

האקדמיה הלאומית הישראלית למדעים The Israel Academy of Sciences and Humanities





ADAMS CONFERENCE 2019 2019 כנס אדמס

February 2019 פברואר



ADAMS CONFERENCE

Wednesday, February 6, 2019

כנס אדמס

יום רביעי, ב' דר״ח אדר א׳, תשע״ט

	Morning Session	מושב בוקר
9:30-10:00	Gathering and Refreshments	התאספות וכיבוד קל
10:00-10:10	Prof. Moshe Oren, Academy Member, Chair of the Adams Committee – Introduction	פרופ׳ משה אורן, חבר אקדמיה, יו״ר ועדת מלגות אדמס – הקדמה
10:10-10:30	Prof. David Harel, Vice President of the Academy – Opening Remarks on "Excellence or Professionalism?"	פרופ׳ דוד הראל, סגן נשיאת האקדמיה – דברי פתיחה על ״מצוינות או מקצוענות?״
10:30-11:10	Prof. Naama Barkai, Academy Member, Professor of Molecular Genetics, The Weizmann Institute of Science, on "Noise and Robustness in Bio-molecular Circuits"	פרופ׳ נעמה ברקאי, חברת אקדמיה, פרופסור לגנטיקה מולקולרית, מכון ויצמן למדע, על ״רעד ויציבות במעגלי חישוב ביולוגיים״
11:10-11:20	Questions & Answers	שאלות ותשובות
11:20-12:00	Prof. Moti Segev, Academy Member, Distinguished Professor of Physics, The Technion, on "Topological Photonics"	פרופ׳ מוטי שגב, חבר אקדמיה, פרופסור מחקר לפיזיקה, הטכניון על ״פוטוניקה טופולוגית״
12:00-12:10	Questions & Answers	שאלות ותשובות
12:10-12:50	Prof. Yosef Yarden, Academy Member, Professor of Molecular Cell Biology, The Weizmann Institute of Science, on "The Current State of Cancer Research and Therapy"	<mark>פרופ׳ יוסף ירדן</mark> , חבר אקדמיה, פרופסור לביולוגיה מולקולרית, מכון ויצמן, על ״מחלת הסרטן: אתמול, היום ומחר״
12:50-13:00	Questions & Answers	שאלות ותשובות
13:00-14:00	LUNCH Afternoon Session	ארוחת צהריים מושב אחר הצהריים
14:00-14:40	Prof. Elon Lindenstrauss, Academy Member, Professor of Mathematics, The Hebrew University of Jerusalem, on "Dynamics and Geometry of Numbers"	פרופ׳ אילון לינדנשטראוס, חבר אקדמיה, פרופסור למתמטיקה, האוניברסיטה העברית, על ״דינמיקה וגיאומטריה של מספרים״
14:40-14:50	Questions & Answers	שאלות ותשובות
14:50-15:30	Prof. Yoel Rak, Academy Member, Professor of Anatomy and Human Evolution, Tel Aviv University, on "Evolution of the Human Brain: The Fossil Evidence"	פרופ' יואל רק, חבר אקדמיה, פרופסור לאבולוציה ולאנטומיה, אוניברסיטת תל אביב על "אבולוציית מוח האדם: עדות
15:30-16:30	Tour of the Academy's Exhibition on Evolution Guided by Prof. Rak	הנזאובנים סיור מודרך ע״י פרופ׳ רק בתערוכת האקדמיה לאבולוציה





Greetings from Prof. Moshe Oren

Academy Member, Chair of the Adams Fellowships Steering and Approval Committee

Warm greetings to all our Adams Fellows, Adams Alumni, Adams Committee Members, Academy President Prof. Nilli Cohen, Academy Vice-President Prof. David Harel, Academy Members and dear members of the Adams family.

Marcel Adams, who generously established the Adams Fellowships Program, was born in 1920 and lived in Europe through the years of the Second World War and the Holocaust. He never had a chance to complete his formal education, but this only increased his excitement for learning and his admiration for human knowledge. As a strong supporter of Israel, it was therefore only natural for him to decide that he should invest in advancing knowledge in this country. And what better way is there than investing in our future generation of scientific leaders?

This entrusts you, Adams Fellows, with a special mission: you are expected not only to advance your own career, but also to fulfil a dream – Marcel's dream of making Israel a hub of scientific excellence and a powerhouse of human knowledge.

We, members of the Adams Committee, make every effort to ensure that we pick the best of the best. You, in turn, should never let your curiosity and your passion for knowledge fade out. And when your time comes to be mentors to the next generation of students, please make sure that you keep their passion as intense as yours and that they remain driven by curiosity and not by convenience. Indeed, we are beginning to see new Adams Fellows whose mentors were earlier recipients of Adams Fellowships and as committee members this gives us great joy. I hope that whoever stands on this podium ten or twenty years from now will be greeting your students. In the meantime, I would like to wish you all a lot of satisfaction in your scientific endeavors and in moving successfully to the next stages of your career.

