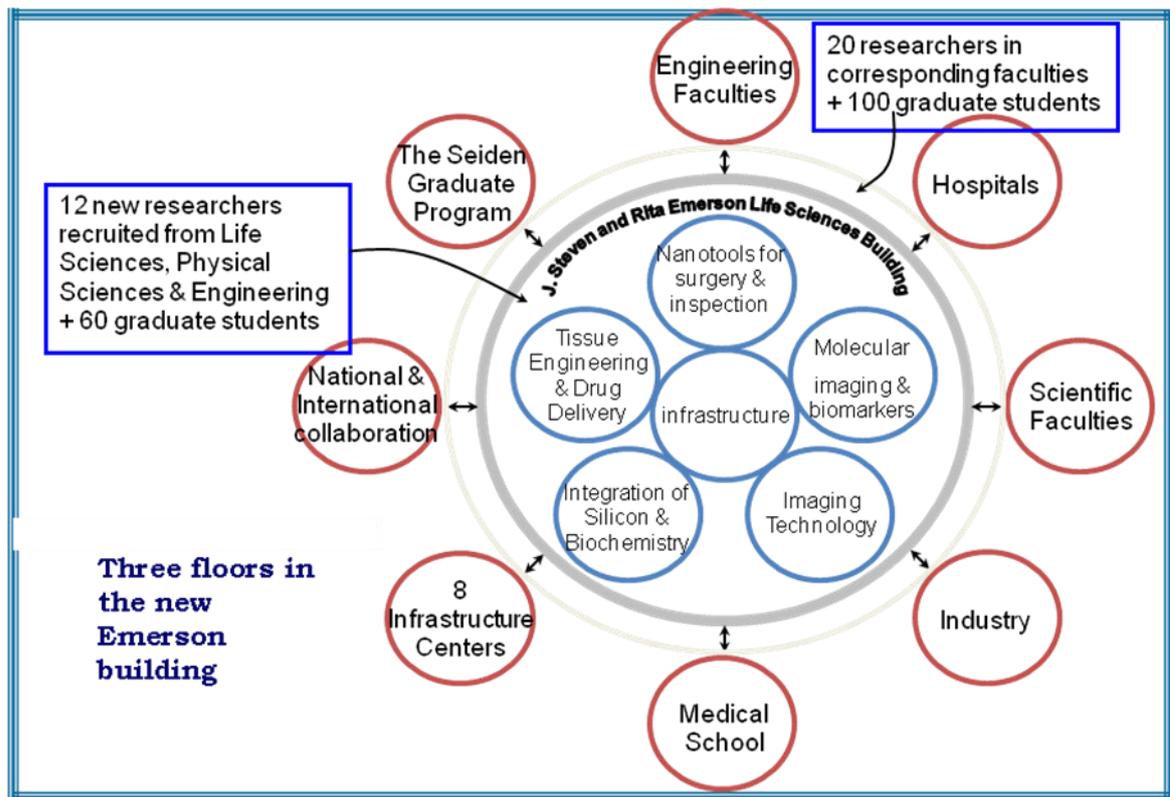
Interdisciplinarity - The Wave of the Future

One of my priorities is to continue the wave of interdisciplinarity sweeping the campus. The future of research lies with this approach and as such it has to be where the Technion is heading. The new academic research programs we are promoting are all interdisciplinary and call for the cooperation between various faculties. These umbrella programs make it possible for researchers from different disciplines to meet, interact and brainstorm, the result being some of the most innovative research in existence.

We shall continue to promote our [Life Sciences and Engineering Program](#) through the *Lorry I. Lokey Interdisciplinary Center for Life Sciences and Engineering* by recruiting new and brilliant faculty members, by building more laboratories and capitalizing on our major strength of merging sophisticated research in the exact sciences and translating them into the language of engineering. There is no doubt in my mind that this all-encompassing program will impact the future of the Technion, Israel and the world by being a beacon of knowledge and innovation in this ever changing discipline.

Another very successful and encompassing interdisciplinary program is the [Nanotechnology and Nanosciences Program](#) under the auspices of the *Russell Berrie Nanotechnology Institute (RBNI)*. This Program with its 110 faculty members from 14 different faculties is the essence of interdisciplinarity and has truly impacted every corner of our physical and virtual campus. Only last year we have completed the first

phase of the program and we are about to begin the second phase which essentially introduces new disciplines to the campus and enlarging the scope of research into new and exciting nano fields such as NanoMed and nano programs in other fields. The NanoMed Initiative is one being undertaken in collaboration with the Life Sciences Program and will certainly begin to make its impact in the coming months. The following diagram visually demonstrates the scope of the NanoMed Program:



The non-bio nano initiative will focus on two areas: nano for photovoltaics and nano for self assembled structure.

In the first phase of the Nanotechnology Program we managed to recruit 13 new and brilliant faculty members out of a planned 15. The faculty members have made their home in 6 Technion faculties and already their contribution is being felt. RBNI was to position Israel as a national and international leader in the field of nanotechnology and indeed it has achieved this ambitious undertaking. The hope for the future is the same and with the momentum already gained with this program I hope that we take the Technion and Israel even further.

Another fascinating interdisciplinary program forming on campus is the [Technion Energy Program](#). This exciting program essentially focuses on 4 key research areas:

- Alternative fuels;
- Renewable energy sources;
- Energy storage;
- Energy conservation;

I believe that you are all aware of how vital this type of research is to Israel in particular and humanity in general. There is no doubt in my mind that we are on the verge of great discoveries that will impact our lives on this planet and make this a truly better world for future generations. You may be a bit cynical at this point and think we are being a tad idealistic but I invite you to personally take a closer look at this program and see for yourselves what can be done in this field; I guarantee that a visit like that will leave you breathless at the possibilities! We hope to raise a total of \$50 million for this program in order to make it fully operational on campus. At this point, the program involves approximately 20 faculty members from various Technion faculties. As is the plan with all new programs on campus we hope to recruit new faculty members specializing in this discipline to enhance the already strong position of the Technion in this field.

The final program I wish to briefly outline is the [Technion Autonomous Systems Program \(TASP\)](#) that is also beginning to make its mark on the Technion campus. Within the framework of this program we already have approximately 45 active faculty members from 9 different faculties, a truly encompassing Program. TASP has 5 main centers:

- The Arlene and Arnold Goldstein Unmanned Aerial Vehicles (UAV) and Satellites Center;
- Unmanned Ground and Marine Systems;
- Autonomous Medical Systems;
- Autonomous Agent Networks;
- Household and Industrial Robotics.

This program is one of its kind in Israel and has evolved at the Technion for a reason. To begin with, the advancements made on campus in nanotechnology have made it possible for ideas to become reality. Also, the Technion, being Israel's premier

engineering school, is a perfect hothouse for such research. For this very promising program to be fully realized we require funds in the total amount of \$25 million.

My friends, as you can see, interdisciplinarity is indeed the wave of the future and it entirely transforms traditional campuses. The Technion has always had an interdisciplinary edge to it, however, over the past few years we have taken this to the next level and my goal is to continue to pursue this as I know it will only better serve the Technion.

The Technion Student - An Investment worth Making

In the past, the Technion was always the first choice of scientifically/engineering minded prospective students in Israel. In the past decade, although Technion's position has only improved, some of the most brilliant students in Israel pursue other universities and colleges. My goal as President is to rectify this and once more make the Technion a first choice for the most brilliant. One of the reasons for this situation is the perception amongst the prospective students that we are a "hard-core" university: tough and demanding. One of the programs we initiated to deal with this issue is the "Good Start" Program. This program is all about supporting the first year students at the Technion and providing them with the best start in their academic journey with us. We hope that this supporting environment will help students excel in their first year of studies and help them adapt to the university's expectations from them. The tools used include attempting to reduce class sizes so that each student can receive the right amount of attention from lecturers (this is dependent upon budgetary constraints), help students with their core mathematics and physics courses which some find so challenging (due to a poor and deteriorating education system), provide Technion lecturers with the right tools to deliver a good lecture and give them teaching tools through specialized workshops, mentoring first year students by final year students, help students better connect to the subject matter and see "the big picture" i.e. the engineers they are destined to become.

For many prospective students the Technion is perceived as a "study only" campus. For some very good prospective students this perception will serve as a deterrent from applying to the Technion. As many of you know, the opposite is true and the cultural lives of Technion students are rich and quite full. My goal is to try, through intense

marketing efforts, to change these misguided perceptions of the Technion and attract more of the "crème de la crème" students to the Technion. I wish to emphasize that there will be no lowering of standards or an attempt to make ourselves "easier", the opposite is true. I am proposing that we emphasize the advantages of the Technion and give our students better support during the initial settling-in period. I shall of course elaborate on this in the Student Affairs section of my report. To summarize this point, my goal is to make the Technion the "first choice" university once more: when a young man or woman thinks about academic studies in disciplines of science and technology they will immediately think of applying to the Technion.

Globalization

Globalization implies opening out beyond local and national perspectives to a broader outlook of an interconnected and inter-dependent world. This is one of the definitions of globalization which I found to be fitting to the Technion case. My vision involves making the Technion a name, not only in Israel, but world-wide. My Vision for the future in this regard is that the Technion will not only be a first-choice university for Israeli students but also for international students wishing to study science or engineering at one of the best schools in the world. Due to its high global profile there is an already great exchange of ideas between the Technion and other renowned universities all over the world, however, my vision includes an even deeper globalization. The seeds of this Vision have already been planted with the initiation of three different programs: The Technion International School of Engineering, The TeAM Program (Technion American Medical Program) and the English language EMBA Program.

The Technion International School of Engineering:

A few years ago it was decided that the Technion should provide the same quality education it provides to Israeli students to international students as well. This is a logical step for a university which already has a world renowned name and is such an engineering powerhouse. In August of 2009 we initiated the Technion International School of Engineering with the first class of undergraduate students studying towards a B.Sc. This class has 21 students from 14 different countries that will finish their first year in July. At this point in time the program is only available through the

Faculty of Civil and Environmental Engineering, however, based on the first year we have started to formulate a plan for the future in terms of marketing the program and even expanding it through the campus.

There is no doubt in my mind that expanding this endeavor and pursuing this goal of an International Technion will only benefit the Technion, its staff and students and will undoubtedly make a better case for the State of Israel. I hope that by the next President's Report I shall be able to share with you more progress made with the Technion International School of Engineering.

The TeAm Program:

To begin with I would like to tell you a little about this program for the benefit of those of you not acquainted with it. The Technion American Medical Students (TeAMS) Program offers an excellent opportunity for qualified U.S. or Canadian pre-med college graduates to pursue a career as physicians and thus study for the M.D. degree at the Ruth & Bruce Rappaport Faculty of Medicine at the Technion.

The program first began as early as 1983 and all the hundreds of graduates have successfully passed the licensing exams to return to the U.S.A. or Canada. Furthermore, all graduates have been accepted for residency positions, many amongst the prestigious specialties and subspecialties. Many of the graduates of this program have found that studying at the Technion has enriched their study experience and has made them better human beings and consequently, better doctors. The students in the TeAM program fulfill 36 months of study, as required from foreign (non-USA) medical school graduates in order to be licensed in the United States. Graduates of the Technion Faculty of Medicine who plan to return to the United States may participate in AMA-approved internship and residency programs upon certification by the Educational Commission for Foreign Medical Graduates (ECFMG), granted after passing parts I and II of the U.S. Medical Licensure Examination (USMLE).

As you can see, the program has been running for a long time and has proven to be extremely successful. This year we have a graduating class of 25 students.

The International English-only EMBA Program:

This program is destined to take the Technion know-how and make it available for top executives both in Israel and abroad. The program is being offered through the *Andre and Katherine Merage - Technion Institute for International Business* so generously established by the Andre and Katherine Merage Foundation. The program will make it possible for us to recruit excellent faculty members in fields that the Technion is lacking and thus enrich the scope of the Faculty of Industrial Engineering and Management and the Technion. The program will make it possible for excellent lecturers from the best management schools in the world to come to the Technion and teach certain classes and workshops thus giving the program the rich diversity it deserves. The Merage Foundation has long since been active in the field of management and its mission has been the education of top notch managers. I therefore believe that our partnership with the Merage Foundation in this program is a very good one as we have the same goal of educating the best managers out there and giving them the tools to excel and in turn, make it possible for their organizations to excel.

