

ADAMS
Fellowships מלגות אדאמס

האקדמיה הלאומית הישראלית למדעים
The Israel Academy of Sciences and Humanities



ADAMS SEMINAR 2015

סמינר אדאמס תשע"ה



Adams Seminar 2015

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Guest Lecturer

Professor Howard Cedar

Academy Member and Israel Prize Laureate in Biology
The Hebrew University of Jerusalem



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Endless curiosity, admits Professor Howard Cedar, has driven him to investigate some of the most fundamental questions in human genetics – about the mechanisms that control the development of the incredibly diverse collection of cells that constitutes the human body. His research, first published back in the late 1970s, not only identified how cells control their development but also initiated a whole new field of science known as epigenetics. What began as fundamental research over three decades ago is now beginning to yield profound insights into the causes of cancer, as well as understanding about a range of genetic diseases.

Cedar immigrated to Israel with his young family just two months before the Yom Kippur War broke out in 1973. He joined the Department of Biochemistry at the Hebrew University-Hadassah Medical School and, during his ensuing career, has received many awards including the Israel Prize, the Wolf Prize in Medicine, the Emet Prize, the Gairdner International Award and the Rothschild Prize. In 2008, he was appointed the University's first Edmond J. Safra Distinguished Professor. Since 2003 he is a member of the Israel Academy of Sciences and Humanities.

Cedar regards his life's research as being "focused on one central idea" concerning how cells select the genetic information they need to function and ignore the rest of the genetic package. He describes the genetic information, or DNA, contained within every cell of our bodies as "an instruction booklet"; his challenge has been to understand how any particular cell uses only a few relevant pages of the book and ignores the rest.

Prof. Cedar's pioneering work in the 1970s — done in collaboration with his current research partner and colleague in the Institute of Medical Research Israel-Canada (IMRIC), Professor Aharon Razin — showed that the DNA becomes partly modified by another chemical, a process known as methylation. This results in only one part of the DNA code being available for the cell to read; in a skin cell, for example, only the instructions for making skin cells are available while the rest of the instructions are methylated and unavailable. "It took time," he says, "to put the whole story together to understand how methylation controls human development." The work has also thrown light on how cells take on specific functions at the very beginning of life. When a human egg cell is fertilized the first bundle of cells produced have the potential to develop into any cell in the human body (none of the DNA is methylated). However, at some stage the cells begin to assume the particular functions that they will have in the new baby — some become liver cells, others become skin, hair, blood, bones.

Of course, hand-in-hand with understanding how the mechanism functions in normal cells have come insights into how it fails in some genetic diseases such as Fragile-X Syndrome. Cedar's most recent work has also discovered that methylation plays an essential role in the development of all cancers.



Introductory remarks by

Professor Ruth Arnon

President of the Israel Academy

I am very pleased to greet our new Adams Fellows for 2015–2016 here at the Israel Academy of Sciences and Humanities. Since the inauguration of the Adams Fellowship Program in May of 2005, 95 Adams Fellows, PhD Students of the highest academic standing, have been inducted. We are happy to introduce this year's new fellows briefly in this brochure.

In the framework of the Adams Fellowship Program, Adams Fellows enjoy sustained financial support for three to four uninterrupted years of doctoral study. In the past year, the amount of the grant was increased to compensate for inflation and currency fluctuation and to maintain the prestige of the Adams Fellowships. The Fellows also enjoy two privileges unique to this graduate student support program. Each Adams Fellow is eligible for an annual international study grant of \$3,000, to be used for active participation in an international scientific conference/workshop, for laboratory study abroad, for international scientific collaboration or to interview for a postdoctoral position, provided the trip is intended to contribute meaningfully to his/her scientific career. Adams Fellows are also given the opportunity to interact with one another and to form a small science community of their own, through initiatives such as invited lectures by renowned scientists at annual seminars, conferences and field trips. We are confident that the Adams Fellowships provide a meaningful contribution to the training of excellent scientists in Israel.

Once again, I would like to extend my heartfelt admiration and appreciation to Mr. Marcel Adams for playing such a meaningful role in the support of Israel's outstanding young scientists. I would also like to congratulate him on the occasion of his 95th birthday and wish him many more years of health and productivity.

ADAMS Fellowship Steering & Selection Committee



Professor Amiram Grinvald,
Chairman



Professor Moty Heiblum



Professor David Kahzdan



Professor Abraham Nitzan



Professor Moshe Oren



Professor Moti Segev

Former Committee Members

Professor Itamar Willner,
Immediate Past Chairman

Professor Chaim Cedar,
Past Chairman

Professor Yoram Groner,
Past Chairman

Professor Yakir Aharonov

Professor Noga Alon

Professor Moshe Moshe

Professor Yosef Shiloh

Professor Yigal Talmi

Professor Jacob Ziv



Professor Amiram Grinvald

Chair of the Adams Fellowships Committee

Dear Friends,

As Chair of the Academic Committee of the Adams Fellowships Program, I am delighted, in opening the traditional Seminar of the Adams Program, to extend my warm greetings to all of the Adams Fellows and particularly to our new fellows.

It is well known that Israel excels in the realm of basic research. Israel, a small country with few academic institutions, has gained international recognition at the highest level for its pioneering and creative research. No other country in the world has attained comparable achievements *per capita*. The nucleus for this success is clearly the brilliant and hard-working emerging scholars who are in the front line of these research efforts. Israel is blessed with a wonderful cadre of top-notch, well informed, highly motivated, mature students, who not only provide the intellectual infrastructure for basic research, but also represent future generations of senior scientists. Not surprisingly, Israeli postdoctoral researchers are highly in demand in the USA and other nations that lead in scientific research. A fraction of these students have today joined the Adams Fellowships Program, and they are sitting with us in this room. These students, together with their gifted colleagues, constitute the foundation of future scientific research in Israel.

