



The Shaw Prize

Press Conference
2024.5.21

邵逸夫獎基金會
The Shaw Prize Foundation

Telephone: +852 2994 4888
Facsimile: +852 2994 4881
Website: www.shawprize.org

Welcome Address by Professor Kenneth Young, Chair of The Shaw Prize Council

We are pleased to bring to you the Shaw Prize Awards for 2024.

The Shaw Prize was established in the year 2002 by Mr Run Run Shaw with the support and help of Mrs Mona Shaw, and is now managed under the Shaw Prize Foundation.

Since 2004, the Shaw Prize has been awarded annually for distinguished and significant achievements in the three scientific disciplines, namely, Astronomy, Life Science and Medicine, and Mathematical Sciences. Each Prize consists of a medal, a certificate and a monetary award of US\$1.2 million.

The Shaw Prize is an international award, dedicated to honouring individuals, regardless of race, nationality, gender and religious belief, who have achieved significant breakthroughs in academic and scientific research or applications, and whose work has resulted in a positive and profound impact on humankind.

Recipients of the Prize are all internationally acclaimed scholars and scientists. Thanks to the effort of members of the Selection Committees and colleagues of the Foundation, the Prize has built up its prestige worldwide in the past twenty years.

We look forward to greater success of the Prize in the years to come.

21 May 2024, Hong Kong

The Shaw Prize

The Shaw Prize is an international award to honour individuals who are currently active in their respective fields and who have recently achieved distinguished and significant advances, who have made outstanding contributions in academic and scientific research or applications, or who in other domains have achieved excellence. The award is dedicated to furthering societal progress, enhancing quality of life, and enriching humanity's spiritual civilisation.

Preference is to be given to individuals whose significant works were recently achieved and who are currently active in their respective fields.

Background

Established in November 2002 under the auspices of **Mr Run Run Shaw**, the Prize honours individuals, regardless of race, nationality, gender and religious belief, who have achieved significant breakthroughs in academic and scientific research or applications and whose works have resulted in positive and profound impacts on humankind.

The Shaw Prize is an international award managed and administered by The Shaw Prize Foundation based in Hong Kong. **Mr Shaw** also founded two charities, The Shaw Foundation Hong Kong and The Sir Run Run Shaw Charitable Trust, both dedicated to the promotion of education, scientific and technological research, medical and welfare services, and culture and the arts.

21 May 2024, Hong Kong

Announcement of The Shaw Laureates 2024

The Shaw Prize in Astronomy

is awarded to

Shrinivas R Kulkarni

George Ellery Hale Professor of Astronomy and Planetary Science,
Division of Physics, Mathematics and Astronomy at the California
Institute of Technology, USA

for his ground-breaking discoveries about millisecond pulsars,
gamma-ray bursts, supernovae, and other variable or transient
astronomical objects. His contributions to time-domain astronomy
culminated in the conception, construction and leadership of the
Palomar Transient Factory and its successor, the Zwicky Transient
Facility, which have revolutionised our understanding of the
time-variable optical sky.

The Shaw Prize in Life Science and Medicine

is awarded in equal shares to

Swee Lay Thein

Senior Investigator and Chief of the Sickle Cell Branch of National
Heart, Lung, and Blood Institute at the National Institutes of Health,
USA and

Stuart Orkin

David G Nathan Distinguished Professor of Pediatrics, Harvard
Medical School, USA

for their discovery of the genetic and molecular mechanisms
underlying the fetal-to-adult hemoglobin switch, making possible a
revolutionary and highly effective genome-editing therapy for sickle
cell anemia and β thalassemia, devastating blood diseases that affect
millions of people worldwide.

Announcement of The Shaw Laureates 2024

(Cont'd)

The Shaw Prize in Mathematical Sciences

is awarded to

Peter Sarnak

Gopal Prasad Professor of Mathematics at the Institute for Advanced Study in Princeton and Eugene Higgins Professor of Mathematics at Princeton University, USA

for his development of the arithmetic theory of thin groups and the affine sieve, by bringing together number theory, analysis, combinatorics, dynamics, geometry and spectral theory.

Tuesday, 21 May 2024. At today's press conference in Hong Kong, The Shaw Prize Foundation announced the Shaw Laureates for 2024. Information was posted on the website www.shawprize.org at Hong Kong time 15:30 (GMT 07:30).

The Shaw Prize consists of three annual prizes: Astronomy, Life Science and Medicine, and Mathematical Sciences, each bearing a monetary award of US\$1.2 million. This will be the twenty-first year that the Prize has been awarded and the presentation ceremony is scheduled for Tuesday, 12 November 2024 in Hong Kong.

