THE BLAVATNIK AWARDS
For Young Scientists

2018

The Blavatnik Awards for Young Scientists honor exceptional young scientists and engineers by celebrating their extraordinary achievements, recognizing outstanding promise, and accelerating innovation through unrestricted funding.
“Encouraging and supporting young scientists is essential if we are to successfully address society’s challenges. By honoring these young individuals and their achievements we are helping to promote the breakthroughs in science and technology that will define how our world will look over the next century.”

LEN BLAVATNIK
FOUNDER AND CHAIRMAN OF ACCESS INDUSTRIES
AND HEAD OF BLAVATNIK FAMILY FOUNDATION

Table of Contents

Key Features.............................................................................................................................................. 4
Our History............................................................................................................................................... 6
Blavatnik Regional Awards.................................................................................................................. 8
Blavatnik National Awards................................................................................................................. 10
Blavatnik Awards in the United Kingdom.......................................................................................... 12
Blavatnik Awards in Israel..................................................................................................................... 14
Blavatnik Science Scholars................................................................................................................ 16
In the News............................................................................................................................................ 18
Key Features of The Blavatnik Awards for Young Scientists

Open to researchers working in more than 35 different scientific and engineering disciplines in three categories:

- The Blavatnik Award for Young Scientists in Chemistry
- The Blavatnik Award for Young Scientists in Physical Sciences & Engineering
- The Blavatnik Award for Young Scientists in Life Sciences

- Recognize and support outstanding young scientists and engineers early in their careers when additional funding and recognition have the greatest impact on their work.
- Honorees are selected based on the quality, novelty, and impact of their research, and their potential for further significant contributions to science.
- Offer the largest unrestricted prizes ever created for early-career scientists.
- Connect alumni with a network of their peers throughout the world to foster collaboration.

“The Awards program provides exceptional opportunities for Winners and Finalists to serve as role models to the world’s youth — showing that young, creative individuals can indeed be the face of science.”

ELLIS RUBINSTEIN
PRESIDENT AND CEO OF THE NEW YORK ACADEMY OF SCIENCES

“Many breakthroughs come from people working on the fringes of their subject. Interdisciplinary science ensures that this is happening, because it is often unexplored territory.”

DR. RICHARD ROBERTS
NOBEL LAUREATE, CHIEF SCIENTIFIC OFFICER OF NEW ENGLAND BIOLABS, AND A MEMBER OF THE BLAVATNIK AWARDS SCIENTIFIC ADVISORY COUNCIL
Our History

The Blavatnik Family Foundation announces doubling of the prize money for Winners and Finalists starting in 2013.

The Blavatnik National Awards announce its first National Laureates in Life Sciences, Physical Sciences & Engineering, and Chemistry.

The Blavatnik Family Foundation and the New York Academy of Sciences host the first annual Blavatnik Science Symposium.

The Blavatnik National Awards receive 300 nominations representing 147 American universities and research institutions.

The Blavatnik Regional Awards receive 130 postdoctoral nominations from institutions in the tri-state area.

The Blavatnik National Awards receive 300 nominations representing 147 American universities and research institutions.

The Blavatnik Family Foundation and the New York Academy of Sciences host the first annual Blavatnik Science Symposium.

The Blavatnik National Awards announce its first National Laureates in Life Sciences, Physical Sciences & Engineering, and Chemistry.

The Blavatnik Family Foundation announces doubling of the prize money for Winners and Finalists starting in 2013.

The Blavatnik National Awards receive 300 nominations representing 147 American universities and research institutions.

The Blavatnik Regional Awards receive 130 postdoctoral nominations from institutions in the tri-state area.

The Blavatnik National Awards receive 300 nominations representing 147 American universities and research institutions.

The Blavatnik Family Foundation announces doubling of the prize money for Winners and Finalists starting in 2013.

The Blavatnik National Awards receive 300 nominations representing 147 American universities and research institutions.

The Blavatnik Regional Awards receive 130 postdoctoral nominations from institutions in the tri-state area.
2017 Blavatnik Regional Awards for Young Scientists

Acknowledge and celebrate the excellence of outstanding postdoctoral scientists and engineers who work in New York, New Jersey, and Connecticut.

