A Window to the Future

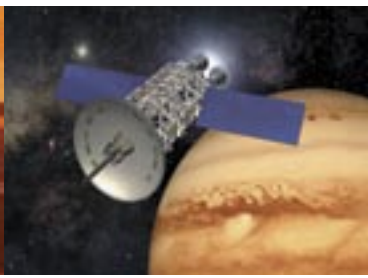
מכון ויצמן למדע

WEIZMANN INSTITUTE OF SCIENCE

UNDERSTANDING THE WORLD

The Weizmann Institute of Science is one of the world's leading multidisciplinary research institutions. Hundreds of scientists, laboratory technicians and research students working on its lushly landscaped campus embark daily on fascinating journeys into the unknown, seeking to improve our understanding of nature and our place within it.

Guiding these scientists is the spirit of inquiry so characteristic of the human race. It is this spirit that propelled humans upward along the evolutionary ladder, helping them reach their utmost heights. It prompted humankind to pursue agriculture, learn to build lodgings, invent writing, harness electricity to power emerging technologies, observe distant galaxies, design drugs to combat various diseases, develop new materials and decipher the genetic code embedded in all the plants and animals on Earth.



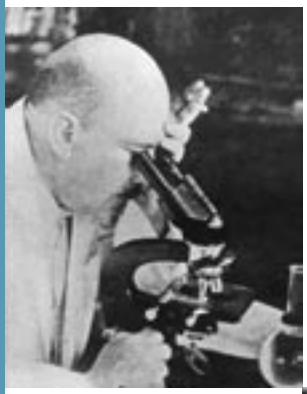
The quest to maintain this increasing momentum compels Weizmann Institute scientists to seek out places that have not yet been reached by the human mind. What awaits us in these places? No one has the answer to this question. But one thing is certain – the journey fired by curiosity will lead onward to a better future.

At the Weizmann Institute of Science, research takes place all along the frontier of the natural and exact sciences: the life sciences, chemistry, physics, mathematics and computer science. Over the years, work by Institute scientists has widely expanded our knowledge in these areas, created new research fields, and combined traditional scientific disciplines in multidisciplinary studies that steer research into new, exciting and often surprising paths.

This curiosity-fueled journey leads Institute scientists to discoveries and inventions that improve our quality of life: drugs to treat cancer and other diseases, technology that forms the basis of the polymer industry, improved visual displays for pilots' headsets and surgeons, amniocentesis for testing fetal genetics, a method of growing seeds that protects them from various pests. These and many other inventions owe their existence solely to the curiosity, perseverance and talents of Weizmann Institute scientists.

PIONEERING PROGRESS

The Institute's roots go back to the Daniel Sieff Research Institute, built in 1934 with the support of Israel and Rebecca Sieff of London in memory of their son Daniel. It was established upon the initiative of Dr. Chaim Weizmann, the driving force behind its scientific activity and its first President. A world-renowned chemist, he headed the Zionist movement for many years and later became the first President of the State of Israel.



Dr. Chaim Weizmann

WEIZAC, the first computer in Israel

Dr. Chaim Weizmann (l) and
David Ben-Gurion at the dedication of
the Weizmann Institute of Science, 1949

In November 1944, with the agreement of the Sieff family, it was decided that the Sieff Institute would become the nucleus of a large-scale research institution named after Dr. Chaim Weizmann. On November 2, 1949, in honor of Dr. Weizmann's 75th birthday, the Weizmann Institute was formally dedicated.

The Weizmann Institute of Science played a key role in the development of the State of Israel. Its scientists pioneered cancer research in Israel, and they designed and built the first electronic computer in the country – one of the first in the world. They were the first in Israel to establish a nuclear physics department, which led to the construction of a particle accelerator; and they were the first to create an academically linked office for technology transfer and to initiate the creation of a science-based industrial park, built near the Institute. The Institute also played a pioneering role in the development of brain research, nanotechnology and solar energy research.

