

CELEBRATING 70TH ANNIVERSARY OF ISRAEL



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CELEBRATING 70 ISRAELI SCIENTISTS



This year marks the seventieth anniversary of the foundation of the State of Israel.

In this rather short period of time, this young nation has contributed significantly to humanity's greatest shared endeavor: the growth of knowledge. To celebrate its achievements, the Milner Global Foundation partners with Ha'aretz - TheMarker Newspaper and Tel Aviv University to recognize seventy scholars - all of them Israeli citizens - who have made ground-breaking contributions in their respective fields. This list is certainly representative, but by no means can it claim to be exhaustive. It cuts across several generations and comprises researchers from a broad range of fields, including physics, mathematics, life sciences, computer sciences and the humanities. It includes the winners of 8 Nobel Prizes and 5 Turing Awards, as well as some early-career researchers who have already made important advances.

The list was compiled by the Department of Commercial Magazines of Ha'aretz - TheMarker Newspaper, with the participation of Tel Aviv University.



1. Prof. Dorit Aharonov
Aharonov is a computer scientist who has done important work in quantum information processing. In 2006 she won the Krill Prize of the Wolf Foundation.



2. Prof. Yakir Aharonov
discovered and explained a new effect in quantum field theory and has produced influential theories on the interpretation of quantum mechanics. In 1998 he shared the Wolf Prize in Physics.



3. Prof. Noga Alon
Alon has discovered new and original algebraic, combinatorial and probabilistic tools with applications in diverse areas of mathematics and computer science. In 2011 he won the EMET Prize.



4. Prof. Ruth Arnon
and Prof. Michael Sela made major discoveries in the field of immunology, enabling the development of safe and effective vaccines. In 1998 they shared the Wolf Prize in Medicine.



5. Prof. Robert J. Aumann
is an economist who has used game theory to enhance our understanding of conflict and cooperation. He won the Nobel Prize in Economics in 2005.



6. Prof. Shlomo Avineri
has written seminal texts on Marx, Hegel, Zionism and other political thought, as well as doing important work in international diplomacy. He won the 2013 EMET Prize.



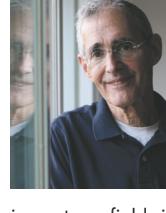
7. Prof. Jacob Bekenstein
had a momentous impact on the theoretical understanding of black holes, showing that they contain entropy and relating their size to their information content. He won the 2012 Wolf Prize in Physics.



8. Prof. Ruth A. Berman
has done groundbreaking studies in linguistics, including language acquisition, language development and the grammatical structure of modern Hebrew. In 2012 she received the EMET Prize.



9. Prof. Joseph Bernstein
is a mathematician who has reached new milestones in representation theory, and integrated tools from fields including algebra, analysis and geometry. He was awarded the Emet Prize in 2016.



10. Prof. Haim (Howard) Cedar
and Prof. Aharon Razin elaborated the mechanism by which genes are turned on and off, with major impacts on fields including embryonic development and cancer research. They shared the 2008 Wolf Prize in Medicine.



11. Prof. Ilan Chet
is a microbiologist who pioneered innovative approaches in breeding and bio-control, contributing to the development of environmentally safe agriculture. He shared the 1998 Wolf Prize in Agriculture.



12. Prof. Aaron Ciechanover
and Prof. Avram Hershko elucidated ubiquitin-mediated protein degradation, a fundamental mechanism by which cells break down and recycle proteins. They shared the 2004 Nobel Prize in Chemistry with Irwin Rose.



13. Prof. David Elieser Deutsch
is one of the pioneers of quantum computation and developed one of the first quantum algorithms. He is also a widely-read popular science author. In 1998 he was awarded the Dirac Prize.



14. Prof. Shmuel Noah Eisenstadt
is known for seminal work combining sociological theory with historical research, advancing our knowledge of ancient and modern societies. He won the 1988 Balzan Prize for Sociology.



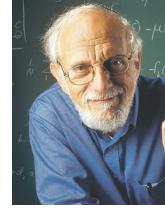
15. Prof. Michael Evenari's studies of runoff rainwater and its use for growing plants in arid environments led to important improvements in agriculture in Israel and beyond. He shared the 1988 Balzan Prize for Applied Botany.



16. Prof. Israel Finkelstein
is one of the leading scholars in the archaeology of the Levant, renowned for his reconstructions of biblical Israelite history. He won the 2005 Dan David Prize.



17. Prof. Saul Friedländer
is a historian who has done important work on the history of Nazism and the Holocaust. He received a MacArthur Fellowship in 1999 and the Dan David Prize in 2014.



18. Prof. Hillel (Harry) Furstenberg
has made major contributions to several fields of mathematics, including the application of techniques from probability theory to other areas such as number theory. He was awarded the 2006/7 Wolf Prize in Mathematics.

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19. Prof. Ruth Gavison is a professor of Law who has made important contributions to areas such as human rights and the protection of minorities. She received the EMET Prize in 2003.



