This IKI ANNUAL REVIEW and ACTIVITY REPORT for 2016

is based in large part on the official Annual Report (2016) submitted to the International Nano-Science and Nanotechnology Advisory Board (INAB).

The report submitted to INAB this year was both an annual report and a 10-year retrospective. Accordingly, the INAB document was nearly 200 pages in length and extremely detailed and technical in nature.

The purpose of this Annual Review is the presentation of selected activities and accomplishments - based on a lay orientation - in order to give our supporters a general representation of our undertakings.

Accordingly, the original 200-page document has been condensed, and remaining text has been modified. Additional material and graphics have also been added. The result should be an informative overview of representative activities and indicative achievements.

Further details, explanations, specifics, and clarifications will gladly be provided on upon request.

Acknowledgments

The impressive progress of the IKI was only possible due to the generous support of our donors:

- Ruth Flinkman-Marandy
- Henry Weiss Family
- Ernest Scheller, Jr. Family
- Pullyben Foundation – Yoda Leon & Luna Benoziyo
- The Neguev Foundation (Robert Equey & Alain Kostenbaum)
- Marty and Carol Weinberg
- Max and Rachel Javit

Director of the Ilse Katz Institute for Nanoscale Science and Technology

Dear Friends and Supporters of the Ilse Katz Institute for Nanoscale Science and Technology (IKI),

I am proud to present you with this report, which highlights exciting progress and laudable achievements in cutting edge nano-based research and education carried out at the University during 2016, with a bit of a retrospective from the last ten years included as well.

We have made use of representative items and illustrative examples to give you a taste of all that we have done.

On behalf of the faculty, staff, and students of the IKI, I wish to thank you for your inspiration, encouragement, and support. Your partnership underpins all that we have accomplished as outlined in the following pages. In a very meaningful sense, this is your report.

As the Director, I can see ALL that we have done . . . and it is much. However, as Director, I can see ALL that we have left to do . . . and that, too, is much.

My hope for 2017 is the continuation of our journey based on the continuation of support from our partners and friends worldwide.

And of course, I repeat my own personal message which is that I hope to go beyond printed page and host you in person at the IKI in order to show you the “very big world of very small dimensions.”

Come and visit . . . you’ll be amazed.

Yuval Golan, PhD
Professor of Materials Engineering
Director of the Ilse Katz Institute for Nanoscale Science and Technology
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Our Vision

Our vision for the IKI at BGU is its recognized status as a center of world-class scientific research and education based on the continuing development of nanotechnologies and their resultant application to central challenges capable of benefiting the Negev, the State of Israel, and society at-large.

The vision of the IKI is based on three key focal areas of interest:

- Nanotechnology and Energy
- Nanotechnology and Photonics
- Nanotechnology and Human Health

Our Mission

The mission of the IKI is to promote, enable, and support innovative nanoscale research and education at BGU, which will meet the challenges in our focal areas of interest.

To fulfill this mission, the IKI recruits and supports leading researchers, attracts excellent students to this field, establishes and operates enabling infrastructure to facilitate cutting-edge research, promotes industry-academia interactions to focus and implement the research, pursues development activities (seminars, workshops, etc.), and lastly, engages in fundraising to ensure the budgetary resources necessary for the fulfillment of its mission.
The Institute recruited 7 new members to its ranks, all of whom are new appointees to BGU, and who have shown outstanding potential in their abilities to contribute to the totality of IKI research and scientific pursuit. This year too, the Ilse Katz Institute succeeded in adhering to its commitment to hire only “the best and brightest.”

- **Dr. Anat Milo, Dept. of Chemistry.** Dr. Milo’s research combines experimental, computational, and statistical strategies to identify design principles behind molecular functionality, reactivity, and selectivity. In her lab, comprehensive experimental inquiry, complemented by data-intensive physical organic analysis is used to enable the study and optimization of increasingly complex systems [for more information see page 20].

