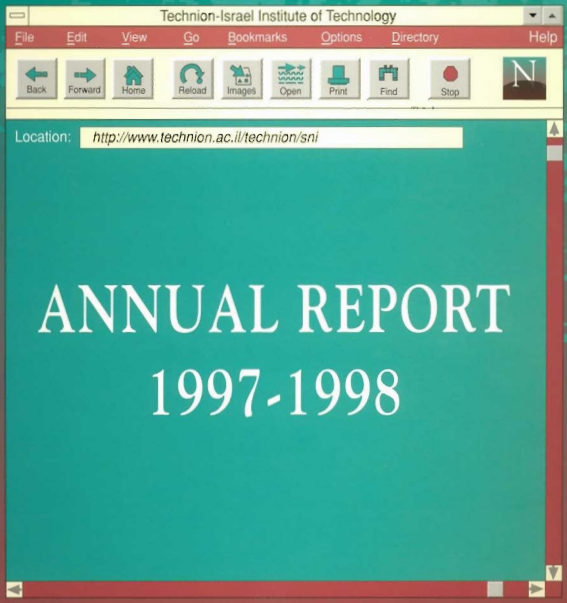
The Samuel Neaman Institute
for advanced studies in science and technology

1978-98
20 Years of
Achievements
page 8



ANNUAL REPORT
1997-1998

Technion-Israel Institute of Technology

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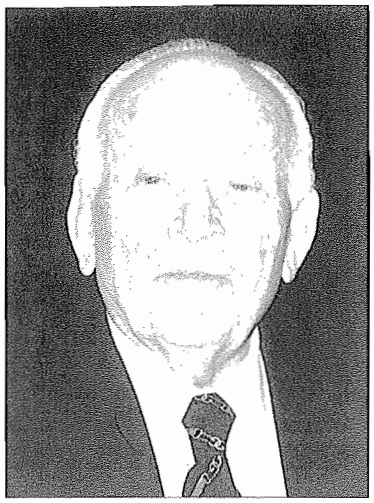
TECHNION – ISRAEL INSTITUTE OF TECHNOLOGY

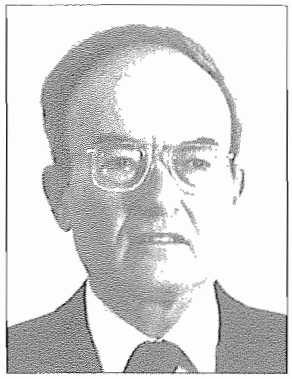
THE S. NEAMAN INSTITUTE

FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY

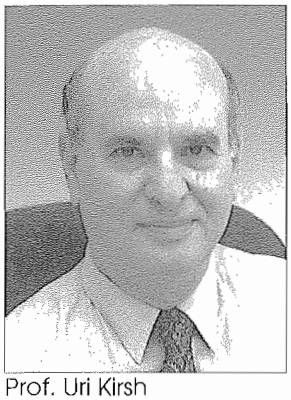
Prof. Zehev Tadmor
Vice-Chairman



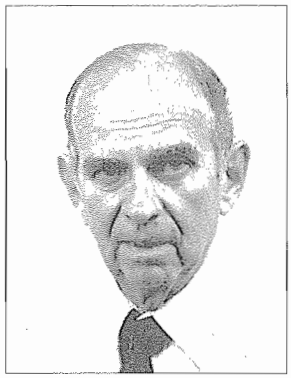
Samuel Neaman
Founder and Chairman



Prof. Arnan Seginer
Director

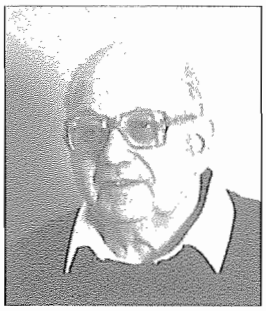


Prof. Uri Kirsh



Prof. Alex Keynan

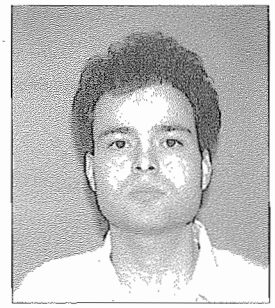
Prof. Arnon Bentur



Ing. David Kohn

Ruth Rivkind, B.A.

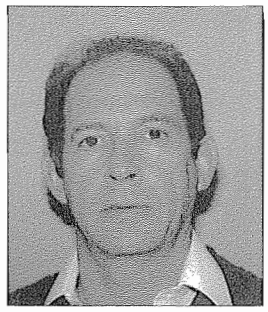
Sima Nadler



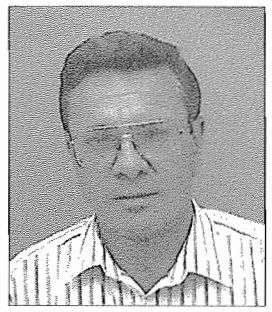
Miron Rozenkranz

Dr. Amnon Frenkel

Dr. Daphne Getz



Joseph Linhart



Dr. Abraham Rotem

THE SAMUEL NEAMAN INSTITUTE FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY

About the Institute

The Samuel Neaman Institute for Advanced Studies in Science and Technology is an independent public-policy research institute, established in 1978 to assist in the search for solutions to national problems in science and technology, education, economy and industry, and social development.
As an interdisciplinary think-tank, the Institute draws on the faculty and staff of Technion, on scientists from other institutions in Israel, and on specialists abroad. The Institute serves as a bridge between academia and decision makers in government, public institutions, or industry, through research, workshops and publications.

The Institute pursues a policy of inquiry and analysis designed to identify significant public policy problems, to determine possible courses of action to deal with the problems, and to evaluate the consequences of the identified courses of action.

As an independent not-for-profit research organization, the Institute does not advocate any specific policy or embrace any particular social philosophy. As befits a democratic society, the choices among policy alternatives are the prerogative and responsibility of the elected representatives of the citizenry. The Samuel Neaman Institute endeavors to contribute to a climate of informed choice.

The Institute undertakes sponsored research, organises invitational workshops and implements continuing education activities on topics of significance for the development of the State of Israel, and maintains a publication program for the dissemination of research and workshop findings. Specific topics for research may be initiated by the Institute, researchers, government agencies, foundations, industry or other concerned institutions. Each research program undertaken by the Institute is designed to be a significant scholarly study worthy of publication and public attention.

ORIGINS

The initiative for establishing this Institute in Israel was undertaken by Mr. Samuel Neaman. He nurtured the concept to fruition with an agreement signed in 1975 between himself, the Noon Foundation, the American Society for Technion, and Technion. It was ratified in 1978 by the Senate of the Technion. Mr. Neaman, a prominent U.S. businessman noted for his insightful managerial concepts and innovative thinking, as well as for his success in bringing struggling enterprises to positions of fiscal and marketing strength, has since retirement devoted his time to the activities of the Institute.

ORGANIZATION

The Director of the Neaman Institute, appointed jointly by the President of the Technion and by the Chairman of the Institute Board, is responsible for formulating and coordinating policies, recommending projects and appointing staff. The Institute Board is chaired by Mr. Samuel Neaman and includes ex-officio Technion's Senior Vice-President and Vice-President for Research. The Board is responsible for general supervision of the Institute, including overall policy, approval of research programs and overseeing financial affairs. An Advisory Council made up of members of the Technion Senate and distinguished public representatives, reviews research proposals and consults on program development.

FUNDING

The Institute's activities are partly financed by the income from the Samuel Neaman Research Fund, located at the American Society for the Technion. This ensures freedom and independence. At the same time, contract research is undertaken for government, public and private organizations, provided it is in accordance with Institute goals and objectives.

Director's report

1997 was an active year for the Institute. The academic research programs that were managed by SNI in the framework of the MAGNET Program of the Chief Scientist's Office at the Ministry of Industry and Trade, increased in scope and funding. As previously reported, SNI managed the academic research programs in six of the fifteen industry-academia consortia for the development of advanced generic pre-competitive technologies. These were:

1. ground stations for satellite communications;
2. digital communication;
3. quarter-micron technologies;
4. multimedia on-line services technologies;
5. diode lasers and diode-pumped laser technologies;
6. magnesium technologies.