21 May 2024, Hong Kong



The Shaw Prize Astronomy

The Shaw Prize in Astronomy 2024
is awarded to

Shrinivas R Kulkarni

for his ground-breaking discoveries about millisecond pulsars, gamma-ray bursts, supernovae, and other variable or transient astronomical objects. His contributions to time-domain astronomy culminated in the conception, construction and leadership of the Palomar Transient Factory and its successor, the Zwicky Transient Facility, which have revolutionised our understanding of the time-variable optical sky.

21 May 2024, Hong Kong

Biographical Note of Shaw Laureate in Astronomy 2024

Shrinivas R Kulkarni was born in 1956 in Maharashtra, India and is currently George Ellery Hale Professor of Astronomy and Planetary Science, Division of Physics, Mathematics and Astronomy at the California Institute of Technology (Caltech), USA. He received his MS degree from the Indian Institute of Technology Delhi in 1978 and his PhD from the University of California, Berkeley, USA in 1983. He was a Millikan Research Fellow (1985–1987) in Radio Astronomy at Caltech. He has been on the faculty of Caltech where he was successively Assistant Professor of Astronomy (1987–1990), Associate Professor (1990–1992), Professor (1992–1996), Professor of Astronomy and Planetary Science (1996–2001), MacArthur Professor (2001–2017) and George Ellery Hale Professor of Astronomy and Planetary Science (2017–). He was also Executive Officer for Astronomy (1997–2000) and Director of Caltech Optical Observatories (2006–2018). He is a member of the Royal Society of London, the Indian Academy of Sciences, the Royal Netherlands Academy of Arts and Sciences and the US National Academy of Sciences.

21 May 2024, Hong Kong

The Shaw Prize in Astronomy 2024

Press Release

The Shaw Prize in Astronomy 2024 is awarded to **Shrinivas R Kulkarni**, George Ellery Hale Professor of Astronomy and Planetary Science, Division of Physics, Mathematics and Astronomy at the California Institute of Technology, USA for his ground-breaking discoveries about millisecond pulsars, gamma-ray bursts, supernovae, and other variable or transient astronomical objects. His contributions to time-domain astronomy culminated in the conception, construction and leadership of the Palomar Transient Factory and its successor, the Zwicky Transient Facility, which have revolutionised our understanding of the time-variable optical sky.

Although most stars shine steadily for billions of years, some of them vary, pulsate, flare or explode on timescales of years, weeks, or even a fraction of a second. These rapid changes provide unique insights into the death of stars, the behaviour of matter at extremely high temperatures and densities, the size and age of the universe, and aspects of fundamental physics such as the nuclear equation of state and Einstein's theory of general relativity.

Discovering and analysing transient events — the subject of time-domain astronomy — is a challenging task that requires sifting through vast databases, identifying rare anomalies, discarding false positives from terrestrial events and other sources, and notifying the astronomy community, ideally within minutes, to enable follow-up studies from other telescopes.

Throughout his career, **Kulkarni** has made a sustained series of fundamental discoveries in time-domain optical and radio astronomy. As a student, he and his collaborators discovered the first millisecond pulsar, a rapidly rotating neutron star that emitted precisely spaced pulses over 600 times per second. Known millisecond pulsars now number in the hundreds. They are the most precise astronomical clocks in the universe, and are used to test Einstein's general theory of relativity and to look for gravitational waves from merging supermassive black holes.

The Shaw Prize in Astronomy 2024

Press Release (Cont'd)

Brief, intense bursts of gamma-rays from across the sky were first detected in the 1960s, but their origin remained mysterious for decades. In 1997, **Kulkarni** and his collaborators made a critical breakthrough by determining the distance to a gamma-ray burst. They showed that the burst originated in the distant universe, far beyond our own Galaxy, and so must have been an extremely energetic event. We now know that most gamma-ray bursts come from similar distances.

Fast radio bursts (FRBs) are intense bursts of radio emission lasting as little as a thousandth of a second. A type of neutron star known as a magnetar, with extremely strong magnetic fields, has long been a candidate for the source of FRBs (the Shaw Prize in Astronomy was awarded in 2021 for work on magnetars and in 2023 for work on FRBs). **Kulkarni** and his collaborators built — quickly and inexpensively — STARE2, a set of three radio detectors dispersed across the southwestern United States, designed to detect nearby FRBs. In 2020, STARE2 was one of two telescopes that detected an FRB from a magnetar located in our Galaxy, showing for the first time that magnetars can generate FRBs.