This program will position the Technion in the league of the best management schools in the world and will provide a much needed service to high-tech managers wishing to acquire first rate management tools on top of their already top-notch professional skills in their respective fields. Like many of the top MBA programs around the world, this program will concentrate on developing the next high-tech leaders who will carry the message of the Technion and Israel globally.

Bridging the Social Gap - A Technion National Mission

As a university which has always shown tremendous national responsibility we take our national role very seriously. One of the problems plaguing Israel in this day and age is the deepening social gap beginning to rear its head. The socially and economically weaker populations in Israel are losing the battle and our role, as I see it, is to promote and invest in these populations. Further on in the report I shall describe how we are trying to do this through the Center for Pre-University Education as well as within the Student Affairs section of the report.

The Hidden Technion Treasure – Our Alumni

The Technion, as the leading technological university in Israel, has had a vast impact on the workforce in Israel. Over the years the Technion has attracted the best human resource and it is only natural that the graduates that have come out of the Technion will become the backbone of the Israeli industry, economy and science. These individuals are our alumni and they are a force to be reckoned with. I believe that investing in bringing these talented men and women back into the Technion fold is a sound investment in the future of the Technion. Over the next few years I shall try to reach as many Technion alumni as possible and make them aware of the wonderful things still being done at the Technion and perhaps make them more involved on our behalf.

To begin with, I have initiated a series of lectures given by Technion faculty members (including myself) to all Technion Alumni. These lectures are taking place due to a fruitful collaboration with the Technion Alumni Association and the Israel Technion Society. The purpose behind these lectures is to expose Technion alumni to all that Technion has to offer; i.e. reintroduce those who have lost touch to the great things being done here.

Together with Pnina Ziv, the Technion Graduate Alumni Association Manager, I have also initiated a new tradition called “Breakfast with the President”, the idea of which is to invite Technion alumni who are leading CEOs in Israel’s top companies in the high-tech industry. The intent of these breakfasts is to bring these alumni closer to the Technion and to interest them in cooperation between the Academia and the high-tech industry. The first breakfast has already taken place and included eight CEOs, of whom seven are Technion alumni. It was a great success and we hope that it would lead to new enterprises in the future.

The leading universities around the world long realized that their alumni are an asset, an asset which has to be nurtured and constantly kept up to date.

The Technion Management Team

The Technion Management

- Professor Paul Feigin – Executive Senior Vice President
- Professor Moshe Sidi – Executive Vice President for Academic Affairs
- Professor Oded Shmueli - Executive Vice President for Research and Managing Director of the TRDF
- Dr. Avital Stein – Executive Vice President and Director General
- Professor Raphael Rom – Vice President for Resource Development and External Relations

Dr. Avital Stein – The new Technion Executive Vice President and Director General

On January 1st, 2010, Dr. Avital Stein became the new Technion Executive Vice President and Director General. Dr. Stein is in fact making history by stepping into this role as she is the first woman in the history of the Technion to serve in this capacity. Dr. Stein received her doctorate from Tel Aviv University in 1995 in mathematics education, she also holds an MBA in senior management with honors from the Hebrew University of Jerusalem, specializing in banking, finance and capital markets. Before accepting this position with the Technion Dr. Stein was the Vice President and General Manager of the Jerusalem College of Engineering.

Technion Deans

- Professor Yaacov Mamane – Dean of the Undergraduate School
- Professor Moshe Shpitalni – Dean of the Graduate School
- Professor Michal Green – Dean of Students
- Professor Yehudit Dori – Dean of Division of Continuing Education and External Studies

New Faculty Deans (starting from January 1st, 2010)

- Professor Yoram Tambour – Faculty of Aerospace Engineering
- Professor Wayne D. Kaplan – Faculty of Materials Engineering
- Professor Adam Shwartz – Faculty of Electrical Engineering
- Professor Noam Soker – Faculty of Physics

Continuing Technion Deans

- Professor Yerach Doytsher – Faculty of Architecture and Town Planning
- Professor Gadi Schuster – Faculty of Biology
- Professor Dan Adam – Faculty of Biomedical Engineering
- Professor Ben-Zion Levi – Faculty of Biotechnology and Food Engineering
- Prof. Yachin Cohen – Faculty of Chemical Engineering
- Professor Moris Eisen – Faculty of Chemistry
- Professor Arnon Bentur – Faculty of Civil and Environmental Engineering
- Professor Eli Biham – Faculty of Computer Science
- Professor Charlotte Schapira – Department of Humanities and Arts
- Professor Boaz Golany – Faculty of Industrial Engineering & Management
- Professor Jacob Rubinstein – Faculty of Mathematics
- Professor Pinhas Bar-Yoseph – Faculty of Mechanical Engineering
- Professor Ido Perlman – Faculty of Medicine
- Professor Avraham Berman – Department of Education in Technology and Science

At this point I wish to mention two other changes made within two important Centers:

- The New Director of the Russell Berrie Nanotechnology Institute is Professor Yeshayahu Talmon from the Faculty of Chemical Engineering. Professor Talmon has replaced Professor Uri Sivan who has served RBNI and the Technion brilliantly. I wish to convey my deep appreciation to Professor Sivan for his tireless work on behalf of RBNI and for his leadership of the Institute, a leadership which has made RBNI what it is today. I am confident Professor Talmon will faithfully continue to develop RBNI and take it to even greater heights.
- The New Director of the Lorry I. Lokey Interdisciplinary Center for Life Sciences and Engineering is Professor Yuval Shoham from the Faculty of Biotechnology and Food Engineering. Professor Shoham is replacing Distinguished Professor Aaron Ciechanover, a brilliant man and scientist, who has really helped establish the Center as a beacon of excellence and innovation. There is no doubt in my mind that Professor Shoham will continue the wonderful things already happening at the Center.

Budget and Finance

The end of the economic crisis in the global markets is not yet in sight and ongoing cuts in the budget for higher education have greatly influenced all university budgets, including the Technion's, and have hindered their ability to continue to foster academic excellence.

Specializing in fields such as engineering and science, where large budgets are required for research and teaching infrastructures, does not allow cross-subsidizing between different disciplines, as is common in most universities. As such, the Technion is in need of a surplus of funds.

In light of this situation, our mission is to increase resources so that we can invest in capital and human resources, continue research in science and engineering, and reward academic excellence.

With that, here is a look at the Technion's financial state.

The Technion budget is presented below in two categories:

1. **The operating budget**, which covers all of the Technion's operational activities, including staff emoluments and pension payments, student fellowships and scholarships, maintenance, and other expenses.
2. **The development budget**, financed almost entirely from donations and gifts. The development budget is used to develop and upgrade the Technion's infrastructure and create new research centers and programs.

This section of my report also includes information about the Technion's investments and pensions.

The Operating Budget

Seventy-five percent of budgeted expenses are for staff emoluments and pension payments. In parallel, about the same percentage of this budget is covered by the government.

Government support is transferred to the Technion, as well as to all Israeli universities, via VATAT, the Planning and Budgeting Committee of the Council for Higher Education. This Council was established to ensure Israeli universities' academic freedom and protect them from political involvement in higher education. It receives money from the Israeli government's Ministry of Finance and distributes it to the various educational institutes.

The 2007/2008 academic year was the final year of the 5-year plan that was agreed upon and approved by the Planning and Budgeting Committee (VATAT). This 5-year plan implemented substantial cuts in all Technion expenditures, but also included a considerable increase in VATAT allocations.

The 2008/2009 and 2009/2010 academic years were conducted without a long-term budget plan. We expect that VATAT will establish a new long-term budget plan in 2010 and hope that it will include an increase in government support.

Over the past decade, we have cut technical and administrative staff by about 17%. There has been a steady decline in senior academic positions that accumulated to a decrease of about 13% in these positions. The reduction was implemented by cutting the positions of retired academic staff. Despite these fundamental cuts in academic positions, the Technion managed to recruit 82 new senior academic faculty members over the past five years.

In recent years, the Technion's student body has numbered around 12,500 (undergraduates and graduates), about the same number it was 10 years ago. A decrease in senior academic positions, therefore, means an increase in student/faculty ratio, which adversely affects the Technion's academic quality and strength.

The 2008/2009 Budget Year

The 2008/2009 budget year ended with an operating budget deficit of NIS 28 million. We did not exceed the budgeted deficit, even though income from societies was much lower than budgeted. The main reasons were a decrease in several expense items and an additional allocation from VATAT. The deficit was covered by withdrawing from the "reserves for deficit coverage" which was left over from previous years.

The 2009/2010 Budget Year

The 2009/2010 budget framework is NIS 1,076.5 million, with a NIS 37.5 million deficit (exceeding 3% of the budget framework). The expenditures are divided into five main categories, as shown below (in NIS million):

| | | |
|---|-----|-----|
| Salaries | 611 | 57% |
| Pensions | 193 | 18% |
| Student fellowships, scholarships, etc. | 81 | 7% |
| Maintenance | 89 | 8% |
| Others | 102 | 10% |

At the same time, the main income components of the budget are (in NIS million):

| | | |
|-------------|-----|-----|
| VATAT | 777 | 72% |
| Tuition | 93 | 9% |
| Societies | 48 | 4% |
| Self-income | 121 | 12% |

The main changes in the 2009/2010 budget compared to the previous year are a decrease in income from Technion's societies, an increase in pension payments, and an increase in self-income.

As indicated above, income from Societies was budgeted at \$12.5 million (NIS 48.0 million). Decreased donations as a result of the global economic climate will cause a higher deficit of up to NIS 60-70 million.

Development Projects

Development projects are managed as multi-year budgets. In the year 2008/2009, the Technion invested (cash and obligations) NIS 227 million (\$57 million) in development projects. Income for development projects amounted to NIS 276 million (\$70 million). Some of the significant development projects were made possible due to donations, including the Student Union Building, the Graduate Students Village, the Asher Space Research Institute, the Emerson Family Life Sciences Building, the Schulich Faculty of Chemistry, the Experimental Life Science Facility, the Faculty of

Biotechnology & Food Engineering, the Kahn Mechanical Engineering Building, and renovations in the undergraduate students' Registration and Administration Center in the Ullmann Teaching Center.

The table below lists our investments (in NIS million) in development projects, divided into three major categories:

| Category | Invested in Projects 2008/9 |
|--|--|
| Buildings, renovations, infrastructure | 148 |
| Multidisciplinary research centers | 61 |
| Laboratories & equipment | 18 |
| Total (NIS million) | 227 |

Investments

Technion's investment portfolio includes the Technion pension reserve fund invested within the framework of the investment pool. The investment policy is set by a public committee. The value of the portfolio on September 30, 2009 was NIS 4,458 billion (\$1.186 billion). About 64% of the portfolio was in Israeli index-linked investments, 8% in foreign exchange linked investments, 19% in shares, and 9% in liquid assets. Our conservative investment policy proved itself during the financial crisis over the past two years.

Pension Payments and a New Pension Plan

Pension payments to all Technion employees are made from the operating budget. In 2008/2009, pension payments amounted to NIS 179 million, representing 17.4% of the operating budget; this year, they are expected to reach a total of NIS 193 million - 18% of the operating budget. This percentage is expected to increase over the next six years, after which it will level out. As was pointed out in previous reports, as of January 1, 2004, all new Technion employees, both faculty and administrative staff, have a regular external pension fund. This will have a very positive, future, long-term effect on Technion's financial stability.

Academic Affairs

As I have stated in the beginning of my report, one of the most important issues the Technion is facing is the recruitment of excellent young faculty members and their retention. A task force headed by the Executive Vice President for Academic Affairs is now forming recommendations to facilitate the recruitment process to make it possible for us to be able to bring to the Technion the best.

With the help of special programs such as nanotechnology, life sciences and the autonomous systems programs, the number of faculty members that are recruited can be increased. We are also hoping that the government will adopt long term plans that will yield significant additional resources to the Technion, thus allowing an increase in the number of excellent young faculty members we can recruit. In addition, we continue to develop new fund raising programs such as the Career Advancement Chair which will allow us to recruit more faculty members and reverse the trend of recent years, increasing back the number of faculty to around 600 over the next five to seven years.

A very bright angle in the recruitment of the past few years, and this year in particular, is the excellent crop of brilliant young faculty members that joined us despite most of them having attractive offers from other universities or industry abroad and in Israel. It took significant effort on behalf of the faculty deans and the Technion management, as well as substantial resources, to attract them to the Technion. *The Leaders in Science and Technology Program* initiated and supported by Mr. Henry Taub, and the recently funded *Shillman Career Advancement Chair*, *Chaya Career Advancement Chair*, *Andro Deloro Career Advancement Chair* and *Advancement Chair in Economy and Finance* played an important role in making this a reality.