These research programs were conducted for SNI by 61 researchers from the Technion, the Hebrew University, the Weizmann Institute for Science, the Tel-Aviv University and the Ben-Gurion University in the Negev.

In the area of public health, SNI continued to collaborate with the Epidemiology and Public Health Department of the Carmel Medical Center (a joint Technion-Kupat Holim hospital). Two programs that continued from previous years: Early detection of breast cancer; and Acute myocardial infarction register; were supported by the Ministry of Health and the Israel Cancer Research Fund. In 1997 we have finally commenced with the intense scrutiny of the immigrant population from the Chernobyl area. This is a one million dollar project sponsored by the US Agency for International Development (USAID) that is based on a previous SNI program that was supported by local funds. In 1997 SNI has also started the national data base on the effects of electromagnetic radiation on human health.

In the area of economics and industry, SNI continued its two joint Israeli-German projects, funded by the German-Israeli Foundation for Scientific Research and Development (G.I.F.) on the spatial diffusion of industrial innovation and regional development; and on technometric

benchmarking. Several surveys were conducted in this area. One was commissioned by the Ministry of Industry and Trade and by the Israel Manufacturers Association on the demand for electronic engineers and computer sciences graduates in Israel's industry, and two others were sponsored by Technion's President on the role of Technion graduates in the Israeli economy, and on the contribution of science in Israel to its defense and civilian industries.

Two new programs on the environment were started in 1997. One on the national priorities in environmental issues sponsored by the Israeli Economic Forum for the Environment. The second, on ways and means to reduce the emission of grass-house gases by industry, agriculture and transportation, commissioned by the Ministry of the Environment.

Outstanding among SNI's workshops and seminars this year were:

1. Symposium on Technology and Zionism, conducted jointly with the Zionist Congress;
2. The International Workshop on Satellite Communications, conducted for the UN Office of Outer Space Affairs and sponsored by the Ministries of Foreign Affairs, Communications and Science;
3. The Workshop on Negotiation on Water in Conflict Areas, conducted for UNESCO by SNI's Israel Center for Negotiation and Conflict Management (ICN).

ICN turned out to be a great success. It developed into a national focus for the promotion of alternate dispute resolution (ADR) methods. ICN conducted nine workshops on negotiation and mediation for judges from all the courts, as well as for various professional groups, and four courses to train mediators from government offices, and public bodies and from the general public.

We expect that 1998 will be even more fruitful.

Prof. Arnan Seginer, Director

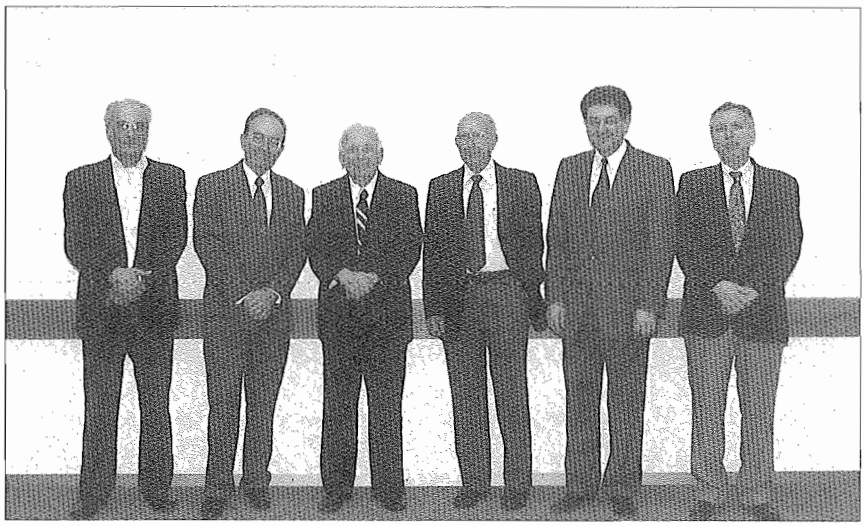
1978 - 1998: 20 Years of Achievements

The S. Neaman Institute opened its doors in 1978. Since then the Institute has been involved in 134 major projects, which have resulted in 320 publications in Hebrew and English, and in 77 national and international workshops and seminars.

As an interdisciplinary thinktank, the Samuel Neaman Institute serves as a bridge between academia and national decision-makers, through research, workshops and publications. The Institute draws on the faculty and staff of Technion, as well as on other Israeli and international scientists.

Three hundred thirty five researchers, including professors from Technion and from other universities in Israel and abroad, participated actively in SNI research projects.

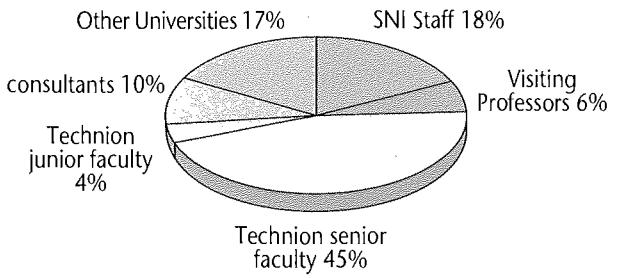
The Institute's directors during the past twenty years were: Professor Jacob Bear (1978-1981), Professor Gad Hetsroni, (1981-1986), Professor Zehev Tadmor (1987-1990), Professor Daniel Weihs (1990-1995), and Professor Arnan Seginer since 1996.



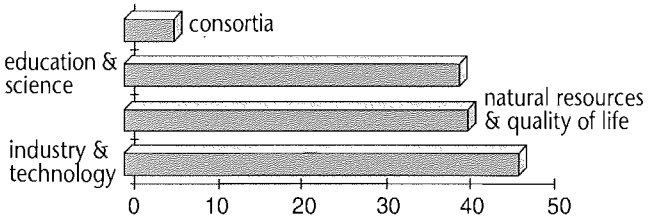
(L to R) G. Hertsroni, A. Seginer, Sam Neaman, J. Bear, Z. Tadmor, D. Weihs

RESEARCH STAFF (%)

TOTAL: 335

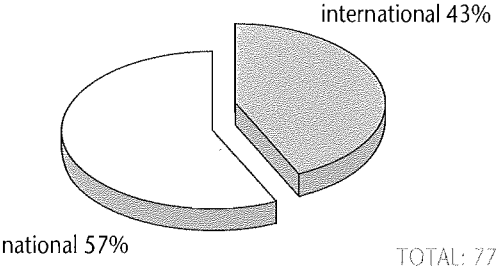


PROJECTS



TOTAL: 134

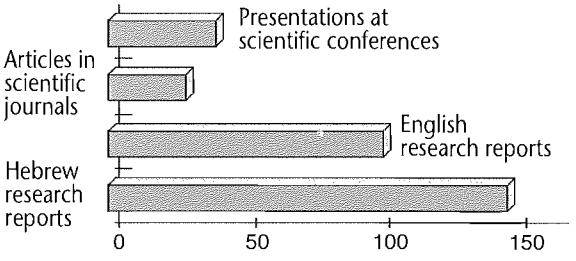
WORKSHOPS AND SEMINARS (%)



