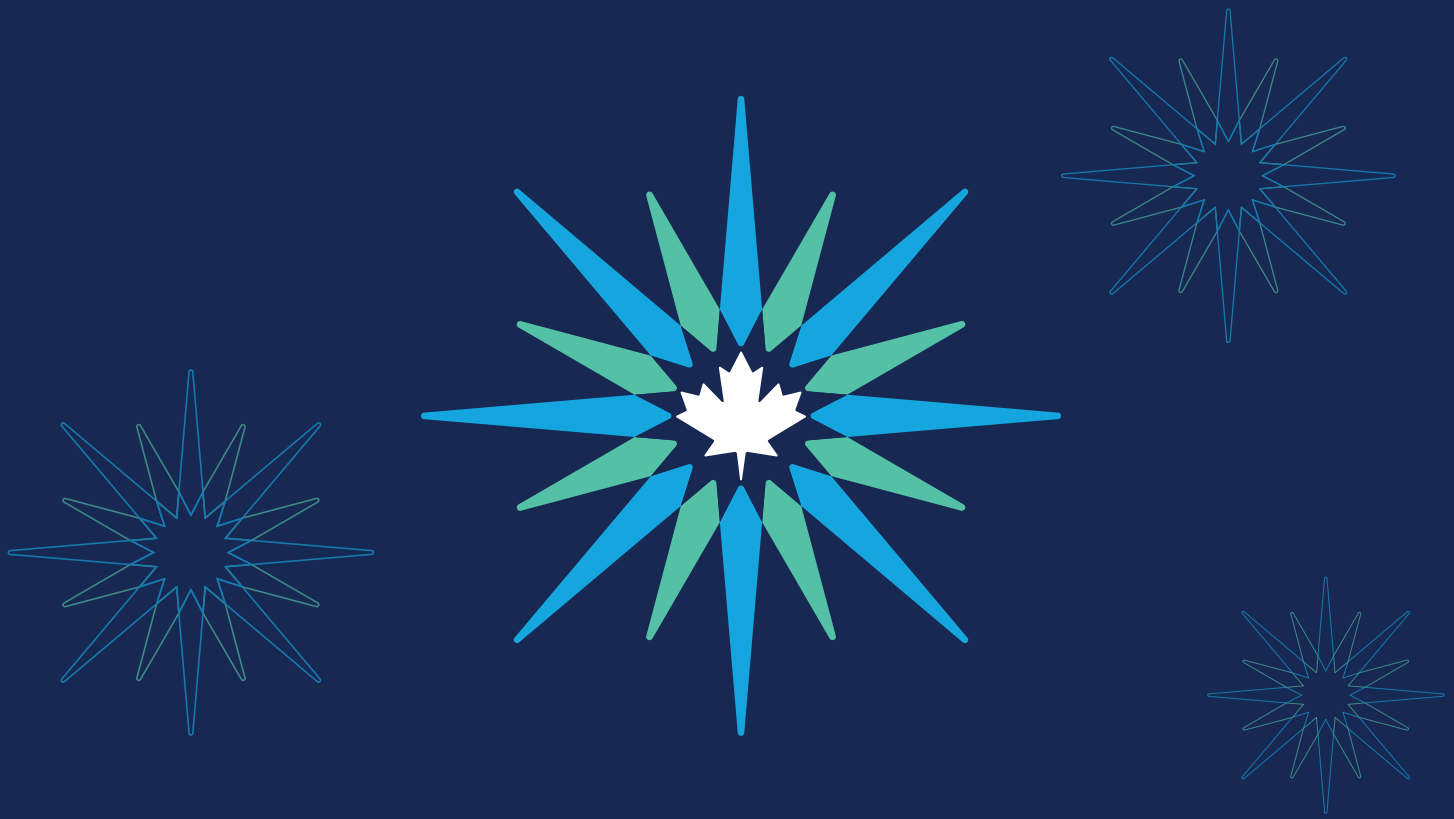

Canadian excellence, Global recognition:

Canada's 2018 winners of major international research awards

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Global Research Excellence

Canada's 2018 winners of major international awards

Foreword by Dr. Brenda Milner, CC, GOQ, DSc, PhD
Dorothy J. Killam Professor, McGill University

As a behavioural neuroscientist, I am intrigued by the functioning of the brain as it relates to specific processes and actions. What, for example, makes one investigator succeed where another might fail?