Winners and Finalists are selected by a group of senior scientists and engineers from institutions primarily in the Northeast. Winners are awarded US$30,000 each and Finalists are awarded US$10,000 each in unrestricted funds.

ANDREW ILOTT
2017 Regional Winner in Chemistry
Bristol-Myers Squibb (formerly at New York University)

Dr. Ilott developed a novel MRI method and achieved the first non-invasive observation of dendrite formation within a functioning lithium battery in real-time. Lithium batteries are ubiquitous in today’s society but are also susceptible to failure which can result in the battery overheating. This is due to the formation of small tree-like structures called dendrites that can cause the battery to short circuit and become a fire hazard. Dr. Ilott’s monumental breakthrough opens the door towards elucidating the mechanism of dendrite formation and has the potential to accelerate development of new battery materials and make battery recycling efforts more viable.

“My research is helping to enable the development of next-generation battery technologies by giving chemists and materials scientists new tools for probing atomic-level interactions inside functioning battery cells. I aim to spend my career innovating in science and influencing others to do the same.”

JUNE HUH
2017 Regional Winner in Physical Sciences & Engineering
Institute for Advanced Study

Dr. Huh is now best known for his proof of the Rota conjecture: an underlying pattern in mathematical graphs that was always found to be true, but that had never been proven from first principles. The Rota conjecture remained unexplained for more than 50 years before Dr. Huh and his colleagues reinterpreted ideas from one area of math – singularity theory – to an entirely unrelated area: matroid theory. He believes that there is an underlying unity between all the different branches of mathematics and his goal is to use this unity to build a framework that allows problems to be tackled with diverse methods.

“There are some important open questions [in mathematics]. It would be great to see any one of them resolved in the future, because resolution of previously unanswered questions means that we have found a new way of thinking, and have pushed the boundary of the power of pure reasoning beyond what was available to the previous generation of thinkers.”

CHAO LU
2017 Regional Winner in Life Sciences
Columbia University (formerly The Rockefeller University)

Dr. Lu’s work focuses on novel approaches to cancer treatment. He identified a novel mechanism by which cancer can develop, demonstrating that mutations in histones—proteins that package and regulate access to DNA—can cause tumor formation. He found that these histone mutations cause abnormal gene expression in cells, and that by correcting this, he could halt the growth of tumors, effectively “reprogramming” the cancer cell back to health. Cancer treatments that alter cancer cells rather than kill them could be a less toxic option for cancer patients. Dr. Lu’s goal is to apply his discoveries to advance current diagnosis, classification and treatment of cancer.

“For many cancer types, toxic chemo- and radiation therapies remain the standard of care. I hope that through understanding the tumor epigenome landscape, novel precision therapies can be developed to effectively eliminate cancer cells while sparing normal tissues.”

Meet the 2017 Blavatnik Regional Winners
JANELLE AYRES
2018 National Laureate in Life Sciences
Salk Institute of Biological Sciences

Dr. Ayres discovery of the host “co-operative defense” system is re-defining our understanding of host-pathogen interactions. This defensive system encodes disease tolerance mechanisms that allows a host to minimize damage while inflicting little to no effect on the invading pathogen, promoting survival of both. She also discovered that this system encodes anti-virulence mechanisms that prevent pathogenic behavior of microbes enabling them to exist as benign microbes in the host. Therefore, promoting co-operative defenses—instead of attack—may offer a novel therapeutic approach to treating infections that is not reliant on antibiotics, will ensure patient survival and reduce the threat of infectious diseases.

“I am driven by the excitement of challenging paradigms and making discoveries that have the potential to fundamentally transform the way we approach problems and impact people on a global scale.”

NEAL K. DEVARAJ
2018 National Laureate in Chemistry
University of California, San Diego

Dr. Devaraj is a biochemist whose transformative work on the synthesis of artificial cells and membranes has created an exciting new field of research that aims to address one of the great challenges in synthetic biology. He has made several game-changing discoveries. Among his signature achievements is the development of new methods for labeling biological molecules, which are widely used by researchers that reagent suppliers now include his probes in their catalogs.