TOTAL: 77

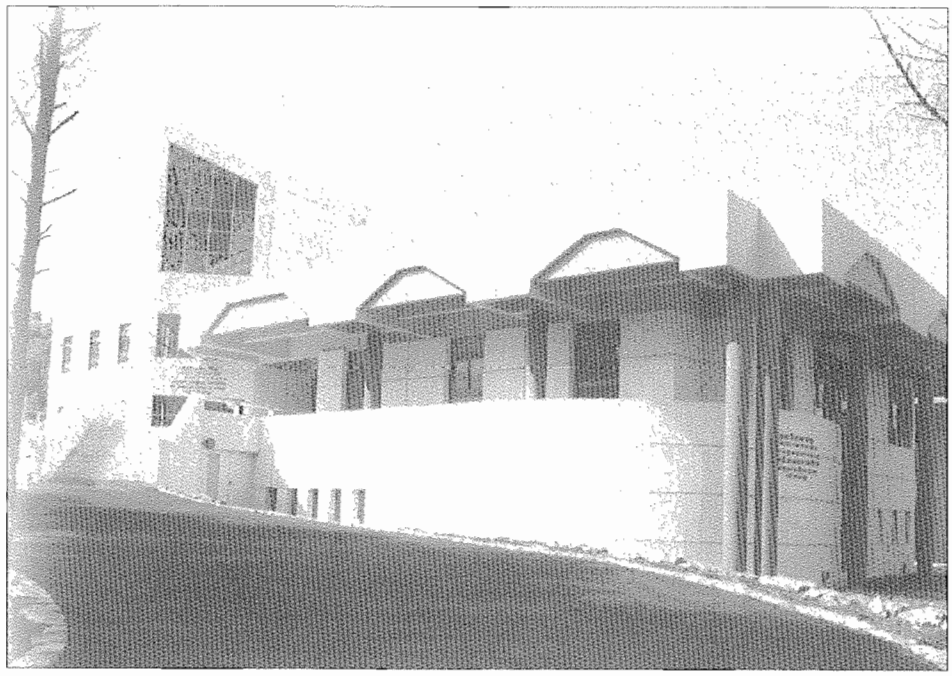
PUBLICATIONS

TOTAL: 317



The permanent home for the S. Neaman Institute was finished at the end of 1995 and the Institute moved into its centrally-located beautiful building in January 1996. The event was celebrated in a special ceremony attended by Mr. and Mrs. Samuel Neaman, their friends, Technion Board members and faculty and Institute researchers and staff. The ceremony was followed by a panel discussion on the "Contribution of Technology to the Future of Israel".

The new Institute building covers 1,600 square meters of offices for researchers, seminar rooms, library, auditorium and an administration wing. With the new building, the Institute is finally able to extend its activities that were previously limited by lack of space for research associates, and houses most of its activities under one roof.



INDUSTRY-ACADEMY CONSORTIA

The emphasis in the Institute's research activity in the past five years was on the Industry-Academy joint R&D Consortia. These associations operate within the framework of a special program called "Magnet" (the Hebrew acronym for "Generic Pre-Competitive Technologies R&D) supported and managed by the Chief Scientist's Office in the Ministry of Industry and Trade. Each consortium comprises several industries, plus at least one research institute, that conduct together generic percompetitive R&D in specific areas.

SNI's participates as a full member in six consortia:

1. Ground stations for satellite communications - develops the technologies required for low-earth orbit satellite communication terminals.

2. Digital communication - develops generic technologies for personal and cellular PCS/PCN communication.

3. Quarter micron technologies - develops vacuum technologies, inspection systems and software systems, essential for the manufacturing and control processes for sub-sub-micron integrated circuits ("chips").

4. Multimedia on-line services technologies - involved in the development of hardware and software necessary for the production and editing of multimedia material, its compression and coding and its transmission and routing for on-line customer service.

5. Laser diodes and diode-pumped lasers - develops generic technologies and processes to produce high-power laser diodes in a variety of wavelengths.

6. Development of magnesium technology - develops the utilization of metallic magnesium produced by the Dead Sea Works in the manufacture of preferably finished products.

Subjects studied over the past 20 years:

TECHNOLOGICAL AND INDUSTRIAL POLICY

SNI is playing an increasingly active role in shaping national policies aimed at strengthening Israel's economy, mainly in R&D intensive industries. Studies include:

Policy studies in specific industrial sectors - including plastics and polymers, space, electronics and chemical industry.

Measurement of R&D quality and productivity - studies and classifies the characteristics of quality in R&D.

Performance parameters for Israeli industry presents a method of calculating an inflation-adjusted rate of return on industrial investment and its implementation in leading chemical, electrical, pharmaceutical, textile and aerospace industries in Israel.

Technometric analysis of industrial products - is aimed at providing a quantitative measure of the technological quality of a product, process or branch of industry.

NATURAL RESOURCES/QUALITY OF LIFE

Closely linked with Israeli technology and industry is the supply of natural resources - in particular energy and water. SNI carries out quality of life studies on the effects of technological and social change on Israeli society. Major areas of study include:

Water policy for Israel - a methodology was developed for the analysis of water policy alternatives for Israel.

Alternative energy policy for Israel - a policy study was conducted for allocating natural resources and a quantitative evaluation of pricing policies for liquid fuels, coal and electricity.

Evaluation of Project Renewal in Israel - examined the National Project Renewal program which has been implemented by the Israeli government and the Jewish Agency.

Community Oriented Practice of Family Medicine focused on the introduction of advanced community health programs into selected Kupat Holim clinics.

Israel's Law Enforcement system in the 21st century - evaluates the objectives of the law enforcement system, police force and the judiciary system and the tools required to achieve those objectives.

Evaluation of alternative policies for municipal solid waste recycling studies regulations and economic aspects.

Application of fly ash for the construction of offshore islands - examines the feasibility of utilizing the ash produced in coal-fired electric power stations and other industrial wastes of rocklike composition to form offshore islands.

RESEARCH PROGRAMS IN EPIDEMIOLOGY

As part of this program, the Institute, with partial support of the Ministry of Health, is conducting several research programs in epidemiology, jointly with the Epidemiology and Public Health Department (a joint Technion-Kupat Holim department) at the Carmel Medical Center. The programs are:

Chernobyl-related health problems - Illnesses and mortality rate since 1986 are studied among 12,000 immigrants who come from this radiation contaminated region. The US Congress has approved a $5M grant to extend this program in Israel and into the Ukraine and Bielorus. SNI conducts the Israeli part of the program (a $1M program).

A national program for early diagnosis of breast cancer. Some 500,000 women were screened.

Central registration of severe infarcts. Every suspected infarct case in the three general hospitals in Haifa is registered.

EDUCATION

Throughout most of this century, engineering education has been undergoing a continuous transformation. SNI performed several major studies on educational policy formulation and the improvement of teaching. Major areas of study include:

Education 2001 . A committee of Technion professors was jointly appointed by the Technion and the S. Neaman Institute to take a fresh critical look at present engineering education and recommend changes to better meet future needs. The recommendations of the report were discussed at an

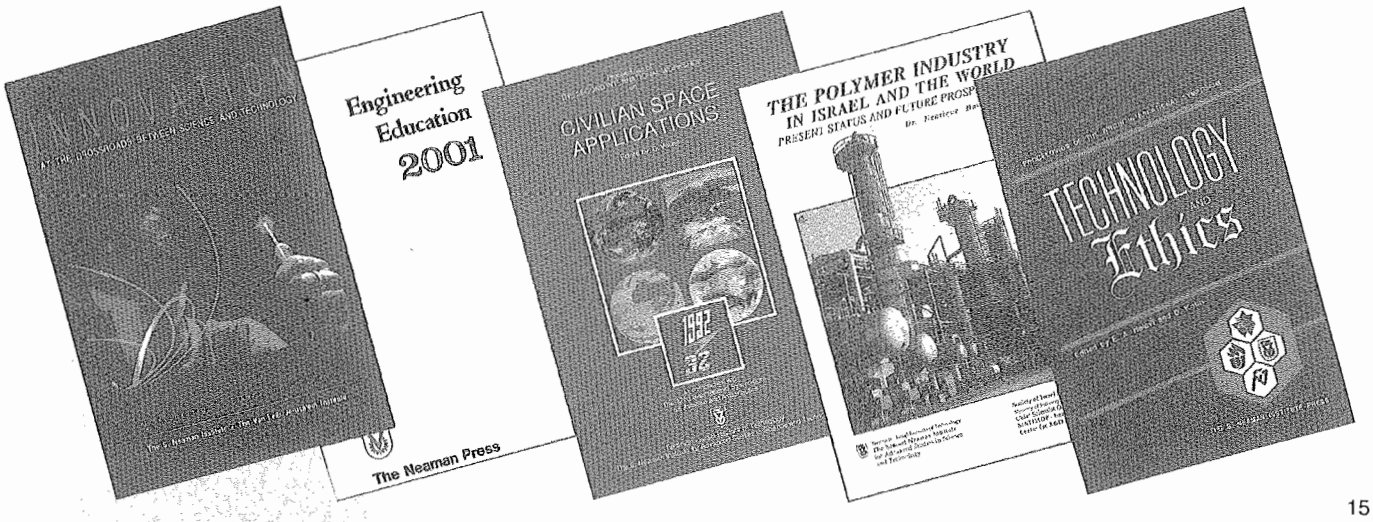
international workshop. Follow-up studies on teaching of design, mathematics and computers were conducted.