The brilliance of our young faculty members is apparent by the fact that each year several of them are awarded various prizes and distinctions, including the prestigious Allon Fellowship. Three years in a row four of our new faculty members won the Allon Fellowship. Last year the four that won this fellowship were:

- *Dr. Gil Alexandrowicz* from the Faculty of Chemistry
- *Dr. Oren Cohen* from the Faculty of Physics

- *Dr. Koby Crammer* from the Faculty of Electrical Engineering
- *Dr. Sigal Savaldi-Goldstein* from the Faculty of Biology

All four have chairs in the Leaders in Science and Technology Program.

This year we had a Technion record of 6 recipients of Allon Fellowship. They are:

- *Dr. Ophir Auslander* from the Faculty of Physics
- *Dr. Ayelet Baram-Tsabari* from the Department of Education in Technology and Science
- *Dr. Ruth Heller* from the Faculty of Industrial Engineering & Management
- *Dr. Emanuel Milman* from the Faculty of Mathematics
- *Dr. Boaz Pokroy* from the Faculty of Materials Engineering
- *Dr. Eran Yahav* from the Faculty of Computer Science

Dr. Auslander completed his Ph.D. Studies at the Weizmann Institute in 2004 and spent his post-doctoral period at Stanford University. His research interests are in low temperature magnetic force microscopy and in imaging and manipulating superconducting vortices.

Dr. Baram-Tsabari completed her Ph.D. studies at the Weizmann Institute in 2007. Her research interests are in identifying best practices for successful facilitation of science learning through general interest television and in assessing the role of media in shaping long and short term public in science.

Dr. Heller completed her Ph.D. studies at Tel-Aviv University in 2007 and spent her post-doctoral period at Pennsylvania University. Her research interest is in statistics.

Dr. Milman completed his Ph.D. studies at the Weizmann Institute in 2007 and continued his post-doctoral studies at the Institute of Advanced Study, Princeton. His research interests are in isoperimetric, functional and concentration inequalities and distribution of volume in convex bodies.

Dr. Pokroy completed his Ph.D. studies at the Technion in 2006 and carried his post-doctoral studies at Bell Labs and at Harvard University. He is interested in Biogenic materials.

Dr. Yahav completed his Ph.D. studies at Tel-Aviv University in 2004 and then worked for IBM at their T.J. Watson Research Center. He is interested in practical synthesis for concurrent systems.

Our *Leaders in Science and Technology Program* assists us in recruiting four to five new faculty members a year since 2002 and continues to serve as a valuable instrument enabling the recruitment of young outstanding faculty members and provide them with the required infrastructure and equipment.

The new Faculty members recruited under this program are:

- Dr. Gil Alexandrowicz from the Faculty of Chemistry
- Dr. Koby Crammer from the Faculty of Electrical Engineering
- Dr. Boaz Pokroy from the Materials Engineering Department (won the Allon Fellowship)
- Dr. Sigal Savaldi-Goldstein from the Faculty of Biology
- Dr. Gilad Yosifon from the Faculty of Mechanical Engineering

Dr. Alexandrowicz completed his Ph.D. studies at the Cavendish Laboratory, University of Cambridge in 2005 and spent his post-doctoral period also at the University of Cambridge. His research interests are in surface dynamics, adsorbate interactions, nano-scale friction and helium atom scattering.

Dr. Crammer completed his Ph.D. studies at the Hebrew university in Jerusalem and completed his post-doctoral period at the University of Pennsylvania. His research interests are machine learning, artificial intelligence, algorithmic game theory and computational finance.

Dr. Savaldy-Goldstein completed her Ph.D. studies at the Weizmann Institute, spent her post-doctoral period at Salk Institute and her research interests are hormone signaling regulations of plant growth and development.

Dr. Yosifon completed his Ph.D. at the Tel-Aviv University and spent his post-doctoral at the University of Notre Dame. His research interests are Micro and Nano-Fluidics with emphasis on electrokinetics of nanochannels and nanocolloids.

Another important national prize for young faculty members is the Wolf fund's Krill Prize for Excellence in Scientific Research and it was awarded this year to *Dr. Kinneret Keren* from the Faculty of Physics who joined the Technion a couple of years ago. Her research interests are Biophysics, Biological Self-organization, Actin-Based cell mobility, artificial cells.

The Technion Center for International Academic Relations (CIAR)

Universities are also judged by their international academic relations and their cooperation and collaborations with leading universities worldwide. Science knows no political borders and is very much a universal language. The Center for International Academic Relations at the Technion, headed by Deputy Senior Vice President for International Academic Relations Professor Anat Rafaeli, serves as a gateway between Technion and people, universities and governments abroad. The Center has existed for many years, but its activities have received an increasingly major emphasis in recent years, due to the increased importance of global collaborations for both the education and research of engineers and scientists.

The Center currently maintains academic collaboration and exchange agreements with 102 universities in 27 countries. Of these, 35 agreements were signed during the past year. Of the newly signed, 25 are university-wide agreements -- agreements that enable student exchange and other forms of collaboration with any of the Technion Faculties and Departments, and ten are Faculty-specific agreements, enabling exchange and collaboration with the Faculties of Medicine and Industrial Engineering & Management. Collaborative agreements include universities in North and South America, Europe, Australia, Asia, and Africa. Focused efforts are dedicated to developing relationships with universities in the Far East, and agreements have been established with 7 universities in China, 4 in India, 4 in Korea, one in Singapore, 5 in Taiwan and one in Thailand.

The Center receives queries on a daily basis from people, institutions and government agencies interested in visiting or developing a relationship with the Technion. Center activities entail identifying the best form and format for effective and productive collaborations, and promoting and assisting visits to the Technion for academic delegations and individual students and scientists. Delegation visits are typically used for exploring options for academic collaboration. Student and scientist visits can be

for periods ranging from a few days to a full year. The Center also assists Technion students who wish to visit universities abroad as part of a Student-Exchange program and faculty members who wish to form collaborations with foreign universities.

The Technion hosted 313 students from 39 countries, 63 post-doctoral fellows from 21 countries and 63 academic visitors from 13 countries this year. Before their arrival the Center provides essential assistance to students or visitors ensuring that they have the necessary entry visas, insurance, residence, and financial arrangements, as well as any other specific needs. The Center also works to promote the social integration of visitors once they have arrived, to ensure a positive experience and integration into the Technion campus life. The Center worked to make the activities of the Dean of Students and the Student Associations available to visitors, and coordinated special social functions for foreign visitors, including a meeting for foreign scientists (coordinated together with the Office of the VP for Academic Affairs) and visiting foreign students, and special holiday functions.

The Center works closely with several key international Technion programs, including the *International School of Engineering (ISE)*, the *Technion American Medical School (TeAMS)*, the *Master of Business Administration (MBA) Program*, the *Technion Liaison Office*, a Technion administrative arm under the VP for Research promoting Technion capitalization on opportunities for research funding collaborations with the European Union and other parts of the world.

The Center also manages several more focused programs: (a) *HIBUR* is a program of collaboration of MIT and Technion students, aimed at connecting Technion students with MIT students. This year a delegation of 10 MIT students visited the Technion and 7 Technion students visited MIT. (b) *MISTI* is an MIT initiative in which undergraduate MIT students visit the Technion for short internships (12 weeks). This year 6 MIT students visited 6 different Technion Faculties. (c) *Technion Program for Cooperation with Far Eastern Universities* is a program offering special funding for visitors from the Far East to the Technion. In collaboration with the VP for Academic Affairs this program hosts post-docs and visiting scientists from universities in China and Korea. This year four scholars were hosted in this program. (d) *Jewish Agency programs*, such as Taglit (Birthright) and MASA, provide funding for attracting young Jewish students from around the world to the Technion. An agreement was

signed with the Jewish Agency last year. This year the Technion received special funding to support the development of the ISE which already hosted 10 Jewish students in the ISE. Furthermore, 10 new immigrants from France were hosted via the Division of Continuing Education and External Studies. From 2010 onwards, the CIAR will also be responsible for the IAESTE exchange program at the Technion. This program finds summer internships in Israeli industry and academia for foreign students, thereby allowing an equal number of Technion students to obtain internships in foreign countries.

To expand the educational opportunities for Technion students, the Center assists students who have a documented outstanding record of studies and wish to spend a semester or a year studying abroad, by connecting them to foreign universities and coordinating their visits. In 2009, the Center assisted 39 Technion students with the arrangements and to 19 universities in 12 countries around the world.

Technion Evaluated

The Technion has been conducting academic review committees for its Faculties for many years now and we continue to place great value in this process as we truly believe these review committees help us improve and see things in perspective. On average, each academic unit is reviewed and evaluated every 6-8 years. These committees are normally made up of a few leading experts from around the world and an Israeli expert as well. The committee always submits a detailed report to the President which is thoroughly discussed by the Technion management and the Senate. This report also becomes the basis for a work-plan for the future of the Faculty.

This year the Technion review committee reviewed the Faculty of Physics. The review committee consisted of 3 foreign experts (MIT, Princeton and NYU) and an Israeli expert from the Tel-Aviv University. The committee commented that it received full cooperation from the Faculty. The committee found that the cuts in faculty positions have put an enormous strain on the research and classes conducted at the Faculty and this needs to be addressed on the national level. The committee had some criticism about the way the Faculty manages its programs and committees, however, overall the review committee had great things to say and whatever criticism was offered was very constructive and taken seriously.

In June 2010 the Faculty of Medicine is scheduled for a review committee which I shall report about next year.

Last year the Council for Higher Education also began its own review committees of Israeli universities and this year they reviewed the Faculty of Biology and the Faculty of Industrial Engineering and Management. The Faculty of Biology received a complimentary report whereby all the changes that were taking place were impressive as well as the new talent being recruited. The Faculty of Industrial Engineering and Management received an extremely positive report whereby the committee members commented that this was a world class Faculty both in term of research and in terms of programs offered.

I wholly believe in the review process in place at the Technion and we shall continue to conduct these review committees which are so important to the Faculties themselves and the Technion, they really give us a sense of what we are doing right and what we are doing wrong.

Undergraduate Studies

Over the last several years the number of students has more or less remained the same, although, due to constraints imposed by VATAT, the number is by about 700 students lower than it was in 2003 – 13,516, when the number of students was the highest in Technion’s history.

The total number of undergraduate students in 2009/10 is 8,863 and 2,177 are new students. Students’ distribution among the various faculties is in the graph on the next page. The four largest faculties are Electrical Engineering, Computer Science, Industrial Engineering and Management, and Civil and Environmental Engineering.

