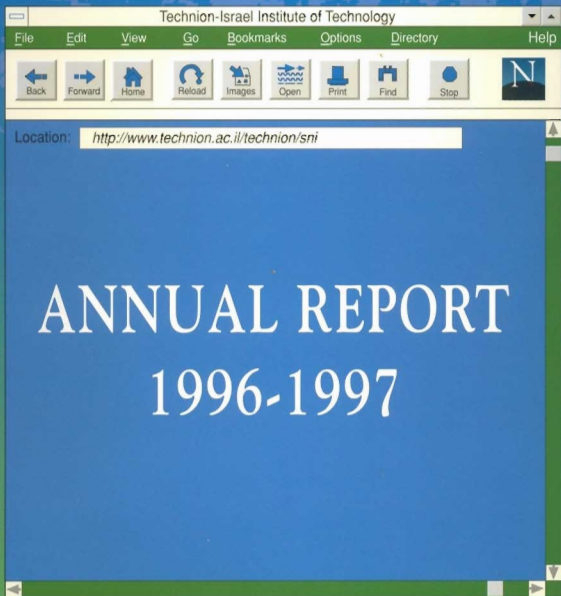




The Samuel Neaman Institute
for advanced studies in science and technology




Technion-Israel Institute of Technology

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TECHNION — ISRAEL INSTITUTE OF TECHNOLOGY



THE S. NEAMAN INSTITUTE

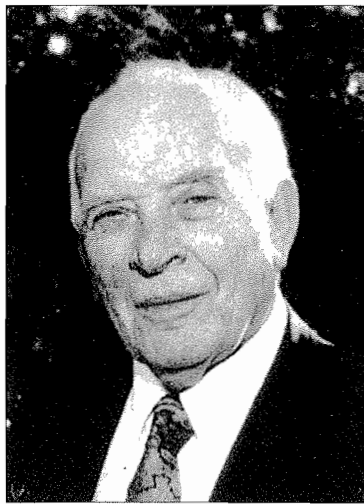
FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY



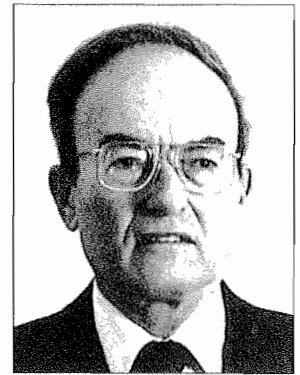
	B oard of Directors, Advisory Council and Staff	3
	A bout the Institute	4
	D irector's Report	6
	L ist of Ongoing SNI Projects	9
	S NI Workshops and Seminars	40
	L ist of SNI Publications 1993-1997 (English and Hebrew)	41
	F ormer SNI Researchers and Associates	47



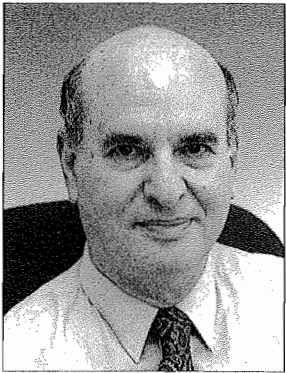
Prof. Zehev Tadmor
Vice-Chairman



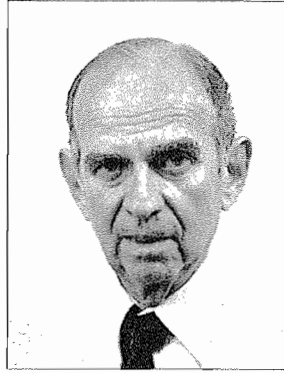
Samuel Neaman
Founder and Chairman



Prof. Arnan Seginer
Director



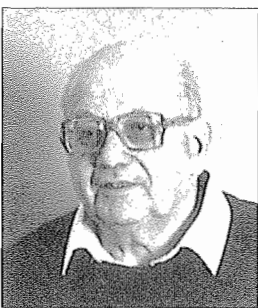
Prof. Uri Kirsh



Prof. Alex Keynan



Prof. Arnon Bentur



Ing. David Kohn



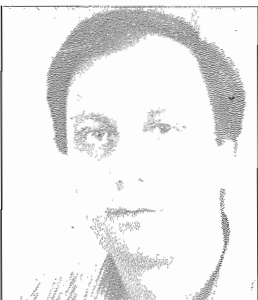
Ruth Rivkind, B.A.



Sima Nadler



Miron Rozenkranz



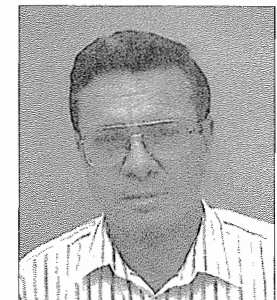
Dr. Amnon Frenkel



Dr. Daphne Getz



Joseph Linhart



Dr. Abraham Rotem



THE SAMUEL NEAMAN INSTITUTE FOR ADVANCED STUDIES IN SCIENCE AND TECHNOLOGY

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Ezra Zeheb, Professor of Electrical Engineering, Technion

Yoram Zvirin, Professor of Mechanical Engineering, Technion

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Senior Researcher: Dr. Amnon Frenkel

Consortium Coordinator: Dr. Daphna Getz

Consortium Coordinator: Joseph Linhart, M.Sc.

Consortium Coordinator: Dr. Abraham Rotem



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

1996 was the first year in which the S. Neaman Institute operated out of its new permanent home. The beautiful building added not just comfort to the researchers and administrative staff, but also prestige to the Institute itself.

For a short time after the move from the old cramped offices it seemed that the Institute will never fill all the new offices. However, within less than a year, most of the offices are busily occupied by researchers and the Institute is seriously considering to divide the upper floor that was left as an empty shell, into additional offices.

Volume-wise the Institute's main activity was in the joint industry-academia R&D consortia. Two new consortia were added to the Institute's arsenal:

1. Laser Diodes and Diode Pumped Lasers.
2. Magnesium Technologies

so that the Institute is now managing the academic research programs and the information centers of six consortia. The Institute's dominant role in bringing the industry and the universities closer together was emphasized many times by the Chief Scientist of the Ministry of Industry and Trade.