Computerized model for continuous curriculum updating. The model updates curricula after constructing an occupational profile for a technological profession.

Teaching of science and mathematics by video. The aim of this project is to improve the quality of science teaching in high-schools and universities. This innovative project initiated by SNI has been successfully implemented in more than one hundred schools in Israel.

Retrospective Follow-Up of Gifted Children. This study examines the academic, military and professional achievements of 400 gifted children who attended enrichment courses at the Technion.

Hebrew for Science and Technology. This project produced textbooks, written specially for Technion students and new immigrants whose professions are related to science, engineering and technology.



SCIENCE POLICY

The foundation for constructing new policies in science and technology is the evaluation of Israel's scientific performance, past and present. Studies were conducted in the following main topics:

Trends in Science and Technology in the Middle East. This study included four main areas:

1. Higher education,
2. Scientific output and productivity
3. Energy and national infrastructure
4. Technology intensive industries.

Science indicators. Utilizing a variety of statistical and computerized data processing tools, this project attempted to quantify the scale of operation and quality of Israeli scientific research based on publications and citation analysis.

Productivity and impact of Israeli science. A study on the extent of cooperation between Israeli researchers and scientists abroad.

Trends in R&D Manpower Planning in OECD countries. This study reviewed the techniques which OECD member countries are employing to predict the future supply and demand of research manpower.

ISRAEL CENTER FOR NEGOTIATION AND CONFLICT MANAGEMENT

The Israel Center for Negotiation and Conflict Management (ICN) is devoted to academic and professional research, training, consulting and facilitation in the fields of negotiation and conflict resolution. ICN was established in June 1996, at the Neaman Institute. Its mission is to provide and improve the skills of negotiation, mediation, dispute resolution and cooperative decision making in the public and private sectors. ICN activities include research and training seminars to support professionals in politics, business and labor, and those involved in dispute resolution of any kind, ethnic, cultural, religious, environmental and personal.

The Samuel Neaman Institute has played an active role in the development of several programs for the absorption of new immigrants from the former Soviet Union at Technion.

SNI policy studies have been used by decision makers in numerous government offices, including Industry and Trade, Energy and Infrastructure, Education, Economy and Planning, Science and Technology and Public Security in addition to sectors of the Israeli Manufacturers Association.

Many of the studies were carried out jointly by organizations and individual researchers from various countries including the United States, Great Britain, Germany, France, Sweden, the Netherlands, Hungary and others.

List of ongoing SNI projects

1. UNIVERSITY-INDUSTRY GENERIC RESEARCH CONSORTIA
   - 19 - Ground Stations for Satellite Communication Consortium
   - 20 - Digital Communication Consortium
   - 21 - Quarter Micron Technology Consortium
   - 22 - Multimedia On-Line Services Technology Consortium
   - 25 - Development of Diode Lasers and Diode-Pumped Lasers Consortium
   - 26 - Development of Magnesium Technology Consortium

2. RESEARCH PROJECTS
   - 27 - The Demand for Electronics Engineers and Computer Science Graduates by the Israeli Industry
   - 28 - Spatial Diffusion of Industrial Innovation and Regional Development
   - 29 - Technometric Benchmarking
   - 30 - Law Enforcement Systems in the 21st Century
   - 31 - Follow-Up of the Immigrant Population from the Chernobyl Area
   - 32 - Early Detection of Breast Cancer
   - 33 - Acute Myocardial Infarction Register
   - 34 - Project Renewal in Israel (1979-1994)
   - 35 - Technion Graduates Role in the Israeli Economy
   - 36 - The UN Workshop on Space Communications Technology
   - 37 - Symposium on Technology and Zionism
   - 38 - Funding of Civilian R&D in Israel
   - 39 - The Contribution of Science to Israel's Defense and Industry
   - 40 - National Environmental Prorities
   - 41 - Reduction of greenhouse gas emission - A National Policy Paper
   - 42 - Israel Center for Negotiation and Conflict Management (ICN)

Ground-stations for satellite communication consortium

RESEARCHERS:

Prof. I. Bar-David

Prof. Y. Birk

Dr. R. Cohen

Prof. M. Feder

Prof. Y. Leviatan

Prof. D. Malah

A/Prof. N. Merhav

Dr. A. Orda

Dr. E. Plotnik

Prof. A. Segall

Prof. S. Shamai

Dr. R. Shavit

Prof. M. Sidi

Distinguished Prof. Y. Ziv

Communication via satellites has grown rapidly in recent years, as technological developments have broadened its accessibility. The trend in satellite communication is to provide a variety of low cost and efficient world-wide services. To provide the market growing needs new systems based on Low Earth Orbit (LEO) satellites are proposed, in addition to the more traditional Geosynchronous Earth Orbit (GEO). In the ground segment of this industry a variety of ground stations or terminals are under development. They will provide the end-users with mobile and fixed wideband and narrowband two-way channels for various applications.

The consortium of Ground Stations for Satellite Communication was formed in 1993 to establish a joint venture in order to develop a generic technological infrastructure in collaboration with academic research that will enable the members to penetrate and compete in this market. The consortium is supported by the MAGNET program in the Chief Scientist of the Israeli Ministry for Industry and Trade.

The Consortium consists of five Israeli companies, Gilat, Galram/Rafael, Elisra, Orbit, Elta, and the S. Neaman Institute. Several generic projects are conducted in the companies' R&D facilities. In some of the projects feasibility tests were performed in Israel and abroad to demonstrate the technologies performances. Eleven academic teams in the Technion, Tel-Aviv University and Ben-Gurion University in the Negev share an annual budget of $650K to conducts 11 research programs related to satellite communications. The S. Neaman Institute represents the academic institutes and administers the Consortium information center.

The achievements and the results of the academic research and of the companies' projects are available to all members. About 50 members from the industry and academia participated in a full-day workshop devoted to the presentation and discussion of the projects and research done during the last year.

Digital communication consortium

RESEARCHERS:

Prof. I. Bar-David

Prof. Y. Be'eri

Prof. B.Z. Bobrovski

Prof. S. Shamai

Prof. I. Sneiders

Prof. M. Feder

Prof. D. Raphaeli

Prof. D. Wolich

The objectives of this Industry-University consortium are to develop precompetitive generic technologies that will contribute to a variety of products in the rapidly increasing digital communications market and in particular in the private communication market.

The S. Neaman Institute played an important role in the process which led to the establishment of the Consortium. The program was approved and first funded in 1994 by the Chief Scientist's Office in the Ministry of Industry and Trade. The Consortium includes eight companies: Elta, Tadiran, Rafael/Galram, Gilat, Shiron, Microcim, Elisra and DSPC, in addition to the S. Neaman Institute and Ramot. In 1997 the program was extended for an additional year.

The program includes six research projects that are performed by project teams of the member companies. Each project involves the cooperation of several companies working closely together. In addition, several academic research programs are conducted by Technion and Tel Aviv University researchers.

The S. Neaman Institute's role includes responsibility for the academic research, organization of workshops and management of the Consortium data center which accumulates both relevant external information and all the R&D results generated by the Consortium members.

Quarter-micron technology consortium

RESEARCHERS:

Prof. P. Bar-Yoseph

Dr. S. Berger

Prof. E. Finkman

Prof. D. Gershoni

Prof. Y. Haas

Prof. Y. Nemirovski

Prof. J. Salzman

Prof. J. Shappir

Dr. I. Shechter

Prof. A. Solan

Dr. D. Spector

Prof. A. Ziegler

The technologies of QUARTER MICRON are a milestone in the production of integrated circuits, paving the way to the production of circuits in Ultra-Scale-Integration (ULSI) technology at quarter micron and smaller scales. The integrated circuit-industry development will be limited by performance of the equipment for processing and for inspection.

The consortium for 0.25μ technology was established to answer the need for pre-competitive, generic R&D, integrating industry and academia in order to build an infrastructure that will support both existing and future IC processing and inspection equipment manufacturers in Israel. Another objective of the Consortium is the successful commercialization of the Consortium development programs.

