

**ADAMS**  
Fellowships מלגות אדמס

האקדמיה הלאומית הישראלית למדעים  
The Israel Academy of Sciences and Humanities



**ADAMS SEMINAR 2017**

סמינר אדמס תשע"ז



# Adams Seminar 2017

## סמינר אדמס תשע"ז

Guest Lecturer

**Professor Menahem Yaari**

Academy Member and Past President  
Israel Prize Laureate in Economics  
The Hebrew University of Jerusalem



## **Professor Menahem Yaari**

Academy Member and Past President,  
Professor of Economics,  
Hebrew University of Jerusalem

Menahem Yaari is Schonbrunn Professor of Mathematical Economics (Emeritus) at the Hebrew University of Jerusalem. In the years 2004-2010 he served as President of the Israel Academy of Sciences and Humanities where

he has been a member since 1991.

Dr. Yaari was born in Jerusalem in 1935, and in 1958 he received a bachelor's degree in economics and philosophy from the Hebrew University of Jerusalem. In 1962, he was granted a Ph.D. in economics and statistics by Stanford University in California. He started his academic career at Yale University, where he served as Assistant Professor and Associate Professor and was a member of the Cowles Foundation for Research in Economics. Later he became Professor of Mathematical Economics at the Hebrew University. He is a founding member of the Center for the Study of Rationality at the Hebrew University, and has served as chair of the Center's Academic Committee from its inception in 1991 until 2004.

Menahem Yaari's research has been mainly in the areas of the economics of uncertainty, consumer theory, and economic justice. He is a Foreign Member of the American Academy of Arts and Sciences, the American Philosophical Society and the Berlin-Brandenburg Academy of Sciences. He is a Fellow of the Econometric Society since 1969 and also a Foreign Honorary Member of American Economic Association. In the period 1985-1992, Professor Yaari was the Director of the Institute for Advanced Studies at the Hebrew University of Jerusalem after which, from 1992 to 1997, he served as President of The Open University of Israel. He is a founding member and co-chair of IPSO (the Israeli-Palestinian Science Organization). In 2000/01 he was a member of the Institute for Advanced Study in Princeton. He was awarded the Israel Prize in 1987, the Rothschild Prize in 1994, and the E.M.E.T. Prize in 2012.



## 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 97 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 Thirteenth Cycle of the Adams Fellowship Program.



## ADAMS Fellowship Steering & Approval Committee



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Greetings from

### **Professor Mordechai (Moti) Segev**

Academy Member, Chair of the Steering  
and Approval Committee

Warm greetings to all the current Adams Fellows, Adams Alumni, Adams Committee, Members of the Israel Academy of Sciences and Humanities, to its President Prof. Nili Cohen, and most of all to the generous Adams Family.

The Adams Fellowship Program attempts to select our very best PhD students, with the clear goal of nurturing the next generation of leading researchers in Israel. Israel is blessed with excellent young researchers, who tend to be more mature and knowledgeable than PhD students in other countries, partly due to the army service, and partly because the respect for knowledge and encouraging curiosity are part of our culture. Very often, our PhD students are also highly motivated, and they tend to have the drive to go after original problems. Creativity – that's the name of the game. I will therefore dedicate this year's welcome greetings to creative thinking.

Let me first describe the need. Israel is a small country, far from the world's center, and our resources generally do not allow us to tackle challenges requiring huge funding. How can an Israeli scientist compete at the cutting edge of the world's research, and quite often win? How can an Israeli researcher lead the world in his or her field?

The answer is simple: think beyond the horizon. Do not compromise for doing secondary work. Do not do follow-up research. Go where no one has gone before.

To a large extent – this kind of thinking is in our culture. It relates to the fact that we tend to be argumentative people. This is reflected in the story about Abraham arguing with God about the destruction of Sdom, with many other Biblical examples, and of course the famous Talmudic arguments and counter-arguments whose traditions last to this day. For at least two millennia, these arguments have enriched our thinking and led us think beyond the horizon.