“When I observe a cell, I marvel at how such complex sets of molecules can assemble to form a living organism. As a chemist, I wonder, what is the minimal prerequisite chemistry from which biology can emerge? Motivated by this question, my lab is developing technologies to unravel the secrets of life’s origin while simultaneously improving our understanding of modern-day biochemistry.”

SERGEI V. KALININ
2018 National Laureate in Physical Sciences & Engineering
Oak Ridge National Laboratory

In his research, Dr. Kalinin develops innovative instrumentation technologies that not only allow scientists to quantitatively map material properties, but also manipulate matter atom by atom and begin to control material functionality at the atomic and nanoscale. He has also taken what was once considered an undesirable artifact in electron imaging – damage incurred by an electron beam hitting the sample during imaging with a scanning transmission electron microscope – and harnessed it in a controlled manner to manipulate atomic structure not only at the surface but also in the bulk of the material.

“The scientific community is undergoing a transformative change in the way that science is performed, driven by marked shifts in the generation and processing of data, and enabled by advances in statistical and machine learning techniques. I aim to harness these advances in the area of atomically resolved imaging, to transform the process from one of pure observation to active manipulation, delivering insights into physics, controlling atomic dynamics and directing individual atoms into desired positions, thereby creating new materials and enabling atomic scale device fabrication.”

Blavatnik National Laureates and Finalists are selected by a jury composed of some of the nation’s most distinguished scientists and engineers.
Meet the 2018 Blavatnik Laureates in the United Kingdom

M. MADAN BABU
2018 United Kingdom Laureate in Life Sciences
MRC Laboratory of Molecular Biology

Dr. Babu has uncovered mechanistic details of a class of proteins called G-protein–coupled receptors (GPCRs). These proteins are implicated in over a hundred human disorders, and drugs targeting GPCRs represent nearly 30% of all drug sales. Dr. Babu and his team has shown that many GPCRs targeted by common drugs are highly variable in the human population, such that patients with different variants are likely to have different responses to the same drug. This work represents a significant contribution to the relatively new field of personalized medicine.

“Our work focuses on extracting knowledge from large-scale datasets to uncover complex patterns, thereby making new discoveries. We have obtained molecular insights into how G-protein–coupled receptors – a major drug target that regulates virtually every aspect of human physiology – function. We have also discovered mechanisms by which unstructured protein regions contribute to cellular function and disease.”

HENRY SNAITH
2018 United Kingdom Laureate in Physical Sciences & Engineering
University of Oxford

Prof. Snaith has striven to develop new high-efficiency photovoltaic technologies based on simply processed metal halide perovskite materials, which have the potential to deliver solar energy to the market at a fraction of the cost of currently used silicon materials. He has raised the energy conversion efficiency of a perovskite solar cell from less than 10% to 22%, which is comparable to mainstream silicone modules, and is currently pushing to surpass the 30% energy efficiency mark by combining perovskites with silicon in a layered device. In addition, Prof. Snaith’s work overturns the long-held view that materials need to be extremely pure to function as semiconductors. His work has initiated a new research field followed by scientists worldwide to apply perovskite materials in other important electronic and optoelectronic applications.

“I have been remarkably fortunate to discover that this previously unexplored family of materials, metal halide perovskites, are like no other semiconductor material studied before, and promise to be transformative in photovoltaic solar energy.”

ANDREW GOODWIN
2018 United Kingdom Laureate in Chemistry
University of Oxford

Prof. Goodwin is a world leader in the study of the dual roles of mechanical flexibility and structural disorder in functional materials. His laboratory uses advanced diffraction and modeling techniques to explore disordered materials and subsequently produce new, tailored materials that display unique properties. He also studies amorphous materials using total scattering methods, which, in the case of amorphous calcium carbonate, the key structural component in bones and shells, has led to a complete understanding of the ability of organisms to nucleate different crystalline structures from the same biomineral precursor.

“Materials design usually focuses on arranging atoms in patterns that repeat in various different ways, but our research asks: what new properties are possible if these atomic patterns never repeat? This fundamental question has very real-world ramifications for the design of next-generation materials — from batteries to pharmaceuticals.”