The Adams family tree is growing well. This year, as in previous years, the Fellowships Committee was faced with difficult decisions. We had many outstanding candidates, and the competition was tough. Nevertheless, we believe that we have made very good choices. The successful academic appointments of Adams alumni attest to the program's success. I expect to see these young scientists become research leaders in Israel. Ariel Afek, one of our current fellows at Ben-Gurion University, was instrumental in overturning one of the central dogmas of Molecular Biology. In collaboration with colleagues from Duke University, Ariel discovered that Protein-DNA binding can occur in the absence of specific base-pair recognition. These findings were published in the highly esteemed journal *PNAS*.

The Adams Fellows are a real family. Beyond the increased financial backing of the fellows, the program has turned into a social and scientific forum for the exchange of ideas and for collaboration.

This August Mr. Marcel Adams will turn 95! Unfortunately he could not travel to Israel for the Seminar, but I would like to use this opportunity to express our thanks to the man who has had the motivation and the vision to promote science in Israel by funding multiple programs. All of us wish Mr. Adams many more healthy years!

Best wishes,



Amiram Grinvald

ADAMS Seminar 2014



(Top and clockwise)

Professor Ruth Arnon presenting Mr. Adams with the Academy's 94th birthday gift, a silver pomegranate, the Academy's symbol

Mr. Adams with guest lecturer and Nobel Laureate Prof. Dan Shechtman

Mr. Adams and fellows

Mr. Adams and Prof. Arnon granting Rivka Bekenstein her certificate

Prof. Dan Shechtman lecturing on "Quasi Periodic Materials - A Paradigm Shift in Crystallography

Center: Dr. Meir Zadok, Academy Director chairing the event



Marcel Adams

Hebrew-speaking philanthropist Marcel Adams, who escaped from a forced-labor camp in Romania in 1944, fought in Israel's War of Independence and made his fortune in Montreal, has endowed the Adams Fellowship Program to support Israel's brightest doctoral students in the natural and exact sciences each year.

Marcel Adams (Abramovich) was born in Piatra-Neamt, Romania, in 1920. The anti-Semitic regime in Romania during the Holocaust interrupted his studies, triggering a lifelong quest for learning and a zest for the life of the mind. An active member of Hanoar Hazioni in Bucharest, Adams survived forced labor, food shortages and arbitrary harassment by the authorities.

After coming to Israel with the Jewish Agency's help in 1944, Adams settled in Pardes Hanna and participated in the War of Independence. He moved to Canada in 1951 and worked as a tanner before going into real estate. He eventually developed dozens of properties, mostly in eastern Canada, including Galeries de la Capitale, the largest shopping mall in the province of Quebec. With his late wife Annie, he established Tel Aviv University's Adams Institute for Business Management Information Systems and endowed the university's Adams Super Center for Brain Research. Marcel Adams is a Montreal resident, the proud father of four and grandfather of eleven. He remains full of energy and looks at least a decade younger than his 95 years.

Adams officially signed an agreement to establish the Adams Fellowships with the Israel Academy of Sciences and Humanities in Jerusalem in May 2005. The fund is large enough to provide \$1 million annually to outstanding Ph.D. students, covering their full tuition and living expenses throughout four years of study and including funds for attending scientific conferences and workshops abroad. Most recipients are aged 26 to 34.

The easy way would have been to hand over a check, but Adams wishes to pay back his 1944 debt to the Jewish people, which gave him a new identity and hope for rebuilding from the ashes of Europe. The fellowship helps young men and women thrive technologically, scientifically and intellectually. In turn, Adams believes they will carry the flag for the next generation and for future generations.

A professional committee at the Academy reviews applications from doctoral students and chooses the awardees, for study in such fields as organic chemistry, molecular biology, chemistry, mathematics, engineering, physics, genetics, computer science and brain research.

Marcel Adams wishes to help the best and brightest academics, those with tremendous potential for growth, who have demonstrated excellence in both quality of mind and personal character.

This year's newly appointed Adams Fellows represent the Eleventh Cycle of the Adams Fellowship Program.



Omri Azencot

PhD student of Assistant Prof. Mirela Ben-Chen, Computer Science Department, Technion–Israel Institute of Technology

Dissertation topic: Operator Representations in Geometry Processing

Omri Azencot hails from Kiryat Haim. After finishing his military service, he began studying for his BSc at the Technion's Computer Science Department. Shortly thereafter, he became attracted to the beauty of mathematics; this led to his joining the Technion's dual degree program, which enabled him to add more math to his curriculum. Upon completion of his studies, Omri received BSc degrees from both the Mathematics and the Computer Science Departments.

His first encounter with geometric algorithms came during the last year of his BSc studies, when he participated in a research project related to Voronoi diagrams, supervised by Dr. Daniel Reem. Inspired by this project, Omri decided to pursue a graduate degree and is currently in a direct PhD track at the Technion, advised by Assistant Prof. Mirela Ben-Chen. Omri is exploring how mappings between vector spaces (i.e., operators) can be used to create simple yet efficient geometric processing tools. He has collaborated with several researchers from leading institutes in the USA and Europe and has published a number of research papers in prestigious journals.

A teaching assistant in his department, Omri teaches undergraduate courses such as Operating Systems as well as advanced courses related to computer graphics and geometry processing.



Izchak Baruch Goldshtein

PhD student of Prof. Moshe Lewenstein and Prof. Ely Porat, Department of Computer Science, Bar-Ilan University

Dissertation topic: Polynomial Lower Bounds on Algorithms and Data Structures

Izchak Baruch Goldshtein was born and raised in Bnei Brak. From a very young age he was attracted by science and technology. His interest increased after he participated in an excellence program; it revealed fascinating aspects of the scientific world and opened new horizons for him.

