THE KLACHKY PRIZE

The Klachky Prize for the Advancement of the Frontiers of Science is an annual prize founded by the late Ms. Rachel Klachky.

The prize is awarded to Hebrew University faculty members or academic units for their achievements in:

- The Advancement of Science
- The Advancement of Scientific Research
- The Advancement of Scientific Knowledge
- The Advancement of the Frontiers of Science
- New Academic Developments
- Academic Ventures
Rachel Klachky (1925-2001) was born in Mexico. Married to the late Engineer Manuel Klachky, she was a central figure in the Jewish community of Mexico, and was one of the founding members of the Mexican Friends of The Hebrew University.

In 1997, she received an Honorary Fellowship from The Hebrew University for her outstanding contributions to the State of Israel and The Hebrew University of Jerusalem. She wholeheartedly supported worthy causes, including the absorption of new immigrants, scholarships for students, and support of various scientific research projects, and studies on superconductivity at The Hebrew University.

After she passed away, her sons, Roberto and Leopoldo, continue her legacy of support to The Hebrew University of Jerusalem. The Klachky Prize has been awarded since 2003.
The rapid development of complex and safety-critical systems requires reliable verification methods. Currently, the world already relies on systems generated with technology that is not worthy of our trust.

Prof. Kupferman’s research focuses on automatic synthesis: algorithmic methods for automatically generating correct-by-construction systems from their specifications. Synthesis enables designers to focus on what the system should do—rather than on how it should do it. The correct way to approach synthesis of systems that interact with their environment is to consider the situation as a game between the environment and the system. During each round of the game, the environment provides an assignment to the input signals, the system responds with an assignment to the output signals, and the system wins the game if the computation that the system and the environment generate together satisfies the specification. Thus, correct systems can be viewed as winning strategies in games.

RESEARCH DESCRIPTION

Formal verification of reactive systems

The overarching objective of Prof. Kupferman's research is to develop the theoretical foundations of advanced synthesis, namely to take into account the complex settings in which synthesis is applied and the many considerations that are abstracted in current definitions of the problem. One primary such consideration is the quality and complexity of the synthesized system: we do not want to construct “simply” any system that satisfies the specification—but one that does so at the highest possible quality. We also seek systems with optimal performance in parameters like the energy they consume or the privacy they maintain. Moreover, we want synthesis algorithms to take into account considerations from game theory, in particular the fact that the system and the environment may be composed of several components, each with its own objectives. Finally, especially in the context of autonomous systems—environments are evolving and unpredictable, posing additional challenges to the synthesis problem.
<table>
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<th>Year</th>
<th>Winner</th>
<th>Institute and Faculty</th>
<th>Field</th>
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<tr>
<td>2021</td>
<td>PROF. MAYA TAMIR</td>
<td>The Department of Psychology, The Faculty of Social Sciences</td>
<td>Social-Personality psychology, Emotion &amp; Self-regulation</td>
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<td>2019</td>
<td>PROF. SIGAL BEN-YEHUDA &amp; PROF. ILAN ROSENSHINE</td>
<td>The Microbiology and Molecular Genetics Department, The Institute for Medical Research Israel-Canada, the Faculty of Medicine</td>
<td>Widespread Bacterial CORE Complex, Executes Intra- and Inter-Kingdom, Cytoplasmic Molecular Trade</td>
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<td>2018</td>
<td>PROF. OREN FROY</td>
<td>The Institute of Biochemistry Food Science and Nutrition, The Robert H Smith Faculty of Agriculture, Food and Environment</td>
<td>Interplay between the Circadian Clock and Metabolism</td>
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<td>2017</td>
<td>DR. KARIM ADIPRASITO</td>
<td>Einstein Institute of Mathematics, Faculty of Science</td>
<td>Interplay between Combinatorial and Continuous Structures in Mathematics</td>
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<td>2016</td>
<td>PROF. NATHALIE Q. BALABAN</td>
<td>Racah Institute of Physics, Faculty of Science</td>
<td>Biological Physics of Self-Replication</td>
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<td>2015</td>
<td>PROF. RE’EM SARI</td>
<td>Racah Institute of Physics, Faculty of Science</td>
<td>Understanding Our Universe</td>
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<td>2014</td>
<td>PROF. MICHAL BIRAN</td>
<td>Departments of Asian Studies, and Islamic and Middle Eastern Studies, Institute of Asian and African Studies, Faculty of Humanities</td>
<td>Inner Asian History: Mobility Empire and Cross-Cultural Contacts in Mongol Eurasia</td>
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<td>2013</td>
<td>PROF. ROI BAER</td>
<td>Institute of Chemistry and Fritz Haber Minerva Research Center for Molecular Dynamics, Faculty of Science</td>
<td>Developing New Theoretical and Computational Techniques that Enable Determination of the Energy Levels of Charge Carriers in Large Molecular Systems and Nanocrystals</td>
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<td>2012</td>
<td>DR. ERAN MESHORER</td>
<td>Department of Genetics, Silberman Institute of Life Sciences, Faculty of Science</td>
<td>Using Genome-Wide Approaches and Sophisticated Imaging Techniques to Understand Genome Plasticity in Stem Cells</td>
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<td>2011</td>
<td>PROF. DAVID WEISBURD</td>
<td>Institute of Criminology, Faculty of Law</td>
<td>Pioneering Research on White Collar Crime, Policing, and Crime Prevention</td>
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Previous Winners

2010
PROF. MERAV AHISSAR
Department of Psychology and Program in Cognitive Sciences, Faculty of Social Sciences
The Neuro-Cognitive Basis of Reading Disability - The “Anchoring-Deficit” Hypothesis

2009
PROF. ISAIAH TUVIA (SHY) ARKIN
Department of Biological Chemistry, Silberman Institute of Life Sciences, Faculty of Science
Structural Biology of Membrane Proteins, Focusing on Pathogen’s Ion Channels and Ion Pumps

2008
PROF. URI BANIN
Institute of Chemistry and the Center for Nanoscience & Nanotechnology, Faculty of Science
Major Advancements in the Science and Technology of Nanocrystals and the Development of Hybrid Multifunctional Nanoparticles

2007
PROF. HOWARD (CHAIM) CEDAR
Department of Developmental Biology and Cancer Research, Institute for Medical Research Israel-Canada, Faculty of Medicine
Establishing the Cornerstone of Epigenetics and Its Role in Human Development
THE KLACHKY PRIZE
FOR THE ADVANCEMENT OF THE FRONTIERS OF SCIENCE
At The Hebrew University of Jerusalem
June 2022

The Hebrew University of Jerusalem
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