Out of an annual turnover of about \$1.5M (a 50% increase over 1995), the turnover of the consortia-related research alone was about \$1M. This research volume is expected to increase in 1997 to more than \$5M.

The public health programs in collaboration with the Epidemiology and Public Health Department (a joint Technion - Kupat Holim Department) at the Carmel Medical Center, were supported in 1996 by the Ministry of Health and the Israel Cancer Research Fund. These programs, (described in the 1995/6 report) are being continued in 1997.

The US Congress has adopted the Institute's program to study illness and mortality rate among the citizens of the Ukraine and Bielorus who were contaminated by the Chernobyl disaster, and has approved a \$5M budget for this program. Out of this budget SNI has won a grant \$1M for the part of the program to be conducted in Israel among the immigrants from the Chernobyl area.

Several other programs, also described in the 1995/6 report, are continuing or are in their final stages. Among them the two joint projects with the Fraunhofer Institute of Karlsruhe, Germany, that are supported by the German-Israel Science Foundation; two programs on public transportation supported by the Ministry of Transportation concerning the traffic load on public highways, and one supported by Egged (Israel's intercity bus company) on electrical urban transportation; a program on the economical aspects of urban solid-waste policy.

SNI continued its very popular workshop series on environmental issues. SNI conducted several contracted surveys, among them on the graduates of Technion (commissioned by Technion) and on Israel's information technology industry (commissioned by the Canadian Embassy). SNI is now conducting a major survey for the Government and the Manufacturers Association on the shortage of engineers for the hi-tech industry.

There is no doubt that the major highlight this year was the adoption of SNI's artificial islands project by the governments of Israel and the Netherlands. An MOU was signed by both prime ministers, and a joint Israeli-Dutch Steering Committee was appointed to oversee an in-depth technological and economical feasibility study, as well as an environmental impact study. SNI's researchers will lead the study and SNI's Director was appointed to the Steering Committee.

Much effort was invested this year in negotiating and preparing collaborative programs with overseas partners. Among them a joint project with Sandia National Laboratories in Albuquerque NM, on cooperative monitoring as a confidence-building tool in the Middle East; a joint project with the University of Hannover, Germany on the absorption of immigrants from East Europe; a joint project with the University of Judaism in Los Angeles, on 21st Century Judaism and a joint project with European partners on an automatic control of high-way traffic. All these programs are on hold until sufficient funding is obtained.

Two new joint programs were started:

SNI will conduct in the fall of 1997 for the UN an international workshop on advanced space communication. The UN will invite experts from the developed countries and guests from developing countries and SNI will invite Israel's scientists and industry.

SNI has established the Israel Center for Negotiation and Conflict Management (ICN) in collaboration with Boston's Conflict Management Group. ICN has already conducted several workshops on these subjects and is planning courses to train negotiators and facilitators as well as educate high-school students in the art of negotiation.

SNI is looking forward to a very exciting 1997.

Professor Arnan Seginer, Director



List of ongoing SNI projects

1. UNIVERSITY-INDUSTRY GENERIC RESEARCH CONSORTIA
 - 11 - Ground Stations for Satellite Communication Consortium
 - 12 - Digital Communication Consortium
 - 13 - Quarter Micron Technology Consortium
 - 15 - Multimedia On-Line Services Technology Consortium
 - 18 - Development of Diode Lasers and Diode-Pumped Lasers Consortium
 - 19 - Development of Magnesium Technology Consortium

2. RESEARCH PROJECTS
 - 21 - The Economic Aspects of Space Activity in Israel
 - 22 - The Demand for Electronic Engineers and Computer Science Graduates in Israeli Industry
 - 23 - Hebrew for Technology and Sciences
 - 24 - Utilization of Coal Fly Ash for Construction of an Offshore Island in Israel
 - 25 - Teaching of Science and Mathematics by Video
 - 26 - Law Enforcement Systems in the 21st Century
 - 27 - Immigration and Integration in Post-Industrial Societies
 - 28 - Follow-Up of the Immigrant Population from the Chernobyl Area
 - 29 - Early Detection of Breast Cancer
 - 30 - Acute Myocardial Infarction Register
 - 31 - Technometric Benchmarking
 - 32 - Economic Incentives in Municipal Solid Waste Management Policy
 - 33 - Electric and Hybrid Propulsion for Buses
 - 34 - Spatial Diffusion of Industrial Innovation and Regional Development
 - 35 - IEEE Workshop and Conference
 - 36 - 1996 Study of Attention and Performance Conference
 - 37 - Monitoring and Air Pollution Control of Volatile Organic Compounds (VOCs)
 - 38 - Israel Center for Negotiation and Conflict Management (ICN)

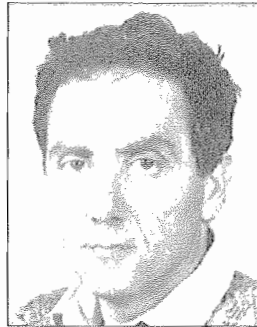
SNI RESEARCHERS AND ASSOCIATES



Prof. Y. Avnimelech



Ms. O. Ayalon



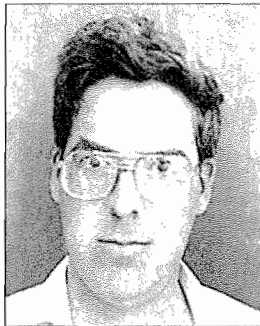
Prof. M. Livio



Yona Shamir



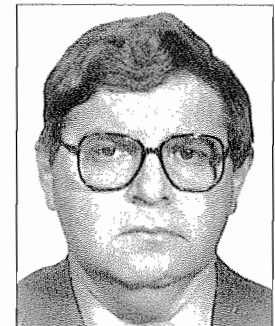
Prof. S. Maital



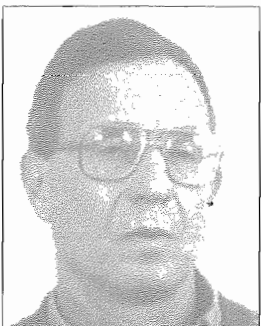
Dr. Gad Rennert



Avi Raveh



Dr. S. Shapira



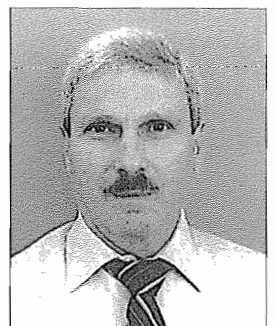
Prof. M. Shechter



Prof. Daniel Shefer



Prof. G. Shelef



J. Shapiro



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

Prof. N. Merhav

Dr. A. Orda

Dr. E. Plotnik

Prof. A. Segall

Prof. S. Shamai

Prof. M. Sidi

Distinguished Prof. J. 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) satellites. 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 founded in 1993 to establish a generic R&D joint venture supported by academic research that will enable the members to penetrate and compete in this market. The consortium is supported by the Chief Scientist of the Israeli Ministry for Industry and Trade and the companies involved.