Nowadays this is reflected in the fact that a very large fraction of the Nobel Laureates in Physics, Chemistry and Economics were Jewish. It is also manifested in the large number of start-up companies in Israel, and in the fact that our economy is blooming in spite of the large expenses on defense and security, which have no comparable case in the Western culture. So the "Jewish secret" on how to think about new creative ideas is to ... argue: argue with your fellow students, and most importantly - argue with your mentors. Do not accept anything for granted. Most often, scientific arguments lead to new discoveries.

Now, let's say you were able to come up with a new idea. How would you know if it's worth going after? How would you recognize its significance?

Here, let me quote my own "scientific father," Amnon Yariv of CALTECH, who used to tell me (when I was a young postdoc): when you evaluate a new idea, think whether it's worth putting on your chest or on your shoulders. On your chest – where you'll wear it like a medal, if it's a fundamental discovery. On your shoulders – where it will help you carry the weight – if it has truly important applications. If it is neither – don't do it. Think about a better idea.

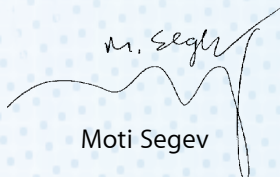
Finally, many times it is not easy to go against the odds, to go after the uncertain, where you may very well fail. It takes courage to take such a risk. This is how science makes progress: by the handful that do take the risk, standing out in front of the masses.

Here, I'd like to add and say that science values creativity more than high grades, originality more than knowledge. Albert Einstein used to say: "Imagination is more important than knowledge, for knowledge is limited to all we know and understand, while imagination embraces the entire world, and all there ever will be to know and understand."

With this, I'd like to wish you all success in your research, imagination to think creatively, good judgement to distinguish between a discovery and secondary work, courage to follow your heart, and persistence to make it happen.

We, the members of the committee that selected you, are hopeful that at least some of you will make huge discoveries, and become the leaders of the next generation of researchers. And - last but far from being least - we sincerely hope that you will do it in Israel!

Best of luck to all of you.



Moti Segev



Introductory remarks by

**Professor Nili Cohen**

President of the Israel Academy

I am very pleased to greet our new Adams Fellows for 2017–2018 here at the Israel Academy of Sciences and Humanities. Since the inauguration of the Adams Fellowship Program in May 2005, 111 Adams Fellows, PhD students of the highest academic standing, have been inducted. Many of them now hold research and teaching positions in major universities and scientific centers. We are happy to introduce this year's eight new fellows briefly in this brochure.

Adams Fellows enjoy sustained financial support for three to four uninterrupted years of doctoral study. The amount of the grant has been 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 international scientific conferences/workshops, 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 and conferences, science communication workshops and field trips. We are confident that the Adams Fellowships constitute a meaningful contribution to the training of excellent scientists in Israel.

I would like to extend my heartfelt admiration and appreciation to Mr. Marcel Adams for playing such a vital role in the support of Israel's outstanding young scientists. I was privileged to meet Marcel Adams and his dear late wife Annie while I was rector of Tel-Aviv University, and I marveled then at their vision and commitment to the advancement of science. It is a great pleasure for me to celebrate Marcel's 97<sup>th</sup> birthday at the Israel Academy! I was happy to meet his family at the Academy, and I remain impressed by their steadfast devotion to the promotion of science. We are deeply grateful to the Adams family and are honored by their outstanding support.