Kulkarni's contributions culminated in the construction of the Palomar Transient Factory (PTF, 2009) and its successor, the Zwicky Transient Facility (ZTF, 2017), two novel astronomical surveys using a seventy-year-old telescope at Palomar Observatory in southern California. ZTF scans the entire Northern sky every two days, analyses the data with automated software, and communicates its discoveries through an alert system that within minutes provides astronomers around the world with notifications of transient events. The flood of data from PTF and ZTF have enabled the discovery of a wide variety of astronomical transients and variable sources. ZTF has discovered thousands of rare events, including extremely bright supernovae, luminous red novae, calcium-rich gap transients, and

The Shaw Prize in Astronomy 2024

Press Release (Cont'd)

disruptions of stars by black holes. ZTF has also found a star swallowing one of its planets, one of the nearest and brightest supernovae in history, a new orbital class of asteroids, binary stars with orbital periods as short as seven minutes that are strong sources of low-frequency gravitational radiation, and many other exotic systems and rare events whose properties are just beginning to be understood. PTF and ZTF have trained a generation of young astronomers now leading the field of time-domain astronomy.

This award is also intended to recognise **Kulkarni**'s discoveries in other areas of stellar astronomy, in particular his role in the discovery of one of the first “brown dwarfs” — stars so small that they cannot burn hydrogen by nuclear fusion. Brown dwarfs bridge the gap between giant planets like Jupiter and hydrogen-burning stars like the Sun, and this discovery revealed the existence of brown dwarfs with atmospheric properties similar to planets and set the stage for decades of work on the atmospheres of sub-stellar objects.

Astronomy Selection Committee
The Shaw Prize

21 May 2024, Hong Kong



The Shaw Prize Life Science & Medicine

The Shaw Prize in Life Science and Medicine 2024
is awarded in equal shares to

Swee Lay Thein and
Stuart Orkin

for their discovery of the genetic and molecular mechanisms underlying the fetal-to-adult hemoglobin switch, making possible a revolutionary and highly effective genome-editing therapy for sickle cell anemia and β thalassemia, devastating blood diseases that affect millions of people worldwide.

21 May 2024, Hong Kong

Biographical Notes of Shaw Laureates in Life Science and Medicine 2024

Swee Lay Thein was born in 1952 in Kuala Lumpur, Malaya (now Malaysia) and is currently Senior Investigator and Chief of the Sickle Cell Branch of National Heart, Lung, and Blood Institute at the National Institutes of Health, USA. She received her Bachelor's degree in 1975 and obtained a DSc in 1999 from the University of Malaya, Malaysia. After her specialist training (1975–1982) and various clinical positions (1982–2000) in UK, she was appointed Professor of Molecular Haematology and Consultant Haematologist at King's College London, UK (2000–2015). At the same time, she also served as Director of the Red Cell Unit at King's College Hospital NHS Foundation Trust in London, UK. She was Head of the Division of Gene and Cell Based Therapy at King's College London (2004–2010). She joined the National Heart, Lung, and Blood Institute at the National Institutes of Health in 2015 as Senior Investigator and Chief of the Sickle Cell Branch (2015–). She is a Fellow of the Academy of Medical Sciences, UK and the Academy of Life Sciences for Chinese in the UK.

Stuart Orkin was born in 1946 in Manhattan, USA and is currently David G Nathan Distinguished Professor of Pediatrics, Harvard Medical School, USA. He received his Bachelor's degree from the Massachusetts Institute of Technology, USA in 1967 and obtained an MD from Harvard Medical School, USA in 1972. He was a Research Associate at the National Institutes of Health, USA (1973–1975) and Research Fellow in Pediatrics at Harvard Medical School, USA (1976–1978). At Harvard Medical School, he was successively Assistant Professor (1978–1981), Associate Professor (1981–1987), Leland Fikes Professor of Pediatric Medicine (1987–2003), David G Nathan Professor of Pediatrics (2000–2016) and David G Nathan Distinguished Professor (2017–). He also serves as an Investigator of the Howard Hughes Medical Institute and Principal Faculty Member of Harvard Stem Cell Institute. He is a member of the US National Academy of Sciences, the American Academy of Arts and Sciences and the American Philosophical Society.