The companies in the Consortium, AGI, Jordan Valley Applied Radiation, Rikor, Tower, and 3T, and the Technion, the Hebrew University and Tel-Aviv University under the umbrella of the Neaman Institute, all join in the effort to develop the desired generic technologies.

1997 was the second year of the Consortium activity. During this year, Tower has joined the Consortium and new research programs were started in the academia. Joint projects of the companies and the academia were originated and their results can already be seen. The information center at the Neaman Institute has been gathering the Consortium information and documentation, and information services began to be supplied to the consortium companies.

The Consortium annual conference, devoted to the presentation of the achievements and of the summary of the research work done within the framework of the Consortium was held at the Neaman Institute.

Multimedia on-line services technology consortium (MOST)

RESEARCHERS:

Prof. A. Averbuch

Dr. R. Aviv

Prof. A. Bar-Noi

Dr. I. Ben Shaul

Dr. Y. Birk

Prof. I. Cidon

Dr. R. Cohen

Prof. M. Heymann

Dr. M. Israeli

Dr. G. Kurtz

Dr. S. Kutten

Dr. M. Lindenbaum

Dr. Y. Moses

Prof. S. Naor

Prof. D. Peleg

Prof. S. Peleg

Dr. E. Rivlin

Prof. A. Segal

Dr. A. Tal

Prof. S. Ullman

The MOST Consortium is an organization of more than 20 Israeli hi-tech companies and about 20 academic research teams who cooperate to advance the state-of-the-art in Multimedia On-line Services Technology in Israel. With a total budget exceeding $100 million and more than 350 developers on board, the MOST Consortium is determined to deliver new levels of integration and breakthrough cost / performance ratios to the world of multimedia on-line services technology market.

Mission

"The MOST Consortium is developing technologies that will change the Internet from its current state of a huge text and graphics information repository into a real-time, collaborative multimedia tool"

Real-time: The Internet today is mainly a tool for storing information for later retrieval. MOST develops technologies for the next generation Internet, which will support high quality live video, video and data conferencing and other types of real-time interactions in an affordable manner. Real-time also applies to information delivery, where push techniques combined with intelligent filtering, shorten the time between the creation of an information item until it is delivered to the interested user.

Internet-based collaboration: Tools and applications developed by MOST will support new types of interactivity among members of on-line communities. Live online communities that identify who is available on-line automatically, direct voice and video communication among members and video-rich presentations and live broadcasts are among the targets of the MOST Consortium R&D.

Multimedia-ready Infrastructure: MOST infrastructure technologies bring broadband, continuous connectivity to homes and small businesses, based on technologies such as ADSL, VSATs and Wireless Access Networks. From highly developed countries demanding Fast Internet to rural areas of developing countries, MOST can provide broadband connectivity at a truly competitive price.

Research Projects Conducted by MOST Members

MOST approaches the challenge of multimedia delivery over the WEB in a unique way which combines infrastructure and software development under the same framework. Advanced implementations of communications and multimedia technologies optimized for the future Internet are being integrated to provide effortless system solutions that emphasize cost-effectiveness and ease of deployment. Specific R&D efforts focus on the following themes:

Real-time streaming of audio and video content over broadband networks

Advanced authoring and coding of 2D, video and 3D graphical information for Fast Internet environment

Integration with virtual-community servers and efficient handling of security and navigation at Fast-Internet rates.

The MOST Consortium members represent a unique mix of innovative young startups, recent success stories of the Internet boom and some of the most experienced and powerful Israeli high-tech companies. The broad range of technological background of the members allows new prospective technologies to be developed with regard to market potential, associated problems and possible effective

solutions. The Consortium expanded from an initial structure of six high-tech companies to become one of the largest alliances in Israel's high-tech industry.

The MOST Lab and Demo Site

As part of its activities, the MOST Consortium has established a state-of-the-art Internet communications center that serves as a test lab and demo facility for the Consortium or other Internet technologies. The Center hosts a range of application servers that connect via either leased lines of fast IP or ATM backbone, several test communication infrastructures.

At the lab, multimedia authoring workstations create demo content and control a range of applications, such as virtual community centers, multi-user games, auto-published multimedia databases and so on. The applications are being used by trial communities selected from the developers, academy and government personnel related to the Consortium.

Consortium for the development of diode lasers and diode-pumped lasers

RESEARCHER :

Prof. D. Fekete

Diode lasers are the most efficient among the lasers available today. Their efficiency in converting energy into laser radiation is high, attaining 25%-30%. The diodes are of small dimensions, have a long service life, are highly reliable, and have modest power requirements.
Their production by microelectronic techniques is likely to reduce their price and will thus create a very great potential for growth and the expansion of applications and performance.

The high price of high-power and high-energy diode lasers constitutes a bottleneck. At present there are only two manufacturers of high-power diode lasers, who apparently have a hold on the requisite production processes.

High-power diodes are the basis for a long list of products and applications. In order to gain a foothold in the development and manufacture of laser diodes, and of products comprising laser diodes, the necessary technology must be made available.

Israel's electro-optical industry has identified the business potential of products based on high-power diodes, and this has led to the formation of a group of leading firms in the manufacture and use of lasers for the development of the generic high-power diode laser technology, which will make a sizable contribution to the improvement of the competitiveness of Israel's industry.

The aim of the Consortium under the "Magnet" program of the Ministry of Industry and Trade, is to develop a capability and proficiency in the generic technologies and processes, putting industrial companies in a position to produce and to export high-power laser diodes in a variety of wavelengths and at competitive and profitable prices.

Six companies and four academic institutions form the Consortium.

Development of magnesium technologies consortium

RESEARCHERS:

Prof. M. Bamberger

Dr. L. Gal-Or

Z. Koren M.Sc

Prof. R. Rosen

Prof. D. Shechtman

Prof. M. Weiss

The Israeli Consortium for Development of Magnesium Technologies was founded in 1997 to establish a generic R&D joint venture supported by the "Magnet Program".

The Dead Sea Magnesium Co. (DSM) plans to produce, by the year 2000, up to 55,000 tons per year with 25,000 tons in the first stage, (production started in December 1996).

The added value of magnesium can be increased significantly by the development of new handling technologies that will make new products possible, or their production simpler, faster and cheaper. The Consortium forecasts that, with the aid of the R&D of Consortium members, Israel will supply about 12% of all the future magnesium-based products, making DSM one of the biggest suppliers in the world.

The fields of activity of the Consortium R&D program are:

* Development of new magnesium alloys using "Green Technologies" and the study of their properties.
* Magnesium casting technologies.
* Finishing and corrosion protection technologies.
* Forming, joining and machining technologies.

The consortium consists of the following Israeli companies:

DSM; Rotem Ind; Ortal; Matar; Algat; Palbam; Habonim; Electrothermics

Two Academic Institutes are members of the consortium:

Technion, Israel Institute of Technology and the Israel Institute of Metals, represented by the S. Neaman Institute.

B.G. University, represented by B.G. Negev Technologies.

The demand for electronics engineers and computer sciences graduates by the Israeli industry

RESEARCHERS:

David Kohn M.Phil.

Ilana Shalev B.Sc.

This study summarizes a survey conducted between January and June 1997 to evaluate the shortage of electronics engineers and computer sciences graduates in companies incorporated in the Electronics Industries Association. The survey was initiated by the Electronics Industries Association and by the Chief Scientist's Office of the Ministry of Industry and Trade.

The study consisted of two main parts:

a) Evaluation of the actual shortage.
b) The employment of 1996 electronics and computer sciences graduates.

Main findings:

* The actual demand for electronics engineers and computer sciences graduates is for 3500 positions, out of which approximately 1000 are electronics engineers and about 2500 are computer sciences graduates.
  The demand for electronics engineers is mainly in the field of communications. In the computer field the demand is for programmers and support and training personnel.
* The electronics engineering graduates are employed by the electronics industry (52%), 15% in start-up companies, 12% in software houses and 12% in the public services.

The findings of the study were published in Hebrew and English reports in July 1997 and presented at a workshop organized by the Electronics Industries Association.

Spatial diffusion of industrial innovation and regional development

RESEARCHERS:

Dr. A. Frenkel,

Prof. D. Shefer

Dr. K. Koschatzky,

Fraunhofer-ISI,

Karlsruhe, Germany

Dr. W. Gunther,

Fraunhofer-ISI,

Karlsruhe, Germany

This is a three year research project sponsored by G.I.F. - German-Israeli Foundation for Scientific Research and Development.

