

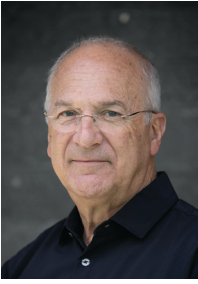


האקדמיה הלאומית הישראלית למדעים
المجمع الوطني الإسرائيلي للعلوم والآداب
THE ISRAEL ACADEMY OF SCIENCES AND HUMANITIES

Ruth Arnon

Fellowships

מלגות רות ארנון תשפ"ה | 2024



Professor David Harel

President of the Israel Academy
of Sciences and Humanities

Professor Ruth Arnon is one of Israel's most revered scientists and a true glass-ceiling-breaker on Israel's scientific scene. At the Weizmann Institute she served as Dean of the Faculty of Biology and then as Vice President – the analogue of a Rector in Israel's universities. Her crowning role was a six-year tenure as President of The Israel Academy of Sciences and Humanities, between 2010 and 2015. In all these positions, she paved the way for women as scientists and as academic leaders.

Professor Arnon has always been acutely sensitive to the issues facing women scientists throughout their careers. Consequently, she agreed to chair the Council for Higher Education's Committee to Further Women in Israel's Institutions of Higher Education. The committee found that the major obstacle to the advancement of women's careers was the necessity of their traveling abroad for postdoctoral training. Without this experience showing up on their CVs, they found themselves at a significant disadvantage in comparison to their male counterparts. Often they were prevented from traveling because their spouses couldn't take the required time off from their careers or couldn't find employment abroad to provide the necessary supplement to cover their young families' needs. Funding daycare for young children abroad is another expense not covered by the various postdoctoral fellowships.

The Arnon Committee made several recommendations, one of which was to seek additional financial assistance for women's postdoctoral training abroad. In 2016, setting a magnificent example to others, Professor Arnon personally endowed a fund, under the auspices of the Israel Academy, to offer a female alumna of the Academy's Adams Fellowships Program for doctoral students a \$20,000 fellowship to supplement the traditional postdoctoral fellowship funding. She suggested that each year the same academic committee that approves Adams Fellowships candidates would review the applications for the Ruth Arnon Fellowship from among the Adams alumnae and select the awardee.

The Academy is continuing the Ruth Arnon Fellowship Program in honor of Professor Arnon, and this year granted a fellowship to Dr. Noam Harel.

Professor Arnon is a champion of women researchers in Israel and abroad. We applaud her bravery and leadership, and extend to her a deep gratitude for all she has done for Israeli science and for the Israel Academy, and wish her many more years of happiness and activity, in good health.



Professor Moshe Oren

Academy Member;
Chair, Adams Fellowships Steering
and Approval Committee

Dear Ruth Arnon Postdoctoral Fellow,

Gender inequality in academic leadership remains a major problem in Israel, as it is throughout the world. As a researcher in the life sciences, I am repeatedly saddened to see that most graduate students in our field are women, but when it comes to professors and research group leaders, the balance gets heavily tilted towards men. There is no objective reason why this must be so: as graduate students, women are at least as outstanding as their male peers. Moreover, as richly proven by Ruth Arnon's own track record, women have the potential to be at least as outstanding as their male peers also when they become professors and scientific leaders. So how can we ensure that this potential does not get wasted?

Everybody talks about the gender imbalance in the scientific career ladder and the need to rectify it, but not many take action to ensure a more balanced representation of female researchers in the top ranks. That is exactly what Ruth Arnon had in mind when she generously established this special fellowship program. And you are exactly the type of young researchers she had in mind.

Being selected as an Adams fellow is already a recognition of your unique excellence. Receipt of the Ruth Arnon Postdoctoral Fellowship puts a final stamp of success on the hard work of your doctoral studies: you promised, and you richly delivered!

As you move on to the next step in your career, on your way to becoming an independent researcher and mentoring the next generation of students, don't forget that your Adams mission is not yet over. You should now serve as a role model to your young female students, showing them that they must believe in themselves and aspire to fulfil their dreams, just as you did. That is what Ruth Arnon expects you to do, and that is what all the members of the Adams Committee expect you to do. And I very much hope that this will happen right here, in Israel!

On behalf of the Adams Fellowships Committee, I wish you continued success in your postdoctoral research. We will be looking forward to seeing you back in Israel as an exemplary scientist and leader of our research community.