The Consortium consists of several Israeli companies, Gilat, Galram/Rafael, Elisra, Orbit, Elta, and the S. Neaman Institute. Several generic projects are conducted in the companies' R&D facilities. Their achievements and the results of the academic research are available to all members.



Digital communication consortium

RESEARCHERS:

Prof. I. Bar-David

Prof. Y. Be'eri

Prof. B. Z. Bobrovski

Prof. S. Shamai

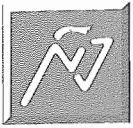
Prof. Y. Sneiders

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 six companies: Elta, Tadiran, Rafael/Galram, Gilat, Shiron and DSPC, in addition to the S. Neaman Institute. In 1997 the program was extended for two additional years. Three new companies will join the consortium in the near future.

The program includes five 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 under the auspices of the S. Neaman Institute.

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. M. Asscher

Prof. E. Finkman

Prof. C. Gutfinger

Prof. Y. Haas

Prof. Y. Nemirovski

Prof. J. Salzman

Prof. M. Shapiro

Prof. Y. Shapira

The technologies of 0.25 μ m/300mm 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 scale. The total IC market is estimated at \$125B by 1998 and the CMOS share will exceed 80%. CMOS will be used for DRAM CPUs, ASIC and standard logic. The Integrated circuit industry development will be limited by performance of the equipment for processing and for inspection.

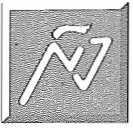
The consortium for 0.25 μ m technology was established to answer the need for precompetitive, generic R&D, integrating industry and academia in order to build an infrastructure that will support both existing and future IC processing and inspection equipment manufacturers in Israel.

The consortium started with three companies: AGI, OPAL, and ORBOT Instruments Inc. AGI manufactures cluster tools for rapid thermal and CDV processing. OPAL and ORBOT are in the field of Inspection. OPAL manufactures a Critical Dimension fully automatic measuring system using Scanning Electron Microscopy (SEM). ORBOT's main products are reticle and wafer inspection systems using short wave imaging technologies and defect classification systems. During 1996, the first year of the consortium activity, three companies have joined in: Applied Radiation, 3T and Ricor. Applied Radiation makes a wide range of X-ray spectrometers that can be integrated into a defect analyzing system. 3T is a young company that specializes in temperature measurement and control. Ricor has 30 years of experience in vacuum and cryogenic equipment and is directing its efforts to develop new cryogenic systems for the semiconductor industry.

Regrettably, at the end of 1996 OPAL and ORBOT had to leave the consortium after being bought by the giant American company Applied Materials Inc.

In the first year 6 research groups from the academia took part in the consortium. Following a call for proposals 1997, sent to all academic institutes, 30 research projects were submitted, 10 of which were finally accepted. Researchers from the Technion, from the Hebrew University and from the Tel-Aviv University, under the umbrella of the Neaman Institute, take part in the research effort of the consortium.

Two full-day meetings for consortium members from industry and academia were organized at the Neaman Institute and devoted to presenting and discussing research work done within the framework of the consortium.



Multimedia on-line services technology consortium (MOST)

RESEARCHERS:

Dr. A. Averbuch

Prof. A. Bar-Noi

Dr. I. Ben Shaul

Prof. Y. Birk

Prof. I. Cidon

Prof. D. Dolev

Dr. J. Gil

Dr. C. Gotsman

Dr. M. Israeli

Dr. N. Kiryati

Dr. S. Kutten

Dr. A. Levant

Dr. M. Lindenbaum

Dr. A. Margolis

Dr. A. Mendelson

Dr. Y. Moses

The MOST consortium is an organization of close to 30 Israeli hi-tech companies and about 40 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.

MOTIVATION

Multimedia on-line services are undergoing a major change these days. Proprietary schemes are being replaced by Internet-based technology, while an increasing number of subscribers turn to the public Internet for content and communication services. The standards that govern the publishing process and the interaction between users and information servers ('sites') change rapidly in an endless effort, to make the users' experience more fulfilling. Yet, the content offered both over the Internet and over the updated ('face-lifted') on-line services is mostly limited to text and low-resolution graphics. Attempts to bring multimedia-type publishing to the Internet, face the reality of today's infrastructure: the vast majority of users are using dial-up modems to access the service, a fact that hardly permits anything but text and some graphics. Servers that were designed to support multiple text terminals are failing to provide the bandwidth necessary to support high loads of interactive multimedia applications.

Efforts to 'widen the pipes' and create the infrastructure for a true on-line multimedia experience, typify the entire computer and telecommunications industry. Companies are building components that will allow the construction of the future high-speed digital highway, as well as ensure fast access by millions of homes and businesses. New electronic on-line publishing technologies have been introduced, while innovative authoring

Dr. A. Orda
Dr. M. Orenstein
Prof. D. Peleg
Prof. S. Peleg
Dr. A. Rappaport
Dr. E. Rivlin
Dr. A. Schuster
Prof. A. Segal
Dr. N. Shimkin
Prof. M. Sidi
Dr. H. Siegelman
Dr. A. Tal
Prof. S. Ullman
Dr. J. Weinberg
Dr. D. Weinshall
Prof. Y. Zeevi

tools have shortened the path between idea to published multimedia content.