Motivated by this interest, Izchak joined the ATUDA (academic reserve) program immediately after high school. Within the ATUDA framework he received his BSc in computer science and mathematics at a young age, graduating from Bar-Ilan University *summa cum laude* with many awards.

Following his graduation, Izchak began his military service in an elite IDF technology unit, where he served more than six years as a cyber-security specialist, a team leader, and a projects officer. During his army duties he garnered several prizes for professional excellence and for the significant role he played in a number of important projects.

During his military service Izchak completed his MSc in computer science at Bar-Ilan University, graduating *summa cum laude*. In his MSc thesis he explored a difficult variant of the famous edit distance problem, which has a wide range of applications, notably those concerning genome rearrangement issues. His work has been published and presented in important international conferences.

Izchak began his PhD studies just as he left the army. Under the joint supervision of Prof. Moshe Lewenstein and Prof. Ely Porat, he investigates polynomial lower bounds on algorithms and data structures. Izchak aims to take a wide perspective on the subject of polynomial lower bounds, which eventually may lead to further, interdisciplinary understanding of the polynomial hardness phenomena. These phenomena are important for learning the limitations of many useful algorithmic tasks. Besides his research activities, Izchak is a teaching assistant in undergraduate courses on algorithms and complexity.



Barak Hirshberg

PhD student of Prof. Benny Gerber, The School of Chemistry,
The Hebrew University of Jerusalem

Dissertation topic: Structure, Interactions and Dynamics of Many-Atom Systems

Barak Hirshberg was born and raised in Jerusalem and attended Boyer High School; his interest in science began there under the influence of his mathematics teacher. After high school, he postponed his military service for three years in order to do a BSc in chemistry at the Hebrew University, as a member of the Amirim Natural Sciences Excellence Program. During this period he was an undergraduate research assistant in the lab of Professor R. Benny Gerber, where he worked on his BSc thesis on the electronic structure and dynamics of all-nitrogen molecules.

After graduating *magna cum laude*, Barak joined the IDF for six years as a theoretical chemist in RAFAEL Ltd. At the same time he studied for his MSc in the group of Prof. Gerber, later transferring to the direct PhD program. Barak has published six papers in international journals, as the leading author of three of them. His most significant contribution is a paper which predicts the existence of a new phase of solid nitrogen, published in 2014 in *Nature Chemistry*. This work brought him the Lise Meitner Prize for an outstanding study in computational quantum chemistry.

One of the main topics addressed in the Gerber Group is the electronic structure and chemical dynamics of atmospherically relevant molecules and processes. Currently, Barak studies the reaction between hot CO₂ molecules impacting on water clusters and surfaces, using *ab initio* molecular dynamics simulations. This reaction is important for the formation of carbonic acid in the oceans, which might lead to ocean acidification.



Michael Kalyuzhny

PhD student of Prof. Ronen Kadmon, Institute of Life Sciences, Department of Ecology,
Evolution and Behavior, The Hebrew University of Jerusalem and Prof. Nadav Shnerb,
Department of Physics, Bar-Ilan University

Dissertation topic: A Theoretical and Empirical Analysis of Factors Affecting the
Dynamics and Structure of Ecological Communities.

Michael Kalyuzhny was born in Novosibirsk, Russia, and immigrated to Israel with his parents during his childhood. He grew up in Haifa on Mount Carmel, where the surrounding forests evoked his passion for nature and the outdoors. As the son, grandson and nephew of scientists, he was a keen reader of science books and attended science camps from an early age. He decided to study biology at The Hebrew University, where he quickly began a modeling project in the laboratory of Prof. Kadmon, investigating the effect of environmental heterogeneity on species diversity. This study, published in *PNAS*, questioned one of ecology's most fundamental concepts: that a heterogeneous environment always promotes species coexistence.

Both Michael's MSc (*summa cum laude*) and his PhD address the dynamic aspects of biodiversity theories. The phenomenon of multiple species coexisting at small spatial scales attracts the attention of every naturalist since it appears to contradict the notion of "survival of the fittest." Many mechanistic theories have been proposed to explain the phenomenon, but they've been scrutinized primarily in terms of their ability to explain "snapshots" of ecological communities. Michael's PhD research will develop methods to examine how well these theories can explain the changes and the dynamics that are observed in several long-term monitored communities. His preliminary results, published in several research papers, indicate that many such communities are much less stable than was previously recognized, and this must be taken into consideration in conservation and management programs.

Michael represented Israel at the Complex Systems Summer School 2014 at the Santa Fe Institute. As a university teaching assistant and a high school lecturer, his goal is to "infect" others with his passions.



Eran Sagi

PhD student of Prof. Yuval Oreg, Department of Condensed Matter Physics, Weizmann Institute of Science

Dissertation topic: Strongly Interacting Topological Phases

Eran Sagi was born in Be'er Sheva but moved at a young age to Tzur Yigal. As he grew up, he became fascinated with physics, which led him to Tel-Aviv University for a BSc in physics.

During his undergraduate years he participated in an academic research project with Prof. Ehud Nakar from the Department of Astrophysics. It rapidly generated interesting results, which were later published in the *Astrophysical Journal*. At the same time, Eran started working with Prof. Eli Eisenberg, who introduced him to the exciting world of condensed matter physics. After graduating *summa cum laude*, Eran's work with Prof. Eisenberg, focused on a unique phase transition that may occur in quasicrystals, evolved into his MSc thesis.

After completing his MSc *summa cum laude*, Eran moved to the Department of Condensed Matter Physics at the Weizmann Institute, where he is currently working toward his PhD under the supervision of Prof. Yuval Oreg. Together they study remarkable electronic phases of matter called topological phases. Specifically, they investigate materials in which interactions between the electrons lead to a qualitatively new behavior that provides a route to fault-tolerant quantum computing. The theoretical analysis and experimental implementation of such strongly interacting topological phases are notoriously difficult.