Although I lack empirical evidence to support this claim, I have found that the best experimenters are curious and open-minded. They may be driven towards a final destination, but they welcome side trips along the way, because they know that unexpected journeys often yield the most interesting results.

The Canadian scholars profiled in this year's publication have followed their paths to fascinating places. As the recipients of major international research awards and prizes, they have achieved outstanding accomplishments across disciplines. Whether their track was straight and narrow, or filled with curves, they have earned their place among the world's research elite.

I congratulate all the winners for the recognition they so richly deserve. It is my hope that their success inspires a younger generation to take their own leap into the unknown.

Canadian excellence, global recognition

Celebrating Canada's 2018 winners of major international research awards

Whether they work in the field of mathematics and physics, health and medicine, or the social sciences and humanities, the 17 Canadian researchers and artists profiled in this booklet have all been recognized at home and around the world for their impressive accomplishments.

Their achievements run the gamut — from advancing theoretical questions in the pure sciences... to identifying how genomics can fight disease and protect biodiversity... to developing new means of expression through images, words and sound in the fine arts.

Some are rising stars, earning prestigious fellowships to help them build on early promise. Others are in the midst of thriving careers with a distinguished list of credits to their names. Still others are late-career winners, receiving accolades for bodies of work that have transformed how we understand the world and each other.

Whatever their discipline, and wherever they fall on the career spectrum, these members of the "class of 2018" are well-deserving recipients of the honours bestowed on them. We salute all the winners for their personal achievements, for advancing collective knowledge and for heightening Canada's reputation on the global stage.

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COSMOLOGY

Photo: Liam Sharp, University of Toronto

J. Richard Bond

Developing a new census for the universe

University of Toronto
Gruber Cosmology Prize

Ten years after winning the Gruber Cosmology Prize for his individual research, J. Richard Bond from the University of Toronto was one of three Canadian members of the Planck Team awarded the 2018 edition of the prize.

The Planck Team generated a wealth of data between 2009-13 from the European Space Agency's Planck satellite observatory. In so doing, it assembled a composite map of the early universe more precise and sensitive than any previous research. Among their findings, Planck's researchers provided a new "census", identifying the universe as 26.8 per cent dark matter, 68.3 per cent dark energy and 4.9 per cent ordinary matter (such as atoms). Their data have transformed theoretical research in cosmology, opening the door to further exploration into the contents and evolutions of the universe for decades to come.

Dr. Bond completed an undergraduate degree in mathematics and physics at the University of Toronto in 1973 before earning graduate and post-graduate degrees in theoretical physics at Caltech. In 1985, he returned to the University of Toronto as a founding faculty member in the Canadian Institute for Theoretical Astrophysics and Fellow of the Canadian Institute for Advanced Research's Cosmology and Gravity Program. A past director of CITA, he was the director of CIFAR from 2002 to 2017.

Among his laurels, Dr. Bond was named University Professor at the University of Toronto in 2000, the highest honour bestowed by the institution. He became an Officer of the Order of Canada in 2005 and was inducted into the Order of Ontario in 2008. In 2012, he was awarded the Queen Elizabeth II Diamond Jubilee Medal.

The Gruber Cosmology Prize honours a leading cosmologist, astronomer, astrophysicist or scientific philosopher for theoretical, analytical, conceptual or observational discoveries leading to fundamental advances in our understanding of the universe. It acknowledges and encourages further exploration in a field that shapes the way we perceive and comprehend our universe. In this way, The Gruber Foundation seeks to extend the pioneering legacy of, among others, Plato and Aristotle; Ptolemy and Copernicus; Brahe, Kepler and Galileo; Newton and Halley; Einstein and Hubble.

PHYSICS

Gilles Brassard

FRS, FRSC, O.C., O.Q.

A quantum leap in information science

Université de Montréal
Wolf Prize for Physics

Gilles Brassard, a pioneer of quantum information science at the Université de Montréal since 1979, became in May 2018 the first Canadian ever to receive the prestigious Wolf Prize in Physics "for founding and advancing the fields of Quantum Cryptography and Quantum Teleportation." The Prize was shared with his lifelong collaborator Charles Bennett of IBM Research.