Sincerely,

M. Oren Moshe Oren



Prof. David Harel

Academy Vice President, Professor of Computer Science, The Weizmann Institute of Science

Professor David Harel is the Vice President of the Israel Academy of Sciences and Humanities, and has been at the

Weizmann Institute of Science since 1980. He was Department Head from 1989 to 1995, and was Dean of the Faculty of Mathematics and Computer Science between 1998 and 2004. He was a co-founder of I-Logix, Inc., which is no part of IBM.

He received his PhD from MIT in 1978, and has spent time at IBM Yorktown Heights, and sabbaticals at Carnegie-Mellon University, Cornell University and the University of Edinburgh. In the past he worked mainly in theoretical computer science (logic, computability, automata, database theory), and he now works mainly on software and systems engineering, modeling biological systems, and the synthesis and communication of smell. He is the inventor of the language of Statecharts and co-inventor of Live Sequence Charts (LSCs), and was part of the team that designed the tools Statemate, Rhapsody, the Play-Engine and PlayGo.

He devotes part of his time to expository work, including series on Israeli radio and TV, and some of his writing is intended for a broad audience (see, for example, *Computers Ltd.: What They Really Can't Do* (2000, 2012), and *Algorithmics: The Spirit of Computing* (1987, 1992, 2003, 2012).

He has received a number of awards, including the ACM Karlstrom Outstanding Educator Award (1992), the Israel Prize (2004), the ACM Software System Award (2007), the Emet Prize (2010), and five honorary degrees. He is a Fellow of the ACM (1994), the IEEE (1995) the AAAS (2007) and the EATCS (2016), a member of the Academia Europaea (2006) and the Israel Academy of Sciences (2010), and a foreign member of the US National Academy of Engineering (2014), and the American Academy of Arts and Sciences (2014).

He is an ardent peace and human rights activist, and his main hobbies are photography and choir singing.





Prof. Naama Barkai

Academy Member, Professor of Molecular Genetics, The Weizmann Institute of Science

Professor Naama Barkai was born and raised in Jerusalem. During her doctoral studies in the Physics Department of

the Hebrew University, she became interested in biological computation systems and began using tools of statistical physics to study models of neural networks. Her interests then shifted to computation systems that function within cells, and she joined a group at Princeton University that was studying a bacterial sensing system. Her theoretical studies, and the experimental studies that followed, established this bacterial sensing pathway as a main model for systems biology studies.

Barkai joined the Weizmann Institute in late 1999, just as the genomic revolution was getting underway. She was fortunate to be among the physics-trained biologists who were applying tools and concepts from the quantitative sciences to study how cellular computation systems are designed. This group was the founding core of the emergent field of systems biology. Barkai's work contributed to two subfields of systems biology: understanding the design principles of biological circuits on a relatively small scale, and understanding principles of gene expression at the genomic level. A central contribution of Barkai's work is the formulation and application of the robustness principle. Biological circuits, in contrast (perhaps) to man-made computation devices, work within what is inherently a highly noisy environment, as manifested in different dimensions. The robustness principle suggests that the biological circuits selected by evolution are robust; that is, they perform their function reliably in a noisy environment, showing minimal dependency on the kinetics of quantitative parameters. Over the years, Barkai has applied this principle to reveal design principles and operational mechanisms of multiple circuits that work in diverse contexts. In particular, her work has revealed mechanisms that function during multicellular development to pattern the body plan.

Barkai is a faculty member in the Department of Molecular Genetics at the Weizmann institute. She has received several awards in recognition of her work, including the EMBO award for Women in Science and the Rothschild Prize.



Prof. Mordechai (Moti) Segev

Academy Member, Distinguished Professor of Physics, The Technion - Israel Institute of Technology

Professor Moti Segev is the Robert J. Shillman Distinguished

Professor of Physics, at the Technion, Israel. He received his BSc and PhD from the Technion in 1985 and 1990. After his postdoc at Caltech, he joined Princeton as Assistant Professor (1994), becoming Associate Professor in 1997, and Professor in 1999. Subsequently, Moti went back to Israel, and in 2009 was appointed as Distinguished Professor.

Moti's interests are mainly in nonlinear optics, photonics, solitons, sub-wavelength imaging, lasers, quantum simulators and quantum electronics, although he finds entertainment in more demanding fields such as basketball and hiking. He has won numerous international awards, among them the 2007 Quantum Electronics Prize of the European Physics Society, the 2009 Max Born Award of the Optical Society of America, and the 2014 Arthur Schawlow Prize of the American Physical Society, which are the highest professional awards of the three scientific societies. In 2011, he was elected to the Israel Academy of Sciences and Humanities, and in 2015 he was elected to the National Academy of Science (NAS) of the United States of America. In 2014 Moti Segev won the Israel Prize in Physics (highest honor in Israel).