Eran's main goal is to find ways of constructing these phases from simpler components, such as quantum wires and superconductors, in the hope that this will eventually translate into experimental implementation of these phases.



Ido Sagi

PhD student of Prof. Nissim Benvenisty, Azrieli Center for Stem Cells and Genetic Research, The Hebrew University of Jerusalem

Dissertation topic: Genetic and Epigenetic Regulation in Human Pluripotent Stem Cells

Ido Sagi, a native Jerusalemite, has been drawn to science since he was very young. He attended The Hebrew University High School in Jerusalem, where his major was biology. Following military service in the Israeli Intelligence Corps, he began his study of life sciences at The Hebrew University with an eye towards a career in biomedicine. A participant in the Amirim–Science and Etgar–Life Sciences honors programs, he won the Rector's and Dean's prizes each year for outstanding undergraduate students. He graduated early, receiving his BSc *summa cum laude*.

Ido's interest in experimental genetics led him to become a research student in Prof. Nissim Benvenisty's lab during his first year at university. The Benvenisty group specializes in genetic research using human stem cells, which are extremely useful in modeling human development and disease and which have unparalleled potential for regenerative medicine. Ido has contributed to several studies with important implications for understanding and treating human disorders, published in *Nature*, *Nature Genetics*, and other journals.

Under the supervision of Prof. Benvenisty, Ido is currently pursuing a direct PhD as a member of the Mada–Life Sciences Excellence Program. His research, centered on genetic and epigenetic mechanisms in human pluripotent stem cells, is largely dedicated to determining the regulation and function of imprinted genes. These genes, activated only on the basis of their parent-of-origin inheritance, are instrumental in creating viable individuals; their dysregulation can cause developmental disorders and malignancy. One of Ido's latest projects explored the stability of imprinted genes after the use of different stem cell derivation methods. The work was presented at an international conference and published in *Cell Stem Cell*.

While continuing his research at The Hebrew University, Ido heads an undergraduate honors program course, based on a curriculum he developed, in the Genetics Department.



Yinon Spinka

PhD student of Prof. Ron Peled, Pure Mathematics Department, Tel-Aviv University

Dissertation topic: Mathematical Models of Statistical Mechanics

Yinon Spinka, born in Holon, spent most of his childhood in the United States. When he was twelve, he and his family moved back to Israel and settled in Hod Hasharon. Around this time Yinon became interested in computers and started to learn programming. During his middle school years he joined

Bar-Ilan University's mathematics program for gifted youth, which allowed him to take his final exam in mathematics at the end of 10th grade. Following his scientific bent, he chose physics, electronics and computer science as his high school majors.

After completing his service with the IDF, Yinon began his undergraduate studies in mathematics and physics at Tel-Aviv University. Although he found both disciplines interesting, he gradually shifted his focus towards mathematics. Upon graduating with a BSc *summa cum laude*, he went on to finish an MSc in pure mathematics, also *summa cum laude*. His master's thesis, produced under the supervision of Prof. Ron Peled, dealt with a problem in probability theory with connections to statistical mechanics.

Today Yinon is a PhD student at Tel-Aviv University, where he continues to research problems in the interface between probability theory and mathematical physics. His research, still under the supervision of Prof. Ron Peled, concentrates on models from statistical mechanics, such as the Potts model and the $O(n)$ model, and is directed primarily towards understanding the physical phenomenon of phase transition. Yinon collaborates with researchers both in Israel and abroad and has lectured at several international seminars and conferences.



Adams Conference 2015



Rivka Bekenstein

PhD student of Prof. Mordechai Segev, Faculty of Physics, Technion-Israel Institute of Technology

Dissertation topic: Gravitational Phenomena and Complex Wavepackets in Nonlinear Optical Systems



Sharon Fleischer

PhD student of Dr. Tal Dvir, Dept. of Molecular Microbiology and Biotechnology, Faculty of Life Science, Tel-Aviv University

Dissertation topic: Engineering 3D Cardiac Stem Cell-Based Patches for Treating Heart Diseases



Yannai A. Gonczarowski

PhD student of Prof. Sergiu Hart and Prof. Noam Nisan, Institute of Mathematics, School of Computer Science & Engineering and Center for the Study of Rationality, The Hebrew University of Jerusalem

Dissertation topic: Game Theory and Mechanism Design



Ouri Karni

PhD student of Prof. Gadi Eisenstein, Faculty of Electrical Engineering, Technion-Israel Institute of Technology

Dissertation topic: Ultra-Fast Non-Linear Dynamic Processes in Nanometric Semiconductor Lasers and Optical Amplifiers



Jonathan Mosheiff

PhD student of Prof. Nati Linial, Institute of Computer Science, The Hebrew University of Jerusalem

Dissertation topic: Forbidden Induced Subgraphs and their Structural Implications



Omri Ram

PhD student of Prof. Oren Sadot, Department of Mechanical Engineering, Ben-Gurion University of the Negev

Dissertation topic: Experimental Study of Shock and Blast Wave Interaction with a Rigid Porous Medium.