The Wolf Prize celebrates Professor Brassard's two most famous discoveries, which are universally recognized among the most fundamental pillars of the now thriving field of quantum information science. *Quantum cryptography* provides unconditionally secure communication between participants who share no secret information beforehand. *Quantum teleportation* was invented following a brainstorming session that took place in Professor Brassard's office in November 1992. It harnesses *entanglement*, which is the most nonclassical manifestation of quantum theory, to enable the transmission of quantum information, which disappears from one place before it can reappear elsewhere without having passed through the intervening space.

An Officer of the Order of Canada and the Ordre national du Québec, and a Fellow of the Royal Societies of London and of Canada, Professor Brassard earned his undergraduate and graduate degrees in computer science at the Université de Montréal. Following completion of his PhD at Cornell University in 1979, he joined the Department of Computer Science and Operations Research of his alma mater in Montreal, where he has remained ever since. Appointed Canada Research Chair in Quantum Information Science (2001-21), he has also received honorary doctoral degrees from universities in Zürich, Ottawa and Lugano.

The Wolf Prize, established by the Wolf Foundation in Israel, awards prizes to outstanding scientists and artists, irrespective of nationality, race, colour, religion, sex or political views, for achievements in the interest of mankind and friendly relations among people.

MATHEMATICAL SCIENCE

Robert Haslhofer

Expanding knowledge of geometric flows

University of Toronto Scarborough
Sloan Research Fellowship

Robert Haslhofer, an assistant professor in the Department of Computer and Mathematical Sciences at the University of Toronto Scarborough, has been awarded a Sloan Fellowship. The award, given to rising research stars, complements a recent grant from the Natural Sciences and Engineering Research Council of Canada.

Dr. Haslhofer has a special interest in geometric analysis and flows, including mean curvature flow and Ricci flow. A simple, two-dimensional example of such a mean curvature flow would be oil drops on the surface of water. Dr. Haslhofer's research explores flows, spheres and manifolds in a multi-dimensional universe.

After receiving his undergraduate, graduate and postgraduate degrees in mathematics at ETH Zurich (Switzerland), Dr. Haslhofer taught at the Courant Institute of Mathematical Sciences in New York for three years before joining the University of Toronto in 2015.

The Sloan Research Fellowships are given annually to early-career scientists and scholars whose achievements and potential identify them as rising stars and influential leaders. They are one of the oldest awards conferred by the Alfred P. Sloan Foundation, a philanthropic, not-for-profit grant-making institution based in New York City. The foundation makes grants in support of original research and education in science, technology, engineering, mathematics and economic performance.

GENETICS

Paul Hebert

Developing genetic barcodes for all species

University of Guelph
Dr. A.H. Heineken Prize for Environmental Sciences

The Royal Netherlands Academy of Arts and Sciences awarded the 2018 Dr. A.H. Heineken Prize for Environmental Sciences to Paul Hebert for his "pivotal contribution to developing a genetic barcode capable of classifying every biological species on Earth."

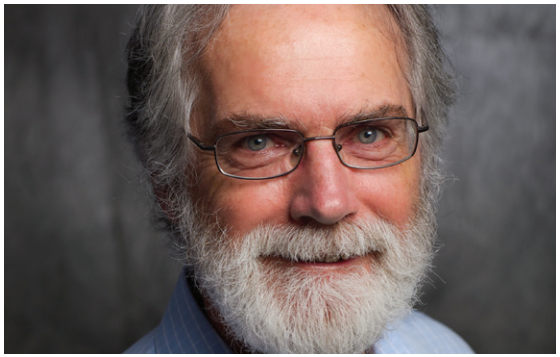
Dr. Hebert, known globally as "the father of DNA barcoding," is Canada Research Chair in Molecular Biodiversity at the University of Guelph. He also directs the Centre for Biodiversity Genomics in Guelph, which is the global leader in the field of DNA barcoding — a system that uses a small DNA fragment to discriminate species.

CBG, for example, leads the International Barcode of Life Project, the largest-ever biodiversity genomics initiative. More than 1,000 researchers from 30 countries are constructing a DNA barcode reference library which now includes more than 6 million barcodes derived from more than 500,000 different species. Ultimately, this project will empower anyone to know, in minutes, essential information about any animal or plant. This holds out the promise of better protection of forestry and agriculture, earlier interception of invasive species, and strengthened ecosystem monitoring and conservation.