However, above all his personal achievements, he takes pride in the success of his graduate students and postdocs, among them 21 are currently professors in the USA, Germany, Taiwan, Croatia, Italy, India and Israel and many hold senior R&D positions in industry.





Prof. Yosef Yarden

Academy Member, Head, Department of Biological Regulation; Director, Dwek Institute for Cancer Therapy Research, MICC, The Weizmann Institute of Science

Born in Israel, Prof. Yosef Yarden received his BSc in biological and geological sciences from the Hebrew University of Jerusalem (1980), and a PhD in molecular biology from the Weizmann Institute of Science (1985). His postdoctoral training was undertaken at Genentech, Inc., in San Francisco and at the Massachusetts Institute of Technology. In 1988, he joined the Weizmann Institute of Science's faculty. At the Institute, he has served as Dean of the Faculty of Biology (1997-1999), Vice President for Academic Affairs (1999-2001), the first Director of the MD Moross Institute for Cancer Research (1999-2001) and Dean of the Feinberg Graduate School (2001-2007). He is the new director of the Institute for Cancer Therapy Research of the Moross Integrated Cancer Center and became the head of the Department of Biological Regulation in June, 2017. He is the Harold and Zelda Goldenberg Professor of Molecular Cell Biology.

Prof. Yarden's research focuses on a vital family of proteins called "growth factors," hormone-like molecules that play a critical role in embryo development and in wound healing; and, particularly, on a group of four membrane-bound cellular proteins known as "epidermal growth factor receptors." His research is helping to shed light on the way growth factors and their receptors promote tumor growth. Prof. Yarden discovered the function of a molecular amplifier, called HER2, that strengthens the chemical signals that cause cells to become cancerous. This amplifier is an enzyme and a receptor found in large quantities on cancerous cell membranes, especially in breast, ovary, and gastric tumors. This finding established a foundation for new cancer treatments based on "silencing" the molecular amplifier.

From 2011 till 2014 Prof. Yarden served as President of the Federations of Israeli Societies of Experimental Biology (FISEB/ILANIT). Among his many honors and awards are the Israel Prize in Life Sciences (2017), the EMET Prize in Biochemistry (2007), the 43rd Leoplod Griffuel Award of Fondation ARC pour la Recherche sur le Cancer (2015), the Susan G. Komen for the Cure® Brinker Award for Scientific Distinction in Basic Research (2012), the Ernst W. Bertner Memorial Award of the University of Texas' MD Anderson Cancer Center (2010), the 2008 Hamilton Fairly Award of the European Societies of Clinical Oncology (ESMO), the MERIT award of the U.S. National Cancer Institute (2005), the TEVA Founders Prize (2004), and the Michael Bruno Prize of the Yad Hanadiv (Rothschild) Fund (2000). He was elected to the Israel Academy of Science and Humanities in 2007.



Prof. Elon Lindenstrauss

Academy Member, Professor of Mathematics, The Hebrew University of Jerusalem

Professor Elon Lindenstrauss was born in Jerusalem in 1970. He obtained his PhD at the Hebrew University of Jerusalem

under the guidance of Benjamin Weiss in 1999, after also obtaining his BSc and MSc degrees there. Lindenstrauss held positions at the IAS in Princeton, Stanford University and Princeton University before returning to the Hebrew University in 2008 where he is currently a Professor of Mathematics, holding the Alice Kusiel And Kurt Vorreuter University Chair.

Lindenstrauss received several prizes for his mathematical achievements, including the Clore Fellowship, the Long Term Prize Fellowship from the Clay Mathematics Institute, the Erdos Award of the Israel Mathematical Union, the European Mathematics Society Prize, the Fermat Prize, and the Fields Medal. He is a member of the Israel Academy of Sciences and Humanities and the Academia Europaea.

ADAMS FIELD TRIP TO THE GOLAN HEIGHTS May 2018



Adams Seminar June 2018



Prof. Yoel Rak

Academy Member, Professor of Anatomy and Evolution, Tel Aviv University

Professor Yoel Rak teaches anatomy and human evolution at the Sackler Faculty of Medicine, Tel Aviv University, in Israel,

which he joined after completing his PhD at the University of California, Berkeley. Beginning with his doctoral dissertation on the architecture and morphology of the australopithecine face, he has devoted most of his research efforts to understanding facial anatomy and the masticatory system in the hominid record, particularly as related to *Australopithecus* and early *Homo* from eastern and southern Africa (at the early end of the human fossil sequence), and Neandertal and early *Homo sapiens* in the Levant and Europe (at the more recent end).

For the last twenty years, Rak has been engaged in fieldwork in the Hadar region of Ethiopia and in Israel, at the Neandertal sites of Amud and Kebara. By integrating an anatomical approach with functional morphology, Rak hopes to gain a deeper insight into human taxonomy and phylogeny. In 2008 he was elected to the Israel Academy of Sciences.



Adams Seminar, June 2018