GOALS

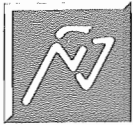
MOST members believe that cost-effective implementation of future on-line multimedia services requires a broad integration of all building blocks: authoring, servers, infrastructure and client tools. Without such integration, on-line service providers are forced to evaluate numerous options, sort out the most effective ones and then launch a self-funded integration project in one of their labs. Full deployment of the new technology becomes a complex move, resulting in a gradual roll-out which increases time to market.

The MOST Consortium's major mission is to eliminate the integration process of the future on-line multimedia service. By bringing together a broad range of companies that can master the complexities of the relevant technologies-multimedia authoring tools, advanced server techniques, high-speed infrastructure and advanced end-user tools, on-line service providers will be offered a complete solution, without being forced to invest further in (what is actually) a development project.

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 regards to market potential, associated problems and possible effective solutions. The consortium expanded from an initial structure of 6 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 and additional 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.



Development of diode lasers and diode-pumped lasers consortium

RESEARCHERS:

Prof. D. Fekete

High-power diodes are the basis for a long list of products and applications. 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, yet are very expensive.

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. However, there are at present only two manufacturers of high-power diode lasers, who apparently have a hold on the requisite production processes. 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 the leading firms in the manufacture and use of lasers, for the development of the generic high-power diode-laser technology, that will make a significant contribution to the competitiveness of Israel's industry. The objective of the consortium, supported by the Ministry of Industry and Trade, is to develop a capability and proficiency in the generic technologies and processes and to put 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. The S. Neaman Institute represents Technion in the Consortium and administers its information center.



Development of magnesium technology consortium

RESEARCHERS:

Prof. M. Bamberger

Dr. L. Gal-Or

Z. Koren M.Sc

Prof. A. Rosen

Prof. D. Shechtman

The objective of the Consortium is the utilization of the metallic magnesium produced by the Dead Sea Works in the manufacture of preferably finished products. The Dead Sea Magnesium Works Co. (DSM) plans to produce, by the year 2000, up to 55,000 tonnes per year with 25,000 tonnes in the first stage, (production started in January 1997). In the more distant future the productive capacity can be increased to about 100,000 tonnes annually.

The added value of magnesium can be increased by up to 200% by the development of new handling technologies that will make new products possible or their production simpler, faster and cheaper. With the aid of the R&D of Consortium members, the Consortium forecasts that Israel will supply about 12% of all the future magnesium-based products, making DSM one of the biggest suppliers in the world.

Recent years have seen a revolution in the demand for magnesium products. Various estimates put the increase in the applications of this metal in the Western World at an average of 13% per annum in the course of the past four years. The market that is increasing most rapidly is the use of magnesium in cast parts, which increased by some 23% annually. The development of a scientific and technological infrastructure will enable the utilization of the raw material by Israel's industry, that plans to capture about 12% of the market, or 18,000 tonnes per year.

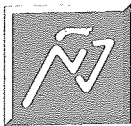
As far as jobs are concerned, it is estimated that the various plants dealing with magnesium will offer employment to about 1000 additional workers, in addition to the 2800 jobs in peripheral occupations - about 4,000 new jobs in all, the majority of those in development areas.

The main subjects of the Consortium R&D program are:

- Development of new magnesium alloys and scrap recycling technologies.

- Development and improvement of magnesium casting.
- Development of methods for finishing and corrosion protection.
- Development of joining technologies - welding, soldering, etc.
- Development of plastic forming technologies.
- Development of precision chipmaking machining.
- Development of technologies that are friendly to the environment.

Eight industrial plants and two research institutes are taking part in the Consortium. Technion researchers from the Israel Institute of Metals and the Department of Materials Engineering, represented by the S. Neaman Institute, and researchers from the Ben-Gurion University, represented by B.G. Negev Technologies and Applications, Ltd. will conduct eight research projects. The eight industrial firms will conduct seventeen R&D projects.



The economic aspects of space activity in Israel

RESEARCHERS:

Dekel Balila

Avi Raveh MA

Dr. J. Shapira

Objective : To analyze the economic aspects of the civilian space activities in Israel and to provide the Israeli Space Agency (ISA) with decision-making tools which will help direct the space activity efficiently within the budgetary constraints.

Activity in 1996 :

Like in most of the industrialized nations much space-related scientific and business activity is conducted also in Israel. However, space agencies all over the world, as well as in Israel, are required to justify, from an economic point of view, the budgets dedicated to space activity. The objective of this review is to provide the Israeli Space Agency with a comprehensive review of the Israeli civilian space activity in the industry and research institutes and with tools to direct this activity efficiently within the budgetary constraints.

This review is divided into five parts. The first part includes a review of research programs that were conducted in the past, analysing the economic benefits of space activity and its quantification, models of decision making in space projects, financing space activity and commercialization of space and space activity.

The second part of this review will discuss the world market for space products and its future directions.

The third part of this review will focus on the Israeli space industry. Current space programs and infrastructure will be reviewed and analyzed and a scheme of the relative advantages and disadvantages of Israel will be drawn. The review will try to point out potential niches in which the Israeli potential industry has relative advantages.

Based on the analysis set forth in the previous parts, recommendations will be made on a national space policy that will concern budget, government support to private and public industries, actions to be taken world wide and more.

The researchers have concluded their meetings with the main policy makers in the space industry and academy, and are expected to submit their report in March '97.



The demand for electronic engineers and computer-science graduates in the Israeli industry

RESEARCHERS:

D. Kohn M.Phil

I. Shalev B.Sc

In recent years, the rapid development of high-tech industries in Israel, developed an acute shortage of electronic engineers and computer-science graduates.

The S. Neaman Institute is conducting a survey for israel's electronics industry association and for a governmental special committee to estimate the magnitude of the shortage. The survey consists of three parts:

- A study of demand advertisements in leading Israeli newspapers.

- A survey of the managements of related industries.

- A survey of graduates of recent years.

The study is in its preliminary stage. A report based on the data collected in the above-mentioned surveys will be presented at the end of 1997.



Hebrew for technology and sciences

RESEARCHERS:

Dr. N. Ben-Basat

Z. Ben-Horin M.A.

R. Paltiel M.A.

Z. Tuviana M.A.

Two textbooks, Hebrew for Technology and the Sciences (for the intermediate level) and Hebrew for Technology and Sciences (for the advanced level), were published in the framework of this project. These books were written specifically for the teaching of Hebrew to new immigrants whose professions are related to the sciences and to the various engineering and technological fields.

