

# Research and Development

**Prof. Moti Herskowitz**, Vice-President and Dean for R&D

One of the key characteristics of a leading research university is the successful recruitment of the very best new faculty members. In a global economy, recruiting high-quality scientists and scholars requires more than just an excellent reputation: a university must provide a suitable research environment including high caliber graduate students, state-of-the-art infrastructure and attractive start-up packages.

BGU is the fastest growing research institute among Israeli universities. For the academic year of 2009-2010, funding from research grants increased from \$47.5 million in 2008-2009 to \$56.7 million, while the total research budgets increased from \$64.1 million to \$72 million. This is partially due to submission of high-quality research proposals to foreign funding agencies, the most important one being the European Union FP7 Programme. Several faculty members were awarded grants from this prestigious funding body:

- **Prof. Sammy Boussiba**, Landau Family Microalgal Biotechnology Laboratory, French Associates Institute for Agriculture and Biotechnology of Drylands at the Jacob Blaustein Institutes for Desert Research (BIDR) and incumbent of the Miles and Lillian Cahn Chair in Economic Botany in Arid Zones – *genetic improvement of algae for value added products (FP-7 FAB), and for biofuel from algae technologies (FP7-Energy)*;
- **Dr. Eugene Katz**, Department of Solar Energy and Environmental Physics at the National Institute for Biotechnology in the Negev (NIBN) – *Large-area organic and hybrid solar cells (FP7-Energy) for Fullerene-based systems for oxidative inactivation of airborne microbial pathogens (FP7-People)*;
- **Prof. Robert Marks**, Department of Biomedical Engineering and the NIBN – *Crimean Congo hemorrhagic fever; Modern approaches to diagnostics, surveillance, prevention, therapy*

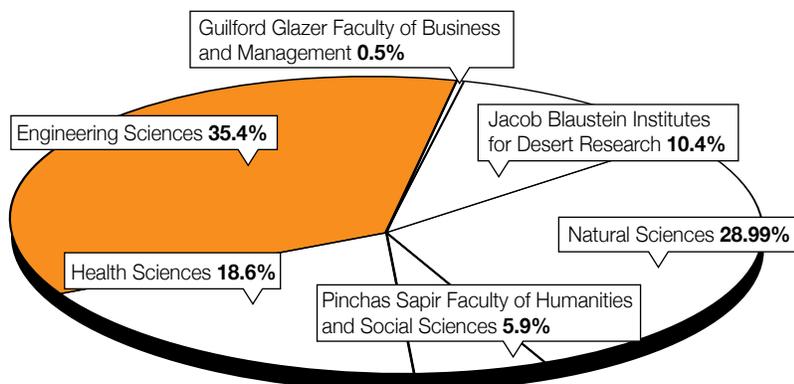
*and preparedness (FP7-Health) and development of a highly sensitive and specific nano-bio-chemo-sensor based on surface-enhanced vibrational spectroscopy through effective optical nano-antennae (FP7-Health).*