Weizmann Institute research has led to the development and production of Israel's first ethical (original) drug, the invention of new computer languages, the discovery of the three-dimensional structure of various biological molecules (including a molecule that plays a key role in Alzheimer's disease), the creation of ways to separate isotopes that are now applied in various places around the world, the mapping and deciphering of the genes involved in numerous diseases, the development of advanced methods for embryonic tissue transplant and the design of a nano-biological computer that may one day be able to operate in the body's cells, identifying disease processes and blocking them before they cause damage.

FACTS AND FIGURES

The Institute is governed by an international Board of Governors headed by an elected Chair, and by an Executive Council, also headed by an elected Chair. The Board of Governors elects the President of the Weizmann Institute, who appoints the Vice President, and the Vice Presidents for Resource Development, for Technology Transfer, and for Administration and Finance. These work alongside the Deans, the Scientific Council (which includes all the Institute's scientists) and the Council of Professors (which decides on the admission of new scientists to the Institute and their promotion).

Five faculties, 17 departments, a graduate school and 50 multidisciplinary centers

The Institute has five faculties – Mathematics and Computer Science, Physics, Chemistry, Biochemistry and Biology – and the faculties in turn are divided into 17 scientific departments. In addition, the Feinberg Graduate School, the Institute's university arm, trains research students pursuing graduate degrees.

The Weizmann Institute serves as a meeting place for scientists from different disciplines, setting the stage for multidisciplinary collaborations and the emergence of new research fields. To encourage this creative activity, the Institute has created some 50 multidisciplinary research institutes and centers, most of which provide an intellectual rather than physical framework for joint projects. These institutes and centers stimulate activity in a multiplicity of fields, including brain research, cancer research, nanotechnology, renewable energy sources, experimental physics, biological physics, environmental studies, the study of autoimmune diseases, plant sciences, photosynthesis, genetics and others.

The human factor

In its early days, the Daniel Sieff Research Institute had a scientific staff of no more than a dozen, working under the guidance of Dr. Weizmann. Today the campus community numbers more than 2,600: some 1,000 scientists and scientific staff, 1,000 research students, 220 postdoctoral fellows and 400 administrative employees.

The Institute has some 250 research groups headed by senior scientists and professors, of whom approximately 100 were born in Israel; the rest have come to Israel and to the Institute from 28 countries: Afghanistan, Argentina, Armenia, Austria, Belgium, Canada, Chile, Colombia, Germany, France, Hungary, Iran, Iraq, Italy, Kazakhstan, Mexico, Morocco, the Netherlands, Poland, Romania, Russia, South Africa, Switzerland, Turkey, Ukraine, the United Kingdom, the United States and Uruguay.

Each year, around 500 scientists from dozens of countries around the globe visit the Weizmann Institute or come to work on its campus. And each year, approximately 25 international scientific conferences take place at the Institute.

Budget
The Weizmann Institute's annual budget stands at approximately $200 million. An allocation from the government of Israel covers about one-third of the budget; the rest is provided by research grants, donations and royalties.

Technology transfer
Yeda Research and Development Company Ltd., which promotes the industrial applications stemming from Weizmann Institute inventions, was founded in 1959. Since then, it has been involved in registering some 1,400 families of patents. Since 1973, Yeda has signed 169 agreements with Israeli companies on the use of various Institute patents and established 42 companies (21 of them since 2000).

The campus
The Weizmann Institute is located in the town of Rehovot, 22 kilometers south of Tel Aviv and 42 kilometers west of Jerusalem.

The Institute campus, covering an area of some 1.1 sq km (280 acres), includes more than 100 buildings with a total area of 155,000 sq m (38 acres), as well as some 100 housing units for scientists. Approximately 120 research students live in dormitories on campus.

TRAINING FUTURE SCIENTISTS

The Feinberg Graduate School, the Institute's university arm, was established in 1958 with the support of a $25-million loan (eventually turned into a grant) from the U.S. government. The School, which will soon be celebrating its 50th anniversary, is registered as an accredited higher education institution both in Israel and in the U.S. It awards M.Sc. and Ph.D. degrees in mathematics and computer science, physics, chemistry, life sciences and science teaching.

