

**Connecting people
to the environment,
and the environment
to people.**



From the Negev Desert, For the World

Drylands comprise 40% of the global landmass, ranging from Mediterranean-climate regions to extreme deserts. Drylands have become a “last frontier” for an expanding global population. Currently, more than one-sixth of the Earth’s population lives in drylands and many of these inhabitants depend on the productivity of the land, but are stricken by poverty. A decrease in land productivity, known as desertification, is an ever-growing problem of epidemic dimensions.

Worsening desertification has come about as society in general, policy makers, and even scientists have failed to recognize that dryland environments differ from all other global environments and require specialized approaches.

Committed to “making the desert bloom” through creative thinking coupled to the use of modern technologies, the Blaustein Institutes of Desert Research (BIDR) have earned an international reputation as a leader in the sustainable development of drylands.

The BIDR is based on three individual research institutes, thematic in nature: the French Associates Institute for Agriculture and Biotechnology of Drylands; the Zuckerberg Institute for Water Research; and the new Swiss Institute for Dryland Environmental and Energy Research.

Additionally, the Albert Katz International School of Desert Studies (AKIS, the Swiss funded school) serves as the teaching arm of the BIDR and is a model for desert living. AKIS is home to approx 180 graduate students who come from countries all over the world for special programs in desert studies, seeking the skills and knowledge necessary for the sustainable development of their home countries.

The new Swiss Institute for Dryland Environmental and Energy Research has adopted a cross-disciplinary approach in tackling the challenges of dryland research by integrating the disciplines of physics, mathematics, ecology, social sciences and architecture.



Harmony: An Unconventional Approach

To the general public, “environmental problems” are man-made and result from what people do to the environment with negative consequences: contaminated water; polluted air; a decline in biodiversity; and general land degradation. Accordingly, other environmental research bodies focus on specific aspects of anthropogenic (man-made) desertification.

Ben-Gurion University of the Negev conceived the new Swiss Institute for Dryland Environmental and Energy Research (SIDEER) based on an unconventional approach: connecting people to the environment, and the environment to people. SIDEER was established in order to face current challenges, and in anticipation of future ones.

Researchers strive to:

- Develop renewable energy technologies
- Study dryland ecosystems
- Promote the concept of “desert-appropriate” living

The new Swiss Institute for Dryland Environmental and Energy Research benefits from the rare combination of its unique location in the heart of a desert, but complete with the scientific facilities and logistical support required for modern, sophisticated scientific research. SIDEER has the unique advantage of functioning as a “living laboratory” in the midst of the Negev Desert, coupled with a guiding principle of “research for results”.





Lior Levy, Student
Department of Solar Energy
and Environmental Physics

An Innovative Research Strategy

The Swiss Institute for Dryland Environmental and Energy Research is the first ever institute designed with the explicit purpose of bringing together experts in architecture, anthropology, ecology, physics, and mathematics under a single umbrella for the purpose of specialized desert research.

SIDEER is based on the creative study of phenomena overlooked by other research institutes - topics that fall into the “grey areas” between the established classical disciplines such as biology, physics, and chemistry. Through an integrated and imaginative approach to the study of dryland environments, SIDEER works to improve human well-being in natural and man-made arid settings based on the principles of conservation and sustainable development.

What will this research achieve? Once understanding is achieved regarding the ways the environmental services are provisioned, this new knowledge will result in meaningful and up-to-date recommendations and directives. These guidelines will instruct people and governments, promoting sustainable development and the healthy preservation of the environment.

Three Departments, A Common Mission

The SIDEER has three departments united by the common mission to foster integrated, interdisciplinary approaches for the study of the environment, renewable energies, and the drylands of Israel and the world.

- **The Marco and Louise Mitrani Department of Desert Ecology**
Applications for conservation and environmental protection
- **The Department of Solar Energy and Environmental Physics**
Applications for solar energy and natural resource management
- **The Department of Man in the Desert**
Applications for “desert appropriate” living and lifestyles

Desert Ecology: A Delicate System

Two main goals underpin research at the Marco and Louise Mitrani Department of Desert Ecology: the first is the study of the desert (primarily the Negev Desert) as a model ecosystem and the second is to ensure that departmental experience and expertise are ultimately used for the conservation and prudent, sustainable development of desert habitats. Towards this end, the department has worked with researchers and scientists from Turkey, Jordan, Egypt, and the Palestinian Authority all affected environments and the plants and animals that depend on them.