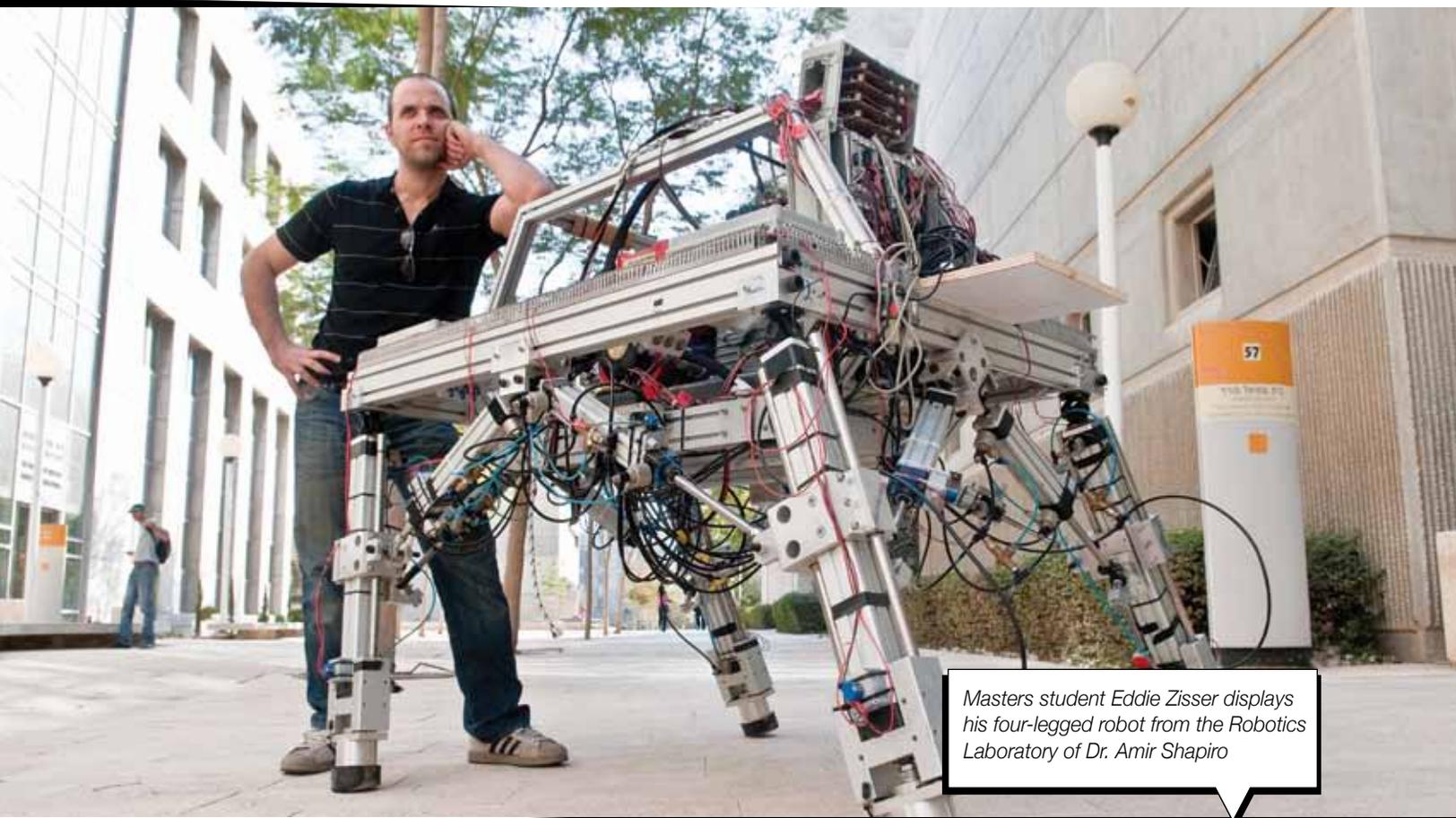
BGU has attracted a number of outstanding young scientists, reflecting the University's success in building an international reputation for excellence and a demonstrated commitment to growth in a number of emerging fields. New researchers recruited over the past five years have already recorded significant accomplishments in terms of prestigious prizes and highly-competitive research grants received, as follows:

Six researchers were awarded prestigious European Research Council (ERC) grants in the three years since they were created. Some 10,000 researchers compete for 250-300 grants annually.

- **Dr. Amir Aharoni**, Department of Life Sciences and the NIBN – *Protein engineering for the study of detoxification enzymes and hub proteins*;
- **Prof. Dr. Ohad Medalia**, Department of Life Sciences and NIBN – *Revealing the molecular architecture of integrin mediated cell adhesion*;
- **Dr. Michael Meijler**, Department of Chemistry, NIBN and the Edmond J. Safra Center for the Design and Engineering of

## Percentage of Grants by Faculty 2009/10





Masters student Eddie Zisser displays his four-legged robot from the Robotics Laboratory of Dr. Amir Shapiro

Functional Biopolymers (Safra Center) – *Chemical elucidation of interkingdom communication pathways;*

- **Prof. Yoav Tsori**, Department of Chemical Engineering and the Reimund Stadler Minerva Center for Mesoscale Macromolecular Engineering and the Ilse Katz Institute for Nanoscale Science and Technology (IKI) and incumbent of the Joseph and May Winston Foundation Career Development Chair in Chemical Engineering – *Phase transitions and chemical reactions in electric field gradients;*
- **Dr. Lital Alfonta**, incumbent of the Elaine S. and Alvin W. Wene Career Development Chair in Biotechnology Engineering at the Avram and Stella Goldstein-Goren Department of Biotechnology Engineering and Safra Center –