Professor Ruth Arnon

**Academy Member and
Israel Prize Laureate in Medicine
The Weizmann Institute of Science**

Professor Ruth Arnon earned both her MSc (1955) and her PhD at the Hebrew University of Jerusalem (1960) prior to joining the Weizmann Institute in 1960. She is the incumbent of the Paul Ehrlich Chair in Immunochemistry and has held a number of senior posts at the Institute, including Head of the Department of Chemical Immunology (1973–74 and 1975–78), Dean of Biology (1985–88), and Vice President (1988–97). From 1985 to 1994 she was the Director of the Institute’s MacArthur Center for Molecular Biology of Tropical Diseases.

Professor Arnon has made significant contributions to the fields of vaccine development and cancer research, and to the study of parasitic diseases. She co-developed Copaxone[®], a multiple sclerosis (MS) drug currently marketed worldwide. She continues to focus on understanding the mechanism by which Copaxone exerts its beneficial effect. She is also developing a synthetic vaccine to provide broad-range immunity against infection with influenza viruses.

Between 2010–2015, Professor Arnon served as President of The Israel Academy of Sciences and Humanities. She is an elected member of the European Molecular Biology Organization (EMBO) and of the American Philosophical Society. She has also served as President of the European Federation of Immunological Societies (EFIS), Secretary-General of the International Union of Immunological Societies (IUIS) and President of the Association of Academies of Sciences in Asia (AASA), and she was a member of the European Union Research Advisory Board (EURAB).

Professor Arnon’s awards and honors include the Robert Koch Prize in Medical Sciences (1979, Germany), the Jimenez Diaz Memorial Award (1986, Spain), the Legion of Honor (1994, France), the Hadassah World Organization’s Women of Distinction Award (1997), the Wolf Prize (1998), the Rothschild Prize (1998), the Israel Prize (2001), the Aesku Prize for Life Contribution to Autoimmunity (2008), the “Yakir Tel-Hai” award of Tel-Hai Academic College (2008), and the Dr. Tovi Comet-Walerstein C.A.I.R Institute Science Award of Bar-Ilan University (2015). She holds honorary doctorates from several universities in Israel and Europe, including Ben-Gurion University of the Negev (2007), Tel Aviv University (2011), the Open University of Israel (2014), and Leuphana University in Germany (2014).

Over the years, Professor Arnon has been active nationally and internationally in efforts to advance women scientists, by participating in conferences, such as the Fulbright Foundation conference on *Women in Science: The Challenge of Progress in Academia* at the Open University of Israel in December 2012, and the *Women and the World Conference on Women in Science* in Tokyo in 2015, and by sitting on committees, and she chaired the Arnon Committee to Further Women in Israel's Institutions of Higher Education for the Council for Higher Education and its Planning and Budgeting Committee. One of her committee's recommendations was to seek additional funding to assist women in traveling abroad for postdoctoral training – an essential stage in advancing their scientific careers.

Addressing this issue, Professor Arnon most generously presented the Academy with a personal gift to establish a fund to encourage alumnae of the Adams Fellowships Program to travel abroad for postdoctoral training upon completion of their doctorates. Each year, one Adams alumna is awarded a fellowship in the amount of \$20,000, to supplement her postdoctoral fellowship. The recipient is selected by the Adams Fellowships Committee solely on the basis of excellence in research. Upon the inauguration of her fellowship, she decided to provide a second fellowship for that year to enable one alumna from a previous year to benefit.

Professor Arnon has two children and six grandchildren.



Photographs of Prof. Arnon courtesy of the Weizmann Institute of Science

Ruth Arnon Fellowships 2025

Dr. Noam Harel



Noam Harel was born in the US and raised in Ramot Meir, a small moshav in central Israel. She completed three years of military service in an elite intelligence corps' technological unit. Noam then enrolled in a joint degree program in biological and medical sciences at Tel Aviv University for her undergraduate studies, graduating with honors. During her studies, she worked as a research assistant in the labs of Professors Adi Stern and Uri Gophna, investigating interactions between "cheater" viruses in the *MS2 bacteriophage*, a virus that attacks bacteria. She continued her academic journey in Prof. Adi Stern's group through the direct PhD track.

During her PhD, Noam explored the multifaceted interactions between viruses and their hosts, investigating both the evolution and genetics of viruses and the impact of infections on their hosts. She combined laboratory work with bioinformatics and data analysis to answer complex biological questions across different organisms.

Noam's primary focus has been on studying bacteriophages, viruses that attack bacteria. Alongside her interest in the social dynamics of viruses, she discovered a mechanism of resistance to virus infection in *E. coli* bacteria. Such mechanisms are of great interest for their biotechnological potential and their applications in phage therapy, which aims to use bacteriophages as an alternative to antibiotics in resistant infections.