21 May 2024, Hong Kong

The Shaw Prize in Life Science and Medicine 2024

Press Release

The Shaw Prize in Life Science and Medicine 2024 is awarded in equal shares to **Swee Lay Thein**, Senior Investigator and Chief of the Sickle Cell Branch, National Heart, Lung, and Blood Institute at the National Institutes of Health, USA and **Stuart Orkin**, David G Nathan Distinguished Professor of Pediatrics at Harvard Medical School, USA, for their discovery of the genetic and molecular mechanisms underlying the fetal-to-adult hemoglobin switch, making possible a revolutionary and highly effective genome-editing therapy for sickle cell anemia and β thalassemia, devastating blood diseases that affect millions of people worldwide.

Sickle cell disease and β thalassemia are blood disorders that affect more than 20 million people worldwide. Five percent of the world's population carry the trait genes for hemoglobin disorders and 300,000 babies are born each year with severe hemoglobin disorders. Most people who have sickle cell disease are of African ancestry or self-identify as Black. The sickle cell trait protects against malaria, explaining the prevalence of the sickle gene in populations in particular regions of the world.

The first sickle cell case was documented in 1846 and the disease was named sickle cell anemia in 1922. Blood cell sickling occurs due to low oxygen levels which is caused by an abnormal hemoglobin protein. Hemoglobin is the protein in red blood cells that transports oxygen throughout our tissues. Shortly after birth, a switch occurs, from the fetal form of hemoglobin to the adult form.

It has long been known that although sickle cell anemia is a disorder that is a consequence of changes in a single gene, disease severity varies. Indeed, studies conducted in the 1970s–1990s showed that patients with a hereditary condition that resulted in continued production of fetal hemoglobin made the sickle cell disease milder. This condition is called hereditary persistence of fetal hemoglobin.

The Shaw Prize in Life Science and Medicine 2024

Press Release (Cont'd)

Over the course of their distinguished careers, **Swee Lay Thein** and **Stuart Orkin** each made wide-ranging, independent contributions to the analysis of blood cell disorders. Their work intersected when they made complementary and reinforcing discoveries that led to the development of a therapy to treat sickle cell disease and β thalassemia.

Swee Lay Thein made a transformative discovery when she performed a genome-wide association examination of individuals displaying extreme differences in sickle cell and β thalassemia traits. Her goal was to identify genes associated with severity of disease. She transformed understanding of how phenotypes due to sickle cell traits can vary when she discovered that most genetic variance in fetal hemoglobin production was due to changes in genes encoding components other than hemoglobin. Using a technique called linkage analysis, **Thein** identified the genetic regions that influenced variation of the sickle trait. She mapped the changes to a gene called BCL11A, making the first connection between BCL11A and red blood cell disorders. She reported that BCL11A encodes a so-called zinc finger DNA binding regulatory protein on chromosome 2. She concluded that BCL11A is the major regulator of fetal hemoglobin production. **Thein's** discovery presaged curative therapies in which manipulation of BCL11A could counteract the sickle cell and β thalassemia disorders.

In elegant work, **Stuart Orkin** established that the BCL11A protein is a repressor of the fetal hemoglobin promoter, and it is this promoter that is mutated in humans with hereditary persistence of fetal hemoglobin. **Orkin** demonstrated that downregulation of BCL11A expression corrects sickle cell disease in engineered mice, an experiment that was crucial for advancing the exciting notion that altering BCL11A production could be pursued for therapeutic translation for both sickle cell and β thalassemia. **Orkin** next identified a particular site in a BCL11A enhancer element that, when deleted using CRISPR gene editing in blood stem cells, dampened

The Shaw Prize in Life Science and Medicine 2024

Press Release (Cont'd)

BCL11A expression. This genome alteration reactivated fetal hemoglobin production. **Orkin**'s mouse work provided the foundation for clinical trials using CRISPR genome editing in patients with sickle cell disease and β thalassemia. Indeed, the trials yielded transformative results: freedom from sickle crises and anemia in sickle cell disease, and transfusion-independence in β thalassemia.

The FDA approved two sickle cell stem cell therapies in December 2023. One of them, called CASGEVY and made by Vertex, is based on **Thein** and **Orkin**'s findings, and is the first approved therapy that uses CRISPR genome editing.

Thein and **Orkin**'s work exemplifies how basic discovery, disease research, and translational medicine can lay the foundation for development of transformative therapies that save lives.

Life Science and Medicine Selection Committee
The Shaw Prize

21 May 2024, Hong Kong



The Shaw Prize Mathematical Sciences

The Shaw Prize in Mathematical Sciences 2024
is awarded to

Peter Sarnak

for his development of the arithmetic theory of thin groups and the affine sieve, by bringing together number theory, analysis, combinatorics, dynamics, geometry and spectral theory.