- **Dr. Idan Hod, Dept. of Chemistry.** Dr. Hod’s areas of expertise include Nano-electrochemistry; Electrocatlysis; Photo-Electrochemical Cells; and Photocatalysis for Solar Fuels. The Hod Lab specializes in the Photo-Electrochemistry of Nano-Porous Materials. Dr. Hod works on the direct conversion and storage of energy into chemical bonds so that “solar fuels” can be produced [for more information see page 18].

- **Dr. Yair Kaufman, Dept. of Desalination and Water Treatment.** Dr. Kaufman studies the molecular interactions between interfaces. Two applications of his research are: (1) biomimetic membranes – he investigates the interaction between lipids and proteins in biological membranes, with the objective of using biomimetic membranes for water purification and biosensors; (2) AFM Development – he is designing a new technique to expand the capabilities of commercially available atomic force microscopy [for more information see page 21].

- **Dr. Gil Shalev, Dept. of Electrical and Computer Engineering.** Dr. Shalev was previously employed at Intel’s research labs. Dr. Shalev is currently establishing his own research lab which will focus on: Bioelectronics; Sensors; Solar Cells; and Bio-inspired Photovoltaics. Dr. Shalev has published his worked on Electrostatically Formed Nanowire (EFN) Sensors.

- **Prof. Menny Shalom, Dept. of Chemistry.** Prof. Shalom is working towards the development of new methods to synthesize metal-free materials and earth abundant metals with the needed structure and properties for their utilization in energy-related applications such as, photocatalysis or photoelectrochemical cells (PEC).

- **Dr Natalie Elia, Dept. of Life Sciences.**IKI Recruit from the Ranks of BGU. Dr. Elia investigates the kinetics and three-dimensional architecture of protein complexes specifically, in order to understand broader cellular functions. Dr. Elia makes use of advanced fluorescence light microscopy techniques, quantitative live cell imaging, and super-resolution microscopy to dissect the spatiotemporal behavior of proteins in their intact cellular environment [for more information see page 19].

- **Dr. Raz Zarivach, Dept. of Life Sciences.**IKI Recruit from the Ranks of BGU. Dr. Zarivach is a structural biologist. The Zarivach Lab utilizes various techniques, quantitative live cell imaging, and super-resolution microscopy to dissect the spatiotemporal behavior of proteins in their intact cellular environment [for more information see page 19].

Excellence in science and technology demands excellence in equipment and instrumentation. The acquisition of new and updated advanced scientific equipment and instrumentation is a matter of capacity building and strategic investment for the IKI.

The combination of the “best and the brightest” researchers working with the most advanced scientific equipment is the key to achieving new heights [and new atomic-level resolutions] for the Ilse Katz Institute.

Listed below are several representative examples of equipment acquisitions from 2016 equipment.

All equipment items were carefully chosen in order to leverage IKI capabilities in the chosen focal areas of: Nanotechnology and Energy; Nanotechnology and Photonics; and Nanotechnology and Human Health.

**1**

**Nano-Imprint Lithography System: Nononex Nano Imprint NX B200** Characterized by full wafer, thermal nanoimprinting capabilities with a specialized design to accommodate different sampling sizes and irregular shapes. Installed and commissioned in 2016 and is now up and running.

**2**

**Field Emission Gun Cryo-Transmission Electron Microscope (TEM). FEI Talos 200 keV cryo-FEG (Field Emission Gun).** This high-brightness, high-coherency gun allows large electron probe currents to be focused onto nanometer sized areas of the specimen. Installed and commissioned in 2016 and is now up and running. [See images below from FEI public gallery]
MALDI – TOF Bruker FLEX Series
MALDI – TOF stands for Matrix Assisted Laser Desorption Ionization Time Of Flight. For accurate mass determination and structure identification of bio-molecules. Installed and commissioned in 2016 and is now up and running.

Confocal Microscope Zeiss LSM 880
Airyscan System. Compact confocal laser scanning microscope. The chosen system incorporates fast linear scanning and enables flexible imaging strategies, including molecular dynamics, recording fluorescence at single photon signal levels, and fast parallel spectral acquisition complete with highly sensitive GaAsP detection (GaAsP = Gallium Arsenide Phosphide). Installed and is now up and running.