Einat Seidel Posner

PhD student of Prof. Ofer Mandelbaum, Lautenberg Center for Immunology and Cancer Research, The Hebrew University of Jerusalem

Dissertation topic: Viral Immune Evasion Mechanisms



Eliran Subag

PhD student of Prof. Ofer Zeitouni, Department of Mathematics, Weizmann Institute of Science

Dissertation topic: Extreme Values and Extremal Processes of Gaussian Fields



New Adams Fellows for 2014-2015 in the Academy's Science Garden in front of the Einstein Memorial, with (far left) Dr. Meir Zadok, Mr. Adams, Prof. Ruth Arnon and (far right) Batsheva Shor

ADAMS Fellows 2013-2014



Ariel Afek

PhD student of Dr. David Lukatsky, Department of Chemistry, Ben-Gurion University of the Negev

Dissertation topic: Design Principles and Consequences of Nonconsensus Protein-DNA Binding



Yoav Bauman

PhD student of Prof. Ofer Mandelboim, Lautenberg Center for General and Tumor Immunology, the Hebrew University of Jerusalem

Dissertation topic: Pathogen Recognition by Natural Killer Cells



Ronen Dar

PhD student of Prof. Meir Feder and Prof. Mark Shtaif, School of Electrical Engineering, Tel-Aviv University

Dissertation topic: Information Theory in Optical-Fiber Communications



Anna Frishman

PhD student of Prof. Gregory Falkovich, Department of Physics of Complex Systems, Weizmann Institute of Science

Dissertation topic: A Search for Statistical Laws in Turbulent Systems



Livnat Jerby Arnon

PhD student of Prof. Eytan Ruppin, School of Computer Science, Tel-Aviv University

Dissertation topic: Genome-scale Modelling of Cancer Genetics and Metabolism Towards the Identification of Selective Anticancer Treatments



Assaf Manor

PhD student of Dr. Carmel Rotschild, Faculty of Mechanical Engineering, Technion-Israel Institute of Technology

Dissertation topic: Thermodynamic Light Management for 3rd Generation Photovoltaics



Sivan Refaely-Abramson

PhD student of Prof. Leeor Kronik, Department of Materials and Interfaces, Weizmann Institute of Science

Dissertation topic: A Generalization of the Optimally-tuned Range-separated Hybrid Scheme to the Solid-state



Liran Rotem

PhD student of Prof. Vitali-Milaman, School of Mathematical Sciences, Tel-Aviv University

Dissertation topic: Asymptotic Geometric Analysis: Log-concavity, α -Concavity, Quasi-Concavity



Eitan Schechtman

PhD student of Prof. Hagai Bergman, The Interdisciplinary Center for Neural Computation (ICNC), the Hebrew University of Jerusalem

Dissertation topic: The Neural Correlates of Basal Ganglia Abnormalities in the Chronic Phencyclidine (PCP) Primate Model of Schizophrenia



Avishay Tal

PhD student of Prof. Ran Raz, Department of Computer Science and Applied Mathematics, Weizmann Institute of Science

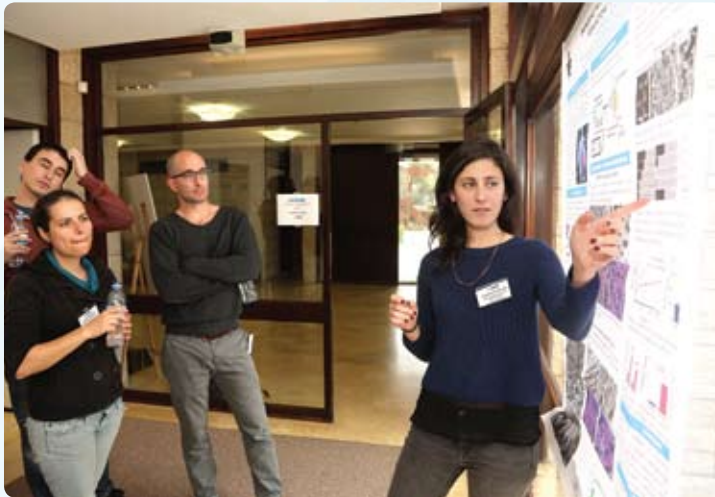
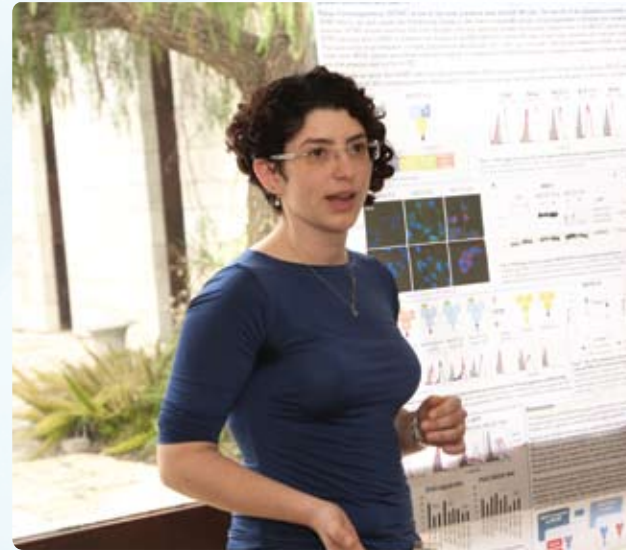
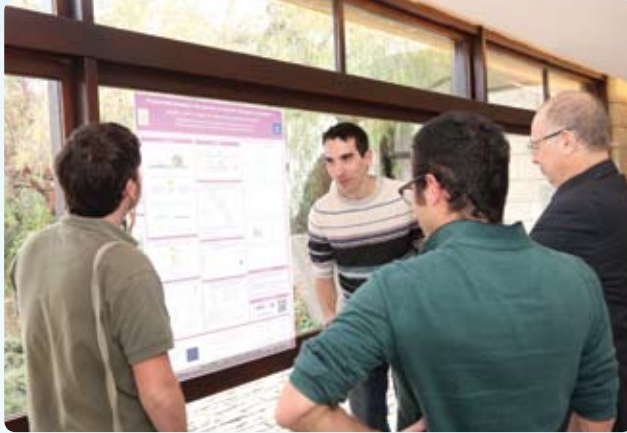
Dissertation topic: Analysis of Boolean Functions in Theoretical Computer Science