During the emergence of the COVID-19 pandemic, Noam shifted her focus to studying the *SARS-CoV-2* virus. She led high-impact projects collaborating with health care providers, including analyzing the patterns of virus spread within Israel and assessing the effectiveness of vaccines against different *SARS-CoV-2* variants.

Noam has received multiple awards and scholarships throughout her academic career, including the Na'amat Research in Science Award, the Miriam Smolarz Scholarship for Achievements in Research, the Life Sciences Faculty Excellence in Teaching Award, and the Israel Academy Adams Fellowship, which supported her throughout her PhD. Noam also participated in an applied research project at Google X, utilizing deep learning to better understand disease biology.

In her postdoctoral training in the Fred Hutchinson Cancer Center in Seattle, Noam aims to investigate the complex mechanisms of the adaptive immune system and its effects on human health disease. She looks forward to incorporating rapidly growing biological databases, new discoveries in machine learning, and the skills she has acquired during different stages of her career to better understand human biology. Noam is honored to have been chosen as a Ruth Arnon Fellowship recipient, which will allow her to pursue cutting-edge research with increased financial support and access to a network of leading scientists and resources, ultimately enhancing her ability to make significant contributions to the field of biomedical research.

Ruth Arnon Fellowships 2024

Dr. Gali Noti



Gali Noti is a native of Yuvalim, a village in lower Galilee. Her undergraduate work in computer science and cognitive sciences at The Hebrew University of Jerusalem focused on human decision-making processes. She continued to an MSc in computer science at the Hebrew University's Center for the Study of Rationality, where her cross-disciplinary approach was encouraged under the supervision of Prof. Noam Nisan (CS) and Prof. Ilan Yaniv (Department of Psychology). In her PhD dissertation, entitled "Behavioral Algorithmic Game Theory," Gali, in a series of papers on behavior-based econometrics and behavior-based machine learning, studied strategic computational systems in which human players interact, with the goal of bridging the gap between the theory and actual human play.

Today, Gali's scientific work is in Human-Centered Artificial Intelligence. Gali's goal in her postdoctoral training at Harvard with Yiling Chen and David Parkes was to study and develop new AI frameworks for hybrid human-AI teams. She developed new forms of human-AI interactions that foster human-AI collaboration in decision-making, leveraging the complementary strengths of the human and of AI for the good of the human users and society. Continues her interdisciplinary approach that involves machine-learning, game theory, econometrics, and experimental methods, with insights about human decision-making, to study and design human-AI systems with improved joint performance. Her results stress the importance of behavior-aware and interactive approaches to improving human-AI systems for their human users.

Dr. Aseel Shomar



Aseel Shomar was born and raised in Nazareth. Her belief that integrating purportedly alien fields could produce innovative applications led her to study biochemical engineering at the Technion – Israel Institute of Technology, with the goal of unravelling some of the mysteries of cancer. Her senior thesis aimed to develop nano-sized factories to manufacture cancer drugs at tumor sites. As Aseel began her MSc studies in the Nanoscience and Nanotechnology Program at the Technion, she became interested in neuroscience. This led her to join the ongoing fruitful collaboration between Prof. Naama Brenner and Prof. Noam Ziv. Having equipped herself with vital skills from wide-ranging fields, she aimed to introduce concepts long studied in neuroscience to the study of biological contexts outside the brain, such as cancer and stem cells. In her PhD research, she developed an algorithm for control identification, elucidating mechanisms for phenotypic transitions, and understanding the implications of learning new phenotypes in cancer progression.

Aseel received several prizes and fellowships in recognition of her distinguished academic achievements. In her postdoctoral training at the Stanford Institute of Theoretical Physics, Aseel's research will encompass two main projects: investigating the microbiome alongside KC Huang and Benjamin Good and collaborating with Daniel Fisher as part of a broad consortium to develop methods for diagnosing cancer from immune cells in the blood.

Ruth Arnon Fellowships 2021

Dr. Yael Korem Kohanim



Fascinated by both worlds of exact sciences and humanities, Yael's aspiration from a young age was to find mathematical tools to describe and understand complex systems. She completed her BSc in physics and the Amirim interdisciplinary honors program in humanities at the Hebrew University. She continued her graduate studies in the Weizmann Institute of Science, majoring in systems biology. With her advisor, Prof. Uri Alon, she sought general design principles in biology, and developed quantitative approaches to the fundamental questions of life.

In her PhD, Yael discovered principles in several fields including bacterial growth, single-cell transcriptomics and epigenetic inheritance in *C. elegans*. This culminated in a new theory for the origin of autoimmune disease, which is her major research focus today. This theory used ideas from control theory to suggest that autoimmune diseases are fragilities of an otherwise essential process.