21 May 2024, Hong Kong

Biographical Note of Shaw Laureate in Mathematical Sciences 2024

Peter Sarnak was born in 1953 in Johannesburg, South Africa and is currently Gopal Prasad Professor of Mathematics at the Institute for Advanced Study in Princeton and Eugene Higgins Professor of Mathematics at Princeton University, USA. He received his Bachelor's degree in Mathematics from the University of Witwatersrand, South Africa in 1975 and PhD in Mathematics from Stanford University, USA in 1980. He was an Assistant Professor (1980–1983) and Associate Professor (1983) at New York University, USA. He then joined Stanford University where he was successively an Associate Professor (1984–1987) and Professor (1987–1991). From 1991, he moved to Princeton University and was appointed H Fine Professor (1995–1996) and the Chair of Mathematics Department (1996–1999). He was a member of the Institute for Advanced Study (1999–2002 and 2005–2007) and has been a Professor there since 2007. He was also a Professor at the Courant Institute of Mathematical Sciences, New York University (2001–2005) and has been appointed as Eugene Higgins Professor of Mathematics at Princeton University (2002–). He is a member of the US National Academy of Sciences and a Fellow of the Royal Society of London.

21 May 2024, Hong Kong

The Shaw Prize in Mathematical Sciences 2024

Press Release

The Shaw Prize in Mathematical Sciences 2024 is awarded to **Peter Sarnak**, Gopal Prasad Professor, School of Mathematics, Institute for Advanced Study and Eugene Higgins Professor of Mathematics, Princeton University, USA, for his development of the arithmetic theory of thin groups and the affine sieve, by bringing together number theory, analysis, combinatorics, dynamics, geometry and spectral theory.

A natural number is called a prime number if it is larger than 1 and is not the product of two strictly smaller natural numbers which themselves are larger than 1. For example, 2 is a prime number, but $4 = 2 \times 2$ is not. Euclid's theorem (circa 300 BCE) asserts that any natural number other than 0 and 1 is the product of prime numbers, and that there are infinitely many prime numbers. The study of the distribution of the prime numbers is a core topic in Number Theory.

The search for prime numbers has been a central theme in number theory since the ancient Greeks. One looks for polynomial functions $f(x)$ such that $f(x)$ is prime for infinitely many integers x . Euclid's theorem says that $f(x) = x$ is one such function. One may enlarge the problem by requiring that $f(x)$ be almost prime valued, that is, the product of a bounded number of primes for infinitely many integers x . For example, the Twin Prime Conjecture is equivalent to the statement that $f(x) = x(x+2)$ is a product of two primes for infinitely many integers x . The Chinese mathematician Jingrun Chen (1973), using Brun's combinatorial sieve, showed that this function has at most 3 prime factors for infinitely many integers x . One may also restrict the set of x considered by requiring them to lie in a sparse subset of the integers. A similar problem can be posed for any polynomial with integer coefficients in several variables.

The Shaw Prize in Mathematical Sciences 2024

Press Release (Cont'd)

Sarnak pioneered the search for almost prime values of polynomials in sparse subsets arising as the orbit of a thin group. A thin group is a subgroup of an arithmetic group with a Goldilocks property: it is neither too large (being of infinite index) nor too small (having the same Zariski closure as the arithmetic group). Thin groups arise very naturally in pure and applied mathematics. For example, the symmetry group of integral Apollonian circle packings is a thin group. In addition, there is an abundance of Kleinian groups, or more generally monodromy groups of differential equations, that are thin groups.

Expanders are highly connected sparse graphs widely used in computer science. Foreseeing how the expander property of finite quotients of a thin group could be used to produce almost primes, **Sarnak** developed the affine sieve. **Sarnak**, together with Bourgain and Gamburd, produced expanders out of some thin groups. The construction relies on earlier foundational work by **Sarnak** and Xue in which they showed a relation between the minimal dimension of representations of finite linear groups and expanders.

Sarnak, together with Bourgain and Gamburd, obtained a precise counting and equidistribution result for integral vectors on an orbit of a thin group which take almost prime values when one applies a given polynomial function to them.

Sarnak, together with Golsefidy, established that, under some natural hypotheses, an integral polynomial function produces almost primes in a Zariski dense subset of a thin orbit.