Research covers a wide range of topics including:

Landscape ecology

the creative use of landscape management to arrest desertification

Conservation ecology

for the preservation of biological diversity

Physiological and behavioral ecology

adaptation strategies for people and drylands

Population dynamics

patterns and processes of desert life, both plants and animals

Integrated ecology

strategies for a healthy ecosystem in desert environments





Dr. Shirli Bar-David, Researcher
Marco and Louise Mitrani
Department of Desert Ecology



Prof. David Faiman, Chair
Department of Solar Energy and
Environmental Physics



Let There Be Light!

The desert has its own unique array of environmental elements characterized by a relatively unpolluted atmosphere, large tracts of open land, bright light, and abundant quantities of solar radiation. Researchers at the Dept. of Solar Energy and Environmental Physics are faced with the challenge of using the unrelenting sunlight as a resource which can be exploited for common benefit.

Scientists specializing in geography, atmospheric physics, engineering, applied mathematics, physics, and chemistry harness their areas of expertise in attempts to solve many of the complex problems that the environment presents. An interdisciplinary team is taking advantage of remote-sensing, to view the earth from above in order to solve the problems below. Data is used in mathematical modeling and computer simulation for the broad areas of climate research, solar energy, and the creative application of remote sensing capabilities.

Specialists in solar energy are actively pursuing solar power development as our brightest hope for an environmentally safe future. Scientists are advancing the use of highly concentrated sunlight for electricity production, materials research (new high-efficiency solar cells), medical applications (such as “solar surgery”), and energy storage.



Prof. Isaac A. Meir, Chair
Department of Man in the Desert

Man in the Desert

The Dept. of Man in the Desert brings together social scientists, architects, and urban planners in one integrated academic framework. Experience proves that sustainable development in drylands requires solutions that are appropriate to the climate and physical environment and are likewise compatible with cultural, socio-economic, and political considerations unique to dryland societies.

Research topics include:

Life-cycle energy efficiency of buildings with an emphasis on passive and low-energy systems for heating and cooling, indoor air quality, and thermal and visual comfort

Urban design and microclimate in built-up areas, focusing on pedestrian thermal stress and resource-efficient landscape strategies

Policy tools for encouraging energy conservation and reducing environmental impact

Behavioral and cultural aspects of resource consumption in built-up environments

In addition to research, the department's specialists in desert architecture are engaged as consultants and designers for selected architectural projects – which are used for monitoring, testing, and analysis, as well as for the public demonstration of accumulated expertise.

Partnering for Success

Excellence can be achieved, but not without investment. To exploit the potential of solar energy and conserve our environmental resources, we need to work hand-in-hand with you to raise the required USD \$5 million development fund for the Swiss Institute for Dryland Environmental and Energy Research.

BGU sees itself as a partner with you in this important endeavor and the University has committed substantial institutional resources for this enterprise. BGU will continue its support of the three academic departments of SIDEER (salaries of all tenured academic and non-academic staff, running costs, infrastructure maintenance, etc.) and is also planning expanded dormitories and other facilities for the Sede-Boqer campus which will serve (among others) the Swiss Institute for Dryland Environmental and Energy Research, stimulating further growth and development.

With funds for research, equipment, international exchange, and scholarships, the new institute can marshal its manifold talents and potential in order to produce new ideas and innovative results leading to new processes and scientific advances for the benefit of all mankind.

Budget Chart (representative costs)	Itemized Cost in USD
Research and Project Funds	250,000
State-of-the-Art Equipment (including laboratory and field equipment)	1,250,000
Infrastructure Upgrade	150,000
Scholarships & Fellowships	
- Graduate Students	2,000,000
- Postdoctoral Fellows	1,000,000
Distinguished Visitors Program	250,000
Workshops, Seminars and Publications	100,000
TOTAL	5,000,000

The Fund will ensure the promotion of both new interdisciplinary activities and outreach activities while maintaining the scientific excellence of the BIDR. It will support the following requirements:

Research and Project Funds: For innovative, interdisciplinary research, and initial expenses required to support young scientists. Funds as “seed money” for young researchers (for equipment, supplies, fieldwork, etc.) as they initiate and conduct proof-of-concept demonstration projects - the key to winning large-scale competitive grants from external funding agencies.