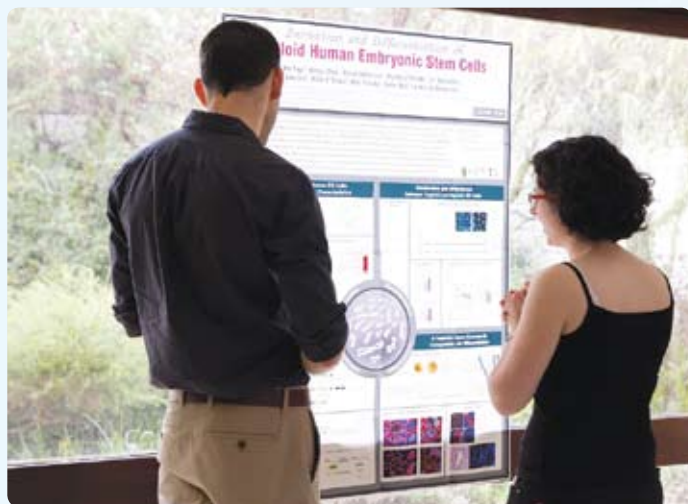
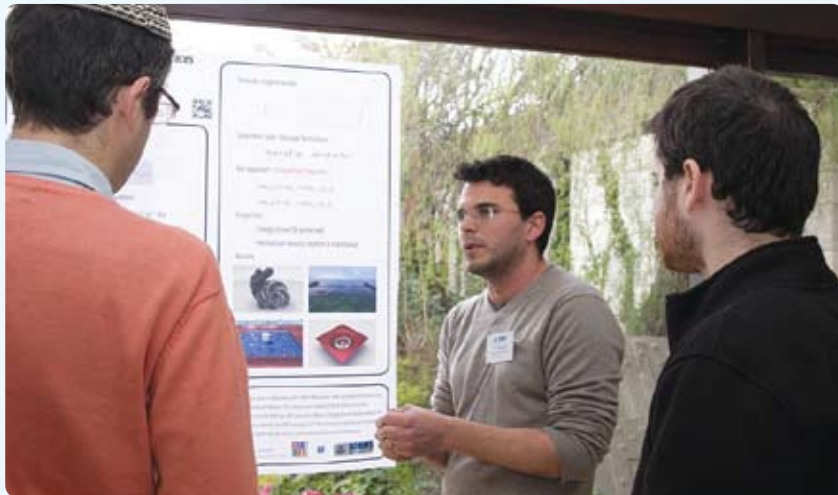


## ADAMS ANNUAL CONFERENCE AND POSTER COMPETITION

January 2017







(Upper left and clockwise)

Prof. Uri Sivan

Prof. Moti Segev granting gift to Prof. Gil Troy

Omri Azencot explaining his poster

Omri Ram

Prof. Ron Milo

Prof. Nili Cohen

Prof. Robert Aumann

Einat Seidel explaining her poster (center)



### Leon Anavy

PhD student of Prof. Zohar Yakhini, Computer Science Department,  
Technion – Israel Institute of Technology

Dissertation topic: Computational Challenges in Synthetic Biology

Leon Anavy was born and raised in Neot Hakikar, a small agricultural village just south of the Dead Sea. From a young age, he was fascinated by the miraculous technology in use on his father's farm, which turned the barren Negev desert into fertile land that yielded exceptional produce. After three years of army service in an intelligence corps technological unit, followed by a short period in the high-tech industry, Leon started his studies at the Technion.

He completed his BSc in industrial engineering and management *summa cum laude* and continued for an MSc in computational biology. Under the supervision of Prof. Itai Yanai of the Technion's Biology Department, he developed computational tools and methods for the analysis of high throughput developmental gene expression datasets. He presented the work at international conferences and published in *Development*. Together with Dr. Michal Levin, Leon led a world-wide collaborative project for the generation of a developmental gene expression atlas for species spanning the animal kingdom and discovered novel evolutionary constraints on animal development. This study was published in *Nature*.

Today, Leon is studying for a PhD in computer science, under the supervision of Prof. Zohar Yakhini. His work focuses on computational tools and methods used in synthetic biology. One such project involves the use of DNA molecules to store digital information for long-term archiving. Other aspects of his work address the use of synthetic DNA in studying regulatory mechanisms in living cells, including the sequence determinants of promoter activity and of non-coding RNA.

Leon is also involved in teaching and other academic activities. He has been a senior teaching assistant the Technion's course in data mining for the past 6 years, and he is involved in the the institute's data science program. He is also a board member of the Technion Teaching Staff Organization.