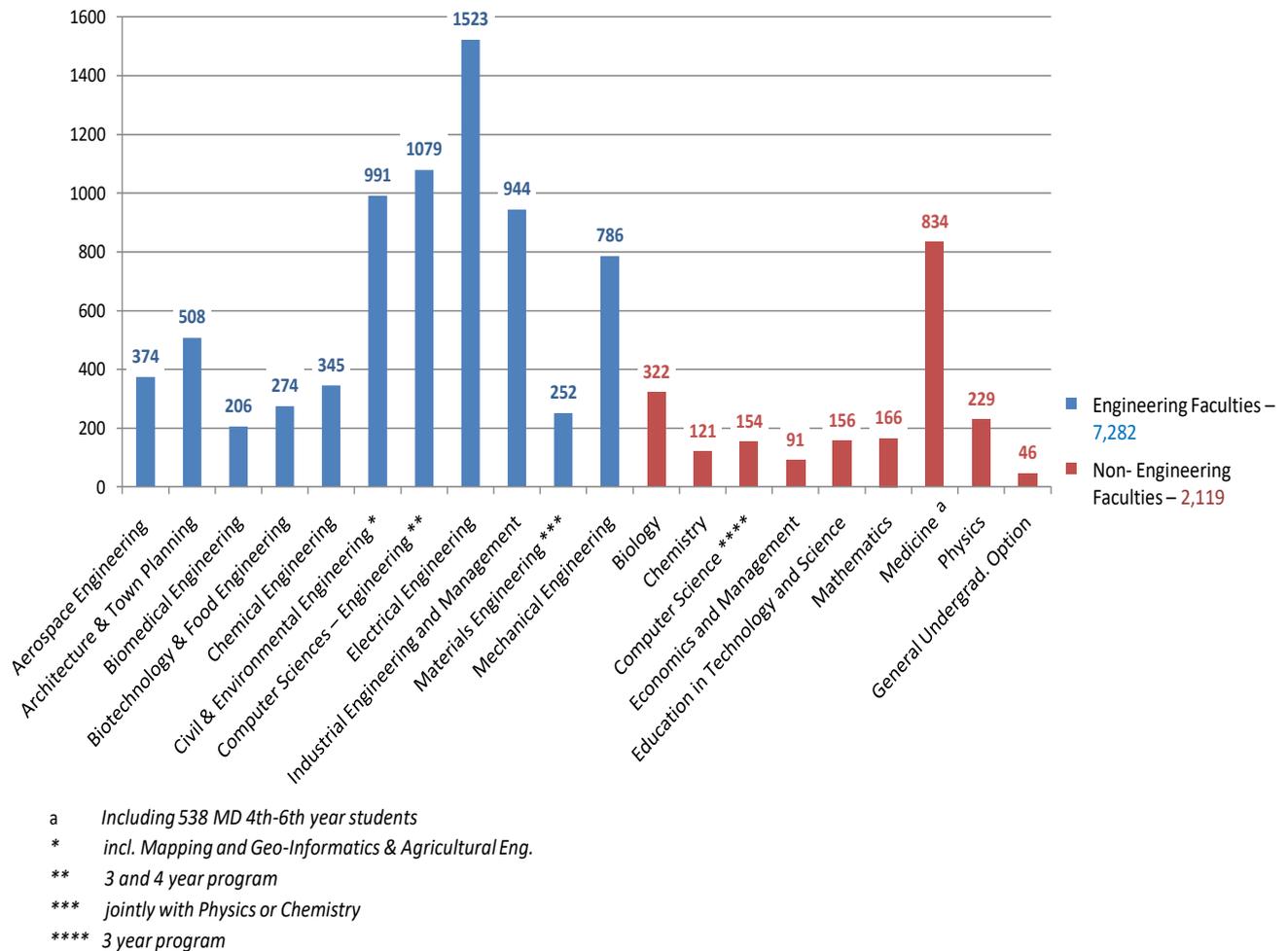
Early figures for this year indicate stability in applications for university entrance for the next academic year to start in October 2010. The Technion is continuing its marketing efforts to attract the best candidates to the campus – including personal tours to the campus, discussions of potential candidates with faculty members, media exposure, and active encouragement of those candidates who have been offered a place to actually enroll. We hope that with these efforts the final number of new enrolments will increase.

Total Undergraduates and New Admission Students

| <i>Total Number of Students</i> | | | | |
|--|---------------|---------------|---------------|----------------|
| Year | 2006/7 | 2007/8 | 2008/9 | 2009/10 |
| Engineering | 6,383 | 6,167 | 7,171 | 7,282 |
| Non-engineering | 2,352 | 2,324 | 2,107 | 2,119 |
| Total | 8,735 | 8, 521 | 9,278 | 9,401 |
| <i>Admissions</i> | | | | |
| Year | 2006/7 | 2007/8 | 2008/9 | 2009/10 |
| Engineering | 1,437 | 1,495 | 1,746 | 1,701 |
| Non-engineering | 659 | 610 | 439 | 499 |
| Total | 2,096 | 2,105 | 2,185 | 2,200 |

Undergraduate Students by Faculty 2009/10

Total - 9,401



Our Efforts to Recruit New Students

The Technion is situated in the Northern part of Israel and as such we learned that it is not always the first choice for students who live in the Center and the South of Israel. There are many reasons for this, all of them are non-academic. Even those who tell us they will study in Tel-Aviv clearly say that academically Technion is definitely their first choice. The Technion has confronted this challenge on several levels. One important side to this is purely economic and in order for us to be more attractive in this respect there are two main issues to advance: housing and scholarships. The Technion has made great efforts to increase the dormitory space available for students, thus making the Technion more attractive for students from the Center and

South of Israel. In fact, we have already initiated a total refurbishment process of existing dormitories and have begun planning two additional dormitory buildings with hundreds of additional beds. With regard to scholarships, we have recently received an important boost from the public American charity Israel Endowment Funds (PEF). PEF has recently decided to allocate very significant scholarships to Technion undergraduate students realizing their importance to Israel's future. Forty scholarships each year, each in the amount of \$7,000, were granted in the last two year to students in need and to excellent students. The number of scholarships is expected to grow to 120 next year and afterwards, each year, there will be 120 scholarships. These scholarships are known as *The Alfred and Anna Grey Scholarships* and they are extremely important as they help us recruit to Technion the best students in Israel.

In the public relations arena, we have been holding open days at the Technion, as well as participating in numerous fairs for soldiers and other potential candidates. High school students from central and southern Israel are invited to visit the Technion with their class to see for themselves the Faculties, Laboratories, housing and the campus in general.

Improving the Quality of Teaching and Learning

Good Start – First Year Students' Experience

As I have mentioned in the beginning of this report, the Technion has always been committed to improving the academic experience and the quality of teaching and we have been investing much effort in our commitment to this issue. As part of our efforts we initiated a revolutionary program for first year students known as the "*Good Start*" Program. This program was designed to help overcome the initial stress that many students experience during their first year of studies at the Technion and their feeling that many of the courses they are studying are "not relevant" to their future profession. A very important component of the program is the first year design course – a vehicle by which engineering students can learn early on the challenges of their chosen profession, experience the excitement of design, develop their capabilities in engineering design, teamwork, problem solving and understand how studying basic science subjects will help meet those challenges. Last year, the design course was piloted in two faculties: Chemical Engineering and Industrial Engineering and Management. A survey carried out among all first-year students in the Faculty of

Chemical Engineering showed conclusively that 50- 70% of the students who took the pilot course felt better prepared and more grounded in their chosen major compared to 20-50% of those who did not. This year we have started to carry out departmental teaching workshops to improve the didactic skills of faculty, and so far, three faculties have participated. The impact of these first steps has already been felt, and we have received positive responses from many students and student leaders.

Another aspect of the program is emphasis on significantly reducing the size of exercise classes in the Mathematics courses (to a maximum of 35 students in each), together with providing the students with more feedback during the course of the semester. The latter is achieved both by training the tutors and teaching assistants to encourage active learning in their sessions, and by providing individual grading of homework assignments. "Drop-in" workshops were instituted and are available every afternoon for students with specific questions. These extra efforts are needed as we have come to realize that the mathematics preparation in high schools has deteriorated significantly over the last decade. This program obviously requires significant resources and despite the difficult budgetary situation, we decided to support it, realizing how important it is for the core of what we do at the Technion.

The Center for the Promotion of Teaching

The center for the promotion of teaching collaborates with faculty and students to promote Technion commitment to excellence in teaching and learning throughout the Institute. The Center provides workshops and individual consultation for new Teaching Assistants (350 TAs each year), new faculty members and departments. The center provides the technological and pedagogical support for designing website courses (1800 courses) and the use of a variety of instructional technology tools. At the Streaming Media Service, students can watch videos of their courses. This is particularly helpful for students who have been called for reserve military service or have been absent for other reasons. The Center conducts the yearly survey of the quality of teaching which helps in the learning process of faculty members

The Unit for Personal Assistance

The Unit for Personal Assistance has always been an essential part of student life at the Technion. In an attempt to make life easier for our students we have placed great emphasis on the services which the Unit offers. Over the last years Israel has had its

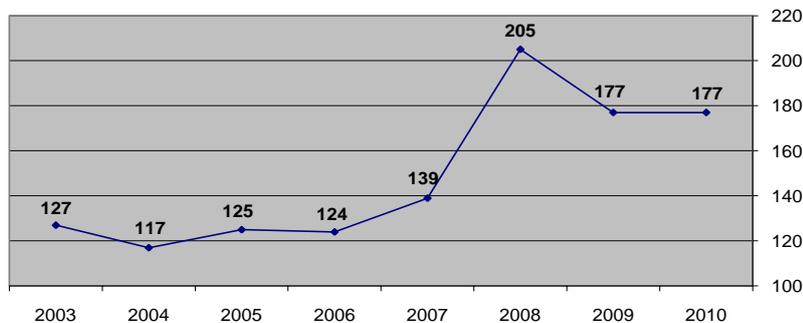
share of military operations and we are proud that many of our students are active reservists who are called for frontline duties on a regular basis, especially in times of a general call-up. At times, students can miss many days of studies and the Unit has to become creative in order to help them catch-up. For example, the Unit will provide tutoring for these students, photocopying services, counseling, summer courses at reduced rates, and at times even provide them with loans or special scholarships. The Unit is a valuable tool in facilitating life for our students and I believe that it has helped hundreds of them navigate through their degree safely.

The Senate of the Technion has recognized that each military reserve service stint during the semesters or examination periods impacts the reservist's academic achievements. Therefore, this year the Senate had modified Regulation 2.3.3 to allow more adjustments and benefits for students serving as reservists in the army during the course of their studies. Also, the Senate has approved a program to encourage students to volunteer and serve in the community through various volunteering organizations.

The Irwin and Joan Jacobs Graduate School

The last 5 years were, in many respects, very successful for the Jacobs Graduate School. The Graph below shows the progression in the number of Ph.D's graduating from the Technion since 2003. The picture is clear and very encouraging – we are witnessing a steady increase since 2006, with the average number of Ph.D's graduating from Technion in the last three years higher by 70% than the number 10 years ago. Based on the total number of Ph.D. students now studying, we expect that each year a total of 180-190 Ph.D.s will graduate in the next three years. This is an important achievement, which pushes us closer to our goal of reaching a steady rate of 1100 Ph.D. students and 200 – 220 graduating ones each year by 2015.

Technion PhD Graduate Students
(2003 – 2010)



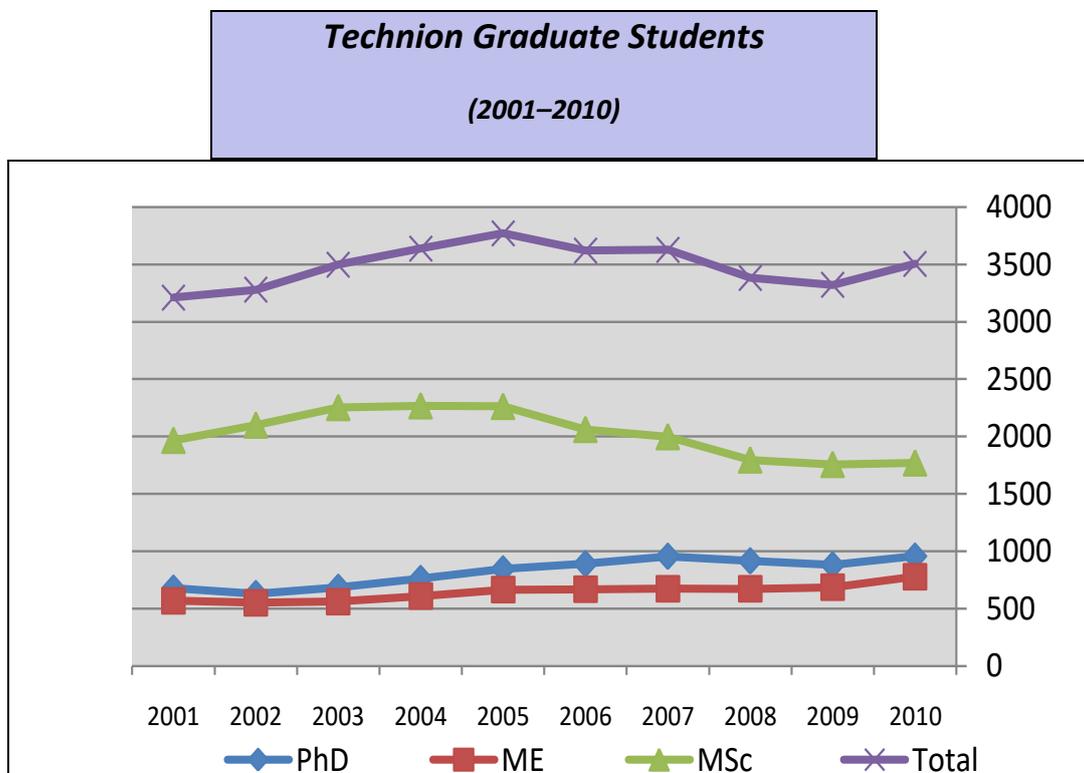
Over 70% of our Ph.D. students earned a Master degree from the Technion and this means that our Masters students are the main resource of our Ph.D. students.