State-of-the-Art Equipment / Upgraded Infrastructure: For large-scale experimental facilities to underpin advanced research and scientific investigation. There is a continuous need to purchase new equipment and maintain capability. The specialized nature of the institute and ongoing developments in the world of research necessitate the need for investment in equipment and infrastructure to support the work of a variety of laboratories and research groups.

Representative equipment needs include: Optical table for solar nano-material production experiments; Helium-neon laser; High performance computing system complete with 30 computer nodes containing dual-core processors.


The equipment and infrastructure will support the work of a variety of laboratories and research groups including: the Advanced Optical System Research Group; the Remote Sensing Laboratory; Laboratory of Conservation Genetics, the Bio-climatic Desert Architecture Group; and the Desert Meteorology Group.

Scholarships and Fellowships: The core resource of any research institute. As the pool of graduate students and post-doctoral fellows is limited, scholarships and fellowships are a crucial tool in attracting the best and the brightest graduate students and post-doctoral fellows to BGU's new institute.

Distinguished Visitors Program: An international dimension - distinguished scientists and researchers from the world over can be hosted, freely interacting with BGU personnel. The new institute would like to be able to sponsor an annual distinguished visitors program. The purpose of such visits will be twofold: to initiate joint research projects and to offer special courses.

Workshops and Publications: For the dissemination of research findings to all relevant stakeholders. As a research body with worldwide relevance and international standing, the institute will host workshops, conferences, seminars, and special events on a range of relevant topics. Funds are needed for a modern, effective website and supplementary publicity material.

Additional funding, from both competitive and philanthropic sources, will be sought to support further activities of the institute. In all cases, BGU will closely supervise the use of funds in order to optimize the allocation and deployment of resources according to the specific needs of the new Swiss Institute for Dryland Environmental and Energy Research.



Prof. Alon Tal, Researcher
Marco and Louise Mitrani
Department of Desert Ecology

Naming Opportunities & Donor Recognition

The commitment and generosity of our donors is aptly recognized in all cases. Naming opportunities and donor recognition comes in many forms: The naming of a physical entity, research fund, or exchange program are just several examples.

A physical entity (e.g. lab) can be named as per the donor's wishes (e.g. in his own name, in memory of a loved one), with a commemorative plaque as a permanent fixture of the named structure. Likewise, a specific program or research fund can be named by a donor thereby linking the donor's name to all literature, presentations, and publications emanating from the sponsored research.

In all cases, donor recognition is always of a fitting and agreed upon manner.

We look forward to working with you in order to support, further, and advance dryland environmental and energy research for the benefit of the whole mankind.

BGU, Technology Transfer, and You

BGU actively pursues the commercialization of University know-how through its technology transfer company, BGN Technologies Ltd.

Working closely with researchers to ensure a successful technology transfer process, BGN Technologies makes use of various mechanisms (commercial patents, technology licensing, and start-up companies) to guarantee BGU know-how makes its way to the marketplace.