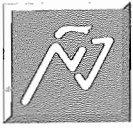
Both books are based on a unique method of instruction which was designed and developed by the Hebrew Unit of the Department of General Studies. This method identified language patterns resulting from the project's research data. The contents include especially selected texts, scientific vocabulary and varied original exercises targeted to achieve specific language skills.

The two volumes were awarded the General Dori Prize by the Haifa Municipality. The judges commented: "These two volumes answer a real and pressing need and will certainly contribute to the immigrant population adjustment and employment, as well as to the Israeli economy and industry".

Since publication, the books serve as a textbook at the Technion for all Hebrew language instruction. They also serve High Schools, technical retraining programs and pre-academic studies and have been adopted by the network of the Israeli Technical Colleges, Vocational schools and the like. An updated edition was published in 1996.

In the new edition, about fifty percent of the original reading passages were replaced, and several lessons in the "Language Usage" were supplemented both by examples and by exercises.

In addition, a wider variety of exercises has been provided in the new edition for every topic, in order to facilitate greater mastery of the material.



Utilization of coal fly ash for construction of an offshore island in Israel

RESEARCHERS:

Prof. G. Shelef

Prof. Y. Zimmels

Two important factors have been identified that drive the materialization of the offshore island project. The first is the persistent increase in the price of prime land in Israel, particularly in the Tel Aviv area. The second is the scarcity of available land reserves that leaves only one option, that of gaining land from the sea. The unique situation, and the increased attractiveness of the project within the framework of coastal development in Israel, have been officially recognized by the governments of Holland and Israel in an agreement signed in Jerusalem by Holland's and Israel's P.M.s.

The international recognition of the project by Holland that shares similar needs for land in coastal areas, has been the culmination of the efforts made over the years by the research team to bring the project into being. Although a model of only one island has been worked out and shown to be feasible, the interest has grown to embrace a system of islands. Environmental and economical issues, as well as technologies, availability and utilization of fly ash and dredged sea-bed materials as fill materials, and potential effects of earthquakes were considered.

Artificial reefs in the periphery of the island can add an asset to the local marine environment. Updated data and forecasts indicate that even under conservative estimates the project will become increasingly attractive toward the turn of the century.

Both governments have set up a joint steering committee, of which the S. Neaman Institute Director is a member, to oversee the next stage of the project. This stage will be equally funded by both countries at several million dollars each, to study in depth the economical and technological feasibility of the whole project, including its environmental impact, and to propose an RFP for the first island off-shore of Tel-Aviv. At the time of writing of this report, the responsibility for the project was transferred from the P.M's office to the Ministry of National Infrastructure under the direct personal leadership of Minister Ariel Sharon.



T

eaching of science and mathematics by video

RESEARCHERS:

Prof. M. Livio

D. Kohn M.Phil

This project is aimed at improving the quality of science teaching in high schools. The concept is to have course material presented in the schools by the best teachers at university level. The most practical way to achieve this goal is to videotape entire courses in high-school physics, mathematics and chemistry, presented by the best teachers from Technion and other institutes. These videotaped lectures are then supplied for use in high-schools. The project began nine years ago, and in this academic year the following activities were performed:

(1) Additional sets of physics and mathematics courses were distributed to high-schools and university preparatory units.

(2) A number of workshops for teachers and students were organized, in which the program was presented, in addition to lectures on advanced physics.

The program is partly funded by the Association for the Advancement of Education.



Law enforcement systems in the 21st century

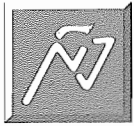
RESEARCHERS:

Dr. G. Mesh

Prof. G. Rahav

Dr. A. Ratner

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. This stage of the project was basically completed. Comprehensive reports were written on the societal issues facing Israel; on science and technology that were relevant to Israel's law enforcement agencies; and an assessment of the future impact of Israeli politics and government on law enforcement. In the present stage, criminologists and experts from the major law enforcement agencies consider the implications of the possible scenarios envisioned in each relevant field, on the Israeli law enforcement systems.



Immigration and integration in post-industrial societies: theoretical analysis and policy-related research

RESEARCHER:

A/Prof. N. Carmon

In May 1993 an international workshop was conducted at the Technion, under the auspices of the S. Neaman Institute, jointly with the Klutznick Center for Urban and Regional Studies and with the financial support of the Ladislav and Wilma Segoe Fund. The symposium theme was "Immigration and Absorption: Advanced Research and its Implications on Policy Determination". Thirty five researchers, about half of them from North America, Europe and Australia participated. The authors of the best presentations were asked to submit their papers in a publishable format and quality.

During the past months a strict evaluation process of these papers was conducted with the purpose of publishing a book on the subject. Twenty one papers that contain theoretical and applicable conclusions were selected.

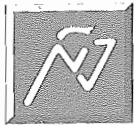
A preface and introduction by the author were added, and the book was published by McMillan Academic Press. The book entitled: "Immigration and Integration in Post-Industrial Societies, Theoretical Analysis and Policy Related Research" Carmon Naomi ed., contains four parts:

Part I - Immigration and Integration in a Changing World;

Part II - New Immigrants in New Circumstances: USA Experience;

Part III - Coping with the Mass Immigration of Educated People:
The Israeli Experience;

Part IV - Immigrant Integration: USA, Australia, Britain and France.



Follow-up of the immigrant population from the Chernobyl area

RESEARCHERS:

Dr. G. Rennert

H. S. Rennert M.P.H

Dr. S. Shapiro

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

The study involves 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. Peterburg, to serve as baseline data. The second consists of immigrants from the radiation-inflicted areas who did not register with the study center. This latter group will be used as a control for a possible introduction of a selection bias into the study group due to a volunteer effect.

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. These self-reports are currently being validated by the primary-care physicians.

Among the 185 "liquidators" (clean-up and rescue teams) evaluated thus far, seven cases of mortality have been reported. Of these five died of cancer. Six more cases of cancer were also diagnosed. Thyroid disease has been noticed in a relatively high proportion of the cases (11.4%).

The continuation of these studies has recently been approved on a much larger scale by the United States Agency for International Development (USAID) through the Ministry of Foreign Affairs, with a budget of \$1M.