Dr. Hebert studied biology at Queen's University (Canada) before transferring to the University of Cambridge (U.K.) for his graduate degree in genetics. After obtaining his PhD in 1972, he spent three years at the University of Sydney (Australia) as a Rutherford Fellow supported by the Royal Society (U.K.). Returning to Canada in 1976, he took up a faculty position at the University of Windsor where he was a professor and director of its Great Lakes Institute. In 1990, he was appointed as Chair of the Department of Zoology at the University of Guelph, a position he held until taking up a Canada Research Chair in 2001. In addition to holding three honorary doctorates, he is a Fellow of the Royal Society of Canada and was invested as an Officer of the Order of Canada in 2015.

The Heineken Prizes, awarded every other year, are the most prestigious international science prizes of the Netherlands. The laureates are selected by juries assembled by the Royal Netherlands Academy of Arts and Sciences and made up of leading Dutch and foreign scientists and scholars. The Heineken Prize for Environmental Sciences is named after Dr. Alfred H. Heineken (1923-2002).

COSMOLOGY



Peter G. Martin

Developing a new census for the universe and Milky Way

University of Toronto
Gruber Cosmology Prize

Peter G. Martin from the University of Toronto was one of three Canadian members of the Planck Team awarded the 2018 Gruber Prize for Cosmology.

The Planck Team generated a wealth of data between 2009-13 from the European Space Agency's Planck satellite observatory. In so doing, it mapped the cosmic microwave background radiation from the early universe with unprecedented precision and sensitivity. Among their findings, Planck's researchers provided a new "census," quantifying the universe as 26.8 per cent dark matter, 68.3 per cent dark energy and 4.9 per cent ordinary matter (such as atoms). Their data, including exquisite maps of our own galaxy, have transformed theoretical research in both the large scale universe and the interstellar medium in the Milky Way, opening the door to further exploration into their contents and evolution for decades to come.

Dr. Martin, who earned undergraduate and graduate degrees from the University of Toronto, returned to the institution after completing his doctorate in the Department of Applied Mathematics and Theoretical Physics at the University of Cambridge in 1972. He became the first faculty member of the Canadian Institute for Theoretical Astrophysics at the university in 1984, where he continues as a professor.

Other recognitions include Officer of the Order of Canada, Fellow of the Royal Society of Canada, Senior Fellow at Massey College in the University of Toronto and the Queen Elizabeth II Diamond Jubilee Medal. From the Canadian Astronomical Society he has received the C.S. Beals Award for outstanding achievement in research and the Executive Award for Outstanding Service, and from the Royal Astronomical Society, two Group Achievement Awards for Planck and for the Herschel Space Observatory.

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GENETICS

Hamed Shateri Najafabadi

Unlocking secrets in the human code book

McGill University
Sloan Research Fellowship in Computational and Evolutionary Molecular Biology

Hamed Shateri Najafabadi, an assistant professor in McGill University's Department of Human Genetics, received a Sloan Fellowship to support his explorations into the inner workings of the cell.

Using computational algorithms and mathematical models, Dr. Najafabadi explores how information in DNA is read and interpreted. Understanding these links can help decipher the nature of the malfunctions in the human genome that lead to disease. While his team focuses on cancer, it has also made discoveries that shed light into Alzheimer's disease.

Following undergraduate and graduate degrees in biotechnology at the University of Tehran (Iran), Dr. Najafabadi completed doctoral studies at the Department of Parasitology and McGill Centre for Bioinformatics in 2011. He joined the faculty at McGill after a postdoctoral fellowship at the University of Toronto.

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MUSIC

Farangis Nurulla-Khoja

An infinite landscape of sound

Guggenheim Fellowship in Music Composition

Farangis Nurulla-Khoja, a Canadian composer born in Dushanbe, Tajikistan, was awarded a Guggenheim Fellowship to continue her search for sounds unheard and forms unseen.

Dr. Nurulla-Khoja, a descendant of the Tajik composer Ziyodullo Shahidi, believes that dance is the complement of music and that language — particularly that of poets — is above all a series of communicative sounds. She has composed more than 50 pieces of symphonic, chamber, vocal and electro-acoustic music that have been performed in more than 21 countries in Europe, North America and Asia. In addition, her music has appeared in various documentary and experimental films.