### Evgeniy Boyko

PhD student of Prof. Moran Bercovici and Prof. Amir D. Gat, Faculty of Mechanical Engineering,  
Technion – Israel Institute of Technology

Dissertation topic: Non-Uniform Electroosmotic Flow in Rigid and Elastic Microfluidic Configurations

Born in Irkutsk (Siberia), Russia, Evgeniy Boyko immigrated to Israel with his family at the age of 12. From a young age, he was attracted to the world of science and engineering, leading him to pursue physics and mathematics in high school. During his military service in the IDF, Evgeniy served as a combat soldier in the infantry and received the Central Command's Excellence Award in counterterrorism.

Shortly after completing his military service, Evgeniy began his undergraduate studies in mechanical engineering at the Technion in the framework of the Re'amim excellence program. During his final year of undergraduate studies, from which he graduated *summa cum laude* in 2015, he joined the research groups of Prof. Moran Bercovici and Prof. Amir Gat, who encouraged him to begin his MSc studies in parallel with his last undergraduate semester. After one semester, Evgeniy was accepted to the direct PhD track.

Evgeniy's theoretical research focuses on understanding the interactions between viscous fluid flow, electric forces, and elasticity. In particular, he is interested in fluid-structure interaction at the micro-scale, where electrokinetic forces can serve as powerful mechanisms to achieve desired deformations, and ultimately – configurable microstructures. He works closely with experimentalists to translate these theoretical ideas into practice. In parallel with his research work, Evgeniy enjoys teaching and serves as the lead teaching assistant in several fluid dynamics courses.



## Shachar Carmeli

PhD student of Dr. Dmitry Gourevitch, Department of Mathematics,  
Weizmann Institute of Science

Dissertation topic: Harmonic Analysis on Spherical Spaces

Shachar Carmeli was born in Mitzpe Abirim in the Western Galilee. He began his undergraduate studies at 16 at the Open University of Israel, during high school. After high school he postponed his military service to volunteer for a year with the youth movement Bnei Hamoshavim.

Shachar finished his BSc in mathematics at Tel-Aviv University in the Arazim program, an Atuda (deferred military service) program for outstanding students in mathematics and computer science. During his studies he both participated in the International Mathematical Competition (IMC) and helped train the Israeli team for the International Mathematical Olympiad (IMO). Since then, he has remained involved in training the teams for the IMO.

Shachar served in the military for over 5 years in a technological unit and commanded a research team in the last year of his service. He completed his MSc at the Weizmann Institute of Science during his military service. His supervisor for his MSc thesis and his PhD. studies is Dr. Dmitry Gourevitch, with whom he worked on verifying the stability and Gelfand property of symmetric pairs. He is currently studying invariant distributions on algebraic manifolds for actions of algebraic groups.



## Tuvia Gefen

PhD student of Prof. Alex Retzker, Racah Institute of Physics, Faculty of Sciences and Mathematics,  
The Hebrew University of Jerusalem

Dissertation topic: Quantum Metrology and Computing with NV Centers and Trapped Ions

Born and raised in Rehovot, Tuvia was drawn to philosophy and physics from a young age. During his army service he started taking courses in mathematics at the Open University of Israel. Later on he completed his BSc in mathematics and physics at the Hebrew University of Jerusalem in the interdisciplinary Amirim honors program. The surprising and deep consequences of quantum physics, as well as its mathematical elegance, convinced him to go deeper into physics and continue for an MSc. He then joined Alex Retzker's group, where he was exposed to the relatively young field of quantum information and technologies. The fundamental challenges in creating this new kind of technology fascinated him.

During his MSc studies, Tuvia investigated the theoretical possibility of improving precision measurements by incorporating quantum error correction. That project led to the publication of two different protocols and stimulated his interest in quantum sensing.