Spectro-Fluorimeter Horiba Scientific
Fluorolog-3. The system is equipped with excitation energies from the ultra-violet (UV) to the near infrared (IR) range, with ultra-sensitive detection capabilities and temperature control up to 150oC (300o F). Installed and is now up and running.

High Resolution Liquid Chromatography – Mass Spectrometry (LCMS) System
ThermoFisher Scientific Q-Exactive with Waters UPL. For lipids and small molecule analysis with multiple applications in drug discovery, proteomics, environmental safety, and clinical research. Installed and is now up and running.

The Malvern NanoSight NS300 uses the technology of Nanoparticles Tracking Analysis (NTA). This unique technology utilizes the properties of both light scattering and Brownian motion in order to obtain the size distribution and concentration measurement of particles in liquid suspension. A laser beam is passed through the sample chamber, and the particles in suspension in the path of this beam scatter light in such a manner that they can easily be visualized via 20x magnification microscope with mounted a camera.

Prof. Smadar Cohen (Dept. of Biotechnology Engineering) licensed a technology platform involving alginate biomaterials for the treatment of hepatic/liver disorders using a very low viscosity alginate. The technology was developed together with a physician from the Hadassah Hospital and licensed by BGN Technologies Ltd. and ‘Hadasit’ to BioLineRx (Novartis) for further development.

Prof. Hanah Rapaport (Dept of Biotechnology Engineering) established a brand new company, Bone Sci. Ltd., which licensed a technology platform for solution treatment of titanium bone implants with peptides for improving compatibility between titanium implants and bone tissue.

Prof. Rapaport’s research focuses on peptides designed to form self-assembled structures, from monomolecular coating films to hydrogels in context of bone tissue regeneration, and nanoparticles for drug delivery and diagnostics.

Prof. Rapaport is interested in generating functional biomaterials with the objective of acquiring control over biological molecules, to construct systems with varied biological, chemical and physical functionalities, inspired by natural biomolecules.
IKI continued its participation in the EduNano partnership designed to advance and enhance Education in Nanotechnologies. The IKI labs manager, Dr. Tsiona Elkayam-Cohen was responsible for all EduNano activities at BGU and she is deserving of “honorable mention.”

EduNano received funding from Tempus, the European Union’s program in support of modernization for higher education, primarily through university cooperation projects. The EduNano project is aimed at course development for modern skills required for advanced technology employment in the broad-based nanotechnology field.

The IKI made a decision six years ago to adapt to the highly interdisciplinary nature of nanoscience, initiating an interdisciplinary PhD degree program encouraging student mobility across traditional dividing lines. In 2016, one student graduated from this program: Dr. Michael Shtein, who was recruited by Dotz Nano Ltd. to be their Chief Technology Officer (CTO). Three additional PhD students are anticipated to graduate in 2017.

*This is a particular area where donations are needed to ensure continuity... and success!*

**Doctoral Students**

**EduNano**

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**Undergraduates**

Eight outstanding students graduated from the IKI’s specialized undergraduate nanotechnology program in 2016, based on a “double major” program in study, culminating in two distinct B.Sc. degrees: one in Chemistry and one in Chemical Engineering. (Separately, nine students began their undergraduate studies in the program— all with the highest credentials.)

**Specialized Training and Customized Exposure in for Students in Selected Areas**

- Based on the focal area, Nanotechnology and Human Health [Nano-Med], the IKI offered a special graduate course for advanced biological and biomedical characterization techniques, covering both theoretical background and “hands-on” laboratory training.
- On the undergraduate level, advanced students (in the 4th and final year of their studies) were able to complete a research project on nano-ceramic samples using advanced scientific equipment and techniques, e.g. electron microscopy, x-ray scattering, and x-ray spectroscopy.
- The IKI also reached out across campus, and across disciplines, and focused on materials science and characterization as applied to archaeology.
- The IKI also continued with an “open doors” policy which allows for tours and training sessions for Nanoscale Materials Characterization, with a special emphasis on Analytical Techniques.