Among recent accolades, Dr. Nurulla-Khoja won the Gold Medal "Best of Show" of the 2017 Global Music Award for her piece *Incandescence*; the Joseph S. Stauffer Prize for the Arts for best mid-carrer composer; the Andrey Petrov prize for *L'infini de l'instant* a piece for full orchestra, and "Ravishi Nur," concerto for saxophone and sinfonietta, and her concerto for violin and string orchestra *Daidu* won a prize at an international competition in Poland. She has also been a composer in residence for many prestigious organizations such as the Royaumont Foundation in France, the Bellagio Center of the Rockefeller Foundation in Italy and the Society of Swedish Composers in Cortona, Italy.

Dr. Nurulla-Khoja, who has studied at the University of California in San Diego as well as the Institut de recherche et coordination *acoustique/musique* in Paris, holds a PhD of fine arts in composition from the University of Gothenburg, Sweden.

U.S. Senator Simon Guggenheim and his wife established the John Simon Guggenheim Memorial Foundation in 1925. The foundation offers fellowships to further the development of scholars and artists by assisting them to engage in research in any field of knowledge and creation in any of the arts, under the freest possible conditions. Guggenheim Fellowships are intended for men and women who have already demonstrated exceptional capacity for productive scholarship or creative ability in the arts.

GENETICS

Janet Rossant

Understanding the role of genes in development

University of Toronto
L'Oréal-Unesco For Women in Science Awards

Janet Rossant, who holds University of Toronto's highest rank of University Professor, was honoured with a 2018 L'Oréal-UNESCO For Women in Science Award in life sciences. The prize, which promotes diversity in science, cites Dr. Rossant's "outstanding research that helped us to better understand how tissues and organs are formed in the developing embryo."

Using both cellular and genetic manipulation techniques, Dr. Rossant works to understand the genetic control of normal and abnormal development in the early mouse embryo. Her interests have led to the discovery of a novel placental stem cell type, the trophoblast stem cell. Ultimately, she envisions a role for stem cells in treating human disease.

Originally from the United Kingdom, Dr. Rossant trained at Oxford and Cambridge universities before coming to Canada in 1977. Between 1985 and 2005, she taught at Brock University and then undertook research at the Samuel Lunenfeld Research Institute at Mount Sinai Hospital in Toronto. From 2005 to 2015, she was chief of research at The Hospital for Sick Children. She is currently a professor in both the Department of Molecular Genetics, and Obstetrics and Gynecology at the University of Toronto. In addition, she is a senior scientist at The Hospital for Sick Children and serves as president of the Gairdner Foundation.

Among other recognitions, Dr. Rossant has received the 10th ISTT Prize from the International Society for Transgenic Technologies, the Ross G. Harrison medal for lifetime achievement in Developmental Biology and the CIHR Michael Smith Prize. A Fellow of both the Royal Societies of London and Canada, she is also a foreign associate of the U.S. National Academy of Sciences.

For almost 20 years, the L'Oréal Foundation, in partnership with UNESCO, has celebrated five exceptional female researchers each year. Winners are selected by an independent jury comprised of high-profile members of the international science community. Each laureate receives €100,000 in prize money for her outstanding contribution to advances in science.

COSMOLOGY

Douglas Scott

Developing a new census for the universe

The University of British Columbia
Gruber Cosmology Prize

Douglas Scott from The University of British Columbia was one of three Canadian members of the Planck Team awarded the 2018 Gruber Prize for Cosmology.

The Planck Team generated a wealth of data between 2009-13 from the European Space Agency's Planck satellite observatory. In so doing, it assembled a composite map of the early universe more precise and sensitive than any previous research. Among their findings, Planck's researchers provided a new "census," identifying the universe as 26.8 per cent dark matter, 68.3 per cent dark energy and 4.9 per cent ordinary matter (such as atoms). Their data have transformed theoretical research in cosmology, opening the door to further exploration into the contents and evolution of the universe for decades to come.

Dr. Scott's interests include examining how structure formed and the numbers that describe the entire cosmos. "While parameters are being measured to greater and greater precision, and the physics of galaxy formation are being dissected in ever increasing detail, we are still left with many unsolved puzzles," he says.

Following an undergraduate in astrophysics from the University of Edinburgh (Scotland) in 1986, Dr. Scott obtained a doctoral degree from the University of Cambridge (U.K.) in 1991. After postdoctoral work at the University of California, Berkeley in the early 1990s, he joined UBC's faculty in 1995. He is currently a professor in UBC's Department of Physics and Astronomy.

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NUMBER THEORY

Arul Shankar

Crunching the numbers

University of Toronto
Sloan Research Fellowship in Mathematics

Arul Shankar, an assistant professor in the Department of Mathematics at the University of Toronto, has been awarded a Sloan Fellowship for his pioneering work in number theory.