Tuvia is currently a PhD student in Retzker's group. His research is focused, for now, on several topics in quantum sensing, in particular the theory of spectroscopy with quantum sensors. Finding optimal protocols for this problem may considerably increase the efficiency of imaging methods, with large impacts on chemistry, biology and medicine. In a broader context, he is interested in general bounds in quantum metrology and their relevance to different applications. Working closely with experimentalists, he hopes to find novel schemes applicable within state-of-the-art technology.





### Bracha Laufer-Goldshtein

PhD student of Prof. Sharon Gannot (Bar-Ilan) and Prof. Ronen Talmon (Technion),  
Faculty of Electrical Engineering, Bar-Ilan University

Dissertation topic: Manifold Learning Techniques for Source Localization and Array Processing

Bracha Laufer-Goldshtein had always been fascinated by science, technology, mathematics and physics, and she therefore chose the multidisciplinary field of electrical engineering for her academic studies. She won the Rector's and Dean's Prizes for outstanding undergraduate students at Bar-Ilan University in every year of her BSc studies and graduated *summa cum laude*, first in her class. She won the award of the Ministry of Science, Technology and Space for promoting women in science.

Bracha is continuing her studies at Bar-Ilan in the direct PhD track. She completed her MSc studies *cum laude* and was again first in her class. Under the joint supervision of Prof. Sharon Gannot (Bar-Ilan) and Prof. Ronen Talmon (Technion), she is investigating novel approaches to acoustic signal analysis and processing using geometric learning. In particular, she develops methods for source localization and array processing based on multiple microphone recordings, in adverse challenging noise and reverberation conditions.

Bracha's work emphasizes both theoretical depth and practical relevance, envisioning applications in human-car communication, hearing aids, and smart homes for the benefit of elderly people. The initial results of her research have been published in two papers in a leading journal in signal processing and in five international conference papers. In parallel with her research work, Bracha is a well-appreciated teaching assistant in undergraduate courses on signal processing and logical circuits, for which she gained high scores in teaching assessment surveys.



### Ofer Neufeld

PhD student of Prof. Oren Cohen, Department of Physics,  
The Technion – Israel Institute of Technology

Dissertation topic: Generation of High Harmonics with Fully Tunable Polarization

Raised in Haifa, Ofer has always been fascinated with the physical sciences. Following the completion of his army service as a tank commander, his passion for science led him to a dual-degree undergraduate program in physics and material science at the Technion. His interest in research and theory began with a project during his BSc studies, of modeling processes that occur in organic photovoltaics used for renewable energy.

After graduating *summa cum laude* for both degrees, he enrolled in the Grand Technion Energy Program for MSc studies under the supervision of Prof. Maytal Toroker. His thesis explored theoretical methods for improving photoelectrochemical cells for the production of hydrogen fuel from solar energy, and it yielded several publications in leading journals.

Upon completing his MSc *summa cum laude*, Ofer moved to the Technion's Physics Department, where he is currently working toward his PhD under the supervision of Prof. Oren Cohen in the Extreme Nonlinear Optics Group. His research explores the fundamental processes that occur when intense laser fields interact with matter. Specifically, Ofer's research attempts to understand how symmetries of laser fields and matter affect the nonlinear process of high harmonic generation, and how they can be used to control the spectral properties of EUV and X-ray radiation.

While carrying out his research, Ofer is also serving as a teaching assistant for undergraduate courses in the Technion's Math and Physics Departments. He hopes to continue working on challenging and interesting physics.



## Inbal Oz

PhD student of Prof. Oded Hod and Prof. Avraham Nitzan, School of Chemistry, Faculty of Exact Sciences, Tel Aviv University

Dissertation topic: Simulating Non-Equilibrium Thermodynamics in Open Quantum Systems

Inbal was born in Haifa, Israel, and spent three years in France during her elementary school years. After serving in the IDF's 8200 intelligence unit, she began studying for her BA in chemistry at Tel-Aviv University, in the Research Program for Outstanding Students. As an undergraduate, Inbal worked on diverse research projects, experimental as well as theoretical, in the fields of classical physical chemistry, quantum physical chemistry and biophysics. After receiving the Rector's Award and the Dean's Prize for outstanding undergraduate students for every year of her BA studies, she graduated *summa cum laude* and first in her class.