**Educational activities of the IKI continued as appropriate in 2016, based on well-established precedent.** This included nano workshops and seminars, undergraduate and graduate academic programs in nanoscience/nanotechnology, and the active participation of the IKI in the incorporation of nanoscience modules in the curriculum of relevant departments on campus.

**Educational activities of the IKI continued as appropriate in 2016, based on well-established precedent.** This included nano workshops and seminars, undergraduate and graduate academic programs in nanoscience/nanotechnology, and the active participation of the IKI in the incorporation of nanoscience modules in the curriculum of relevant departments on campus.
Prof. Ira Weinstock (Chemistry) was the corresponding author for a major paper published in *Nature Nanotechnology* entitled “Host–Guest Chemistry with Water-Soluble Gold Nanoparticle Supraspheres.” *Nature Nanotechnology* **12** (2017): 170-176

*Covered by various science sites such as Phys.org, NanoTechWeb.com, among others.*

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Dr. Yonatan Dubi (Chemistry) was a corresponding author for a major paper published in *Nature Chemistry* entitled “Molecular Rectifier Composed of DNA with High Rectification Ratio Enabled by Intercalation.” *Nature Chemistry* **8** (2016): 484-490

*Covered by various science sites such as Phys.org, ScienceDaily.com, Futurism.com, SciNews.com, among many others.*

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A paper co-authored by Prof. Ariel Kushmaro (Biotechnology Engineering) and Robert Marks (Biotechnology Engineering) was featured on the inside cover of *Advanced Materials Interfaces.* The article was entitled “Novel Anti-Adhesive Biomaterial Patches: Preventing Biofilm with Metal Complex Films (MCF) Derived from a Microalgal Polysaccharide.” *Advanced Materials Interfaces* **Vol. 3** (2016): 1500486

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ACHIEVEMENTS OF NOTE

Selected “highlights” as a partial and representative list. All achievements are from 2016.
Prof. Eugene Katz (Solar Energy and Environmental Physics) was an author on a paper entitled "Identifying Fundamental Limitations in Halide Perovskite Solar Cells" which was published in Advanced Materials 28 (2016): 2439-2445.

Prof. Yosi Kost (Chemical Engineering) received a group of honors this past year: He was named Chairman of an Evaluation Committee of the Israel Academy of Sciences and Humanities; he was appointed a Distinguished Professor at BGU; and he received an award for Outstanding Achievement in 'Drug Delivery' Research by a professional society.

Two notable papers were published as a result of the collaborative efforts of Prof. Yuval Golan and Prof. Guy Makov; detailing the discovery of a new semiconducting nanocrystalline binary phase in the tin monochalcogenide system. The first article was published in RSC Advances [RSC for the Royal Society of Chemistry] and the second one in CrystEngComm [abbreviated form of Crystal Engineering Communication].

The Krill Prize for Excellence in Research, as given by the Wolf Foundation, chose Dr. Maya Bar Sadan (Chemistry) as one of the recipients for this important award.
Dr. Idan Hod

Dr. Idan Hod is a new faculty member affiliated with the Dept. of Chemistry, having joined the University in October 2015. After earning his Ph.D. from Bar-Ilan University, Dr. Hod was awarded a prestigious Fulbright Postdoctoral Fellowship, and he accepted a position at Northwestern University. At Northwestern, Dr. Hod focused on metal organic frameworks (MOFs) for photoelectrocatalytic solar fuels and energy applications.

At BGU, Dr. Idan Hod established his own independent research laboratory with a particular focus on the Photoelectrochemistry of Nano-Porous Materials with the objective of generating solar fuels. To do so, the lab makes use of functional, highly porous hybrid organic-inorganic materials based on metal organic frameworks (MOFs), MOF composites, and MOF-derived compounds.