The objective of this study is to identify the spatial diffusion of industrial innovation and to examine its effect on regional development in Israel and in Germany.

The desire to develop peripheral regions exists in many countries throughout the world. In Israel this desire has been translated into public policies aimed at developing the Northern Galilee and Southern Negev regions. In Germany, government programs in the form of investment allowances and development of industry-related infrastructure, were designed in order to promote the economic growth of lagging regions.

Having finished the field survey of firms belonging to three fast growing industries (FGI) in Israel and Germany, a thorough data analysis and a bilateral comparison were carried out by the two research teams.

The use of simple statistical models, augmented by multi-variable Logit Models, support the hypothesis that expenditure on R&D is a good surrogate for the probability of the firm to innovate, regardless of the industrial branch to which the plant belongs.

In general, there exists a strong similarity in the frequency of industrial innovation in both countries; i.e., the rate of innovation in the hi-tech firms is statistically and significantly higher than that found in the "traditional" firms. On the other hand, the pattern and spatial variations in the rate of innovation in Israel is much more pronounced and visible than in Germany.

Technometric benchmarking.

RESEARCHERS:

Dr. Hariolf Grupp - Fraunhofer-ISI, Karlsruhe, Germany

Prof. Shlomo Maital - Neaman Institute, Technion

Dr. Amnon Frenkel - Neaman Institute, Technion

Topic: Toward an Integrative Operational Model for Management of Technology and Innovation in Science-Based Corporations

Objectives: This project builds on a previous German-Israeli Foundation project (G.I.F.), to construct a set of benchmarking tools to guide criticial decision-making at all stages of the innovation process, for managers of science-based firms. Modules include those that focus on: R&D investment; product design and innovation; marketing; and production.

Papers describing the results of this program were accepted for publication by: Research Evaluation and R&D Management. The paper "Interpreting Sources of Value in a Capital Goods Market" won the Best Paper Award (out of some 400 papers) at the International Management of Technology Conference in Gotheburg, Sweden, June 25, 1997.
A review paper on Quantitative Methods in Benchmarking" has been commissioned by the Handbook of Industrial Marketing, and is now in preparation; and the case study "Global Integration of Marketing & R&D" will be published in a later edition of the same Handbook.

SNI organized and ran a successful Workshop held at Iskar, at Tefen, Galilee, on May 29th, 1997, on "Innovation: Technology Forecasting, Strategy and Regional Policy", in cooperation with another GIF project headed by Dr. Knut Koschatzky and Dr. Amnon Frenkel. The paper "Optimal Radical Innovation" will be presented at the annual IAMOT Conference in Orlando, FL., on Feb. 16-20.

An initial version of Technometric Benchmarking software has been developed and is undergoing site testing.

Law enforcement systems in the 21st century

STEERING COMMITTEE:

Prof. Israel Barak

Idit Hachimi

Prof. Daniel Weihs

David Kohn

Zvi Merom

Chaya Herskovic

This project, jointly sponsored by the Ministry of Public Security, the S. Neaman Institute and the Jerusalem Center for Public Affairs, seeks to define the future objectives of the Israeli law enforcement systems, and to specify the tools required to achieve these objectives. The first stage of this project has involved the exploration of developmental trends within the Israeli society by teams of experts in various fields. Comprehensive reports were written on the societal issues facing Israel; on science and technology that were relevant to Israel's law enforcement agencies; and on the future impact of Israeli politics and government on law enforcement.

The reports were grouped in accordance with the thematic order and published in two volumes:

The first volume contains reports and workshops summaries on demography, society, the economy, minority groups and terrorism.

The second volume contains reports relating the institutional system of Israeli society. This volume concludes with a report from a criminological team, that refers more closely to the implications of the various forecasts of law enforcement.

The reports will be presented in a workshop organized jointly by the sponsors.

Follow-up of the immigrant population from the Chernobyl area

RESEARCHERS:

Gad Rennert, M.D., Ph.D.

Semion Shapiro, M.D.

Dorit Reisfeld, M.P.H.

Neomi Bar-Yosef, M.A.

Hedy S. Rennert, M.P.H.

The aim of this activity is to evaluate the magnitude of health effects possibly attributable to radiation exposure following the accident at the Chernobyl nuclear reactor.

The studies involve immigrants to Israel from areas in the former USSR, where increased Cesium 137 levels were measured following the 1986 accident in the Chernobyl nuclear reactor. The number of participants accrued thus far is about 12,000. All participants provided self-reported information on their exposure and on their health status before and after the accident.

Two control groups were sampled: one includes immigrants from areas not affected by the Chernobyl radiation such as Moscow and St. Petersburg, to serve as baseline data. The second consists of immigrants from radiation inflicted areas who did not register with the study center.

A very high rate of self-reported medical complaints is evidenced among the study group. These mainly include various thyroid problems but also benign and malignant tumors. The second follow-up round after the first 10,000 participants started in November 1997.

Among the 369 "liquidators" (clean-up and rescue teams) evaluated thus far, 12 cases of cancer were diagnosed. Thyroid disease has been noticed in a relatively high proportion of the cases (14%).

The continuation of these studies is funded by the USAID (United States Agency for International Development) through the Ministry of Foreign Affairs.

The new component in this activity is the study of exposed children, reflecting the emphasis on high-risk groups. About 4,000 adolescents who were children at the time of the accident (in utero to 4 years old) will be studied (of them about 2,000 from the exposed areas and 2,000 controls) for developmental and medical problems.

Early Detection of Breast Cancer

RESEARCHERS:

Gad Rennert, M.D., Ph.D.

Dafna Kutner

Shoshi Fuks

The aim of the activity is to achieve an as-high-as-possible mortality-reduction effect from breast cancer in the Israeli female population through enhancement of the use of mammography, and promotion of high quality medical diagnostic processes.

The National Israeli Breast Cancer Detection Program has been established by the Israel Cancer Association in conjunction with the Ministry of Health and is operating for the last 5 years. During this period, 36 mammography units were recruited to participate in the program and are providing diagnostic services under strict quality criteria.

More than 600,000 women have been examined in the National-Program sites since 1992, of them more than 65% were referred for routine screening. The program also involved the evaluation and quality assurance of all breast tissue reports from all the pathology and cytology institutes in Israel.

In the last 12 month more than 2000 new cases of breast cancer have been evaluated and diagnosed in the program's centers, of them close to 300 as a result of routine screening in the target population. The mortality among these women is expected to decrease by about 30%.

The project is funded by the Israel Cancer Association and is run under the mandate of the Ministry of Health.

Acute Myocardial Infarction Register

RESEARCHERS:

Prof. G. Kark

Liora Ore, M.D., M.P.H.

Marcello Lao, M.P.H.

The aim of the study is to measure the incidence of acute myocardial infarction in the defined area of greater Haifa. In addition, it is meant to evaluate risk factors for the disease and outline the clinical course of this event.

All new cases of acute myocardial infarction, reporting to any of the three general hospitals in Haifa, are recorded. The suspected cases are evaluated according to the Monica criteria. Cases are interviewed when necessary and medical data are extracted from the medical files. All data are then computerized. In order to cover the true incidence and avoid a survivors-selection effect, the study also involves the evaluation of all sudden death events to include those who are of a coronary nature.

During 1997, about 500 definite and 700 suspected cases were evaluated using a cold pursuit method of every other month.

Project Renewal in Israel (1979-1994)

RESEARCHERS:

Prof. Naomi Carmon

Ilana Shafran

Arye Hershcowich

The collection of references in this partly annotated bibliography is intended to serve as a tool for researchers and students who want to know and understand "The Program For Neighborhood Regeneration and Renovation in Israel" which was named "Project Renewal". Research into this large-scale and broad-aim program affords familiarity with urban and socio-economic developments and with public decision-making processes in Israel. Many lessons can be drawn from this extensive research, including identification of the goals which can and cannot be promoted by means of specific planned interventions.

The bibliography contains primarily publications from the years 1979 to 1994. While the project was initiated in 1976, its realization on a wide scale began in 1979. Formally speaking, the project was still in existence at the time this bibliography was compiled (1996), but from 1993 on, its character has changed.