*Development of an accessible platform for ex vivo site specific post-translational modifications of proteins;*

- **Dr. Gonen Ashkenasy**, Department of Chemistry and chair of the Safra Center – *Systems chemistry from bottom up: Switching, gating and oscillations in non-enzymatic peptide networks.*

BGU has also demonstrated an extremely high rate of success in awards for young researchers, receiving a significant number of European Commission International Reintegration Grants (IRG).

Three BGU members have received the Wolf Foundation Krill Prize for young researchers: **Prof. Yoav Tsori** and **Prof. Ann Bernheim**, Department of Chemical Engineering and IKI, and

**Dr. Taleb Mokari**, Department of Chemistry and IKI.

The France-Israel Foundation Prize for Young Researchers was awarded to **Dr. Moshe Herzberg**, Department of Desalination and Water Treatment at the Zuckerman Institute for Water Research, BIDR, for Academic Excellence in the Field of Water.

Other significant grants include two U.S. government grants (US-AID MERC) for regional cooperation to:

- **Dr. Moshe Herzberg** for his project *Reclamation of Secondary Effluents with Reverse Osmosis Membranes: Fouling Mechanisms and Control;*
- **Dr. Simona Bar-Haim**, Department of Physiotherapy and **Dr. Amir Karniel**, Department of Biomedical Engineering and the Zlotowski Center for Neurosciences for their

## Research and Development (Cont.)

project *Promotion of a physically active life style in populations of teenagers with cerebral palsy in the Middle East (CP-PALS)*.

Dr. Taleb Mokari received a Morasha Grant for the Absorption of Scientists Returning from Abroad.

Dr. Alberto Bilenca, Department of Biomedical Engineering and IKI, is the first BGU staff member to receive a Bill and Melinda Gates Foundation Grant – awarded for his proposal *Affordable and Fully Noninvasive Point-of-Care Testing of Malaria by a Cellphone*.

Dr. Itzhak Katra, Department of Geography and Environmental Development, is the first BGU researcher to receive an Environment and Health Fund Research Grant for his proposal *Soils as a source for atmospheric particles: A spatio-temporal impact on air quality and human health in the Negev*.

Prof. Varda Shoshan Barmatz, Director of the NIBN, a member of the Department of Life Sciences and incumbent of the Hyman Kreitman Chair in Bio-Energetics was the first BGU faculty member to receive the Leukemia & Lymphoma Society of America Grant with her proposal *Inducing cell death in CLL using VDAC1-based peptides: A novel therapeutic approach*.

The Institute for New Economic Thinking (INET) funded by the Institution for New Economic Thinking selected Dr. Karine Van Der Beek, Department of Economics, to research the evolution of human

capital in England during the Industrial Revolution of the 18th century.

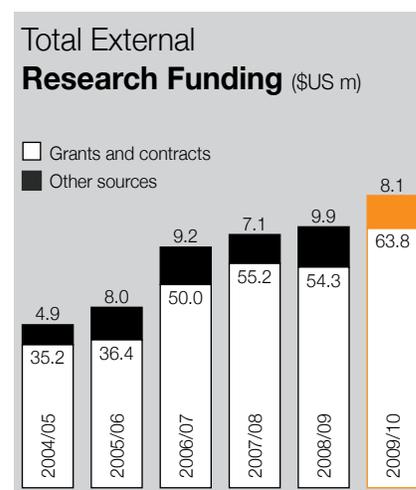
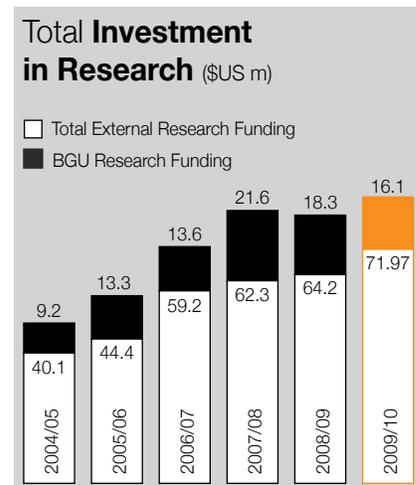
Five grants were awarded from the Israel Science Foundation for a new program for the Humanities in book publishing; Dr. Daniel Unger, Department of the Arts; Dr. Yoran Hanan, Department of General History; Dr. Gidi Nevo, Department of Hebrew Literature; Dr. Adiel Kadari, Goldstein-Goren Department of Jewish Thought; and Dr. Raz Aviad, Department of Sociology and Anthropology.