Therefore, in order to increase the number of Ph.D. students and reach our annual goal of over 200 new graduating Ph.D.s a year, we have to increase the number of Masters (thesis track) students. Unfortunately, due to lack of resources and budget cuts, the number of these students is decreasing, which may jeopardize our efforts.

The solution to this is one which we have been stressing for some years now and that

is an increase of available fellowships which will enable us to support more doctoral students. We hope to establish a large enough fellowship fund to allow for as many doctoral students as possible to study at the Technion without the constant worry of budgetary constraints.

The Graph below shows the progression in the total number of active M.Sc. and Ph.D. students in the past 10 years. As shown, the total number has slightly increased compared to the year 2001. As for the Master students, a continuous trend shows a decrease in the number of thesis track Master students (allowing them to continue to a Ph.D.) and an increase in the number of non-thesis M.Sc. students.



In mid March 2010, the number of graduate students stood at 3,802, 963 of which are doctorate students and 2,839 are Master’s students, 1,770 of which are studying towards an M.Sc. degree with thesis. This number marks a slight increase compared to last year's (March 2009) numbers which stood at 3,350 graduate students in total.

In the upcoming Masters graduation ceremony the Technion will be awarding 783 Masters Degrees – a record number! 340 thesis –track Masters and 251 non-thesis track Masters, 123 are MBA graduates and 69 who are on the direct doctorate track. These

numbers are significantly higher than those of last year (2009) - 751 Masters Degrees in total.

The following new programs were approved this year:

- Masters and Ph.D. programs within the new Interdepartmental Committee of Robotics and Autonomous Systems
- Masters and Ph.D. programs within the new Interdepartmental Committee of Energy
- Master of Architecture II with specialization in "Green Architecture".
- International Executive Master of Business Administration (IEMBA).

Other significant issues I wish to report to you are:

- The construction of the new *Stanley Shalom Zielony Graduate Student Village* is continuing in high gear. In fact we hope to begin populating it in less than a year. This new Village will certainly serve as a drawing factor for top graduate students and postdoctoral fellows from both Israel and abroad, especially those with families.





- In spite of the difficulties we continue to increase our students' travel budget, allowing our students (mainly Ph.D.s) to present their research work in international conferences abroad. I am a strong advocate of this policy as it is through these conferences that the doctoral student can meet his/her peers, make scientific ties and even brainstorm. This, to my mind is a sound investment for the Technion.
- During the last year we have signed Joint/Double Doctorate Degree agreement with the Technical University of Berlin (TUB), and we are in the process of formulating such an agreement with KTH in Sweden and NTU in Singapore. The first Ph.D. student from Technion is already studying at KTH, and another one is scheduled to arrive from TUB.

The Center for Pre-University Education

As I previously mentioned, one of my priorities as President is to exercise, what I believe to be, our National duty as a university and help to bridge the gaps which are, unfortunately, only deepening in Israeli society. The Center for Pre-University Education has been doing some extremely important work in this area as well as its ongoing activities. The Center is in fact a marvelous tool to help promote those who have not been given the proper opportunity to achieve their full potential. Over the years we have uncovered some magnificent intellectual "diamonds" through the blessed activities of the Center.

One of the units operating within the Center is the **Unit for Pre-Academic Studies** which offers preparatory programs. The programs offered by this unit are diverse and adapted to the different populations of Technion candidates. During the year, between 600-700 students participate in the preparatory programs for admission to Technion and approximately 1,000 students participate in the other programs offered.

A Preparatory Course for Discharged Soldiers and New Immigrants

This is one of the most veteran programs offered by the Center. This is a 10 months program which opens twice a year for admissions. The teaching staff includes 30 experienced and dedicated teachers and 40 mentors. The subjects taught are Mathematics, Physics, English and Scientific Writing. Around 60-65% of the students in the program will later qualify to be admitted to the Technion or other universities.

Pre-Entry Courses

These courses are meant for students already admitted to the Technion and their purpose is to strengthen the knowledge of students in Mathematics and Physics, thus making it easier for them during their first year of studies. There are approximately 800 students participating in these courses. There are also special courses for certain faculties such as the Graphic Skills Prerequisite Course which helps prepare students (60 students a year) towards their entrance exams to the Faculty of Architecture and Town Planning. Another course held in the unit is one meant for Arab students (90 students a year) who were admitted to the Technion. The purpose of this course is to strengthen the knowledge of these students in subjects such as Mathematics, Physics and English.

A Pre-Preparatory Course for the Atidim Project

The purpose of the course is to strengthen the knowledge of future *Atidim* students prior to the beginning of the preparatory program. This has proven to be important in view of their weak school knowledge. This year, 50 Ethiopian descent, Druze and periphery students participated in this course. At this point I wish to mention that the *Atidim Project* itself is still going strong at the Technion and in October of 2009, 45 students were enrolled in this program as well as 16 additional students from the IDF Technological Administration.

A Special Program for the Preparation of Arab students for Higher Education (NAAM Program)

The purpose of this program is to prepare Arab students from Northern Israel for higher education. The students participating in this program come from low socio-economic background but have achieved good grades in Math, English and the Sciences. In 2009, 95 students participated in the program and 85% of the group was admitted to the Technion's various departments, including the most sought after departments. The others were admitted to the Hebrew University and the Ben-Gurion University. This is a spectacular success and it is clear that without this program, many of these students would never have had the opportunity to study at the Technion. The program is fully supported by Mr. Eitan Wertheimer.

A special Program Aimed at Students from the Jewish Ultra-Orthodox Sector

The purpose of this innovative and unique program is to train students from the Jewish Ultra-Orthodox sector of the population, aiming to integrate these students in the Technion and other higher learning institutions in Israel. The challenge is huge, almost imaginary, because these students have no background what so ever in science and mathematics, and therefore cannot attend the regular preparatory classes. In 2007 and 2008 this program trained 60 students. The program includes a 5 months pre-entry program and an additional 12 months as a preparatory program that teaches Mathematics, Physics, English and Scientific Writing. In 2008, 12 program participants (the first graduating class) were admitted to the various Technion departments – a great achievement! In 2009, 7 graduates out of the 11 were admitted to the Technion. Based on this success the program will also continue in the future. The importance of this program to Israel is huge because it will allow integrating the Ultra-Orthodox sector

into the labor force. This program is also financially supported by Mr. Eitan Wertheimer.

The Ofakim – HighTech Program

This program is for IDF veterans who served in combat units and completed 12 years of schooling but have neither a psychometric score nor the matriculation certificate. This program was initiated by our alumnus, Mr. Yehuda Zisapel, and is managed by the Technion Alumni Association. The program is partnered by the Israel Technion Society, the *Rashi Foundation* and the *Gross Foundation*. In 2008, the pilot for the program was initiated with 60 students. Three months of studies prepare the students for a twelve-month preparatory course. Once the students complete the program their achievements and the psychometric score will stand as criteria for admittance to the Technion. In 2009 we admitted 120 students to the Program.

Another unit operating under the Center is the ***Harry and Lou Stern Youth Activities Unit***. The purpose of this unit is to make science and technology more attractive and accessible to children and youths by offering them a range of activities suited for their age group. The activities are mainly aimed at children in junior high school and high school. The activities are held in the morning during science and technology days and in the afternoons as after school programs. This is the third year in which the unit is operating out of the new *Arie and Jacqueline Carasso Youth Wing* which houses 7 modern well-equipped teaching laboratories, modern classrooms and the *Amos and Shoshana Horev Auditorium*. This year, 9,500 children participated in 150 days of activities. Some of the activities include:

Sci-Tech 2009

For the past 16 years the Technion has been holding this unique international research youth camp. The whole program is designed to allow youths from all over the world to experience real research. I hope that in the future, as our International School grows, these youths will decide to continue their higher education at the Technion. This year 35 youths participated in the camp: 18 from the US, 2 from Bulgaria, 2 from Serbia, 1 from Italy, 1 from Turkey, 1 from Canada and 9 Israeli youths.

TeLeM - Technion Lessons in Mathematics

The TeLeM program is a joint program between the Center and the Department for Education in Technology and Sciences. It aims to encourage children in grade 6 and up

to develop Mathematical thinking and complete their mathematic matriculation studies at the highest, 5 credit-points level. Our hope is that these children will choose to study at the Technion later on. This is the 10th year of this Program's operation. Training workshops are given regularly to mathematics teachers who participate in the program. Today there are 700 pupils participating in the program from 10 schools throughout Northern Israel and approximately 130 Mathematics teachers went through the TeLem training program. As part of the Program we also hold special competitions and Math Olympics for all students of the Program. Graduates of this program in the 11th and 12th grades are offered the option of academic studies at the Technion while still in high-school.

The Ort – Technion Classroom

This program is a joint venture between the Technion and Ort Schools and is meant for excellent pupils. This year 11 classrooms operated within the framework of the program with a total of 300 pupils. The goal for these pupils is to graduate high school with gained Technion academic credits for future studies. The program is 8 years long and follows the pupils through junior and high school until they enroll as full time Technion students.

The Legacy Program

In 2008 we began preparations to launch the *Legacy – Licensed for Science Program* sponsored by the Legacy Heritage Fund. The purpose of the program is to encourage a positive attitude towards the sciences and to foster excellence amongst junior high pupils from peripheral regions and low socio-economic families. The activities take place on campus, in the teaching laboratories of the Carasso Youth Wing. This year, 17 two-hour sessions took place during the school year in subjects such as Mathematics, Physics, Biotechnology, Robotics, Medicine, Architecture and Electronics. The sessions also dealt with topics of Israeli heritage and how it relates to sciences and engineering. In the 2009/10 academic year 200 pupils participated in the program. These pupils came from 16 schools in 9 peripheral towns in Northern Israel.

There are many other such programs taking place at the Center. Our hope is to reach as many pupils and turn their lives around. My greatest hope is that with this activity we shall be able to narrow the deepening gaps of Israeli society and make it possible for as many youths to have optimism regarding their future.

Continuing Education and External Studies

The Division of Continuing Education and External Studies specializes in organizing and developing advanced study programs for university graduates in various engineering and science domains. It also grants diplomas to high-ranking professionals in different fields of engineering, architecture, medicine, administration, and teaching through specially-designed courses. All advanced courses and programs for Master in Engineering (ME) are carried out in collaboration with various Technion Faculties.

The Division's goals are to promote, update, and enrich the knowledge of engineers, scientists, doctors, and other professional populations in accordance to the needs of industry and trends of the marketplace. The Division's programs are approved by the academic council which consisted of Technion professors representing different faculties. Over the years the Division has grown considerably, providing professionals with the opportunity to further their education and careers.

The Division operates out of three centers: the Technion campus in Haifa, the Tel Aviv Center, and the newly established Jerusalem Center. This distribution offers accessibility to a large population of professionals in different parts of the country. In view of the Divisions' needs of appropriate space for academic studies in Tel Aviv, the Technion is in the process of leasing and developing three buildings in Sharona, a unique German Templar Colony established in 1871. The Municipality of Tel Aviv is investing in restoring and developing the site in order to create a cultural and academic environment.

About 2,800 students are currently studying in the Division and more than 300 faculty and staff are involved in its activities. In the last six years, about 800 graduate students received an MBA, M.E. or M.Sc. through the Division, of whom 132 students graduated in the academic year 2009-2010.

Below I list some of the programs which were offered in the current academic year:

Programs leading to academic degrees:

- MBA with emphasis on High-Tech companies.
- M.E. in systems engineering, biomedical engineering, environmental engineering, civil engineering with focus on development and business management in construction, and civil engineering with focus on managing construction projects.
- MARCHII in architecture with emphasis on conservation.
- M.E.E. in electrical engineering – a program offered through Intel.
- M.R.E – Master of Real Estate.
- B.A. in Geo-Information.

Programs leading to a certificate:

- *Management Studies* in human resources, project management, quality assurance engineering, logistical systems management, and coaching.
- *Real Estate Studies* in land assessing and property management, planning and construction law, and construction project management.
- *Interior Design Studies* in landscape design and curation of art exhibits.
- *Computer Studies* in software development, software testing, software security, network administration and management, and data protection.
- *Family medicine*.
- *Tailored programs* for various companies such as the Israel Electric Corporation, Intel, RAFAEL, Elbit, Cellcom, Bezeq, IDF, and Ministry of Defense.

In the last fall semester two additional M.E. programs were approved: Industrial Design and Robotics, which will start operating in fall 2010. Other new programs were also established: Photography and Quality, which have already started their activities, offering special courses.