Inbal is currently studying in the university's direct PhD program under the supervision of Prof. Hod and Prof. Nitzan. Her research in computational quantum chemistry focuses on developing a thermodynamic description of nanoscale systems out of equilibrium, where dynamic quantum effects dominate. The calculation schemes require a construction of a theoretical framework as well as a numerical platform for simulations of nanoscale nonequilibrium thermodynamic processes. Once developed, such a description is likely to reveal new, unexplored quantum physical phenomena. Inbal has presented her research at numerous conferences in Israel and abroad.

As a teaching assistant, Inbal received the Rector's Award for excellence in teaching. She has lectured at the Dov Lautman Unit for Science-Oriented Youth and currently serves as a member of TAU's PhD Students Committee, with the aim of increasing the number of women in graduate school, at the post-doctoral level and in the academy.



## Or Yair

PhD student of Prof. Ronen Talmon, Viterbi Faculty of Electrical Engineering, Technion – Israel Institute of Technology

Dissertation topic: Geometric Learning for Data-Driven Analysis of Dynamical Systems

Or Yair was born in 1988 and grew up in Givat-Elia in Emek Yizrael. In 2011, following five years of service in the IDF, he began studying electrical engineering at the Technion – Israel Institute of Technology. He received his BSc *summa cum laude* in 2015 and is now studying for his PhD at the Technion.

From 2012 to 2015, Or worked in the field of image processing and algorithms as well as in software development. His current principal areas of interest include signal processing, machine learning and geometric methods. Since 2015 he has been a teaching assistant in signals and image processing courses with the Viterbi Faculty of Electrical Engineering at the Technion.

Or received the Meyer Fellowship and Zipers Award for 2015, the Diane and Leonard Sherman Interdisciplinary Fellowship for 2016, and the Jacobs Award for 2017.





### Angelica Elkan

PhD student of Prof. Boris Rybtchinski, Department of Organic Chemistry, Weizmann Institute of Science

Dissertation topic: Hybrid Materials Based on Organic Nanocrystals and Carbon Nanotubes (CNTs)



### Hezi Grisaro

PhD student of Prof. Avraham N. Dancygier, Faculty of Civil and Environmental Engineering, Technion – Israel Institute of Technology

Dissertation topic: Response of a Structural Element to Combined Loading of Explosion and Fragmentation Impacts



### Yael Korem

PhD student of Prof. Uri Alon, Department of Molecular Cell Biology, Weizmann Institute of Science

Dissertation topic: Optimal Division of Labor in Cells and Tissues



### Gali Noti

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

Dissertation topic: Behavioral Algorithmic Game Theory



### Avia Raviv Moshe

PhD student of Prof. Yaron Oz, School of Physics and Astronomy, Faculty of Exact Sciences, Tel-Aviv University

Dissertation topic: Lifshitz Quantum Field Theories, Gravity and Hydrodynamics



### Asael Roichman

PhD student of Prof. Haim Cohen, Faculty of Life Sciences, Bar-Ilan University

Dissertation topic: Sirtuins in Aging and Metabolism



### Alexander Shleyfman

PhD student of Prof. Carmel Domshlak, Faculty of Industrial Engineering and Management, Technion-Israel Institute of Technology

Dissertation topic: Symmetry Breaking and Operator Pruning in Classical Planning and Beyond



### Amitai Yuval

PhD student of Prof. Jake Solomon, Department of Mathematics, The Hebrew University of Jerusalem

Dissertation topic: Geodesics of Positive Lagrangians in Almost Calabi-Yau Manifolds

## ADAMS SEMINAR 2016



Prof. Ruth Arnon, Guest Lecturer, on "Development of Copaxone – From Bench to Bed and Back"



The first Ruth Arnon Postdoctoral Fellows, Dr. Sophia Buhbut Sinai between Prof. Arnon and Prof. Segev and Dr. Rivka Bekenstein between Prof. Segev and Prof. Cohen



### Omri Azencot

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

Dissertation topic: Operator Representations in 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



### 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



### Michael Kalyuzhny

PhD student of Prof. Ronen Kadmon, 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.