Early detection of breast cancer

RESEARCHER:

Dr. G. Rennert

The objective of this activity is to achieve as high as possible a 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 has been operating for four years. During this period, thirty one mammography units were recruited to participate in the program and are providing diagnostic work-up under strict quality criteria.

More than 450,000 women have been examined in the National Program sites since 1992, of them more than 60% were referred for routine screening. The program also involves the evaluation and quality assurance of all breast tissue reports from all the pathology and cytology institutes in Israel.

In the last twelve months more than 1200 new cases of breast cancer have been evaluated and diagnosed in the program centers, close to three hundred of which were diagnosed as a result of routine screening of the target population. The mortality among these women is expected to decrease by about 30%.

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



Acute myocardial infarction register

RESEARCHERS:

Prof. J. Kark

M. Lao M.P.H.

Dr. L. Ore

The objective of this 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, is recorded. The suspected cases are evaluated according to the Monica criteria. All cases are interviewed and medical data are extracted from the medical files. All data are then computerized. In order to cover the truer incidence and avoid a survivors-selection effect, the study also involves the evaluation of all sudden death events for the plausibility of a coronary background.

During seven months in 1996, about 650 definite and 400 suspected cases were detected.



Technometric benchmarking

RESEARCHERS:

Prof. H. Grupp

Dr. A. Frenkel

Prof. S. Maital

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

Objectives: This research builds on previous results of the same research group on "technometric benchmarking", to develop an operational, quantitative integrative decision-support model. The research seeks to provide managers with a set of quantitative tools that guide crucial decision-making at four key points in the innovation process: R&D, innovation, production and marketing. This research builds on actual case studies of high-tech companies, many of them linked with Technion.

In 1996, the following was performed:

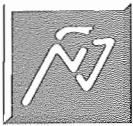
- a) The innovation module was completed.
- b) The R&D module was completed.
- c) The marketing module was revised and submitted for publication.
- d) Progress on the manufacturing module [5] was made.

The preparation of software, to assist managers in implementing the decision-support module, was begun.

An update of previous research on biodiagnostics, to be submitted to a special issue of the International Journal of Technology Management, was prepared.

Two major workshops on the Technometric Benchmarking approach, with participant companies, were conducted and a Handbook was produced.

A workshop on "Innovation: Technology Forecasting, Strategy and Regional Policy", will be held at Iskar Ltd., Tefen, Galilee, on May 29th, 1997, with the participation of scholars from Germany and Israel.



Economic incentives in municipal solid waste management policy

RESEARCHERS:

Prof. Y. Avnimelech

O. Ayalon M.Sc

G. Carmel

Prof. M. Shechter

The Research objectives:

1. To study the different alternatives, including technological and economic aspects, of waste management: separation, processing and recycling.
2. To develop an economic model for minimum waste management costs.
3. To study economic incentives for waste management.

Activities in 1996:

1996 was the concluding year of a 3-year study on municipal solid waste (MSW) management policy in Israel, supported by the Ministry of the Environment and S. Neaman Institute.

The main conclusions of this research are:

1. MSW policy should be based on economic and environmental principles.
2. Economic incentives or taxes can and should be used in order to assure the implementation of "polluter pays principle" (PPP).
3. These taxes, or incentives, can be used at any point along the waste generation chain: the industry, the municipality, the citizen.
4. Analyzing the situation in Israel, we found that separation, at the source, of MSW to a wet stream (including kitchen waste, yard waste and disposable diapers) and a dry stream (all the rest of the waste) seems to be the best environmental and economic solution for MSW management in Israel.

This alternative minimizes the costs of waste management and increases the economic and environmental benefits.

5. Life Cycle Analysis, presently being studied by the research team, will provide a practical tool for an economic and environmentally sustainable solution for MSW management in Israel.



Electrical and hybrid propulsion for buses

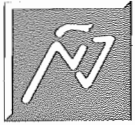
RESEARCHERS:

Dr. M. Gutman

Dr. L. Tartakovsky

Prof. Y. Zvirin

Electric or Hybrid buses seem to offer cost-effective and rather quick solutions for problems of air pollution in city centers, compared with other means of urban transportation (such as light or electric trains, etc.). The research work includes a detailed review of technologies for electric (EV) and hybrid vehicles, and up-to-date information on experiments and demonstrations performed with them worldwide. Published data about energy storage devices, such as batteries, fuel cells and inertial flywheels, different driving and charging systems for EV, and air charging and conditioning problems are summarized and analyzed. Performance characteristics of several electric and hybrid buses, are compared. The work also includes a description of a methodology for the selection of test routes relevant to electric buses, and preliminary recommendations about their use. A preliminary design of a road test with several electric/hybrid buses, on these selected routes, has been devised. In order to aid in developing a policy for the introduction of electric/hybrid buses for public transportation in Israel, several other aspects are studied: techno-economical evaluations (including comparison of converting existing buses with the purchasing of new ones), and estimates of investment in equipment, infra-structure and training of manpower. The research is sponsored by the Egged Israel Transportation Cooperative and the S. Neaman Institute for Advanced Studies in Science and Technology, Technion.



Spatial diffusion of industrial innovation and regional development

RESEARCHERS:

Dr. A. Frenkel

Prof. D. Shefer

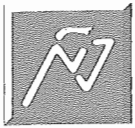
This is a three year research project sponsored by the G.I.F. - German-Israel Foundation for Science Research and Development.

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. This will lead to the identification of the general and country-specific aspects of spatial diffusion processes.

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 preliminary data analysis and a bilateral comparison were carried out by the two research teams. The results uncovered similarities as well as differences between the two countries. In Israel, variance between locations, within a given industry, as well as between industries within a given location, were often found to be statistically significant.

In Germany, most of the differences in innovation activities of firms can be attributed to the industrial branch. Regional environment does not play a significant role in explaining firm differences.