The bibliography includes a special chapter on published books and articles in English. Most of these items were published in English only, and contain material not published in Hebrew.

The Samuel Neaman Institute of Advanced Studies in Science and Technology, provided support for the research related to Project Renewal from its early days (1978) and over the course of many years.

Technion graduates role in the Israeli economy

RESEARCHERS:

David Kohn M. Phil.

Ilana Shalev B.Sc

The aim of the study is to analyze the role of Technion graduates in the Israeli economy. The study measures the national job creation of Technion graduates - leaders and innovators -- and their distribution in the various branches of Industry, construction companies and engineering services.

In a national economy that increasingly emphasizes innovation and leadership, the findings will extend the understanding how the Technion has been instrumental in generating new enterprises and extending existing ones.

The United Nations Workshop on Space Communications Technology

ORGANIZING COMMITTEE:

Prof. Arnan Seginer,

SNI, Chairman

Abi Har-Even,

Ministry of Science

Zohar Zisapel, Israel

Manufacturers' Association

Uzi Manor,

Ministry of Foreign Affairs

Rafi Hoida,

Ministry of Communications

Dr. Joseph Shapira,

Chair, Program Committee

David Kohn, Coordinator

The UN Workshop on Space Communications Technology was held at the S. Neaman Institute between 21 - 25 September 1997. The workshop was co-sponsored by the UN office for Outer Space Affairs, the Government of Israel: Ministry of Foreign Affairs, Ministry of Communications, Ministry of Science - Israel Space Agency, The Israel National Committee for Radio Science, and The Israel Export Institute. It was hosted by The S. Neaman Institute.

The workshop reviewed the status and projected direction of communications technology with special emphasis on (i) current and future developments of communications technology, (ii) fixed-satellite services, (iii) mobile satellite serves, (iv) remote and rural services by satellite, (v) low-earth orbit broadband and narrowband systems, (vi) high altitude long-endurance stratospheric platforms, (vii) development of regional and international cooperation in satellite communications. The Workshop also considered ways in which developing countries can use satellite communications and broadcasting to become a part of the Global Information Society.

The program of the Workshop included the following main topics:

* satellite-based digital audio broadcasting systems for developing countries;
* geostationary broadband satellite systems;
* low-earth orbit broadband satellite systems;
* stratospheric broadband telecommunications systems;
* satellite-assisted communications for disaster relief operations;
* narrowband non-voice satellite services;
* fixed satellite services, transportable terminals, VSATs and USATs;

In addition to the lectures, a one day visit was organized to space related industries.

Symposium on Technology and Zionism

ORGANIZING COMMITTEE:

Prof. Arnan Seginer, Chair

Dr. Ada Aharoni

Uri Agami

Shlomo Wohl

David Kohn

The Neaman Institute together with the Zionist Council in Israel, organized a symposium on 'Technology and Zionism,' on April 7, 1997, to commemorate a hundred years of the first Zionist Congress that took place in Basel, Switzerland, and was convened and chaired by Theodore Herzl. In the opening remarks, both Dr. Ada Aharoni of the Department of General Studies who chaired the Conference, and Professor Seginer, Director of the Neaman Institute, recalled that in Herzl's view, Zionism and the renaissance of modern Israel, were always integrally linked with science and technology, and that is why it was so appropriate to conduct the Conference on this subject at the Technion.

The symposium had two parts. The first session on "The Development of Science and Technology in Israel," included three lectures. The first lecture was delivered by Dr. Avraham Wolfenson, on: "The Relation of Jewish People to Science and Technology: a Continuation of the Tradition of the People of the Book." The second lecture was delivered by Professor Isaac Parnass, who lectured on "Technology, Research and Development - Today and Tomorrow." And Professor Moshe Arens delivered a lecture on the contribution of Technology to the security of the State of Israel.

In the second session, on "Technology and the Achievement of the Goals of Zionism," there were four lectures. Dr. Ada Aharoni lectured on "The Revolutionary Influence of Science and Technology on Communication and the Media." Professor Judith Rosenhouse lectured on "Zionism, the Hebrew Language and Technology." And Member of Parliament, Dr. Roman Bronfman, lectured on "The Absorption of New Immigrants and their Contribution to Science and Technology in Israel."

Funding of civilian R&D in Israel - status analysis & recommendations

RESEARCHERS:

Prof. Zehev Tadmor

Dr. Reuven Eshel

The purpose of this survey is to analyze the funding of the civilian R&D in Israel in terms of US dollars per capita inhabitant and percentage of GDP, to compare it with the relevant figures in the OECD countries and to recommend how to adjust it to Israel's long term needs.

The main thesis presented is that the basic structure of Israel's R&D policy does not fit the tremendous developments in science and technology in the past two decades, and does not meet the needs and therefore will not make full use of the unique historic opportunity window which was opened here in the early nineties, when after two decades of economic stagnation Israel has achieved in the nineties an annual growth of 6%. This was made possible due to four events:

A. The reduction of the high inflation rate of the eighties.
B. The achievement of world-record high percentage of engineers and scientists due to the huge wave of immigration from the former soviet union in the early nineties.
C. The massive defense investments in military technology in earlier years, have reached the state-of-art and started to feed the civilian hi-tech industries.
D. Finally the peace process opened Israel to an influx of industrial investments.

In recent years Israel's total annual investments in R&D were about 2.3% of its GDP, as compared with 3.0% in Sweden, 2.9% in Japan and 2.6% in Switzerland. It is therefore recommended to increase the national funding to 3% of the GDP, mainly in long term technology, which today constitutes only 8% of the total, as compared with 20-25% in the OECD countries. The present situation is exhausting all the reserves that were built up in the seventies and early eighties by the Ministry of Defense through massive funding of technology, reaching up to 33% of its total R&D funding.

The results were reported by Professor Tadmor to the Technion Alumni 100 Club on July 18, 1997.

The contribution of science to Israel's defense and industry

RESEARCHERS:

Professor Zehev Tadmor

Dr. Reuven Eshel

The purpose of this survey is to demonstrate the huge impact of Israel's Research Universities and Institutions on the development of sophisticated arms for the Israeli Defense Forces as well as on the development of the Israeli Industry in general and its Hi-Tech Industry and start-ups in particular.

The survey was started in late November 1997 and is to be concluded in April 1998.
So far some of the literature has been surveyed and various questionnaires have been developed and distributed among the leading Industries, Universities, Research Institutions and Scientific Government Agencies. The topics to be covered are:

A. All forms of knowledge distribution i.e. undergraduate studies, graduate studies, continued education, conferences and workshops.
B. Creation of new knowledge through research, innovations, consortia and technological hot-houses.
C. Knowledge transfer by experts through consulting, Sabbaticals, founding of start-ups, technical management, etc.
D. Services for the industry, such as laboratories, new standards, Hebrew terminology, professional associations, etc.

The information from the questionnaires will be cross checked, processed and completed by interviews. The final results and conclusions will be published by late April 1998 as part of the 50-th. anniversary celebration of the State of Israel.

National Environmental Priorities

RESEARCHER:

Yoram Avnimelech

Principal investigator

The preservation of the national environment encompasses a very large number of areas, but the national resources (manpower and budget) that can be devoted to this objective are, per force, limited. Israel must, therefore, determine the environmental issues, that are more urgent or important than others, and prioritize the dedication of resources accordingly.

The Israel Economic Forum for the Environment, a voluntary consortium of industries, businesses and the "green" organizations, has joined SNI in a collaborative effort to investigate the relative importance and urgency of the environmental issues and to formulate a set of national priorities in dealing with these issues.

More than 10 scientists and engineers, each a noted expert in his field, are charged with developing a set of priorities in the areas of water, air, solid waste, hazardous waste, transportation, urban planning, nature and open space, marine environment, and agricultural systems. Each of the above areas will be reviewed by about 10 more experts, so as to develop an accepted and well balanced environmental policy.

Reduction of greenhouse gas emission - A National Policy Paper

RESEARCHERS:

Yoram Avnimelech - Project leader.