2018 Blavatnik Awards for Young Scientists in the United Kingdom

Launched in 2017 to recognize and support outstanding young scientists and engineers in the UK. Each year, beginning in 2018, one nominee in each category will be named a Blavatnik Laureate in the UK and awarded US$100,000 in unrestricted funds, with two Finalists in each category each receiving US$30,000 in unrestricted funds. Talented young faculty across the UK are nominated by their university or research institution, or by members of the UK Scientific Advisory Council.

Blavatnik Laureates and Finalists in the UK are selected by a jury of distinguished researchers in their respective disciplines.

“There are many prizes for senior scientists often at a time when they don’t need them and frequently years after they’ve made their big discoveries. It is a really nice change to see scientists rewarded early in their career when they have many great things ahead of them.”

SIR VENKI RAMAKRISHNAN
NOBEL LAUREATE, PRESIDENT OF THE ROYAL SOCIETY, AND MEMBER OF THE BLAVATNIK AWARDS IN THE UK SCIENTIFIC ADVISORY COUNCIL

Meet the 2018 Blavatnik Laureates in the United Kingdom

ANDREW GOODWIN
2018 United Kingdom Laureate in Chemistry
University of Oxford

Prof. Goodwin is a world leader in the study of the dual roles of mechanical flexibility and structural disorder in functional materials. His laboratory uses advanced diffraction and modeling techniques to explore disordered materials and subsequently produce new, tailored materials that display unique properties. He also studies amorphous materials using total scattering methods, which, in the case of amorphous calcium carbonate, the key structural component in bones and shells, has led to a complete understanding of the ability of organisms to nucleate different crystalline structures from the same biomineral precursor.

“Materials design usually focuses on arranging atoms in patterns that repeat in various different ways, but our research asks: what new properties are possible if these atomic patterns never repeat? This fundamental question has very real-world ramifications for the design of next-generation materials — from batteries to pharmaceuticals.”

HENRY SNAITH
2018 United Kingdom Laureate in Physical Sciences & Engineering
University of Oxford

Prof. Snaith has striven to develop new high-efficiency photovoltaic technologies based on simply processed metal halide perovskite materials, which have the potential to deliver solar energy to the market at a fraction of the cost of currently used silicon materials. He has raised the energy conversion efficiency of a perovskite solar cell from less than 10% to 22%, which is comparable to mainstream silicone modules, and is currently pushing to surpass the 30% energy efficiency mark by combining perovskites with silicon in a layered device. In addition, Prof. Snaith’s work overturns the long-held view that materials need to be extremely pure to function as semiconductors. His work has initiated a new research field followed by scientists worldwide to apply perovskite materials in other important electronic and optoelectronic applications.

“I have been remarkably fortunate to discover that this previously unexplored family of materials, metal halide perovskites, are like no other semiconductor material studied before, and promise to be transformative in photovoltaic solar energy.”

M. MADAN BABU
2018 United Kingdom Laureate in Life Sciences
MRC Laboratory of Molecular Biology

Dr. Babu has uncovered mechanistic details of a class of proteins called G-protein–coupled receptors (GPCRs). These proteins are implicated in over a hundred human disorders, and drugs targeting GPCRs represent nearly 30% of all drug sales. Dr. Babu and his team has shown that many GPCRs targeted by common drugs are highly variable in the human population, such that patients with different variants are likely to have different responses to the same drug. This work represents a significant contribution to the relatively new field of personalized medicine.

“Our work focuses on extracting knowledge from large-scale datasets to uncover complex patterns, thereby making new discoveries. We have obtained molecular insights into how G-protein–coupled receptors – a major drug target that regulates virtually every aspect of human physiology – function. We have also discovered mechanisms by which unstructured protein regions contribute to cellular function and disease.”
Launched in 2017, in collaboration with the Israel Academy of Sciences and Humanities, the Blavatnik Awards for Young Scientists in Israel recognize and support outstanding young faculty scientists and engineers in Israel. Each year, beginning in 2018, one nominee in each category will be named a Blavatnik Laureate in Israel and awarded US$100,000 in unrestricted funds. Nominations are accepted from universities and via the Scientific Advisory Council in Israel.

Blavatnik Laureates in Israel are selected by a jury of world-recognized researchers in their respective disciplines.