TIDES – Technion International Distance Education & Studies Center

In the current globalized world in which enterprises and other organizations compete for ever increasing requirements from their products and services, engineers and scientists are adopting habits of what is termed long-life learning in order for them to keep up with the pace science and technology and remain as current as possible. To

cater to this increasing need, various forms of distance education have been on the rise over the last two decades in the business, government, and higher education sectors. Distance education is defined as an interactive teaching-learning process, of which at least part is carried out online, via multimedia and emerging visualization and teleconferencing technologies. Distance education occurs when the student and the teacher are physically separated and technology connects them, and this proliferates at universities conducting higher degree programs in engineering, business administration, and medicine. At the Technion, until recently, distance education activities have been sporadic and uncoordinated. The Division of Continuing Education and External Studies has initiated and is leading an institute-wide effort to establish high-quality Distance Education at the Technion on an international scale. Our aim is to develop distance education for enabling professionals, individually or through their employers, to adopt long-life learning and continue specializing in their workplaces at their own time and pace. This initiative is called the **TIDES** Center and I hope that by next year I can report that we have made progress and have fully initiated the Center.

Student Affairs

The Dean of Students has the responsibility of dealing with issues relating to the welfare of the Technion students. The Office of the Dean of Students operates six professional units whose responsibility is to support and advance the students. These units serve approximately half of the total student body:

- *The Unit for Personal Assistance* offers help and guidance to students in financial distress. The aid offered includes scholarships, loans, and special help and personal consultation for students who are called to the IDF reserve duty.
- *The Beatrice Weston Unit for Student Advancement* offers advice and counseling to students who have difficulty studying due to adjustment issues, personal difficulties and learning disabilities. It also helps with career guidance, and assists students with physical disability or family related difficulties.
- *The Professional Employment and IAESTE Unit* provides professional and career guidance to students and graduates. The unit organizes job fairs, career focus days, workshops for resume writing and job interviewing. The unit also helps to place students who wish to go for technical training abroad over the summer months.
- *The Phillip and Francis Fried Counseling Center* offers a professional team of skilled clinical counselors, therapists, social workers and a psychiatrist for the benefit of the student population. Over the last few years there has been a 25% increase in counseling requests from students and we therefore created a program for expanding the center that is waiting for donor adoption. The counseling center is an important feature on campus and one which can truly make a difference in the lives of students who feel overwhelmed.
- *The Unit for Social and Cultural Activities* works in collaboration with the Technion Students Association to provide social and cultural activities for both undergraduate and graduate students.
- *The Student Housing Unit* offers housing solutions to about 3,600 students. We continue our long-term project to upgrade old dormitories.

Ongoing Special Projects

“Bubbly Campus” – In a one of a kind, unique initiative the Technion has announced a prize winning competition called "Bubbly Campus" whose purpose is to bring to the Technion ideas for projects which will contribute and upgrade the student vibe of the campus. The idea behind this is to attract the best students to the Technion and provide them with a vibrant campus feeling. The project has ended by now, and over a hundred suggestions were sent to the competition. A special committee will choose the best 10 out of them for the final stage, and then a first, second and third places will be chosen and announced.

Scholarships – due to a demonstrated need and the current financial situation we have awarded scholarships, all sponsored by donations, to approximately 20% of the undergraduate students population. The maximal amount of the Technion's financial aid scholarship covers 100% of the tuition fee. Many students receive additional financial aid from many external non-profit private organizations and foundations. These organizations have actually increased their grants for Technion students for this academic year. Over the past few years more students from a lower socio-economic background and from the periphery of Israel have been applying and admitted to the Technion which directly impacts our role.

Loans – Technion student loans in the sum amount of NIS 12,000, offered at preferred interest rates, were awarded to about 300 undergraduate students. In addition, 100 Magbit and Geller Foundation loans in the amount of \$2,500 each were awarded, with student-tailored remittance conditions effective after graduation.

Reservists – We have recently made the decision to allow students who are reservists to convert reserve duty into academic points up to twice in their degree as well as allow them 25% more time for the first round of exams. This will be implemented on top of the already wide range of benefits given by the Technion to reservists.

New students Welfare project – A new project for high potential new students has been successfully initiated last year. As part of this project we personally accompany the new students from the registration stage until the end of the first year.

The ATIDIM Project – assists high school graduates from Israel's periphery and economically distressed neighborhoods who have received permission to postpone

their military service in order to attain an academic education in engineering or science. This program is in collaboration with the IDF. At the Technion we offer them one-on-one tutorships, academic workshops and counseling. We try to ease their entrance into academic life as much as possible. This year approximately 100 students were absorbed into the program at the Technion.

New Immigrant Students – The majority of these students came to Israel without their families and encountered difficulties in meeting academic requirements and tasks in addition to the expected adjustment difficulties. These students receive financial assistance and personal counseling related to their difficulties.

Students of Ethnic Minorities – A special project is underway to help ease the absorption and adjustment process of first-year students from ethnic minorities. The goal of the project is to reduce first-year dropout rates among these populations and help them to excel. In the current academic year, 420 students were assisted by this project. Our model for absorption of these populations of students was adopted as a working model for all Israeli Universities by Council for Higher Education.

Haredim "Halamish" project – 17 students from an ultra-orthodox Jewish background who have graduated from the Technion Center for Pre-University education successfully started studying at the Technion so far. The program supports the students with academic enrichments and emotional support.

The "Ofakim" Project – this is a project meant for discharged soldiers from the periphery who have completed the Technion preparatory program. The first class began their studies in the beginning of the 2009/10 academic year and they will receive workshops on learning strategies, support and follow-up.

Professional Employment and IAESTE – This year two job fairs were held with the participation of 50 companies. These job fairs are among the largest in the country, reflecting the Technion's leading position as a major human resource provider for the high-tech industry. In addition, 16 career focus days for recruiting and interviewing were held by leading companies. We also gave job-preparation lectures to approximately 500 students.

This summer we have 60 students going abroad on professional training as part of the IAESTE exchange students program.

Social, Cultural and Sport Activities – This year we enlarged and consolidated the activity of the *High Q Club* which hosted the likes of Nobel Laureate Professor Israel (Robert J.) Aumann, Professor Avishay Barverman, Minister Dan Meridor, Professor Moshe Arens and more.

Community projects – More than 300,000 hours of community work were contributed by approximately 2,000 undergraduate students, i.e., about 25% of the student population. The community-related activities were associated with various frameworks such as *PERACH*. In another program, Technion students reach out to about 300 junior high- and high-school students from lower socio-economic groups and peripheral areas. The students help them with their science and technology related studies. The *M.A.T.A* initiative, a collaborative effort shared by the Haifa Municipality, the Ministry of Education and the Technion, sends 50 students to provide assistance in mathematics to students in grades 4 and 5 from various Haifa schools.

Faculty in Focus – Biology

The “Quality Transition”

In this first report I present to the Technion Board of Governors I wanted to start a new tradition whereby I provide you with a glimpse at one Technion Faculty. The reason for this is that sometimes when looking at the larger picture you can lose sight of the details and I wanted to make it possible for you to get a taste of the actual workings of a given Technion Faculty. This year I have chosen to tell you a little about our Faculty of Biology and the reason for this is that this Faculty is a fine example of a Faculty in transition. The Dean of the Faculty of Biology, Professor Gadi Schuster, his academic colleagues and administrative staff have embraced the vision of a current and contemporary Faculty of Biology that excels in research, one that will play a major role in the Life Sciences revolution at the Technion.

The Faculty of Biology started as a small department that diverged from the Faculty of Chemistry in 1971. During the first 25 years the Faculty of Biology developed slowly in terms of quality and quantity, focusing primarily on molecular and cellular biology research. After it became a Faculty, Biology was not dominant on campus as compared to Biology departments at other universities. About ten years ago, the Technion management decided to establish strong and leading Life Science activities on the Technion campus by upgrading the Faculty of Biology to serve as the focal point for research into modern Life Sciences and teaching efforts. One of the tools for implementing this decision was the establishment of the *Lorry I. Lokey Center for Life Sciences and Engineering* founded by Distinguished Professor and 2004 Nobel Prize laureate, Aaron Ciechanover. As head of this Center, Professor Ciechanover collected and implemented the essential resources and funds for *the Emerson Family Life Sciences Building* adjacent to the Faculty of Biology to house modern infrastructure, technologies and facilities in Biology and Life Sciences. The mission of which is to expand research capacity and to attract excellent new faculty members as investigators to the Technion.

The Faculty of Biology rapidly implemented these moves and adopted its mission to quickly become an excellent biology research unit, comparable to the best departments in the country and on the global scene. Through pro-active recruitment of

young investigators as well as seasoned leaders, the Faculty grew from 23 members a mere two years ago to 27 this year, with the goal of reaching 30 full time faculty members as principal investigators in the foreseeable future. The faculty has expanded into the new building, housing both research labs and - more importantly- inter-departmental infrastructure such as genomic, proteomic and microscopy facilities. These coordinated efforts position the Faculty of Biology as the principal unit of life science research and teaching at the Technion. Surrounding the Faculty of Biology, a network of collaborations and joint research projects are being forged with multiple disciplines encompassing Engineering and Physical Science departments.

Special emphasize has been invested in the recruitment of excellent and talented new researchers, as well as upgrading the existing scientific research capacity, and the quality of teaching. Today, we can already say that although we are only halfway along our road of transformational change, this optimistic move is hugely successful. The recent recruits, alongside our current generation of faculty members, are excellent, conduct forefront research, publish in the highest profile and prestigious scientific journals, and reap international recognition. Evidence of this is that the Faculty of Biology is among the highest at the Technion in the amount of research funds obtained from competitive sources. Nothing reflects this rapid ascent better than the rapid promotion of its rank and file: whereas there were only two full professors of Biology in 2005, this number has multiplied itself five fold in five years leading to the present number of ten full professors (more than one third of Faculty members). If I may summarize at this intermediate stage of our journey, the Faculty of Biology at the Technion has reached the stage of a very high quality biology research unit, primarily in Molecular, Development, and Cellular Biology, with excellent prospects into new and exciting fields such as Biodiversity, Marine Microbiology, Cancer Research, Protein Science, and Quantitative Systems approaches to resolving large biological datasets.

Stepping out of the Cellular and Molecular Biology Foundations by Capitalizing on the Technion Advantage

Having set the stage for a strong scientific framework, the Faculty of Biology together with the Technion management have determined that the time has come to add capacity in Quantitative and Biophysical Biology to the ongoing cellular and

molecular biology endeavors, or to quote their dean: "to finally take advantage of a Biology Department situated in the midst of a Technology Institute". Therefore, in addition to the longstanding aim of excelling and serving as the major life science research and teaching force at the Technion, "phase 2" has been inaugurated to link the Faculty of Biology with technology rich analytical approaches such as Physics, Mathematics, Engineering, and Nanotechnology. This objective has been spearheaded by some of our Biology Department laboratories that are conducting high-throughput genome sequencing or large scale proteomic analysis of cells and tissues, making use of the top-of-the-line DNA sequencing and Mass Spectrometry facilities recently purchased and housed in the Biology core facilities managed by the *Lorry I. Lokey Center for Life Sciences and Engineering*. To this end, the present recruitment efforts are excellent scientists that trained on single molecule biophysics, systems biology, nano-biotechnology, high resolution/high throughput screens, structural biology, and related aspects of quantitative or biophysical biology. In fact, recruiting efforts are well under way with established professors at leading institutes abroad to bring them to the Technion next year. As you may have noticed, the research in the Faculty of Biology is following the overall campus-wide trend of interdisciplinary and the recruitment of new faculty members will facilitate this even further as these new recruits will be active in fields that require the involvement of several Faculties. My report next year will undoubtedly unveil many exciting surprises describing the significant impact this transition in our Biology Department has on the Technion community.