After she finishes her postdoctoral studies at the lab of Prof. Jimmie Chun Ye in UCSF, California, Yael wishes to return to Israel and become a principal investigator in academia. She would like to establish a lab that studies the design principles of the human immune system and apply them to understand clinical data.

Dr. Anael Ben Asher



Anael was raised in Karmiel, Western Galilee. Always fond of mathematics, she won an award for a creative solution in the Weizmann Institute's math competition for middle-school students. While still in high school, Anael enrolled in academic courses in chemistry in the framework of the "Archimedes" program at the Technion, where she discovered the beauty of the chemistry world. She won the second prize in the "Chemiada," the Israeli national chemistry competition for high school students, and she was a member of the Israeli delegation to the International Chemistry Youth Olympiad.

After serving in the IDF as a technological intelligence researcher, Anael completed her B.Sc. in chemistry at the Technion and graduated *summa cum laude*. During her studies, she became fascinated by quantum chemistry and by the possibility of using mathematical tools to theoretically explain chemical processes. Anael started researching quantum chemistry as an undergraduate under the supervision of Prof. Nimrod Moiseyev, where she has continued her research as a graduate student in a direct Ph.D. track.

Since the fall of 2021, Anael is doing her postdoctoral training in the group of Prof. Johannes Feist at the Condensed Matter Physics Center (IFIMAC) at the Autonomous University of Madrid in Spain. Her planned research concentrates on the emergent field of polaritonic chemistry, i.e., the manipulation of chemical reactions through strong coupling with confined light modes.

Ruth Arnon Fellowships 2020

Dr. Avia Raviv Moshe

Upon finishing her BSc in physics at Tel Aviv University, *magna cum laude*, Avia went on to earn an MSc, *summa cum laude*, in theoretical high-energy particle physics. Avia continued to a PhD in the field of theoretical high-energy particle physics. Her PhD dissertation, *Aspects of Scaling in Supersymmetric Quantum Field Theories*, under the supervision of Prof. Yaron Oz, focuses on non-relativistic quantum field theories and the applications of Lifshitz scaling symmetry to quantum field theory, to the study of quantum anomalies and to supersymmetry. During her PhD studies, Avia was awarded the Judah Eisenberg Award for outstanding academic achievements and the prestigious Adams Fellowship of the Israel Academy of Sciences and Humanities. She has published several papers and presented her research at a number of national and international scientific conferences and workshops.

Avia's research interests are quantum field theory, quantum gravity and the applications of quantum field theory to condensed matter and high-energy physics. This discipline-bridging field of research relates particle physics to condensed matter physics in a way that may reveal new properties of the laws of nature.

She joined the Simons Center for Geometry and Physics (SCGP) at Stony Brook University, New York, as a postdoctoral researcher.

Dr. Bracha Laufer-Goldshtein

Bracha Laufer-Goldshtein's longstanding fascination with science, technology, mathematics and physics drew her to the multidisciplinary field of electrical engineering. She won the Rector's and Dean's prizes for outstanding undergraduate students at Bar-Ilan University for every year of her BSc studies, graduating *summa cum laude* and first in her class.

Bracha continued her studies in the combined MSc-PhD track at Bar-Ilan University. Under the joint supervision of Prof. Sharon Gannot of Bar-Ilan University and Prof. Ronen Talmon of the Technion – Israel Institute of Technology. Bracha has received several prizes and awards for her research achievements, including the Adams Fellowship of the Israel Academy of Sciences and Humanities, the Wolf Foundation prize, the Israel Ministry of Science and Technology award for women in science and the Bar-Ilan Rector's prize.

Her work was chosen for presentation in a three-hour tutorial talk at the European Signal Processing Conference 2019, and the same findings appeared in a survey monograph in *Foundations and Trends in Signal Processing*.

Following her postdoctoral training at MIT in various fields of engineering, such as harmonic analysis, statistic machinery and signal processing, Bracha returned to a faculty position at Tel Aviv University's School of Electrical Engineering.

Dr. Ayelet Arazi



In 2009, Ayelet began her BSc in Biomedical Engineering at Ben-Gurion University of the Negev. In her final year, Ayelet began working as a research assistant in the laboratory of Prof. Ilan Dinstein, in the Psychology Department. Ayelet developed advanced algorithms for analyzing EEG activity recorded from individuals with autism, in an attempt to uncover the unique sensory processing that characterizes such individuals. Working in a research lab specializing in neuroimaging and computational neuroscience motivated Ayelet to pursue graduate studies in the Department of Brain & Cognitive Sciences at Ben-Gurion University. She completed her master's degree *summa cum laude* and continued to a PhD under Prof. Dinstein's supervision.