### Michal Natan

PhD student of Prof. Ehud Banin and Prof. Shlomo Margel, Institute of Nanotechnology and Advanced Materials, Bar-Ilan University

Dissertation topic: Synthesis of Rechargeable N-halamine Nanoparticles and Determination of Their Antibacterial and Antibiofilm Activities



### Eran Sagi

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

Dissertation topic: Strongly Interacting Topological 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



### Yinon Spinka

PhD student of Prof. Ron Peled, Pure Mathematics Department, Tel-Aviv University  
Dissertation topic: Mathematical Models of Statistical Mechanics

## ADAMS SEMINAR 2016



New Adams Fellows for 2016-2017 in the Academy's Science Garden in front of the Einstein Memorial  
(far left) Asael Roichman, Hezi Grisaro, Gali Noti, Angelica Elkan, Prof. Nili Cohen, Sylvan Adams, Margaret Adams, Amitai Yuval, Avia Raviv Moshe, Yael Korem, Linda Adams, Prof. Gil Troy, Prof. Moti Segev, Prof. Ruth Arnon, Dr. Meri Zadok, Batsheva Shor



### **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

## ADAMS SEMINAR 2016



Left: Prof. Arnon receiving the Academy's sign of recognition of her generous gift of Postdoctoral Fellowships for Adams Alumnae

Top: Prof. Arnon greeting Linda and Sylvan Adams at the festive dinner

Bottom: Jazz singer Lee Ganor and musicians at the festive dinner in the garden





### 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 Prof. 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,  $\alpha$ -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

## ADAMS SEMINAR 2016



(left to right) Sylvan Adams, Margaret Adams, Prof. Gil Troy, Linda Adams



Prof. Moti Segev, Chair of the Adams Fellowship Committee



### **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 Prof. Uri Erez, School of Electrical Engineering, Tel-Aviv University

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



### **Liel Sapir**

PhD student of Prof. 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 FIELD TRIP TO THE CITY OF DAVID AND THE KOTEL TUNNELS**

Group photograph inside the Old City walls





### **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 Prof. Nirit 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

## ADAMS FIELD TRIP TO THE CITY OF DAVID AND THE KOTEL TUNNELS



## 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 Prof. 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 Prof. 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 Prof. 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 Prof. 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 Prof. 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 Prof. 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, Faculty of 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, School of Computer Science, Tel-Aviv University

Dissertation topic: Structural Bioinformatics: Flexible Molecular Docking



### Or Meir

Phd student of Prof. Oded Goldreich, Department of Computer Science and Applied Mathematics,, Weizmann Institute of Science

Dissertation topic: Combinatorial Construction of Probabilistic Proof Systems



### Moshe Mishali

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

Dissertation topic: Compressive Processing of Analog Signals



### Uri Roll

PhD student of Prof. Lewi Stone , Department of 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, Department of 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 Department,  
Technion-Israel Institute of Technology

Dissertation topic: Probabilistic Methods in Distributed Computing



### **Emanuele Dalla Torre**

PhD Student of Dr. Ehud Altman, Department of Condensed Matter Physics, Weizmann  
Institute of Science

Dissertation topic: Strongly Correlated States in Ultra-cold Atoms



### **Noam Gross**

PhD Student of Prof. Lev Khaykovich, Department of 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, School of 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, School of 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, Department of Electrical & Computer  
Engineering, 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, The Department of Computer Science,  
Ben-Gurion University of the Negev

Dissertation topic: Evolutionary Computation



### Eran Segev

PhD Student of Prof. Eyal Buks, Faculty of 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, Department of Computer Science and Applied  
Mathematics, Weizmann Institute of Science