The research is highly interdisciplinary and draws from physical chemistry, electrochemistry, and materials science.

Keywords: Solar Fuels; Photo-Electrochemistry; Porous Materials and Catalysis; Metal–Organic Frameworks; and Photo-Electrocatalysis.

Current projects include:
- Electrocatalysis and Energy Related Reactions
- Photo-Electrochemical Cells and Photoelectrocatalysis for Solar Fuels
- Fundamental Elements of Nano-Electrochemistry

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Dr. Natalie Elia

Dr. Natalie Elia is a new recruit to the Ilse Katz Institute for Nanoscale Science & Technology. She joined BGU in 2012 and is a member of the Dept. of Life Sciences.

Dr. Elia received her Ph.D. from the Hebrew University of Jerusalem, summa cum laude, where she focused on Biological Chemistry. She then received a postdoctoral position at the National Institutes of Health (NIH) in the U.S. Her appointment was with the Institute of Child Health and Human Development. At the NIH, she focused on Cell Biology and Metabolism.

In particular, she worked on advanced scientific imaging techniques including: electron microscopy (EM); atomic force microscopy (AFM); super resolution fluorescent microscopy; and live cell imaging.

At BGU, Dr. Elia is applying her special talents to:
- Dissecting the Spatiotemporal Regulation of Cytokinesis
- Investigation the ESCRT Mechanism [endosomal sorting complexes required for transport]
- Studying the Structural-Functional Role of the Centrosome
Dr. Anat Milo

Dr. Anat Milo was educated in Israel, France, and the United States. Her Ph.D. is from the Weizmann Institute of Science in Chemistry. At Weizmann, she worked on design, synthesis and characterization of novel organic-inorganic chiral materials used as heterogeneous catalysts for enantioselective hydration and oxidation reactions.

She was a Postdoctoral Research Fellow at the University of Utah where she focused on the prediction, optimization, and experimental probing of selectivity in catalysis by multivariate mathematical modeling of free energy relationships for previously unexplored substrate and ligand classes with significant electronic and steric perturbations.

As a member of the IKI, the overarching goal of her research program is an improved and more exact understanding of the structural effects at the origin of chemical reactivity, selectivity, and functionality. To this end, novel parameter systems and data analysis strategies will be applied and developed, allowing the prediction of chemical outcomes and the study of reaction mechanisms. These techniques will be employed in the context of functional organic materials as well as organo-, organometallic, and biomimetic catalytic systems.

Dr. Anat Milo is active in 'Girls Education International.' As a girl growing up, her father taught her about engineering, electrical circuits, plumbing, and instilled in her the sense that anyone can enjoy STEM as long as they aren’t told otherwise.

The Development of Multidimensional Analysis Tools for Asymmetric Catalysis and Beyond

Dr. Yair Kaufman

Dr. Yair Kaufman is a new faculty member with the Dept. of Desalination & Water Treatment (DWT) at the Blaustein Institutes for Desert Research.

Dr. Kaufman received his Ph.D. in Environmental Engineering from Ben-Gurion University of the Negev based on his thesis entitled: "Biomimetic Membranes for Water Purification in Microfluidic Device." He then went on to do postdoctoral research at the University of California Santa Barbra.

Awards and Prizes while a Doctoral Candidate

- 2009 - Eyal Yoel Prize for Outstanding Ecological Research
- 2010 - Award for Excellence in Water Research (for doctoral research)
- 2010 - Prize for ‘Environmentally Friendly Desalination Method’

Dr. Kaufman and the group he leads study the molecular interactions between interfaces. These molecular interactions determine whether the macroscopic interfaces, e.g., air-water interface droplet and air-glass interface, adhere or repel each other. The strength of the adhesion/repulsion between two macroscopic interfaces is manifested in many ways; for instance, the strength of the adhesion determines whether liquids spread or are "pinned" on surfaces, or whether a lipid membrane can (or cannot) self-assemble on a surface.