20. Prof. Shafi Goldwasser has done foundational work on the science of cryptography, as well as creating new methods for efficient verification of mathematical proofs in complexity theory. She won the 2012 Turing Award.



21. Prof. Amiram Grinvald is a pioneering figure in functional optical imaging of brain activity, whose work has implications for both fundamental questions in neuroscience and clinical interventions. He received the Dan David Prize in 2004.



22. Prof. Haim Harari has made important contributions to the standard model of subatomic particles, as well as advancing Israeli research and education. He was awarded the Harnack Medal of the Max Planck Society in 2001 and the EMET Prize in 2004.



23. Prof. David Harel has been at the forefront of computer science research for over three decades, creating graphical languages and other inventions that are standard tools in many industries. He won the 2010 Emet Prize.



24. Prof. Elhanan Helpman has had a major impact on the connection of international economics to the issues of enduring growth and the functioning of the state economy. He received the Emet Prize in 2002.



25. Prof. Avram Hershko and Prof. Aaron Ciechanover elucidated ubiquitin-mediated protein degradation, a fundamental mechanism by which

cells break down and recycle proteins. They shared the 2004 Nobel Prize in Chemistry with Irwin Rose.



26. Prof. Yoseph Imry has played a foundational role in mesoscopic physics, which studies objects at scales larger than the atomic but invisible to the naked eye. In 2016 he won the Wolf

Prize in Physics.



27. Prof. Joshua Jortner and Prof. Raphael D. Levine have modeled the way molecular systems acquire and dispose of energy and made many other insights into

theoretical chemistry. They shared the 1988 Wolf Prize in Chemistry.



28. Prof. Daniel Kahneman and long-time partner Prof. Amos Tversky collaborated on research integrating insights from psychology into economics, especially concerning

human decision-making under uncertainty. Their work was recognized by Kahneman's Nobel Prize in 2002.



29. Prof. David Kazhdan is a mathematician who has made important advances in representation theory and its uses in algebra, algebraic geometry and number theory. He won the EMET Prize in 2016.

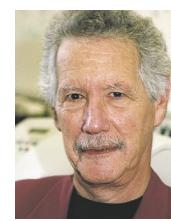


30. Prof. Ruth Elke Lawrence is a mathematician who has produced novel ideas in topology and knot theory, especially her work showing that braid groups are linear.



31. Prof. Abraham Lempel has done pioneering work in lossless data compression, especially the Lempel-Ziv algorithms, which have led to the development of familiar image formats

such as GIF. He won the IEEE Richard W. Hamming Medal in 2007.



32. Prof. Raphael D. Levine and Prof. Joshua Jortner have modeled the way molecular systems acquire and dispose of energy and made many other insights into theoretical chemistry.



33. Prof. Michael Levitt and Prof. Arieh Warshel developed computational models of complex chemical and biological molecules such as proteins. They shared the 2013 Nobel Prize in Chemistry with Martin Karplus.



34. Prof. Alexander Levitzki has pioneered the development of new chemical inhibitors against harmful molecules produced by cancer and other diseases. In 2005 he won the Wolf Prize in Medicine.



35. Prof. Elon Lindenstrauss is a mathematician renowned for his insights into ergodic theory, and their applications to number theory. He won the 2010 Fields Medal.



36. Prof. Michal Lipson is a physicist who has made influential discoveries in silicon photonics, developing devices that use light for information processing. In 2010 she won the Blavatnik Award.



37. Prof. Benjamin Mazar made outstanding contributions to the investigation of the cultures of the Middle East and their relation to biblical documents. He received the Harvey Prize in 1986.



38. Prof. Vitali Milman played a crucial role in the discovery and development of the concentration of measure phenomenon in mathematics, and its implications for geometric analysis. He won the Emet Prize in 2007.



39. Prof. Yuval Ne'eman was a theoretical physicist and politician, whose work helped lay the foundations of the quark model of subatomic particles. In 1970 he received the Albert Einstein Award.



40. Prof. Judea Pearl has made fundamental contributions to the field of artificial intelligence, especially through the development of a calculus for probabilistic and causal reasoning. He won the Turing Award in 2011.



41. Prof. Ilya Piatetski-Shapiro made major advances in a number of mathematical fields including number theory, representation theory and algebraic geometry. He was awarded the 1990 Wolf Prize in Mathematics.



42. Prof. Alexander Pines has made revolutionary contributions to NMR spectroscopy, a technique for observing magnetic fields around the nucleus of the atom. In 1991 he won the Wolf Prize in Chemistry.



43. Prof. Amir Pnueli did seminal work introducing temporal logic into computing science and developing program and system verification. He won the Turing Award in 1996.



44. Prof. Jakob Polotsky made outstanding contributions to the study of the languages of the Middle East, particularly his reconstruction of ancient Egyptian languages. In 1982 he received the Harvey Prize.

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45. Prof. Michael O. Rabin produced, among other achievements, the classic paper "Finite Automata and Their Decision Problems," which introduced the fertile concept of nondeterministic machines. He shared the 1976 Turing Award.