Dissertation topic: The Complexity of Resilient Sketches



### Reut Shema

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

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

## ADAMS FIELD TRIP TO THE CITY OF DAVID AND THE KOTEL TUNNELS





## ADAMS Fellows 2007-2008



### Avraham Ben-Aroya

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

Dissertation topic: Quantum Computation and Quantum Information



### Shai Carmi

PhD student of Prof. Shlomo Havlin, Department of Physics, Bar-Ilan University

Dissertation topic: Complex Networks: Theory and Applications



### Chen Davidovich

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

Dissertation topic: Ribosome Structure and Function



### Shahar Dobzinski

PhD student of Prof. Noam Nisan, School of Computer Science and Engineering,  
The Hebrew University of Jerusalem

Dissertation topic: The Power of Approximations in Mechanism Design



### Moshe Goldstein

PhD student of Prof. Richard Berkovits, Department of Physics, Bar-Ilan University

Dissertation topic: Interference Effects in Interacting Mesoscopic Systems



### Amir Goren

PhD student of Prof. Gil Ast, Department of Human Molecular Genetics and  
Biochemistry, Tel-Aviv University

Dissertation topic: Inferring Regulatory Elements of Splicing Using Comparative  
Genomics



### Dan Hermelin

PhD student of Prof. Gad M. Landau, Department of Computer Science,  
University of Haifa

Dissertation topic: Algorithmic Challenges in RNA Comparative Analysis



### Yoav Lahini

PhD student of Prof. Yaron Silberberg, Faculty of Physics,  
Weizmann Institute of Science

Dissertation topic: Disordered Nonlinear Systems



### Guy Ron

PhD student of Prof. Eliezer Piasetzky, Department of Physics, Tel-Aviv University

Dissertation topic: Measurement of the Proton Elastic Form Factors at Low Q<sup>2</sup>



### Avraham Saig

PhD student of Prof. Ehud Ahissar and Dr. Amos Arieli, Department of Neurobiology,  
Weizmann Institute of Science

Dissertation topic: Guiding Principles for Sensory Substitution: From Vision to Touch



### Alexander Sodin

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

Dissertation topic: Probabilistic Methods in Asymptotic Geometric Analysis



### Haim Beidenkopf

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



### Liat Benmoyal Segal

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



### Olga Khersonsky

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



### Dana Moshkovitz

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



### Ariel Procaccia

PhD student of Prof. Jeffrey S. Rosenschein, School of Computer Science and Engineering, The Hebrew University of Jerusalem  
Dissertation topic: The Theoretical Foundation of Multi-agent Systems (MAS)





### **Carmel Rotschild**

PhD student of Prof. Moti Segev, Physics Department,  
Technion-Israel Institute of Technology

Dissertation topic: Soliton Interactions in Nonlocal Nonlinear Media



### **Ofer Shayevitz**

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

Dissertation topic: Universal Communications with Feedback



### **Amir Shlomai**

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

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



### **Noam Stern**

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

Dissertation topic: Natural Killer (NK) Cells

## **ADAMS FIELD TRIP TO THE CITY OF DAVID AND THE KOTEL TUNNELS**





**Yael Eshed-Eisenbach**

PhD student of Prof. Elinor Peles, Department of Molecular Cell Biology, Weizmann Institute of Science

Dissertation topic: Neuro-Glial Interactions



**Nathan Keller**

PhD student of Prof. Gil Kalai, Einstein Institute of 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, School of Computer Science, Tel-Aviv University

Dissertation topic: Efficient Transformers for the Verification of Heap Manipulating Programs



**Raz Palty**

PhD student of Dr. Israel Sekler, Department of Physiology and Cell Biology Ben-Gurion University of the Negev

Dissertation topic: Characterization of the Novel Exchanger NCLX – a FLJ2233 Gene Product



**Sharon Schwartz**

PhD student of Prof. Moti Segev, Physics Department, Technion-Israel Institute of Technology

Dissertation topic: Nonlinear Optics in CZT:V



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