His primary focal points are:

- Biological and Biomimetic Membranes [Supported Biological Membranes)
- Biological and biomimetic membranes, which can be used as a selective interface (i.e. filtration) and/or an indicative interface (i.e. sensors) and/or preventive for the adhesion of bacteria to the surface (i.e. anti-biofouling).
- Atomic Force Microscope (AFM) Development
- Dr. Kaufman is working to develop a new 'extension' for measuring the absolute distance between an atomic force microscope probe and a surface. This will also allow the measurement of the contact area of the probe and the surface, shedding-light on the molecular interactions between two interfaces.

- Molecular Interactions between Interfaces
- Molecular interactions determine whether the macroscopic interfaces, e.g., air-water interface droplet and air-glass interface, adhere or repel each other.

Molecular Smooth Self-Assembled Monolayer for High-Mobility Organic Field-Effect Transistors

Bidentate H-Bond of catachols on mineral and metal oxide surfaces forming defect-free SAM
The Metro450 consortium is sponsored by the MAGNET program, part of the Office of the Chief Scientist of the Ministry of the Economy. Currently, advanced wafer fabs process 300mm diameter wafers. The industry is determined to follow Moore’s Law in order to respond the need for better performance and lower transistor cost. Moore’s Law demands a miniaturization of the device geometries. Now we have reached the 20 nanometer scale. This progress demands an adoption of new technologies in all steps of manufacturing. The implementation of new solutions has increased the tool’s complexity and cost dramatically.

**Metrology** is the science of measurement. In the semiconductor field, metrology usually refers to the measurement of various critical dimensions. Such measurement determines if the semiconductor device was built properly.

### Pre-Competitive and Long-Term R&D Programs

**MAGNET Instruments**

MAGNET (the acronym in Hebrew for Generic Pre-Competitive R&D) programs encourage collaboration among industrial companies and between the companies and researchers from academic institutions, through several instruments that deal with innovative technologies. Those instruments seek to develop Israel’s industrial infrastructure by supporting the R&D activities and sharing technological knowledge between the participants.

**MAGNET Consortia**

Supports the formation of consortia made up of industrial companies and academic institutions, in order to jointly develop generic, pre-competitive technologies. The duration of a MAGNET Consortium is 3-5 years. Grants are up to 66% of the approved budget for industry and up to 80% for the academic institution. No royalty payments are mandated.

### Work Packages

- WP1 – Wafer Handling
- WP2 – Sampling Optimization
- WP3 – Eliminating Wafer Damage and Contamination
- WP4 – 450mm Standard Calibration Wafer
- WP5 – Fast Data Collection and Processing

The 450Metro Consortium deals with metrology equipment wafer handling, computation, reduction of throughput time, standardization and micro-contamination. All of these and more are at the heart of the Israeli 450Metro Consortium and its worldwide collaboration.
The commercialization of intellectual property is an integral part of BGU’s strategy to promote research in general, and nanotechnology-related research & development in particular. BGN Technologies, the technology transfer company of BGU, is in charge of the examination, application, and implementation of the patents. A special patent committee guides this process. In the past year, 25 new patent applications passed the initial screening stage and advanced to subsequent stages of processing. Additionally, 15 patent applications, filed in prior years, continued to subsequent stages of processing as either national patents (NPs), or, internationally via the Patent Cooperation Treaty (PCT), which allows applicants to seek patent protection internationally and simultaneously for their inventions.

All in all, IKI researchers proved their inventiveness through commercially viable inventions, with one representative example below.

**IKI RESEARCHERS AND THEIR ‘PATENTED’ GOOD IDEAS**

The invention is a system and method for obtaining interference and optical coherence tomography images from an object. The system comprises a wideband source, an optical mask for extending the depth of field, a liquid crystal tunable filter, and a phase modulator all of which are uniquely integrated in a Linnik interferometer microscope. The system has several imaging modes: in the time domain mode, the device may operate either with wideband illumination or with quasi monochromatic illumination. The monochromatic illumination can be varied in wavelength along a wide spectral region thus allowing true spectroscopic imaging in high resolution and with high speed.