IEEE workshop and conference

ORGANIZING COMMITTEE

Information Theory Workshop

Prof M. Feder

Prof. N. Merhav

Prof. S. Shamai

Prof. M. Sidi

Dr. A. D. Wyner

The IEEE Information Theory Workshop and the Semiconductor Laser Conference were sponsored by SNI within its program to support international scientific meetings related to advanced research carried out at the Technion - Israel Institute of Technology. The IEEE Information Theory Workshop was held between June 9-13, 1996. The workshop program included the following sessions:

Source Coding, Coded Modulation, Shannon Theory, Convolutional and Block Block Codes, Cryptography, Network Information Theory, Detection and Estimation, Communication Techniques and Models, Statistics and Information Theory.

The technical program also encompassed two "Recent Result" sessions comprising 23 presentations.

The highlight of the technical program was the plenary address "On the Individual Sequence Approach to Information Theory" delivered by the honoree of the workshop, Prof. Jacob Ziv, who was introduced by Prof. Abraham Lempel.

CHAIR,

ORGANIZING COMMITTEE

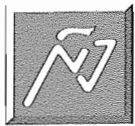
Semiconductor Laser Conference

Prof. G. Eisenstein

The IEEE - International Semiconductor Laser Conference was held between October 13-18, 1996.

The Conference included lectures in the following sessions:

Quantum Confinement Laser, Optical Communication, High Power Laser, Laser Dynamics, Analog Lasers, Visible Lasers, VCSEL and Micro-Cavity.



Meeting of the international association for the study of attention and performance

ORGANIZING COMMITTEE

Prof. D. Gopher

Prof. A. Koriat

The XVII bi-annual meeting of the Association, which celebrates thirty years of existence, was held between July 7-12 1996. It is the first time that the Association is convened in Israel.

Sixty world-leading scientists in the field of Cognitive Psychology and Attention participated in this meeting. There were twenty six formal lectures and discussions, that will be published as a book by the MIT Press.

The topic of the meeting was " Genitive Regulation of Performance: Theory and Application". It is the first meeting of the Association that is dedicated to the bridge between basic research and application. The lectures focused on the application of models and principles, which were developed in the study of attention control, memory and learning, to such problem areas as the design of displays, interaction with complex systems, training of skills and overcoming performance deficits resulting from aging or neurological disorders.

The meeting was highly successful and productive. It is hoped that the resulting book will achieve the same significant scientific impact that earlier meetings of the Association had.



Workshop on monitoring and control of volatile organic compounds (VOCs)

ORGANIZING COMMITTEE

Dr. J. Goldshmid

D. Kohn M.Phil

Prof. Y. Mamane

The Ministry of the Environment is in the final stages of preparing the promulgating regulations for air-pollutant emission standards. These regulations will determine the maximum permissible concentration of a pollutant in chimneys and will thus permit the effective monitoring and control of emissions from industrial plants. The standards deal with three groups of air pollutants: particles, organic substances, and inorganic particles and gases.

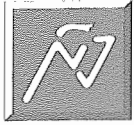
In the group of organic substances some one hundred compounds are listed, some volatile (referred to as VOCs, an abbreviation of "Volatile Organic Compounds"), others not. These substances react with nitrogen acid activated by the sun's rays, creating the so-called photochemical smog, with its known high oxidability and its adverse effects on human health, plant life, and materials in general. Volatile fuels, organic solvents, and paints applied on surfaces are the foremost sources of VOCs in the air.

The Workshop, held on June 27, 1996, at the S. Neaman Institute, dealt with three salient aspects of the subject:

- A. The Clean Air Law and international and Israeli standards of VOC emission (M. Garber, Ministry of the Environment).
- B. Means and methods for measuring and monitoring organic substances in stacks and in the open air (S. Lerman - Ben-Gurion University; and Y. Mamane and R. Hashmonay - Technion).
- C. Apparatus for controlling emission of organic matter into the air (Y. Goldschmid - Environmental Planning and Engineering Co.; Ch. Meisels - Acutop; Y. Ragiano - Israel Aircraft Industries; E. Vick - Durr Co., Germany)

The Workshop was held under the auspices of the S. Neaman Institute for Advanced Research in Science and Technology, the Ministry of the Environment, and the Israel Association for Ecology and Environmental Quality. About one hundred engineers and scientists participated in the workshop, representing the chemical industry, oil refineries, painting shops, and others.

This Workshop was the second in a series organized by the S. Neaman Institute dealing with the measurement and prevention of air pollution.



Israel center for negotiation and conflict management

EXECUTIVE DIRECTOR

Yona Shamir MBA

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.

A workshop on "Principles, Techniques and Strategies in Negotiation" was delivered by Professor Howard Raiffa (Harvard Business School and Conflict Management Group) to 55 CEO's, Presidents and top management from the hi-tech industry.

Two Workshops for top management of the Armament Development Authority (ADA) were conducted at ICN by Eric Kornhauser from CMA - Conflict Management Australia, and Daniel Ebenstein from ICN: A seminar for representatives from the public in the labor courts and a workshop for Israeli labor courts judges on mediation in labor disputes.

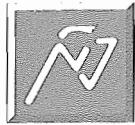
Planned activities include:

- A series of workshops for training arbitrators to become mediators in labor disputes.
- A course in negotiation - principles, techniques and strategies, for managers in the Israeli industry .
- A course in mediation - in business and labor disputes, for lawyers.
- A UNESCO workshop on "Water Negotiation in Areas of Conflict" as a part of UNESCO's program on "Water and Civilization" (May 1997).
- "Program for Young Negotiators (PYN)"- To teach school-age children and to develop skills for resolving conflicts -- including those of an ethnic, religious and cultural origin - in a non-violent way.



- "Train the Professionals" Preparing a cadre of people from the Government and its agencies, to become in-house trainers of other personnel in negotiation skills, and act as a resource on matters requiring negotiation, in the various Ministries and agencies.
- A Regional Training Program for NGO's on Environmental Issues.
- A Regional training program for Mayors and Heads of Municipalities
ICN works in cooperation with international negotiation centers, including CMG - Conflict Management Group in Cambridge, Massachusetts, PYN - Project on Young Negotiators, Harvard University, CMA - Conflict Management Australia, and others.

ICN is in the process of constituting its International Advisory Board. It will consist of prominent international and Israeli statesmen, community and business leaders and experts in the theory and practice of negotiation.