46. Prof. Aharon Razin and Prof. Haim (Howard) Cedar elaborated the mechanism by which genes are turned on and off, with major impacts on fields including embryonic development and cancer research. They shared the 2008 Wolf Prize in Medicine.



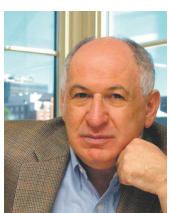
47. Prof. Aviv Regev is a computational biologist who has done significant work on gene expression and the mathematical representation of biochemical processes. She won the Overton Prize in 2008 and the ISCB Innovator Award in 2017.



48. Prof. Ariel Rubinstein is an economist who contributed to the formation of game theory, as well as creating a strategic approach to the process of bargaining which bears his name. He won the 2006 Emet Prize.



49. Prof. Leo Sachs was one of the inventors of amniocentesis, which is used for prenatal diagnosis of diseases, as well as elucidating mechanisms that differentiate normal and cancerous cells. He shared the 1980 Wolf Prize in Medicine.



50. Prof. Joseph Schlessinger played a critical role in deciphering a new code for the flow of information from the surface of cells into their interior. He received the Dan David Prize in 2006.



51. Prof. Gershon Scholem was an influential philosopher and historian, who made illuminating studies of the history of Jewish mysticism. In 1974 he received the Harvey Prize.



52. Prof. Oded Schramm was a mathematician renowned for his work at the intersection of probability theory and quantum field theories. He won the Ostrowski Prize in 2007.



53. Prof. Nathan Seiberg has developed supersymmetric quantum field theories that enabled new progress in both physics and mathematics. In 2012 he was an inaugural winner of the Breakthrough Prize in Fundamental Physics.



54. Prof. Michael Sela and Prof. Ruth Arnon made major discoveries in the field of immunology, enabling the development of safe and effective vaccines. In 1998 they shared the Wolf Prize in Medicine.



55. Prof. Shulamith Shahar is a historian whose work includes ground-breaking texts on the roles of women and children in the medieval period. She received the Israel Prize in 2003.



56. Prof. Adi Shamir has brought ingenious insights to cryptography and computer science, which helped enable pragmatic public-key cryptography. He won the 2002 Turing Award.



57. Prof. Saharon Shelah brought fundamental insights to mathematical logic and set theory, and their applications within other parts of mathematics. He won the 2001 Wolf Prize in Mathematics.



58. Prof. Dan Shechtman is the discoverer of quasicrystals, atomic structures that are ordered but not periodic, and which were not previously thought to exist. He won the Nobel Prize in Chemistry in 2011.



59. Prof. Yosef Shiloh has done key research on cellular responses to DNA damage and its relation to cancer formation, as well as on the molecular basis of human genetic disorders. He received the 2005 Emet Prize.



60. Prof. David Shulman is an Indologist who has done diverse and important research on the languages and cultural and religious traditions of India. He won the Emet Prize in 2010.



61. Prof. Nahum Sonenberg is a leader in the field of protein translation, the process by which the genetic code is converted into the proteins that perform most cellular functions. In 2014 he won the Wolf Prize in Medicine.



62. Prof. Amos Tversky and long-time partner Prof. Daniel Kahneman collaborated on research integrating insights from psychology into economics, especially concerning human decision-making under uncertainty. Six years after Tversky's death, Kahneman received the 2002 Nobel Prize in Economics for their joint work.



63. Prof. Shimon Ullman has made ground-breaking contributions to the development of artificial intelligence and computer vision and to the theoretical foundations of human cognition. He won the 2014 Emet Prize.



64. Prof. Isaak Wahl developed techniques for improving cereal grains, which have been used to provide food supplies for an ever-growing world population. In 1978 he was awarded the Harvey Prize.



65. Prof. Arieh Warshel and Prof. Michael Levitt developed computational models of complex chemical and biological molecules such as proteins. They shared the 2013 Nobel Prize in Chemistry with Martin Karplus.



66. Prof. Avi Widgerson is a mathematician who has done outstanding work in the field of computational complexity. He won the quadrennial Nevanlinna Prize in 1994 and the Gödel Prize in 2009.



67. Prof. Meir Wilchek has developed affinity chromatography, a powerful tool for the isolation and purification of biologically important molecules. He shared the 1987 Wolf Prize in Medicine.



68. Prof. Yosef Yarden has made crucial discoveries unravelling the roles of growth factors in cancer, leading to their recognition as targets for cancer therapy. He won the Emet Prize in 2007.



69. Prof. Ada E. Yonath is a crystallographer who mapped the structure of ribosomes, tiny cellular machines that convert genetic information into the proteins that perform most cellular functions. She won the Nobel Prize in Chemistry in 2009.



70. Prof. Yaakov Ziv has done pioneering research in information theory and developed the theoretical and practical infrastructure for data compression, used in many modern communications systems. In 2017 he won the Emet Prize.

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