Number theory is a branch of pure mathematics that explores the properties of integers (...,-2,-1,0,1,2, ...). Dr. Shankar focuses specifically on arithmetic statistics, examining the average behaviour of number theoretic objects. Building on previous works of Gauss, Siegel and Davenport, who proved important finiteness results in arithmetic statistics, Shankar and his colleague Manjul Bhargava have shown that the average rank of elliptic curves is finite.

Dr. Shankar completed his undergraduate and graduate degrees in mathematics at the Chennai Mathematical Institute (India) and Princeton University (U.K.), respectively.

Following completion of his PhD in 2012, he pursued postgraduate research at the Institute for Advanced Study and Harvard University. In 2016, he joined the faculty of the University of Toronto.

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FILM AND VIDEO

Brett Story

Ways of seeing prisons

Ryerson University
Guggenheim Fellowship in Film-Video

Dr. Brett Story, an assistant professor of Image Arts at Ryerson University, was awarded a Guggenheim Fellowship in film and video.

Dr. Story, who holds a PhD in geography from the University of Toronto, is a writer and independent non-fiction filmmaker based out of Toronto. As a filmmaker with a geographer's eye, she considers the relationship between where we are, what we see and how we think.

Her second feature documentary, *The Prison in Twelve Landscapes*, harnesses the power of cinema to show how penitentiaries in the United States reflect power structures braided deeply into the relationships, economies and landscapes all around us. By situating prisons in a particular space, the film poses questions about how their presence may have more to do with jobs, resource extraction, economic development, race and poverty than with crime. In so doing, it opens the possibility that these landscapes could be put to more productive use. The film was nominated for a Canadian Screen Award for best Canadian documentary in 2017.

Dr. Story's first book, *Prison Land: Mapping Carceral Power Across Neoliberal America*, will be published in the spring of 2019 by the University of Minnesota Press. Her journalism and film criticism have appeared in such outlets as *CBC Radio* and *The Nation* magazine. Her other honours include the Documentary Organization of Canada Institute's New Visions Award in 2014 and a Sundance Institute Art of Nonfiction Fellowship in 2016.

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PHYSICS

Donna Strickland

A Nobel Prize for inventions in laser physics

University of Waterloo
Nobel Prize in Physics

Donna Strickland, a professor at the University of Waterloo, was one of three winners of the Nobel Prize in Physics 2018. Dr. Strickland was recognized along with her former PhD supervisor, Gérard Mourou, for "groundbreaking inventions in the field of laser physics" for the "method of generating high-intensity, ultra-short optical pulses." Their breakthrough Chirped Pulse Amplification was detailed in a 1985 paper, which became Dr. Strickland's first scientific publication.

At the University of Waterloo, Dr. Strickland's ultrafast laser group develops high-intensity laser systems for nonlinear optics investigations. She is currently developing short-pulse lasers in the long-wavelength, mid-infrared spectral region.

After receiving an undergraduate degree in engineering physics at McMaster University in 1981, Dr. Strickland earned a doctorate in physics (optics) at the University of Rochester (United States). She has been a faculty member at the University of Waterloo's Department of Physics and Astronomy since 1997.

Among her honours, Dr. Strickland was named a Fellow of the Optical Society of America. Over the past 20 years, she has received various awards for her work, including a Sloan Research Fellowship, the Premier's Research Excellence Award and the Cottrell Scholars Award from Research Corporation.

The Nobel Prize is awarded by the Royal Swedish Academy of Sciences. Founded in 1739, the Academy is an independent organization whose overall objective is to promote the sciences and strengthen their influence in society. It takes special responsibility for the natural sciences and mathematics, but endeavours to promote the exchange of ideas between various disciplines.

MATHEMATICAL SCIENCE

Giulio Tiozzo

Exploring the complex dynamics of systems

University of Toronto Scarborough
Sloan Research Fellowship in Mathematics

Giulio Tiozzo, an assistant professor in the Department of Computer and Mathematical Sciences at the University of Toronto Scarborough, has been awarded a Sloan Fellowship. The award, given to rising research stars, complements a Connaught New Researcher Award bestowed for 2017-19.