Outstanding students from around the globe pursue their studies at the Feinberg Graduate School. The language of instruction is English, and the average advisor-student ratio is 1:3. About 1,000 research students are enrolled: some 300 are pursuing M.Sc. degrees, and 700 Ph.D. degrees. About 45% are female. In addition, the School lists some 220 postdoctoral fellows, about a third of them from the United States, Canada, Latin America, the European Union and Africa, as well as Korea, China, India, Australia and New Zealand.

The Feinberg Graduate School trains research students for senior posts in academia, scientific and medical research, industry and governmental bodies. Its curriculum mandates the students' direct involvement in research conducted at the Institute. This intensive program poses a real challenge to the students; all receive scholarships to cover their tuition and living expenses so that they can devote their full attention to research and study.

Summer science programs
The Academic Affairs Office organizes the Karyn Kupcinet International Science School for Overseas Students and the Emma and Oscar Getz Summer Science Program for Israeli Students. Every summer, about 30 undergraduate students who have completed at least two years of studies are admitted to each of these programs. (Neither admits graduate students.) They spend 10 to 16 weeks at the Weizmann Institute, gaining experience in various fields of science under the guidance of Institute scientists.

Community involvement
Feinberg Graduate School research students are involved in Israeli society and deeply committed to helping improve the quality of life of different segments of the population. They initiate and take part in the distribution of foodstuffs to the needy, tutor at-risk youth and participate in various activities aimed at bringing the public closer to science.

Performances of Feinberg's student theater group are an important part of the cultural and community life, both for Institute scientists and employees and for the residents of towns, settlements and villages in the vicinity of the Institute.

SCIENCE IS FOR SHARING

General scientific knowledge has become a vital tool, essential for becoming successfully integrated into modern society.

The Davidson Institute of Science Education, established in 2002, provides a continuation and expansion of Weizmann Institute activities in the area of science teaching. Since its establishment, the Davidson Institute has been examining innovative methods for promoting science education through the use of advanced technologies. It implements programs for all sectors of the society and offers special frameworks for the ongoing professional development of science teachers.

The "Perach" all-Israel tutoring program, currently headquartered at the Davidson Institute of Science Education, was launched at the Weizmann Institute in 1973. It enlists students from all the Israeli universities to serve as tutors to underprivileged youth who need intensive guidance and encouragement in their studies.

Each year, some 33,000 youngsters take part in activities organized by the Weizmann Institute's **Young@Science section**. These include a wide variety of activities for children, youth and the young-at-heart.

The Science Mobile, a teaching lab-in-a-van developed at the Weizmann Institute, visits schools and community centers in remote parts of Israel, introducing local youth to the entertaining and enjoyable aspects of learning scientific principles.

The Clore Garden of Science, an outdoor facility established at the Weizmann Institute of Science, is the first science museum of its kind in the world. Its 100 hands-on exhibits allow visitors to learn about science and nature through play and firsthand experience.

The Clore Garden of Science is at the center of the Institute's annual **Science Festival**, a bustling and colorful celebration of science and technology featuring presentations, competitions, shows, workshops, observations, tours, lectures and demonstrations – all aimed at children and youth as well as at people of all ages curious about the world around us. Thousands of visitors attend the festival each year.

The Weizmann Institute's **Science Teaching Department** works to raise the level of science education in junior and senior high schools within Israel's education system. Department members design new curricula, experiment with future teaching methods, write textbooks (in Hebrew and Arabic), create games and interactive computer programs and implement special teacher training courses.

Mathematics curricula developed in the Science Teaching Department have been translated into English and adapted to the needs of the educational system in the United Kingdom, where they are being used at the cutting edge of mathematics teaching.

The Weizmann Institute makes a great effort to bring scientific information to the general public. In a friendly, easily accessible format, its Internet site, Weizmann Wonder Wander, **http://wis-wander.weizmann.ac.il**, provides news from the laboratories of the Institute's scientists, and its popular science publications and films vividly portray recent scientific innovations.