Mr. Marcel Adams, Adams Seminar July 2014

POSTER COMPETITION ANNUAL ADAMS CONFERENCE

January 2015





(Upper left and clockwise)

- Ariel Afek
- Einat Seidel Posner
- Rivka Bekenstein
- Anna Frishman
- Liel Sapir
- Yannai Gonczarowski
- Sharon Fleischer
- Center - Ouri Karni



Tslil Ast

PhD student of Dr. Maya Schuldiner, Department of Molecular Genetics, Weizmann Institute of Science

Dissertation topic: Uncovering the Translocation and Quality Control Mechanisms of Glycosylphosphatidylinositol (GPL) Anchored Proteins



Assaf Ben Moshe

PhD student of Prof. Gil Markovich, Department of Chemical Physics, Tel-Aviv University

Dissertation topic: Chiroptical Effects Induced in Metal and Semiconductor Nanoparticles



Miri Krupkin

PhD student of Prof. Ada Yonath, Department of Structural Biology, Weizmann Institute of Science

Dissertation topic: Towards the Determination of the Structure of Mycobacterium Smegmatis Ribosome and Studies on the Properties of the Prebiotic Ribosome



Nir Lazarovich

PhD student of Prof. Michah Sageev, Department of Mathematics, Technion-Israel Institute of Technology

Dissertation topic: Non-positively Curved Homogeneous Polygonal Complexes



Or Ordentlich

PhD student of Dr. Uri Erez, School of Electrical Engineering, Tel-Aviv University

Dissertation topic: Robust Lattice Schemes for Multi-User Communication Networks



Liel Sapir

PhD student of Dr. Daniel Harries, Institute of Chemistry and The Fritz Haber Research Center, The Hebrew University of Jerusalem

Dissertation topic: Modeling Osmolyte-Induced Conformational Changes in Biomacromolecules



David Tsivion

PhD student of Prof. Ernesto Joselevich, Department of Material and Interfaces, Weizmann Institute of Science

Dissertation topic: Guided Growth of Horizontal Nanowires



Erez Zohar

PhD student of Prof. Benni Reznik, School of Physics and Astronomy, Tel-Aviv University

Dissertation topic: Quantum Simulations of Quantum Field Theories

ADAMS CONFERENCE

January 2015



(Top right and clockwise)

Prof. Chava Turniansky on "Hebrew and Yiddish: Two Languages, One Society"

Prof. Itamar Willner, Conference Chair

Prof. David Harel on "Excellence or Professionalism?"

Prof. Jacob Bekenstein on "Thermodynamics: From Steam Engines to Black Holes"





Dmitry Batenkov

PhD student of Prof. Yosef Yomdin, Department of Mathematics, Weizmann Institute of Science

Dissertation topic: Algebraic Reconstruction of Geometric Models from Integral Measurements



Avraham Braun

PhD student of Prof. Jeffrey Gordon, Department of Solar Energy and Environmental Physics, Ben-Gurion University of the Negev

Dissertation topic: The Physics of High Carrier Injection Rates in Concentrator Photovoltaics



Sophia Buhbut

PhD student of Prof. Arie Zaban, Institute of Chemistry, Bar-Ilan University

Dissertation topic: FRET Mechanism Based on Nanomaterials in Dye-Sensitized Solar Cells: Synthesis, Characterization and Applications



Amir Erez

PhD student of Prof. Yigal Meir, Department of Physics, Ben-Gurion University of the Negev

Dissertation topic: Superconductor to Insulator Transition in Thin Films



Daphna Nachmani

PhD student of Prof. Ofer Mandelboim, Lautenberg Center for General and Tumor Immunology, The Hebrew University of Jerusalem

Dissertation topic: MicroRNAs in Immune-Regulation: Viral Mimicry of Host Mechanisms



Amir Nevet

PhD student of Prof. Meir Orenstein, Department of Electrical Engineering, Technion-Israel Institute of Technology

Dissertation topic: Two-Photon Processes in Micro and Nano Semiconductor Structures



Doron Puder

PhD student of Prof. Nati Linial, Einstein Institute of Mathematics, The Hebrew University of Jerusalem

Dissertation topic: The Combinatorial, Algebraic and Topological Aspects of Word Maps



Eran Small

PhD student of Prof. Yaron Silberberg, Department of Physics of Complex Systems, Weizmann Institute of Science

Dissertation topic: Statistical Properties of Light Propagating in Non-Linear Systems



Hadas Soifer

PhD student of Dr. Nirith Dudovich, Department of Physics of Complex Systems, Weizmann Institute of Science

Dissertation topic: Probing Electronic Wavefunctions via High Harmonic Generation



Amir Wand

PhD student of Prof. Sanford Ruhman, Department of Chemistry, The Hebrew University of Jerusalem

Dissertation topic: Investigation of the Photochemistry of Retinal Proteins and Model Systems Using Novel Techniques of Ultrafast Spectroscopy: Resolving the Dynamics as well as Structural Information of the Excited States



Festive 94th birthday celebration with children and grandchildren, July 2014

ADAMS Fellows 2010-2011



Avital Adler

PhD student of Prof. Hagai Bergman, Interdisciplinary Center for Neural Computation (ICNC), The Hebrew University of Jerusalem

Dissertation topic: Value Encoding in the Striatum in View of Serotonin Neurotransmission



Leonid Barenboim

PhD student of Dr. Michael Elkin, Department of Computer Science, Ben-Gurion University of the Negev

Dissertation topic: Efficient Network Utilization in Locality-Sensitive Distributed Algorithms



Arren Bar-Even

PhD student of Dr. Ron Milo, Department of Plant Sciences, Weizmann Institute of Science

Dissertation topic: The Design, Analysis and Testing of Synthetic Carbon Fixation Cycles