Dr. Tiozzo focuses on dynamical systems and their relations with complex analysis, Teichmüller theory, ergodic theory, probability and group theory. In one major research stream, for example, he explores one-dimensional real and complex dynamics and develops the theory of core entropy, which quantifies the amount of randomness in a system. A highly chaotic system, for example, will have high entropy.

Following an undergraduate degree in mathematics at the *Scuola Normale Superiore di Pisa* in Italy, Dr. Tiozzo pursued postgraduate studies at Harvard University, earning his PhD in 2013. In 2016, after two years at Yale University as a Gibbs Assistant Professor, he joined the faculty of the University of Toronto.

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LANGUAGE

Photo: Lëa-Kim Châteauneuf

Michel Tremblay

A language all his own

Grand Prix de la Francophonie

Michel Tremblay, the first Québécois author to use working-class French (*joual*) in his work, was awarded the Grand Prix de la Francophonie in 2018 for his significant contributions to maintaining and showcasing the French language.

Considered a leading theatre figure in Quebec, Mr. Tremblay made his debut as a playwright with his work *Les belles-soeurs*, which premiered in August 1968 in Montreal. Though the play first scandalized audiences for its frank depiction of working-class women and its use of vernacular French, *Les belles-soeurs* is celebrated today for painting an accurate portrait of Quebec's working-class in the sixties. Translated into several languages, *Les belles-sœurs* has been performed in multiple countries and has become a classic of Quebec theatre.

Over the past 50 years, Mr. Tremblay has written a considerable number of plays, including *À toi, pour toujours, ta Marie-Lou; Albertine, en cinq temps; Le vrai monde?*; and *La maison suspendue*. In addition, he was written novels such as the six-volume *Chroniques du Plateau Mont-Royal* and the nine-volume *La diaspora des Desrosiers*. His significant work also includes essays, musical comedies, screenplays and an opera. Regardless of the form he uses, Mr. Tremblay's universe is peopled by ordinary women expressing their everyday struggles in *joual*.

Over his storied career, Mr. Tremblay has received dozens of prestigious literary prizes, as well as honorary doctorates. Among his notable awards are the Gilles-Corbeil Prize, awarded every three years to recognize a Quebec writer's body of work; the Molson Prize from the Canada Council for the Arts; and the Ordre des Arts et des Lettres de France.

The Grand Prix de la Francophonie is bestowed annually by the Académie française for the work of a francophone who has made a substantial contribution to the maintenance and depiction of the French language in the writer's own country or abroad.

NEUROLOGY

Stuart Trenholm

Examining the nature of perception

Montreal Neurological Institute and Hospital, McGill University
Sloan Research Fellowship in Neuroscience

Stuart Trenholm, a Canada Research Chair and assistant professor at the Montreal Neurological Institute at McGill University, has been awarded a Sloan Fellowship to support his research into the nature of perception.

Leading a team of senior researchers and technicians, Dr. Trenholm studies visual circuits in healthy, vision-impaired and vision-rehabilitated animals. By understanding how the wiring of neuronal circuits in the visual system leads to complex visually responsive neurons, he hopes to gain insight into the nature of perception. To that end, his lab merges multiple disciplines, including physiology, animal behaviour, viral circuit tracing, genetics, disease models and optogenetics. Ultimately, the research may lead to better treatments for visually impaired people.

Dr. Trenholm completed his undergraduate degree in biology at the University of Victoria. Following completion of his PhD in neuroscience at Dalhousie University in 2013, he pursued postgraduate research at the Friedrich Miescher Institute for Biomedical Research. In 2017, he joined the faculty of McGill University.

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PHYSICS

Amar Vutha

Atomic and molecular tools to probe the universe

University of Toronto
Sloan Research Fellowship in Physics

Amar Vutha, a professor in the Department of Physics at the University of Toronto, has been awarded a Sloan Fellowship to support his research into fundamental physics.

Dr. Vutha's research group measures the oscillation frequencies of atoms and molecules, which are fixed by universal constants like the speed of light and the electron mass, and uses them to test the limits of known physical laws. One of his projects is to build compact and portable atomic clocks to better study gravity. Another involves measuring the shape of the electron to high precision, to find clues to why the universe only contains matter, instead of equal parts matter and antimatter.

Dr. Vutha was a physics undergraduate at the Indian Institute of Technology Kanpur. After obtaining his PhD from Yale University in 2011, he was a postdoctoral researcher at York University, before joining the faculty of the University of Toronto in 2015.