Energy:

Prof. Gideon Grader

Prof. Ephraim Shavit

Prof. Dan Zaslavski

Transportation:

Dr. Yoram Shiftan

Dr. Leonid Tratakovsky

Prof. Yoram Zvirin

Industry:

Prof. Ephraim Kehat

Prof. Chaim Aharoni

Buildings climate:

Prof. Edna Shaviv

Agriculture & open space:

Prof. Gedalia Manor

Prof. Eitan Kimmel

Solid waste and waste water:

Prof. Yerachmiel Argaman

Ofira Ayalon, M.Sc.

Environmental economy:

Prof. Mordechai Shechter

Dr. Nir Becker

Environmental chemistry:

Prof. Yitzhak Oref

The Kyoto Convention on the Preservation of the Environment is a binding undertaking by all the developed (industrial) countries to reduce their emission of greenhouse gases to prescribed levels. Israel was not included in this category, but volunteered to join the Convention. The Ministry of the Environment intends to submit a National Policy Paper on the reduction of greenhouse gases emission in Israel between now and the year 2050. The Ministry has commissioned SNI to survey all sources of greenhouse gasses emission (industry, transportation and agriculture) to catalogue the sources and propose ways and means to reduce these emissions.

A team of Technion and Haifa University experts was retained to conduct the survey and to propose a national policy.

Israel Center for Negotiation and Conflict Management (ICN)

EXECUTIVE DIRECTOR:

Yona Shamir

The Israel Center for Negotiation and Conflict Management (ICN) was established in June 1996. ICN is devoted to academic and professional research, training and facilitation in the fields of negotiation, mediation and conflict resolution.

ICN's mission is to improve the skills of negotiation, mediation, dispute resolution and cooperative decision making in the public and private sectors. ICN is an active member of the world's professional dispute resolution community.

ICN activities include research, training and consulting to support professionals in politics, business and labor, and those involved in dispute resolution of any kind -- ethnic, cultural, religious, educational, planning, environmental, and personal.

ICN conducted in 1997 nine workshops on negotiation and four courses on mediation for professional groups and for the general public.

ICN is in the process of constituting its International Advisory Board, which will consist of prominent international and Israeli experts in negotiations, from business, politics and academia.

Members of the Advisory Board:

Israel

Prof. Moshe Arens	Former Minister of Defense & Foreign Affairs
Prof. Issac Galnoor	Former Commissioner of Public Service
Prof. David Libai	Former Minister of Justice
Marguerite Millhouser	Attorney

Abroad

Marjorie Corman Aaron	Harvard University, PON
Prof. Max Bazerman	Northwestern U. Kellogg Graduate School of Business
Prof.Kevin Clements	George Mason University
Prof. Robert Mnookin	Harvard University, Law School
Prof. Howard Raiffa	Harvard University, Business School
Prof. Leonard Riskin	University of Missouri-Columbia
Prof. Larry Susskind	Massachusetts Institute of Technology

Workshops And Seminars on Mediation (organized by ICN):

Workshop for Top Management of the Armament Development Authority (ADA), January 1997

Seminar on Mediation for Public Representatives in the Labor Courts, February 1997

Seminar for Judges in Labor Courts, March 1997

Negotiation Workshop - for Marketing Managers, April 1997

UNESCO Workshop on Negotiation on Water in Conflict Areas, May 1997

Mediation Seminar for Lawyers at the Institute of Social Security, July 1997

Mediation Course for Mediators, September 1997

Mediation Workshop for Judges from the Tel-Aviv Magistrate's Court, September 1997

Mediation Course for Mediators, October 1997

Negotiation Course for the MBA Program, October 1997

Bargaining and Negotiations in International Relations by Prof. Jacob Berkowitz, at the Ministry of Foreign Affairs, October 1997

Seminar to Canadian Labor Representatives, November 1997

Mediation Course for Mediators, December 1997

Workshops and seminars 1997-98

Consortium for Digital Communications:
Presentation of Academic Research, January 13, 1997
The ENST - Technion Workshop on Turbo Coding, May 21,1997
Presentation of Academic Research, November 27, 1997
Presentation of Industrial Research, June 16, 1997

Consortium on Ground Stations for Satellite Communication:
Presentation of Academic and Industrial Research, November 11, 1997

Quarter Micron Technologies Consortium:
Presentation of Academic Research, February 11, 1997
Presentation of Academic and Industrial Research, Jan.1,1998

Multimedia On-Line Service Technology Consortium:
Presentation of Academic Research, Nov.30-Dec.1,1997

Physics Laboratory Demonstrations, February 23, 1997
Technology and Zionism, April 7, 1997
Innovation: Technology Forecasting, Strategy and Regional Policy, May 29, 1997
The Demand for Electronic Engineers and Computer Sciences Graduates, June 23, 1997
The UN Workshop on Space Communications Technology for Capacity Building, September 21-25, 1997
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N. Carmon (ed.), Immigration and Integration in Post-Industrial Societies: Theoretical Analysis and Policy Implications, London: McMillan, and New York: St. Martin Press, 1996.

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A. Frenkel, H. Grupp, K. Koschatzky, S. Maital, "Technometric Approach to Technology Assessment", International Journal of the Management of Technology, special issue on Technology Assessment, special issue, 1995.

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A. Frenkel, D. Shefer, "Technological Innovation and Diffusion Models: A Review.", Chapter in a book: CS. Bertugila, S. Lombrdo, P. Nijkamp (eds.), Innovation Behavior in Space and Time, Springer Series in Advances in Spatial Science, Berlin, Verlag Springer Verlag, Chapter 3, pp. 41-63, 1997

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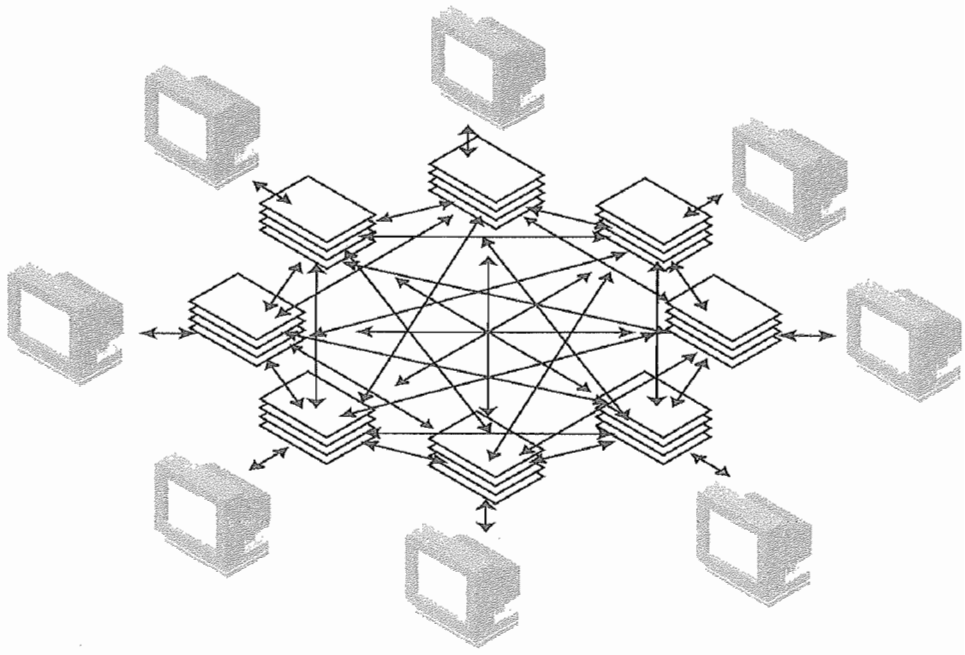
G. Rennert, S. Shapiro, H.S. Rennert, The Israeli Chernobyl Health Effects Study (ICHES) presented at the 19th Annual Meeting of the American Society of Preventive Oncology, Houston, Texas,
March 8-11, 1995.

Educational Video Tapes

1. High-School Physics: Mechanics - Prof. Mario Livio
2. High-School Physics: Electricity - Prof. Mario Livio
3. High-School Algebra - Giora Harubi, M.Sc.
4. Vectors - Prof. David Chillag
5. Calculus - Prof. Ron Aharoni
6. Trigonometry - Giora Harubi, M.Sc.
7. Chemistry - Dr. Riva Bar-Shai
8. Intermediate Calculus - Lea Inger, M.A.



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