“We are delighted that the Blavatnik Awards have come to Israel. They are a unique way to showcase and support the remarkable talent that exists amongst the country’s young scientists, and our inaugural Laureates show just how the young researchers of Israel are truly at the cutting edge of scientific exploration.”

PROF. NILI COHEN
PRESIDENT OF THE ISRAEL ACADEMY OF SCIENCES AND HUMANITIES

ANAT LEVIN
2018 Israel Laureate in Physical Sciences & Engineering
Technion – Israel Institute of Technology

Dr. Levin has made ground-breaking contributions to the emerging field of computational photography, which blends computing with traditional imaging techniques to transcend the limitations of traditional camera or other imaging systems. Her work is rooted in discovering mathematical foundations and applying them in computational algorithms that solve many real-world challenges in imaging. Her research has potential benefits in the medical, digital, and entertainment industries as well as academic research where imaging systems are utilized.

“My research focuses on computational photography—how to use computing, statistical and optics to better exploit images. For instance, I have recently looked at how light scatters and spreads in a material in order to accurately measure the material’s chemical composition. This can be extended to evaluate pollution in the air, improve ultrasound imaging, or understand the geophysical structure of the earth layers.”

ODED RECHAVI
2018 Israel Laureate in Life Sciences
Tel Aviv University

Dr. Rechavi uncovered a novel mechanism of inheritance, demonstrating that environmentally induced acquired traits such as adaptive responses to stress can be passed to subsequent generations by small RNAs without changes to the DNA. In doing so, Dr. Rechavi has provided crucial evidence to support the controversial theory that acquired traits can be transmitted to future generations. This body of work represents a paradigm shift that will have ramifications throughout the fields of evolutionary biology, genetics, developmental biology, and social science. These studies can help us to understand how complex traits and diseases are inherited – a first step towards treatments for many diseases where causative genes have not been identified.

“I want to understand at the molecular level how memory, in the broadest sense, is encoded. To do this I am trying to challenge dogmas, and as Marcel Duchamp said, ‘to challenge myself,’ to avoid conforming to my own tastes.”

CHARLES DIESENDRUCK
2018 Israel Laureate in Chemistry
Technion – Israel Institute of Technology

Dr. Diesendruck’s research focuses on the emerging field of “mechanochemistry,” in which mechanical stress on a material is used to induce chemical transformations. A common goal in mechanochemistry is to produce materials that respond when damaged by outside forces, either by reporting the damage, self-reinforcing or even regenerating. One of the themes of Dr. Diesendruck’s research involves the production of polymers that distribute stress evenly throughout the larger structure, rather than at the center where stress is typically focused. Such systems may one day find widespread application in smart materials, where the loss of properties due to aging or mechanical damage is corrected, reversed, or even eliminated.

“Chemistry is known as the central science; as such, it should strive to erase its borders and impact neighboring fields. We seek to understand the connection between chemistry and mechanics, looking at how stress affects molecules, and how small changes in molecules transform the mechanical response of materials.”
In the twelve years since its launch, the Blavatnik Awards for Young Scientists has built an exceptional network of past and current honorees, whose members together represent one of the most dynamic, innovative, and cross-disciplinary communities in the world — the Blavatnik Science Scholars Community.

2007

FACTORY WINNERS
Léon Bottou
George Malliaras
Ruslan Medzhitov
Milan Stojanovic
Leslie B. Vossshall

FACTORIAL FINALISTS
Antje Bauemmer
Christoph Bregler
Geoffrey Coates
Antonio Giraldez
Taru Kapoor
Scott Keeny
Philip Kim
Colin Nuckolls
Kathryn Ulrich

2008

FACTORIAL WINNERS
Steve Gubser
Laura Landweber
Tom Muir

FACTORIAL FINALISTS
Daphne Bavelier
Geoffrey Coates
Christine Jacobs-Wagner
Pandras Dincă
Kenneth Shepard
Saeid Nalchi
Kathryn Ulrich