**Abstract**

The invention is a system and method for obtaining interference and optical coherence tomography images from an object. The system comprises a wideband source, an optical mask for extending the depth of field, a liquid crystal tunable filter, and a phase modulator all of which are uniquely integrated in a Linnik interferometer microscope. The system has several imaging modes: in the time domain mode, the device may operate either with wideband illumination or with quasi monochromatic illumination. The monochromatic illumination can be varied in wavelength along a wide spectral region thus allowing true spectroscopic imaging in high resolution and with high speed.

**COLLABORATIVE RESEARCH IN ISRAEL**

**Light-Harvesting in Molecular Systems: The Role of Environment in Optimizing the Efficiency of Energy Transfer on the Nanoscale**

Dr. Yonatan Dubi, Dept. of Chemistry, Ben-Gurion Unik.
Prof. Uri Peskin, Dept. of Chemistry, The Technion

Using an open quantum systems approach, the researchers show that partial quantum coherence can lead to substantial enhancement in the power output of the exciton complex. The project is at the forefront of an emerging field in energy science, namely longtime quantum coherence during electronic energy transfer (EET) in biological light-harvesting complexes in photosynthetic systems.

An anticipated breakthrough in understanding EET mechanisms in molecular systems is important not only in terms of basic science, but holds great import in terms of technological promise, including high-efficiency organic photo-voltaic (OPV) cells. Another potential beneficiary is the development of quantum information devices, where controlled long time quantum coherence is of essence. This project addresses one of the critical issues in the theory of light-harvesting in molecular systems: the role of the environment (either the local protein environment at any node along an EET network and/or the arrangement of neighboring nodes on the molecular network).

The central goal is to evaluate the EET properties (power output, efficiency) of molecular light-harvesting systems under various assumptions and approximations for the environment, and to distinguish between universal properties and model-dependent ones. Such a comparative study has never been performed.
IKI was a participant in a Pan-European Science & Research Initiative:

**COST: Co-Operation in Science and Technology**

**StableNextSol**
**Stable Next-Generation Photovoltaics:**
Unravelling Degradation Mechanisms of Organic Solar Cells by Complementary Characterization Techniques

**Objectives**

To create an interdisciplinary network of laboratories and industry, with complementary analytical techniques to study the degradation mechanisms of state-of-the-art Organic Solar Cells to foster the Next-Generation of Organic Photovoltaics.

**Cost Participants from Israel:**
Prof Eugene Katz and Dr Iris Visoly-Fisher

**Working Group Leaders**
WG5 Leader: Prof Eugene Katz

The Action seeks to integrate and generate fundamental knowledge and expertise... aiming to develop new concepts for OPVs that are more stable and reach lifetimes longer than 20 years. The added value of this COST Action will be the contribution of photovoltaic researchers at the European (EU) and international levels along the entire value chain, such that this technology can fulfill its potential and supply clean electricity on a global scale.

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**WORLDWIDE COLLABORATIVE RESEARCH – AN ARRAY OF PROJECTS & COUNTRIES**

**IKI Researcher**  **Country of Information on Collaboration**

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Nano Israel 2016 is held in cooperation with the Israel National Nanotechnology Initiative (INNI), the nanotechnology centers at Israeli universities along with the Ministries of Economy and Foreign Affairs and key industry players.

Meet the Speakers

Prof. Smadar Cohen
Ben-Gurion University of the Negev, Israel

Dr. Iris Visoly-Fisher
Ben-Gurion University of the Negev, Israel

Dr. Ayelet David
Ben-Gurion University of the Negev, Israel

Major presence of the IKI at NanoIsrael 2016 – Featuring a noteworthy booth, invited speakers, multiple posters, and the receipt of a prize for discoveries related to nano-crystals
Contact Person:
Dr. Carmen Segall
The Ilse Katz Institute for Nanoscale Science & Technology
Tel: 972-8-6461246
casegall@bgu.ac.il

www.bgu.ac.il/iki