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PHYSICS

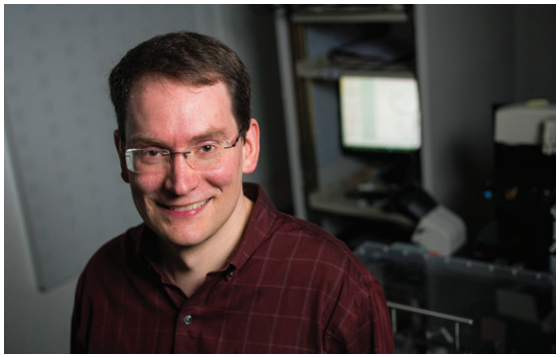

Photo: John Ulan for UAlberta Science

Michael Woodside

Understanding triggers for disease

University of Alberta
Guggenheim Fellowship in Physics

Dr. Michael Woodside, a professor in the Department of Physics at the University of Alberta, was awarded a Guggenheim Fellowship — a first for the Faculty of Science and the first such honour for the university in nearly 40 years.

Integrating physics, molecular biology and biochemistry, Dr. Woodside studies how single biological molecules like nucleic acids and proteins respond to mechanical forces. These responses offer clues to the behaviour of proteins at the molecular level, which in turn can help shed light on how proteins can trigger neurodegenerative diseases such as Parkinson's and prion diseases like Creutzfeldt-Jakob.

Dr. Woodside completed undergraduate degrees in physics and music at the University of Toronto before completing his PhD in physics at the University of California, Berkeley. Following a postdoctoral fellowship in biological sciences at Stanford University, he became a research officer at the National Institute for Nanotechnology in Edmonton. Since 2013, he has been the iCORE Chair in Biophysics at the University of Alberta.

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École nationale d'administration publique
Emily Carr University of Art + Design
First Nations University of Canada
University of the Fraser Valley
University of Guelph
HEC Montréal
Huron University College
Institut national de la recherche scientifique
University of King's College
The King's University
King's University College at Western University
Kwantlen Polytechnic University
Lakehead University
Laurentian University
Université Laval
University of Lethbridge
Luther College
MacEwan University
University of Manitoba
McGill University
McMaster University
Memorial University of Newfoundland
Université de Moncton
Université de Montréal
Mount Allison University
Mount Royal University
Mount Saint Vincent University
University of New Brunswick
Nipissing University
University of Northern British Columbia
NSCAD University
OCAD University
University of Ontario Institute of Technology
University of Ottawa
Polytechnique Montréal
University of Prince Edward Island
Université du Québec
Université du Québec à Chicoutimi
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Université du Québec en Outaouais
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Royal Military College of Canada
Royal Roads University
Ryerson University
Saint Mary's University
Saint Paul University
Université de Saint-Boniface
Université Sainte-Anne
University of Saskatchewan
Université de Sherbrooke
Simon Fraser University
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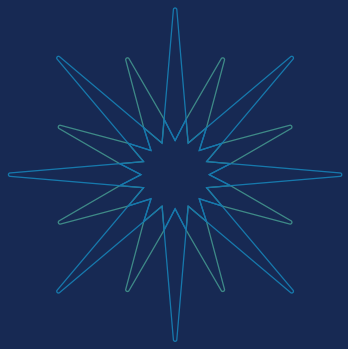
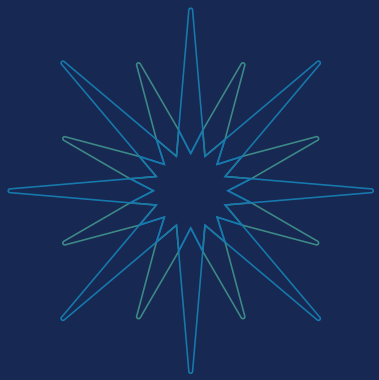
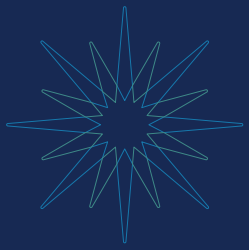
St. Jerome's University
University of St. Michael's College
St. Paul's College
St. Thomas More College
St. Thomas University
University of Sudbury
Université TÉLUQ
Thompson Rivers University
University of Toronto
Trent University
University of Trinity College
Trinity Western University
Vancouver Island University
University of Victoria
Victoria University
University of Waterloo
Western University
Wilfrid Laurier University
University of Windsor
The University of Winnipeg
York University







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