2009

FACTORIAL WINNERS
Paul Chirik
Carina Ganzrine
Rebecca Oppenheimer
Shah Shaham

FACTORIAL FINALISTS
Tamas Horvath
Lan Hui
Daniel Sigman
Denis Zorin

2010

FACTORIAL WINNERS
Song-Ha Shi
Zoltan Haiman
Michal Lipson
Evgeny Nudler

FACTORIAL FINALISTS
Elza Ekeri
David Evans
Neal Wanz

2011

FACTORIAL WINNERS
Szeah Shi
Zoltan Haiman
Michal Lipson
Evgeny Nudler

FACTORIAL FINALISTS
Elza Ekeri
David Evans
Neal Wanz

2012

FACTORIAL WINNERS
Andre Bernevig
Jason Friddle
Alston Galvani
Assaf Naor

FACTORIAL FINALISTS
Andrey Kefalov
Michael Hahn
Robert Johnston
Elisa Orlicchio
Nicholas Stavropoulos

2013

FACTORIAL WINNERS
David Blei
Kristjan Haule
Patrick Holland
Samie Jaffezy
Frank Petrorius

FACTORIAL FINALISTS
Jonathan Fisher
Rachel Rosen

2014

FACTORIAL WINNERS
Robert Anderson
Chanampoom Koharum
Jun Korenaga
Olga Troyanskaya
Gerard Wysoczynski

FACTORIAL FINALISTS
Franck Oury
Valentino Tosatti

2015

FACTORIAL WINNERS
Robert Borsaon
Mary Kay Loblo
Shawn Olsen
Ruth Van De Water

FACTORIAL FINALISTS
Andre Bernevig
Jason Friddle
Alston Galvani
Assaf Naor

2016

FACTORIAL WINNERS
Robert Borsaon
Mary Kay Loblo
Shawn Olsen
Ruth Van De Water

FACTORIAL FINALISTS
Andre Bernevig
Jason Friddle
Alston Galvani
Assaf Naor
The Blavatnik Family Foundation is an active supporter of many leading educational, scientific, cultural, and charitable institutions in the United States, the United Kingdom, Israel, and throughout the world. Recipients of Foundation support include the University of Oxford, Harvard University, Yale University, Tel Aviv University, Stanford University, New York University, the New York Academy of Sciences, Tate, the Victoria and Albert Museum, Carnegie Hall, the Royal Opera House, the Hermitage Museum, Lincoln Center, Jewish charitable organizations, and countless other philanthropic institutions. The Foundation is headed by Len Blavatnik, a major American and British entrepreneur and philanthropist. Len Blavatnik is the Founder and Chairman of Access Industries, a privately held U.S. industrial group with global strategic interests in natural resources and chemicals, media and telecommunications, venture capital, and real estate.

For more detailed information, please visit: www.accessindustries.com.

The New York Academy of Sciences is an independent, not-for-profit organization that, since 1817, has been driving innovative solutions to society’s challenges by advancing scientific research, education, and policy. Throughout its history, the Academy’s Membership has featured thinkers and innovators from all walks of life, including U.S. Presidents Thomas Jefferson and James Monroe, Thomas Edison, Lord Kelvin, Charles Darwin, Margaret Mead, Louis Pasteur, and more than 130 Nobel Laureates. Today, the Academy numbers over 20,000 Members in 100+ countries, with a President’s Council that includes 36 Nobel Laureates, and a distinguished Board of Governors comprised of leaders from business, academia, and philanthropy. It is also young and dynamic, with nearly 10,000 post-doctoral, post-graduate, undergraduate, and gifted high school student Members. Through collective action, the Academy is partnering with the United Nations to address their Sustainable Development Goals, advising national leaders and organizing public-private partnerships to address the grand challenges of the planet.

Please visit us online at www.nyas.org and follow us on Twitter @NYASciences.

The Israel Academy of Sciences and Humanities is the preeminent scientific institution in Israel. It was established by law in 1961 and acts as a national focal point for Israeli scholarship in all branches of the sciences, social sciences, and humanities. The Academy comprises 125 of Israel’s most distinguished scientists and scholars who operate in two sections—the sciences section and the humanities section. It is tasked with promoting Israeli scientific excellence; advising the government on scientific matters of national interest; publishing scholarly research of lasting merit; and maintaining active contact with the broader international scientific and scholarly community.

Please visit us online at www.academy.ac.il and follow us on Twitter @IsraelAcademy.