Several new faculty members who recently joined the University have already been awarded two or three grants simultaneously:

- Dr. Anat Ben-Zvi, Department of Life Sciences and NIBN was awarded a BSF and an IRG grant;
- Dr. Moshe Shechter, Department of Physics was awarded a grant from the ISF and IRG;
- Dr. Eyal Gur, Department Life Sciences and NIBN received a GIF Young grant, a BSF Start-up grant and an IRG grant;
- Dr. Maoz Shamir, Department of Physiology and Neurobiology also received three separate grants; from the ISF the BSF and from the IRG;
- Dr. Yoav Bar-Anan, Department of Psychology, was awarded an ISF grant and an IRG grant;
- Dr. Oren Rigbi, Department of Economics, received a grant from the ISF and an IRG grant.

BGU has also responded to the call from the Israeli Centers of Research Excellence (I-CORE)

to collaborate with other Israeli universities in submitting to the PBC proposals aimed at promoting research in specific fields. BGU was a partner in the submission of four proposals, including Systems-Level Analysis of the Molecular Basis for Human Diseases: From Genomics to Personalized Therapy; Advanced Approaches in Cognitive Sciences; Advanced Topics in Computer Sciences; and Renewable, Sustainable, and Alternative Sources of Energy. The decision is still pending as of April 2011.



# BGN Technologies

BGN Technologies is the University's technology transfer company, responsible for the commercialization of know-how and innovative technologies created by BGU researchers. BGN is responsible for filing patent applications worldwide and managing the University's patent and IP portfolio.

Despite the still weak worldwide economic situation and its impact on R&D budgets in the business arena, 2010 was a good year for BGN and the University in terms of income generated from business entities. A fifteen percent increase in revenue was reported, totaling some \$15 million in royalties and industrial research, representing the highest figure ever.

Among the recent highlights is the agreement signed with PTT Chemical Public Company Limited of Thailand and the Landau Family Microalgal Biotechnology Laboratory (MBL) of the French Associates Institute for Agriculture and Biotechnology of Drylands, to collaborate on the development of the industrial production of dihomogamma-linolenic acid (DGLA – Omega 6) using BGU's proprietary mutant strain of the green microalgae *Parietochloris incisa*. The market potential of DGLA is estimated at \$300 million by 2015.



Masters student Lior Levy at the Ben-Gurion National Solar Energy Center checks the spectral behavior of a photovoltaic panel (Nechamia Hassid)

An effort was made this year to strengthen the University cooperation with the Israeli homeland security industry. Agreements were signed with Elbit, Israel Aviation Industries and its daughter companies, Plasan, Rafael and others.

Beside its classic technology transfer activities, BGN is involved in a number of projects to advance the economic development of the Negev, such as the creation of Bio-Negev – an umbrella organization that promotes biotechnology research and development activities in the region. BGN is also involved in the development of the Advanced Technologies Park adjacent to the Marcus Family Campus.

A significant accomplishment this year included the creation of the technology center for renewable energy. Initiated by the Eilat-Elot municipality and Ben-Gurion University of the Negev, the Arava group recently won a tender from the Israeli Ministry of Industry, Trade and Labor to establish and operate a technology center for renewable energy in the south of the country. The government of Israel and the group will each invest half of \$30 million over a five-year period. The group includes industrial leaders such as Ormat, Elbit Systems and Rafael; leading investment companies, including ProSeed Venture Capital Fund, Direct Insurance Group and the Consensus Business group; academic and research groups such as the Ben-Gurion National Solar Energy Center on the Sede Boqer campus; and the Eilat-Elot Renewable Energy Authority.