Workshops and seminars 1996-97

Consortium for Digital Communications:

Presentation of Academic Research, January 13, 1997

Consortium on Ground Stations for Satellite Communication:

Antennae and Microwaves, July 7, 1996

Presentation of Industrial Research, October 28, 1996

IEEE Conference, Satellite Communication Session, November 5-6, 1996

Presentation of Academic Research, December 1, 1996

Quarter Micron Technologies Consortium:

Presentation of Industrial Research, November 14, 1996

Presentation of Academic Research, February 11, 1997

Multimedia On-Line Services Technology Consortium:

Presentation of Academic Research, December 30, 1996

Multimedia Workshop, January 4, 1996

Seminar for Physics Teachers in Colleges, January 17, 1996

IEEE - Information Theory Workshop, June 9-13, 1996

Workshop on principles, Techniques and strategies of negotiations, June 26-27, 1996

Workshop on Monitoring and Control of Volatile Organic Compounds, June 27, 1996

The International Association for the Study of Attention and Performance Conference, July 7-12, 1996

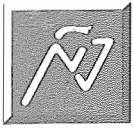
IEEE - International Semiconductor Laser Conference, October 13-18, 1996

Workshops on Negotiation for Rafael Management, January 8-9, 12-13, 1997

Physics Laboratory Demonstrations, February 23, 1997

Seminar for Representatives from the Public on Mediation, February 24, 1997

Mediation Workshop for Judges of the Labor Courts, March 18, 1997



List of SNI publications* - 1993-1997

English Publications

A. Frenkel, S. Maital, K. Koschatzky, H. Grupp, Estimating and Partitioning Sources of Value in Technologically-Sophisticated Products, Working Paper, SNI, 1993.

S. Maital, A. Frenkel, H. Grupp, K. Koschatzky, Toward a Dynamic Technometric Benchmarking Model for Strategic Innovation and Second-Generation R&D Investment, Working Paper, The S. Neaman Institute, Jan. 1993.

E.A. Halevi, D. Kohn, Technology and Ethics, Proceedings of the Whizin International Symposium, Haifa, June 17-19, 1992. March 1993.

Peritz, B.C., Further Investigation in the Evaluation of Scientific Activity, May 1993.

S. Maital, H. Grupp, A. Frenkel, K. Koschatzky, A Technometric Analysis of Comparative Advantage in Selected High-Technology Industries in Israel, Final Report, Vol. I - II, October, 1993.

N. Carmon, (Ed.), Immigrants - Liability or Asset? Innovative Research and Policy Implications, May, 1993.

E. Kehat, R. Wachs The Chemical Industry 2000, Phase A, December, 1993.

D. Shimshoni, Human Resources Policy in an Age of Change, 1994 (Internal Report).

Workshop on Signal and Image Representation in Combined Spaces (Abstracts), May 1994.

D. Chillag, S. Gepstein, N. Movshovitz-Hadar, M. Perl, A. Rosen, Report of the S. Neaman Institute Committee on the Advancement of Teaching at Technion, June 1994.

* The list of previous publications is available separately.

- E. Kehat, R. Wachs, The Chemical Industry 2000, Phase B, November 1994.
- N. Gomelski, D. Simmons-Cohen, An Evaluation of the Promotion of Immigrant Entrepreneurship in the Haifa Area, December 1994.
- N. Gomelski, D. Simmons-Cohen, Entrepreneurial Theory and Practice: Immigrant Opportunities, December 1994.
- E. Kehat, R. Wachs, The Chemical Industry 2000 Potential for Future Growth, March 1995.
- S. Maital, H. Grupp, eds., Technometric Benchmarking: Towards an Integrative Operational Model for Management of Technology and Innovation in Science-Based Startups, Selected Readings, January 1996.
- D. Kohn, Israeli Information Technology, April 1996.
- J.R. Wolberg (ed.), Italian-Israeli Binational Conference on Natural Gas, June 1996.
- G. Gilbar, The Middle East Oil Decade and Beyond, Frank Cass (publisher), London, 1996.
- N. Carmon (ed.), Immigration and Integration in Post-Industrial Societies: Theoretical Analysis and Policy Implications, London: McMillan, and New York: St. Martin Press, 1996.
- M. Shechter, Y. Avnimelech, O. Ayalon, G. Carmel, Economic Incentives in Municipal Solid Management Policy, Final Report, Ministry of the Environment, 1996
- Conference Proceedings ECLAS - 1997, February 1997,

Papers Published in Archival Journals

I. Adler, D. Kohn, Teaching Sciences by Video, *Hypermedia in Vaasa*, '93, May 24-26, 1993.

A. Frenkel, T. Reiss, K. Koschatzky, S. Maital, "Technometric Evaluation and Technology Policy: The Case of Biodiagnostic Kits in Israel. *Research Policy*, 23, 281-292, 1994.

N. Carnon, and M. Baron, "Reducing Inequality by means of Neighborhood Rehabilitation: An Israeli Experience and its Lessons", *Urban Studies*, Vol. 31, No. 9, 1994.

S. Maital, A. Frenkel, H. Grupp, K. Koschatzky, "The Relation between the Level of Technological Complexity and Its Dispersion across Firms: An Empirical Study of High-Tech Products in the United States and Japan", *J. of Evolutionary Econ.*, 4: 273-288, 1994.

H. Grupp, S. Maital, A. Frenkel, and K. Koschatzky, "A Data Envelopment Model to Compare Technological Excellence and Export Sales in Israel and European Community Countries", *Research Evaluation*, Vol. 2, No. 2, 87-101, 1994.

S. Maital, A. Frenkel, H. Grupp, K. Koschatzky, "The Relation between Scientific and Technological Excellence and Export Performance: Theory and Empirical Results for 7 E.C. Countries", *Science and Public Policy*, Vol. 21, No. 3, 138-146, 1994.

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.

C. Tadmor, J. Brandes, Biopsychological Profiles of Pregnant Women at High or Low Risk to Encounter Preterm Birth", *Journal of Community Psychology*, Vol. 22, July 1994.

S. Maital, "Peace, Trade and Technology in the New Mideast", *Technology and Science*, 17(2) 1995, pp. 143-157.

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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
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8. Intermediate Calculus - Lea Inger, M.A.



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7.16



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