Alongside her principal research, Ayelet conducted two projects at the National Center for Autism Research at Ben-Gurion University. During her PhD studies, Ayelet was awarded the Ben-Gurion University of the Negev fellowship for outstanding students, and the prestigious Adams Fellowship of the Israel Academy of Sciences and Humanities. She has published several papers as a first author and presented her research at a number of national and international scientific conferences.

In the fall of 2020, Ayelet began her postdoctoral training in the laboratory of Prof. Tobias Donner at the University Medical Center Hamburg-Eppendorf in Hamburg, Germany.

Ruth Arnon Fellowships 2017

Dr. Sharon Fleischer



Nowadays, the only cure for patients who survive end-stage heart failure is a heart transplant. As cardiac donors are scarce, there is an urgent need to develop new strategies to repair the diseased heart. One of the most promising is cardiac tissue engineering, in which cells are seeded within biomaterials to promote the assembly of functional cardiac patches. One of the most critical challenges to developing such tissues for clinical use is that the biomaterials widely used today do not recapitulate the cardiac microenvironment. *In-vivo*, cells reside within a complex microenvironment that provides them with cues to guide their organization into functional tissues.

In her PhD, one of Sharon's aims was to recapitulate this process *in-vitro*. She developed novel biomaterials and fabrication techniques to synthetically mimic different aspects of the cardiac microenvironment, demonstrating these materials' ability to promote the assembly of individual cardiac cells into functional heart tissues, able spontaneously to generate pump function. She developed an entirely new platform for the assembly of 3D cardiac tissues for transplantation in humans. These were incorporated with a rationally designed built-in vascular network and a controlled-release system of drugs to improve their integration into the heart muscle after transplantation. Her findings helped advance the field of cardiac tissue engineering and they could also be utilized to advance other engineered tissues, such as liver, lung and spinal cord tissues. Sharon is currently doing her postdoc at Columbia University.

Ruth Arnon Fellowships 2016

Dr. Sophia Buhbut-Sinai



Sophia completed her PhD in Chemistry at the end of 2014 under the guidance Prof. Arie Zaban at Bar-Ilan University. The first part of her doctoral research was to build a new design of DSSC, which combines the benefits of QDs, in terms of their broad absorption spectrum, with the evolved charge transfer mechanism of DSSC. In this design, QDs serve as "antennas," funneling absorbed energy to nearby dye molecules via Förster resonance energy transfer (FRET). The use of this novel design enabled her to overcome the low light absorption of the dye monolayer in DSSCs and opened new opportunities for the expansion of the spectral window in QDSSCs.

The second part was to increase the efficiency of QDSSCs. She proposed a unique strategy for smart photon management which opened a new path for the fabrication of highly efficient QDSSCs. Sophia demonstrated that by using the PID concept it is possible to increase the open circuit voltage of a solar cell by more than 100mV.

Following post-doctoral research in organic chemistry at the Weizmann Institute, Sophia, with the assistance of her Ruth Arnon Fellowship, joined the Orenstein Lab of the Debye Institute for Nanomaterials Science at the University of Utrecht, The Netherlands.

Dr. Rivka Bekenstein



In 2016, Rivka Bekenstein completed her PhD in Physics under the guidance of Prof. Mordechai Segev at the Technion. Although Rivka's dissertation is in fundamental physics, applicative ideas arose as the research advanced, suggesting that the tools and techniques of creating curved space for light can contribute to novel nanophotonic applications.

Rivka presented a new class of nanophotonic structures with intricate design in three dimensions, enabling control over light dynamics, through the curvature of the medium in which the light is propagating, based on General Relativity (GR) principles. Moreover, she presented wavefront shaping by a miniature dielectric slab sample with predesigned refractive index that varies according to the curvature of space. She used this technique to construct non-diffracting beams, suggesting that GR can inspire any wavefront shaping in highly tight waveguide settings. Finally, using the same miniature device, the phenomenon of Einstein Rings, dating back to 1936, was emulated.

With her Ruth Arnon Fellowship, Rivka moved with her husband and two daughters to the US, where she joined Prof. Mikhail Lukin's lab at Harvard University. The fellowship has enabled her to conduct her research at Harvard while her daughters attend private Jewish childcares and schools.

Rivka returned to Israel to a faculty position at the Hebrew University of Jerusalem's Racah Institute of Physics.