Omer Bobrowski

PhD student of Prof. Robert J. Adler, Department of Electrical Engineering, Technion-Israel Institute of Technology

Dissertation topic: Some Topics in the Algebraic Topology of Random Fields



Ronit Bustin

PhD student of Prof. Shlomo Shamai, Department of Electrical Engineering, Technion-Israel Institute of Technology

Dissertation topic: The I-MMSE approach for Multi-Terminal Problems in the Gaussian Regime



Klim Efremenko

PhD student of Prof. Amnon Ta-Shma and Prof. Oded Regev, Department of Computer Science, Tel-Aviv University

Dissertation topic: Algebraic Constructions in Computational Complexity



Yoav Livneh

PhD student of Dr. Adi Mizrahi, Department of Neurobiology, The Hebrew University of Jerusalem

Dissertation topic: Adult Neurogenesis: From Synapse Formation, Through Sensory Coding to Animal Behavior



Itai Roffman

PhD student of Prof. Eviatar Nevo and Prof. Avraham Ronin, The International Graduate Center of Evolution, University of Haifa

Dissertation topic: Studying Suite of Homo Traits in Pan: Supporting Cultural and Genetic Evidence for their Inclusion in Homo Genus



Yoav Oved Rosenberg

PhD student of Prof. Jiwchar Ganor, Department of Geological and Environmental Sciences, Ben-Gurion University of the Negev

Dissertation topic: The Fate of Radium in Evaporitic Systems



Osip Schwartz

PhD student of Dr. Dan Oron, Department of Physics of Complex Systems, Weizmann Institute of Science

Dissertation topic: Nonlinear Microscopy with Nanoparticles



Adi Sheinfeld

PhD student of Prof. Avishay Eyal, Electrical Engineering, Tel-Aviv University

Dissertation topic: Optical Detection of Alzheimer's Disease Via Ocular Spectroscopy



Avital Swisa

PhD student of Dr. Yuval Dor, Department of Developmental Biology and Cancer Research, The Faculty of Medicine, The Hebrew University of Jerusalem

Dissertation topic: Role of LKB1 in Pancreatic Beta Cell Dynamics



Monther Abu-Remaileh

PhD student of Prof. Yehudit Bergman, Human Genetics, The Hebrew University of Jerusalem

Dissertation topic: Understanding the Molecular Mechanism of Oct-3/4 Oncogenicity



Danny Ben-Zvi

PhD student of Prof. Naama Barkai and Prof. Ben-Zion Shilo, Molecular Genetics, Weizmann Institute of Science

Dissertation topic: Scaling and Robustness in Embryonic Development



Oded Berger-Tal

PhD student of Prof. David Saltz, Desert Ecology, Ben-Gurion University of the Negev

Dissertation topic: Movement Ecology of Persian Fallow Deer



Ronen Gabizon

PhD student of Dr. Assaf Friedler, Institute of Chemistry, The Hebrew University of Jerusalem

Dissertation topic: Activating Proteins by Shifting their Oligomerization Equilibrium: A New Approach to Drug Design



Alex Hayat

PhD student of Prof. Meir Orenstein, Electrical Engineering, Technion-Israel Institute of Technology

Dissertation topic: Applications of Multi-Photon Processes for Semiconductor for Quantum Photonics.



Efrat Mashiach

PhD student of Prof. Haim Wolfson and Prof. Ruth Nussinov in Computer Science, Tel-Aviv University

Dissertation topic: Structural Bioinformatics: Flexible Molecular Docking



Or Meir

Phd student of Prof. Oded Goldreich, Theoretical Computer Science, Weizmann Institute of Science

Dissertation topic: Combinatorial Construction of Probabilistic Proof Systems



Moshe Mishali

PhD student of Prof. Yonina Eldar, Electrical Engineering, Technion-Israel Institute of Technology

Dissertation topic: Compressive Processing of Analog Signals



Uri Roll

PhD student of Lewi Stone in Zoology, Tel-Aviv University

Dissertation topic: Spatial Perspectives of Epidemiological and Ecological Problems



Sivan Sabato

PhD student of Prof. Naftali Tishby, School of Computer Science and Engineering, The Hebrew University of Jerusalem.

Dissertation topic: Supervised Learning with Partial Information



Efrat Shema

PhD student of Prof. Moshe Oren, Molecular Cell Biology, Weizmann Institute of Science

Dissertation topic: RNF20 as a Novel Tumor Suppressor: Exploring its Roles in Transcriptional Regulation, Formation and Progression of Cancer, Senescence and Development



Keren Censor

PhD student of Prof. Hagit Attiya, Computer Science, Technion-Israel Institute of Technology
Dissertation topic: Probabilistic Methods in Distributed Computing



Emanuele Dalla Torre

PhD Student of Dr. Ehud Altman, Condensed Matter Physics, Weizmann Institute of Science
Dissertation topic: Strongly Correlated States in Ultra-cold Atoms



Noam Gross

PhD Student of Dr. Lev Khaykovich, Physics, Bar-Ilan University
Dissertation topic: Nonlinear Dynamics and Interactions of Bright Matter-wave Solitons in a Bose-Einstein Condensate.