ADVANCING ISRAEL

The Institute's contribution is to be found in every corner of Israel and in every area of activity – from security, to education, to the economy.

WEIZAC, one of the world's earliest electronic computers and Israel's first, was designed and built at the Institute, its construction completed in 1954. This computer has recently been recognized as a milestone in the world history of computer development. Following WEIZAC, two Golem computers were built at the Institute in the 1960s, laying the foundation for the software industry in Israel, today one of the country's leading economic sectors. The Institute's Feinberg Graduate School was the first academic institution in Israel to teach computer science.

The Weizmann Institute of Science was the first to introduce cancer research in Israel, the first to build particle accelerators, and the first to establish, in 1959, a technology transfer company – Yeda – that has enriched Israel's economy and driven the country's advanced industries forward.

The first hi-tech park in Israel, Kiryat Weizmann, was established in Nes Ziona on the initiative of the Weizmann Institute. Today it is home to dozens of companies developing and manufacturing pharmaceuticals and other products based on Institute scientists' inventions.
New innovations on the horizon include advanced vaccinations, nanomaterials that might greatly improve the efficiency of various machines, unique molecules and antibodies for advanced medicine, innovative electro-optic components and sophisticated research tools.

Drugs developed at the Institute and already approved for use in different countries include Israel's first ethical (original) drug, Copaxone®, for the treatment of multiple sclerosis, produced and marketed by Teva; another multiple sclerosis drug, Rebif®, produced and marketed by Serono; and a new vaccination for viral liver infection (hepatitis B), to be produced and marketed by Biotechnology General. An original method for bone marrow transplants from mismatched

donors is implemented at a number of hospitals in Israel and abroad, as is a non-invasive method for distinguishing between malignant and benign tumors using magnetic resonance imaging (MRI). Numerous additional drugs, including a treatment for type 1 diabetes and a vaccination for spinal cord injuries, are today in advanced stages of clinical trials.

Institute scientists have developed improved varieties of agricultural crops: protein-rich, high-yield wheat; early-ripening melons; disease-resistant Delilah cucumbers and others.

Electronic encryption systems developed by Institute scientists are being manufactured in Israel and serve, among other applications, for encoding and decoding satellite-TV broadcasts.

These products, manufactured mainly in Israel and sold around the world for billions of dollars a year, bring a great deal of foreign currency into Israel.

Institute scientists have initiated the establishment of technological "incubators" that assist inventors and entrepreneurs in their first steps.

The tradition of Institute scientists holding public service posts goes back a long way:

Dr. Chaim Weizmann, the Institute's founder and first President, served as the first President of the State of Israel. Prof. Ephraim Katzir, who was one of the pioneers of Institute research and headed its Biophysics Department from 1949 to 1973, was Israel's fourth President and a recipient of the Israel Prize in natural sciences.

Institute scientists have served as Chief Scientists in various government ministries and have held such positions as President of the Israel Academy of Sciences and Humanities, Chairman of the Planning and Budget Committee of the Council for Higher Education, Director-General of the Israel Atomic Energy Commission, and Chairman of the National Council for Research and Development.

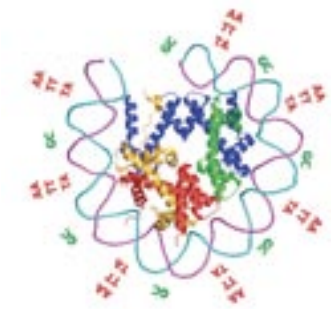
NEW HORIZONS

The Weizmann Institute of Science follows two interconnected avenues of activity. The first, the basic scientific research avenue, helps to shape the future. The second is aimed at enabling people to understand the scientific discoveries exerting a revolutionary impact on our lives and successfully take part in the new world being formed.