The new building

A faculty in transition with such ambitious plans for positive change requires and needs facilities that will make all of this possible. On June 6th, 2010 we are inaugurating the state of the art *The Emerson Family Life Sciences Building* which will house the whole Life Sciences initiative. I wish to tell you a little about this building which is so important for our campus and for the Faculty of Biology. We began construction on this building in the beginning of 2008. The building will comprise of 9 floors: one floor will house all the machinery, 2 floors are infrastructure floors and the remainder 6 floors will house various research labs. The Faculty of Biology will house a total of 5 floors: the machinery floor, an infrastructure floor which will house the protein center and the infrastructure center, and 3 floors

designed for research laboratories. There are 7 Biology Faculty members who will be moving into the building and in the near future 2 additional faculty members (newly recruited) will be moving in as well. After the building is complete we hope to begin renovating the administration floor in the existing Faculty of Biology building (3rd floor) which connects to the double helix bridge between the two buildings as well as refurbish the existing laboratories so they can be adapted to new faculty members. We also hope to add two seminar rooms and a cafeteria that will be set up around the Spanish-style courtyard that is encompassed by the two buildings. In the future we hope to be able to provide the Faculty of Biology with a large auditorium for its bigger classes as at this point in time the only facilities seat up to 100 people. The needs of the Faculty are for an auditorium that can seat at least 250 people to host classes, guest lectures and international meetings. I know that the new building will begin a whole new phase in the Faculty's life, one which is exciting and will steer the Faculty into the future.

I hope that this glimpse at the Faculty of Biology as a faculty on the track of a meaningful important change has piqued your curiosity and I invite you to take a closer look. I am confident the Faculty staff will be happy to welcome you so you can see firsthand the great things taking place within its walls.



Research at the Technion

As a scientist myself who is actively involved in research I believe that any university is as good as the research conducted within its walls. I shall continue to promote research as well as place strong emphasis on the quality of research being conducted. Over the next few pages I shall outline what has transpired in this area in the past year.

Funded Research

The research contracts signed by the Research Authority in 2009 amounted to \$ 61.7 million. In the past four years the scope of these research contacts was as follows: \$40.6 million in 2005, \$44.5 million in 2006, \$50.6 million in 2007, and 64.4 million in 2008. This illustrates an increase of 52% over the last five years which is very impressive indeed.

We have vigorously continued our activities to encourage the submittal of research proposals to competitive scientific funds. In the last few years there is an increase in these submissions, grants and budgeting from the three main funds (Israel Science Foundation, Binational Science Foundation and German Israeli Foundation). From the ISF alone we received \$13.7 million in the past year.

Under the auspices of the European Union 7th Framework Program for R&D launched in January 2007 €31.4 million were approved by the end of 2009. This figure includes the sum of €11.2 million awarded to nine young researchers by the European Research Council. We have thus achieved our goal of doubling the research commitments from the European Framework Programs from €5 million per year to €10 million per year. It is worth mentioning that the amounts received in the first two years of the 7th Framework Program is equal to the total amount received from the whole 6th Framework Program.

The total amount of research grants received in 2009 from the Office of the Chief Scientist at the Ministry of Industry, Trade and Labor stand at NIS 35 million— an increase of 12 % over 2008. Since 2002, the research grants received have tripled despite cutbacks from the Office of the Chief Scientist due to improved competitiveness of Technion researchers.

In 2009 the total amount of orders from R&D activities funded from industrial/commercial/business sources in the framework of the Research Authority has reached \$4.18 million, a decrease of \$0.22 million as compared with 2008.

In addition to the above mentioned extramural funding, we have also received contributions from donors aimed at specific projects or individual researchers in the total amount of \$17 million. We also raised \$6.2 million from donors for the purpose of equipping laboratories of new faculty members, in 2008 this sum stood at \$8 million. In addition, we received \$4 million as part of the ongoing programs sponsored by the Ministry of Immigrant Absorption.

Over the past year we have also allocated \$1.5 million for activities to promote research on campus (this includes internal grants, bonuses for researchers submitting proposals to competitive funds etc). \$602,000 was allocated through Chairs and \$18 million were allocated to finance fellowships for graduate students engaged in research.

The total amount invested in research, including extramural funding, contributions from donors, internal funding and graduate fellowships stands at about \$105 million.

In 2009 we continued to promote interdisciplinary research on campus which allows for the collaboration of faculty members from different faculties and different disciplines. For example: The Technion Autonomous Systems Program (TASP) has continued to actively fund collaborating faculty members from various faculties. In 2009 the amount of \$229,000 was awarded as opposed to \$185,000 in 2008.

International and Industrial Collaboration

- **The Singapore Project:** In October 2009 the Singapore National Research Foundation (NRF) and Ministry of Education invested \$15 million in tissue engineering research through a joint project for the Technion and Singaporean researchers from two Singaporean universities (NTU and NUS).
- **Johnson & Johnson:** the Technion has signed an agreement for research collaboration on medical issues with Johnson & Johnson. In the framework of this agreement, promising medical Technion projects will be supported in the total amount of about \$50,000 per project. So far three such project grants have

been approved and we have sent out a campus-wide call for submissions of other projects.

- **The Umbrella Energy Program:** As I mentioned above, this symposium is held every year and this year was no exception. In the beginning of 2010 the Umbrella symposium was jointly held with Aachen University and the German Jülich Research Institute. This year's symposium dealt with the topic of simulation in Medicine, Science and Engineering and was held at the Jülich Research Institute. Prior to the symposium researchers submitted proposals for collaboration dealing with this topic and Technion researchers received \$20,000 for this purpose.
- **The International Institute of Biomedical Sciences and Technology (IIBMST):** This is an international collaborative program between three institutions: the Technion, Upstate Medical University in Syracuse NY and National Cheng Kung Univ. in Taiwan. The purpose of the program is to "break down" borders between nations for promoting basic and applied medical research.
- **Northeastern University Research Collaboration:** This is a collaboration for research purposes which was initiated this year. I hope that by next year I shall be able to update you on specific joint research projects within this framework.
- **Environmental Health Institute:** The Technion was awarded funding from the Foundation for Environmental Health in the amount of \$1 million for 5 years for the purpose of establishing a Center of Excellence:
"From Environmental Stressors through Risk Assessment to Health Outcomes".
This center is a joint one for researchers from various Technion faculties and it is run by the Faculty for Civil and Environmental Engineering and the Faculty of Medicine.
- **The Wolfson Foundation:** Within the framework of the Technion Energy Program, in 2009 the Foundation awarded a £330,000 to the alternative energy program.

Some Research Highlights of the Past Year

- Professor Michael Aviram of the Rappaport Faculty of Medicine and the Rambam Medical Center has been researching for many years the health

benefits of fruits and vegetables. In light of the fact that not only the level but also the quality of cholesterol in the blood determine the risk factor of heart and vascular disease (heart attack and strokes), researchers made an effort to find fruits and vegetables containing especially active antioxidants, which can improve the quality of cholesterol in the blood by delaying its oxidation. What he and his team found was that **Eating 100 grams of dates a day does not cause an increase in blood sugar and can even improve the quality of cholesterol in the blood.** These findings were published in the *Journal of Agriculture and Food Chemistry*.

- Professor Yair Ein Eli from the Faculty of Materials Engineering has been researching metal-air batteries for many years and has recently succeeded in developing a silicon-air battery capable of working non-stop for thousands of hours. This **kind of battery, with an almost unlimited shelf life, will be good for use in medicine (for example in pumps for diabetics or in hearing aids) and in electronics as a built-in part of a structure entirely from silicon.** The innovative battery can supply energy for thousands of working hours without need for replacement. The development was published in the leading scientific journal *Electrochemistry Communications*.
- Professor Yishayahu Talmon from the Faculty of Chemical Engineering and his team have proven for the first time the possibility of **dispersing carbon nanotubes in “super acid”.** This is a breakthrough that could lead to revolutionary developments in material sciences and nano electronics, and could be the first stage in spinning fibers from carbon nanotubes. This was reported in an article just published in the prestigious scientific journal *Nature Nanotechnology*.
- Professor Marcelle Machluf from the Faculty of Biotechnology and Food Engineering and her team have succeeded in **building a platform for encapsulating engineered stem cells.** These cells produce an anti-cancer drug that is secreted near the tumor. In animal experiments in the lab, the researchers succeeded, after two weeks of a single treatment, in reducing the tumor's volume by 87% and decreasing its weight by 83%. Until now, the approach to encapsulating cells that create anti-cancer drugs and implanting them near the cancerous tumor has not succeeded in meeting clinic

requirements. The cells triggered immune reactions in the body that prevented system operation. The development was published in the scientific journal *Federation of the American Society for Experimental Biology* and has aroused great interest. The Technion has registered a patent on this development.

- Dr. Erez Ribak from the Faculty of Physics and his team were able to solve a mystery which troubled scientists and medical doctors for more than a century, and found how the retinal structure aids in improving our vision acuity. In a scientific paper to be published in the journal *Physical Review Letters* they describe an optical model of the retina which they constructed in the computer and through which they passed light. Through this model they found why the eye was constructed by nature the way it is and why it made sense even though it baffled scientists for years.

The Technion Research & Development Foundation (TRDF)

The expected profit of the TRDF for 2009 is approximately NIS 2 million (after the allocations due to actuarial maintenance of pension payments). The TRDF financial results are affected by approximately NIS 27 million in pension payments to 375 retired TRDF employees.

The results of the financial activities of the TRDF without the pension component, for which the TRDF has no control over or funding, show a surplus of income over expenses. The improved financial results stems mainly from the increased research activity on the one hand and a significant increase in the TRDF's share of income from intellectual property.

There are five types of activities which come under the umbrella of the TRDF:

- *The Research Authority* which handles the Technion sponsored research and has been reviewed in the previous section.
- *The Liaison Office* which handles the research ties with the European Union, industry, universities abroad and the Ministry of Industry and has been reviewed in the previous section.
- *The Technion Technology Transfer Office* which deals with the commercialization of Intellectual Property and patents which are developed at the Technion.
- *The Israel Institute of Metals*
- *The Unit for External Studies and Continuing Education*

The Israel Institute of Metals

The Institute has several activities such as the corrosion laboratories, metallurgy, foundry technology, vehicle testing laboratory, and steel testing. About 40%-50% of the Institute's income is derived from funded research from industry, the government and the European Union. The remainder 50%-60% of the income comes from testing for industry. In 2009, the Institute's turnover stood at NIS 16.7 million and the operational profit stood at NIS 2.3 million.

The Unit for Business Development and Commercialization of Intellectual Property

The year 2009 was influenced by the global economic crisis which manifested as hesitant investor behavior; especially in high risk early stage investments. Despite this, the commercialization activity did not slow down, including the establishment of new companies and signing of license agreements. This year the unit went through an organizational change which included the transfer of the Patent portfolio from an outside firm (where it was for 10 years) to the unit itself.

The activities of the unit during the past year took place on several levels:

1. **Patent Applications:** In the past year over 100 invention disclosure papers were submitted to the unit by Technion researchers. Out of these 90 inventions were registered to become patents. This number shows stability as opposed to the years 2006-2008 and double what it was between the years 2004-2005. The increase in patent submission from faculty members shows a continued trend of more openness towards commercialization of intellectual property and the acknowledgement of the important work done by the unit. This year, as was the case before, we see a large share of applications in the field of IT as well as more interdisciplinary proposals. This year an effort was made to increase the volume of commercialization and this has paid off as you will see in the following lines.
2. **Establishment of New Companies:** In 2009 the TRDF was directly involved in initiating and establishing 7 new companies (as opposed to 6 in 2008) in various fields including medical instrumentation, three dimensional ID, desalination membranes, optics and more. Unfortunately, as was the case last year, we were unable to commercialize a project from the Technion incubator.
3. **Licensing Agreements:** In 2009, 8 such agreements were signed for the purpose of commercializing technologies developed by Technion researchers. In addition, 11 "Magnetron" agreements were signed with leading firms such as Elbit, RAFAEL and GE.
4. **Entrepreneurial Agreements:** In 2009 agreements were signed with entrepreneurs to realize 4 technologies developed by Technion researchers. 2 out of the 7 companies established this year were established with the leadership of these entrepreneurs who we signed these agreements with.

5. **Collaboration with the *Alfred Mann Institute at the Technion (AMIT)*:** In 2009 the commercialization activity in conjunction with AMIT continued. In this joint effort, several projects were reviewed for commercialization and one of the projects led to the establishment of a company called CardiAmit Ltd. This company raised funds from several sources including the Chief Scientist's Office. AMIT continues to try to identify projects which could be commercialized as well trying to commercialize existing projects.
6. **Income from Commercialization** – In the past year the TRDF income from commercialization stood at \$9.9 million (including the researchers share). As was the case last year, most all of the income this year came from the sales of *Azilect (Rasagaline)* – \$ 9.5 million. The overall volume of sales for the drug stood at \$240 million this year.
7. **Investment in Projects** – The TRDF vigorously continued to improve the intellectual property developed at the Technion through direct financial investment in promising projects. The investment is done through several designated donor funds such as the Mitchell Fund and the Gurwin Fund. In 2009, the unit invested a total of \$300,000 in promising Technion projects. Regrettably, in 2009 we felt the absence of the Yeshaya Horowitz Association which supported this activity as it was completely wiped out following the Madoff Fraud. This is significant because over \$1 million was annually received from this source for the purpose of investing in promising projects. The loss of this source of funds has significantly damaged the unit's ability to support and promote projects for the purpose of commercializing them and we are working hard to find alternated funding sources.