Ishay Haviv

PhD Student of Prof. Oded Regev, Computer Science, Tel-Aviv University
Dissertation topic: Combinatorics and Theoretical Aspects of Computer Sciences; Complexity of Lattice Problems



Amir Ingber

PhD Student of Prof. Meir Feder, Electrical Engineering, Tel-Aviv University
Dissertation topic: Coding Methods and Bounds for the Bandwidth Limited Regime



Mor Mordechai Peretz

PhD Student of Prof. Shmuel Ben-Yaakov, Electrical Engineering & Computer Science, Ben-Gurion University of the Negev
Dissertation topic: Time Domain Design of Digital Controllers for PWM Converters



Michael Orlov

PhD Student of Prof. Moshe Sipper, Computer Science,
Ben-Gurion University of the Negev

Dissertation topic: Evolutionary Computation



Eran Segev

PhD Student of Dr. Eyal Buks, Electrical Engineering,
Technion-Israel Institute of Technology

Dissertation topic: Back-Reaction Cooling and Quantum Phenomena in
Nanomechanical Resonators



Gil Segev

PhD Student of Prof. Moni Naor, Computer Science, Weizmann Institute of Science

Dissertation topic: The Complexity of Resilient Sketches



Reut Shema

PhD Student of Prof. Yadin Dudai, Neurobiology, Weizmann Institute of Science

Dissertation topic: The Role of PKMzeta in Long Term Memory Storage in the Rat Brain



Yannai Gonczarowski singing opera at Mr. Adams' festive birthday dinner, July 2014

ADAMS Fellows 2007-2008



Avraham Ben-Aroya

PhD student of Dr. Oded Regev and Dr. Amnon Ta-Shma, Computer Science, Tel-Aviv University

Dissertation topic: Quantum Computation and Quantum Information



Shai Carmi

PhD student of Professor Shlomo Havlin, Physics, Bar-Ilan University

Dissertation topic: Complex Networks: Theory and Applications



Chen Davidovich

PhD student of Professor Ada Yonath, Structural Biology, Weizmann Institute of Science

Dissertation topic: Ribosome Structure and Function



Shahar Dobzinski

PhD student of Professor Noam Nisan, Computer Science, The Hebrew University of Jerusalem

Dissertation topic: The Power of Approximations in Mechanism Design



Moshe Goldstein

PhD student of Professor Richard Berkovits, Physics, Bar-Ilan University

Dissertation topic: Interference Effects in Interacting Mesoscopic Systems



Amir Goren

PhD student of Professor Gil Ast, Human Genetics and Molecular Medicine, Tel-Aviv University

Dissertation topic: Inferring Regulatory Elements of Splicing Using Comparative Genomics



Dan Hermelin

PhD student of Professor Gad M. Landau, Computer Science, University of Haifa
Dissertation topic: Algorithmic Challenges in RNA Comparative Analysis



Yoav Lahini

PhD student of Professor Yaron Silberberg, Physics, Weizmann Institute of Science
Dissertation topic: Disordered Nonlinear Systems



Guy Ron

PhD student of Professor Eliezer Piasetzky, Experimental Physics, Tel-Aviv University
Dissertation topic: Measurement of the Proton Elastic Form Factors at Low Q²



Avraham Saig

PhD student of Professor Ehud Ahissar and Dr. Amos Arieli, Neurobiology,
Weizmann Institute of Science
Dissertation topic: Guiding Principles for Sensory Substitution: From Vision to Touch



Alexander Sodin

PhD student of Professor Vitali Milman, Mathematics, Tel-Aviv University
Dissertation topic: Probabilistic Methods in Asymptotic Geometric Analysis

ADAMS Fellows 2006-2007



Haim Beidenkopf

PhD student of Professor Eli Zeldov, Physics, Weizmann Institute of Science
Dissertation topic: Vortex Thermodynamics in High-Temperature Superconductors



Liat Benmoyal Segal

PhD student of Professor Hermona Soreq, Biological Chemistry, and Professor Hagai Bergman, Physiology, The Hebrew University of Jerusalem
Dissertation topic: The Role of the Cholinergic System in the Pathogenesis of Parkinson's Disease



Yael Elbaz

PhD student of Prof. Shimon Schuldiner, Biological Chemistry,
The Hebrew University of Jerusalem
Dissertation topic: Structure-Function Study of Multidrug Transporters



Olga Khersonsky

PhD student of Dr. Dan Tawfik, Chemistry, Weizmann Institute
Dissertation topic: Mechanistic Enzymology: From Classical Tools to Directed Evolution



Dana Moshkovitz

PhD student of Prof. Ran Raz, Mathematics, Weizmann Institute
Dissertation topic: Probabilistically Checkable Proofs



Ariel Procaccia

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The Hebrew University of Jerusalem
Dissertation topic: The Theoretical Foundation of Multi-agent Systems (MAS)



Carmel Rotschild

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Technion-Israel Institute of Technology

Dissertation topic: Soliton Interactions in Nonlocal Nonlinear Media



Ofer Shayevitz

PhD student of Professor Meir Feder, Electrical Engineering, Tel-Aviv University

Dissertation topic: Universal Communications with Feedback



Amir Shlomai

PhD student of Prof. Yosef Shaul, Biochemistry, Weizmann Institute

Dissertation topic: Metabolic Alterations in the Liver and Hepatitis B Virus Gene Expression



Noam Stern

PhD student of Professor Ofer Mandelboim, Immunology, The Hebrew University of Jerusalem

Dissertation topic: Natural Killer (NK) Cells



Festive birthday celebration, July 2014



Yael Eshed-Eisenbach

PhD student of Prof. Elior Peles, Molecular Cell Biology, Weizmann Institute of Science
Dissertation topic: Neuro-Glial Interactions



Nathan Keller

PhD student of Prof. Gil Kalai, Mathematics, The Hebrew University of Jerusalem
Dissertation topic: Probabilistic Combinatorics and its Relations with Harmonic Analysis



Tal Lev-Ami

PhD student of Prof. Shmuel Sagiv, Computer Science, Tel-Aviv University
Dissertation topic: Efficient Transformers for the Verification of Heap Manipulating Programs



Raz Palty

PhD student of Dr. Israel Sekler, Physiology, Ben-Gurion University of the Negev
Dissertation topic: Characterization of the Novel Exchanger NCLX – a FLJ2233 Gene Product



Sharon Schwartz

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Dissertation topic: Nonlinear Optics in CZT:V