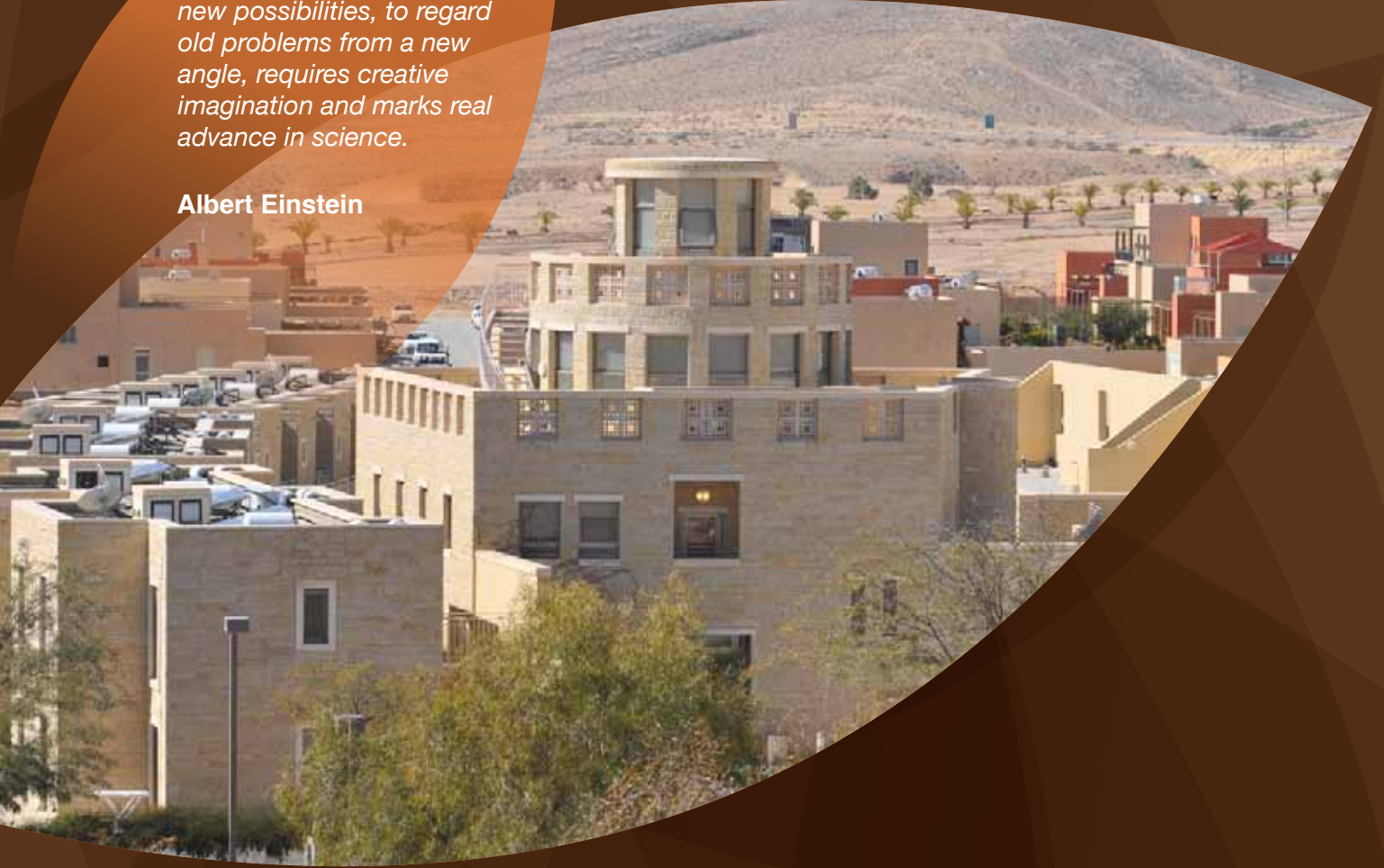
Our major donors are committed to BGU in special ways and BGU makes every effort to reciprocate. In terms of the new Swiss Institute for Dryland Environmental and Energy Research, the University will regularly update major donors concerning the commercialization of research emanating from the new institute, allowing donors to pursue investment opportunities.



Mukherjee Shomen, Student
Department of Man in the Desert

*To raise new questions,
new possibilities, to regard
old problems from a new
angle, requires creative
imagination and marks real
advance in science.*

Albert Einstein



About Ben-Gurion University of the Negev

Created in 1969 with the mandate to bring development to the region, BGU has gained recognition for its unique pioneering spirit that combines outstanding academics and research with a commitment to the community.

With nearly 20,000 students, five faculties and a number of unique research institutes, the University has become a world leader in interdisciplinary research in cutting-edge fields that range from desert studies and solar energy to nanotechnology and from bioengineering to international medicine.

The University is a world leader in arid zone research, offering its expertise to many developing countries. In keeping with its mandate, it plays a key role in promoting industry, agriculture and education in the Negev. Thousands of its students take part in community-oriented activities and special tutoring projects.

Contact

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The University anticipates exciting challenges in innovative fields of research and strives to bring new opportunities to Beer-Sheva and the Negev, while continuing its pursuit of academic excellence and expanding its contribution to the world community.