To be able to shape a better future, the Institute is continuously developing and constantly changing. On the research front, boundaries between the different disciplines are being torn down and formerly impossible collaborations and combinations are being formed. As in the new global economy, scientific research has reached the stage where all parts of the picture taken together create a whole that is greater than the sum of its parts.

The Weizmann Institute of Science is one of the leading institutions in this worldwide trend. Its unique structure encourages mathematicians, physicists, chemists and biologists to collaborate, create new research fields, lift science to new heights – and determine the face of the future.

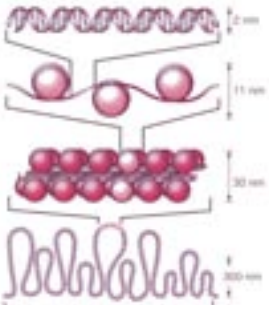
One of many examples is an ambitious multidisciplinary research program the Institute is establishing to advance solutions and alternative strategies for handling the world's energy crisis. Institute scientists seek to make an important contribution to the world effort in this research field. The participation of friends of the Institute in this endeavor could create a synergy that will make this dream a reality.



Another example is the creation of a new scientific field, biomatics – a surprising, exciting and stimulating combination of the life sciences and mathematics. The Weizmann Institute is playing a key role on this scientific frontier, which promises to usher the life sciences and medicine into a new era of deep insights and powerful, innovative medical solutions.

To become successfully integrated into the new world and be able to choose wisely among an ever-expanding array of options, people from different strata of society need to understand the basic principles and concepts of science and technology. What's the difference between an atom and a molecule, a gene and a chromosome, software and hardware? What tasks can be entrusted to a computer? What "cells" lie at the basis of cellular phones? How do drugs work?

People who know the answers to these questions will be able to navigate and manage their lives according to their own priorities and desires. The knowledge will grant them a greater freedom and independence, as well as a better chance to lead an accomplished life. The Weizmann Institute of Science operates dozens of programs intended to grant basic scientific knowledge to all sectors of the population. That's the Institute's contribution to human dignity and freedom.



SUPPORTING NETWORK

The Institute is assisted by a world network of supporting committees that secure its future, provide resources for continuous development and inform the public in Israel and the world at large about the vision and accomplishments of the Institute scientists.

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VISITING THE WEIZMANN INSTITUTE

Come feel the excitement of the scientific discovery taking place in Israel's leading scientific research institute – the Weizmann Institute of Science

- The Barbara and Morris Levinson Visitors Center
- The Weizmann House – the official residence of the first President of the State of Israel, Dr. Chaim Weizmann, and his wife Vera

To arrange visits: 08-934-4500/4499 fax: 08-934-4960

- The Clore Garden of Science
  A unique, outdoor, interactive science museum

To arrange visits: 08-934-4401

For more information on the research done at the Weizmann Institute and further possibilities for visiting the Institute, visit our website:

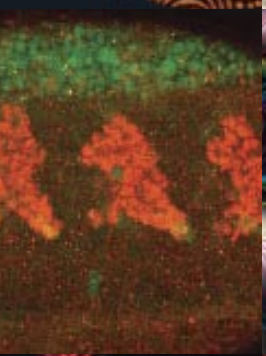
http://wis-wander.weizmann.ac.il

BEAUTY IN SCIENCE

A beautiful environment inspires and stimulates creativity. That's why the Weizmann Institute of Science invests great efforts in nurturing the work environment of the Institute scientists.

Gardens take up 380,000 sq m (94 acres) of the Institute grounds. They include 150,000 sq m (37 acres) of lawns with five types of grass, 180,000 sq m (44 acres) of some 750 kinds of shrubs and 30,000 sq m (7 acres) of orchards. Approximately 1,300 trees of 70 kinds grow on campus.

The Institute's gardens, enjoyed by staff and visitors alike, instill calm and peace of mind. Scattered within them are environmental sculptures – some the work of top Israeli artists, others by foreign sculptors – while several Institute buildings are, in themselves, architectural gems. Even the scientists, in the course of regular research in their laboratories, generate scientific images of great aesthetic delight.



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