Physical Development

In the past year, we have continued to pursue new construction projects as well as maintain and upgrade existing buildings. A great deal of emphasis has been placed on the building safety. A campus-wide effort has been made to promote energy saving. The program encompasses Faculties of Electrical Engineering, Physics, Computer Sciences, Civil and Environmental Engineering, Biology and Medicine and the Department of Education in Technology and Science. Electric meters have been installed in all Technion units, including 550 dormitory apartments.

Measures have been taken in all new construction projects to ensure that buildings be as “green” as possible to ensure maximal energy efficiency and savings in water consumption. All new buildings are planned to ensure easy maintenance and follow the motto that Safety Comes First. In addition, they are fitted with computerized monitoring systems that will save on maintenance costs and efficiently control all systems. We are continuing to make the campus as accessible as possible for individuals with disabilities.

The “Green Campus” project is continuing, with emphasis on preserving the beautiful Carmel flora found on campus, conserving water and energy, and enhancing campus cleanliness.

Below is an overview of the main development projects recently completed, those under construction and those in advanced planning stage.

Projects Completed in 2009

- *Shalom Stanley Zielony Student Union Building* – addition new wing and complete renovation covering a total of 8,000 m²
- *Louis & Bessie Stein Biotechnology Complex* – new wings of laboratories and offices, covering a total area of 2,900 m²
- Life Sciences Experimental Research Facility, covering an area of 1,500 m²
- *Ullmann Student Center* – Undergraduate Studies, renovation of the Dean’s offices, tuition offices and information center.
- Adapting campus buildings for the disabled Teaching floors at the Rappaport Faculty of Medicine

- Faculty of Civil and Environmental Engineering – renovation of microbiologic laboratory in the Sherman Environmental Engineering Center
- Technion Energy Program – renovation of a laboratory at Gutwirth Park
- Faculty of Mechanical Engineering – renovation of research laboratories
- Schulich Faculty of Chemistry – Goldberg Family Garden
- Rifkin Dormitories Village for Undergraduate Students – renovation of 2 buildings.

Projects under Construction

- *Shalom Stanley Zielony Graduate Student Village* – major construction project with 216 apartments involving an estimated investment of \$35 million
- Schulich Faculty of Chemistry – renovation of laboratories, offices and public areas
- Schulich Faculty of Chemistry – renovation of Teaching Wing.
- Schulich Faculty of Chemistry – renovation of Student Club
- Emerson Family Life Sciences Building – covering a total of 10,500 m² including parking spaces
- Sohnis Garden – at entrance to the Emerson Family Life Sciences Building
- Wolfson Faculty for Chemical Engineering –renovation of Nanotechnology laboratories
- Faculty of Mechanical Engineering – new D. Dan Kahn new wing
- Faculty of Mechanical Engineering – Renovation of 2 Research labs
- Biotechnology & Food Faculty – Renovation of infrastructures.
- Biotechnology & Food Faculty – Renovation of Fermentation lab.
- Sport Center – 2 Swimming Pools for Infants & Children.
- Canadian Dorms – Renovation of 944 Entrances.

Projects in the Planning Stage

- Undergraduate Zielony Village –
 - (650 beds)
 - Guest Apartments (5 + 1 Presidential)
- Chemistry – Laboratory Renovation for new Researcher.
- Faculty of Aerospace Engineering - Satellite Center

- Canadian Dorms – Renovation of Entrance 945
- Rappaport Faculty of Medicine – Renovation of Surgical Experimental Plant.
- Rappaport Faculty of Medicine - Increasing of Classrooms to accommodate more students.
- Churchill – Partial Renovation.
- Real Estate Upgrading from Special management Budget – Various safety and Adapting for the Disabled Projects.



Public Affairs and Resource Development

PARD has always had an important role at the Technion and it will continue to be an important tool in promoting the Technion both in Israel and abroad. PARD has always been instrumental in making sure the Technion keeps its friends and supporters updated about what goes on at the Technion and what the needs of the Technion are. As I have mentioned before, I was the Vice President for Resource Development and External Relations for 7 years prior to becoming President and I know firsthand the important things done here.

In the last year a number of changes have taken place within PARD. After four years of service we said farewell in October to Mr. Shimon Arbel the Director of PARD. I wish Shimon all the best and much success in his new role. Mrs. Irit Chiel who was the Scholarships and Fellowships Coordinator retired after 13 years and this provided PARD with the opportunity to do some internal restructuring: The Donor Relations and Recognition Section was divided into two separate sections – Donor Recognition and Ceremonies Section and Donor Relations and Reporting. We were also able to reconsider the administrative and governance tasks related to the Board of Governors. Maurice Ross was appointed as Executive Secretary to the Board alongside his role as Coordinator of Special Donor Relations. After serious consideration a decision was also made to coordinate all activities related to Technion Alumni within the Technion Alumni Association and it is no longer directly part of PARD. Further reference is made to the Alumni work of the Technion below.

Whilst we continue to face a challenging world economic climate with the dollar and other currencies continuing to be weak against the Israeli shekel we have issued seventy proposals for new fundraising project. In addition forty-five projects have been adopted.

We are in the process of reviewing the work of the Societies in cooperation with them. Overall it has been a positive period characterized by the consolidation of aims and objectives where necessary. A lot of work has been undertaken by societies in the realm of Leadership Development.

The American Technion Society's fundraising is nearing the end of their ambitious \$1 billion "Shaping Israel's Future" campaign, launched in October 2006. As of February 15 of this year, the amount raised totaled \$985 million, realizing 98% of

their goal. Their 21st Century Leadership Development Program has graduated 56 future leaders who have taken positions ranging from chapter presidents to national president. The fourth class of the Program group concludes their series of training and educational sessions with the ATS Mission to Israel in June. In addition, several chapters have successful local leadership development programs.

The Technion Society of Australia (NSW Division) has focused on restructuring its Board and to this end has recruited several new, younger businessmen and professionals. This process is continuing. A structured leadership development program will be developed in due course and meanwhile members are trained on the job and encouraged to visit the Technion. The Society has passed on to the Technion some bequests for use in extra library funding and has almost achieved tax deductibility for donations supporting joint research between Technion and Australian academic institutions and universities - a major milestone that they have been working on for some years now.

The British Technion Society has formed a committee to lead it into the future with Daniel Peltz as the Chairman. He is supported by a group of influential members of the British Jewish community. Furthermore, Professor Sir Michael Berry and Lord Turnberg have joined the British Technion Society in the capacity of scientific advisors. In November 2009, the British Technion Society organized the Eighth Ron Arad Lecture and Dinner. Two hundred people attended and over £100,000 was raised for the development of Technion satellite systems.

The Canadian Technion Society has received a single donation of \$100,000 exclusively for Leadership Development purposes. They are currently formulating a framework for the use of the funds subject to donor approval. They are also taking steps to establish a series of student exchange programs and cooperation agreements between Canadian universities and the Technion. The Canadian Technion Society has also seen the recovery of their endowment capital by 14% (from Canadian\$15.2 million to Canadian\$17.3 million). They also held a successful Gala Dinner in Montreal last November.

The French Technion Society continues to increase its relationships with the French Government, industry and scientific institutions ensuring its future development and potential. A major Gala Evening was held during the year celebrating the 85th anniversary of the Technion attended by 800 guests.

The German Technion Society nominated a new vice chairman. He is a member of the “new generation” and well connected with the ability to represent the Society in scientific, industrial and political circles. The Society also held its Science Prize Ceremony and Dinner for the fifth time in the historic Leibniz-House in Hanover.

The Greek Technion Society has a new Chairman, Danny Benardout. Danny, together with the Vice-President of the Greek Society Matilda Beraha, are Technion Alumni. They have a vision for development which bodes well for the future.

The Israel Technion Society has focused its work on supporting projects which narrow the educational gaps in Israeli education. They supported programs for youth to achieve academic advancement in the peripheral areas of the country. The Society also held a series of lectures promoting the Technion to those seeking university admission. The Israel Technion Society, under the very capable and dedicated leadership of Gen. (in res.) Amos Horev has been a rock the Technion can truly depend upon and count on in difficult times. I am grateful for their support and their continued activities on our behalf. It is impossible to finish this segment without mentioning and thanking Drora Avisar, who for many years managed the Israel Technion Society with great success and has retired this year.

The Italian Technion Society has successfully obtained the sponsorship of the Fondazione Roma (one of Italy’s powerful foundation within the banking world); the Aniene, one of the best established Athletic clubs in Rome; and the Italian Paralympic Committee to promote a special Technion event. The Society also staged a very successful Israeli University Day. The Society continues to cultivate links with Italian universities for student and faculty cooperation as well as joint efforts for the development of high tech start-ups.

Two new members joined the board of the **Technion Society of the Netherlands**: Pim van den Dam (KPMG) and Uri Rosenthal (VVD – the Dutch Liberal Party). The Society has established a Committee of Recommendation and is planning to expand its number of supporters in the year 2010. The Society is concentrating on several important projects which involve cooperation between leading Dutch Universities and companies and the Technion. Two visits to the Technion are already being organized.

In **Switzerland** there have been two additions to the Board of the Society: Sandy Shapira and Marc Richter. This society is also seeking to appoint a professional manager.

We are always looking for new ways to promote the Technion and during the year we launched the Technion's new YouTube channel. This is proving to be a very popular and effective public relations tool. As of February 2010 there have been well over 25,000 channel views and over 42,000 views of individual films and over 300 subscribers. The channel (<http://www.youtube.com/Technion>) is significantly placed in the YouTube EDU category together with the major US universities.

PARD more traditional support services continued as follows:

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| General Donor Reports | over 200 issued to numerous donors; |
| Scholarships and Fellowships | 1400 funds administered covering thousands of students; |
| Dedication and Other Ceremonies | 60 arranged for both internal and external purposes; |
| Plaque Installation | 120 including renovations; |
| Press Releases and Publications | 400 publication inclusions were generated in the printed and electronic press. There were three editions of the Focus Magazine distributed to over 400 donors and in addition the Technion Magazine is distributed in Hebrew to more than 50,000 Technion Alumni in Israel. |

The Vice President for External Relations and Resource Development, Professor Raphael Rom, continued his visits to Societies. Since the last Board Meeting he has been to Canada, the Netherlands and Switzerland and has visited the US three times. These meetings nurture the relationship between the Technion and its donors and between PARAD and the societies.

We have also intensified the Technion's presence worldwide by the increased number of visiting professors to world societies for lectures and presentations to supporters. The number of faculty members who went on speaker tours in the period June to December, 2009 was nine and this does not include those faculty members who are on sabbatical visits abroad who also participate in speaking events.

Of equal importance in promoting the Technion is the number of visitors from abroad and Israel who are given due care and attention by the Coler Visitors' Center. Altogether there have been just fewer than 4,800 visitors since the last Board Meeting and it is expected that this number will double by the time the next Board Meeting is held in June.

The work of establishing a joint Volunteer and Professional Task Force to support Societies exchanging information and ideas that may assist in public relations and fundraising will be given priority during the forthcoming year with the arrival of a new Director of PARD. It is anticipated that the Task Force will be established in time for the Board Meeting in 2011. The cooperation of the Societies will be sought in support of this venture as will their promotion of an International Mission of interested potential contributors for the work of the Technion. This work will be built on the existing foundations of visits by 29 Society Professional Staff and six Society Missions since the last Board Meeting.

As mentioned above, a decision has been made to coordinate all activities related to Technion Alumni within the Technion Alumni Association under the Directorship of Pnina Ziv. There will continue to be full cooperation between the Association and PARD with the full support of the Technion.

The Association has been extremely active in the last year enhancing their growth and developing a new concept to ensure their contact with upward of 80,000 alumni throughout the world.

The Alumni association also launched the "100 Club" which is a group of top managers representing the entire spectrum of the Israeli High-Tech Industry all of whom are Technion alumni. The association was also instrumental in bringing together approximately 1000 alumni for a major event celebrating 50 years of the Faculty of Aerospace Engineering.