The Shaw Prize in Mathematical Sciences 2024

Press Release (Cont'd)

Sarnak's introduction of combinatorial and ergodic theoretical methods to Diophantine problems has had a profound impact. His original and deep vision has launched a vast research programme that brings together number theory, combinatorics, analysis, dynamics, geometry and spectral theory.

Mathematical Sciences Selection Committee
The Shaw Prize

21 May 2024, Hong Kong

The Shaw Prize 2024

Board of Adjudicators

Chair

Professor Reinhard GENZEL

Director

Max Planck Institute for

Extraterrestrial Physics

GERMANY

Vice Chair

Professor Kenneth YOUNG

Emeritus Professor of Physics

The Chinese University of Hong Kong

Chair

The Shaw Prize in Astronomy

Selection Committee

Professor Scott D TREMAINE

Emeritus Professor of Astrophysical Sciences

Princeton University and

Institute for Advanced Study, Princeton

USA

Members

Professor Gilles CHABRIER

Professor

Centre de Recherche Astrophysique de Lyon,

France and Professor of Astronomy

University of Exeter

UK

Professor You-Hua CHU

Professor Emerita

Department of Astronomy

University of Illinois at Urbana-Champaign

USA

Professor Eiichiro KOMATSU

Director, Department of Physical Cosmology

Max Planck Institute for Astrophysics

GERMANY

Professor Elaine M SADLER

Professor of Astrophysics

School of Physics

The University of Sydney

AUSTRALIA

Chair

The Shaw Prize in Life Science and Medicine

Selection Committee

Professor Bonnie L BASSLER

Squibb Professor and Chair

Department of Molecular Biology

Princeton University

USA

Members

Professor Michael N HALL

Professor

Biozentrum, University of Basel

SWITZERLAND

Professor Dennis YM LO

Li Ka Shing Professor of Medicine and

Professor of Chemical Pathology

The Chinese University of Hong Kong

Professor Joan A STEITZ

Sterling Professor of Molecular Biophysics and

Biochemistry, School of Medicine

Yale University

USA

Professor Marc TESSIER-LAVIGNE

President Emeritus and Professor of Biology

Stanford University

USA

Professor Fiona M WATT

Professor of Regenerative Medicine and

Director of Centre for Stem Cells &

Regenerative Medicine

King's College London

UK

Professor Huda Y ZOGHBI

Professor of Pediatrics,

Molecular and Human Genetics, Neurology

and Neuroscience, Baylor College of Medicine

USA

Chair

The Shaw Prize in Mathematical Sciences

Selection Committee

Professor Hélène ESNAULT

Einstein Professor, Emeritus

Freie Universität Berlin

GERMANY

Members

Professor Ngaiming MOK

Edmund and Peggy Tse Professor and

Chair of Mathematics

Department of Mathematics

The University of Hong Kong

Professor Hee OH

Abraham Robinson Professor of Mathematics

Department of Mathematics

Yale University

USA

Professor Horng-Tzer YAU

Merton Professor of Mathematics

Department of Mathematics

Harvard University

USA

Council Members

Professor Kenneth Young (Chair)

Dr Raymond Chan

Professor Wai-Yee Chan

Professor Pak-Chung Ching

Professor Reinhard Genzel

Professor Yuet-Wai Kan

Members' Biographical Notes:

Professor Kenneth Young is Chair of the Council and Vice Chair of the Board of Adjudicators of The Shaw Prize, and Emeritus Professor of Physics at The Chinese University of Hong Kong.

Dr Raymond Chan is Member of Board of Advisor of The Sir Run Run Shaw Charitable Trust, Chair of The Shaw Foundation and The Shaw Prize Foundation and Managing Director of Shaw Group of Companies.

Professor Wai-Yee Chan is Pro-Vice-Chancellor / Vice-President, Li Ka Shing Professor of Biomedical Sciences and Director of the Institute for Tissue Engineering and Regenerative Medicine, The Chinese University of Hong Kong.

Professor Pak-Chung Ching is Director of Shun Hing Institute of Advanced Engineering and Research Professor of Electronic Engineering at The Chinese University of Hong Kong.

Professor Reinhard Genzel is Director, Max Planck Institute for Extraterrestrial Physics, Germany.

Professor Yuet-Wai Kan is Professor Emeritus of Medicine at the University of California, San Francisco, USA.

21 May 2024, Hong Kong

The Shaw Laureates 2004–24

	Astronomy	Life Science and Medicine	Mathematical Sciences
2024	Shrinivas R Kulkarni (USA)	Swee Lay Thein (USA) Stuart Orkin (USA)	Peter Sarnak (USA)
2023	Matthew Bailes (Australia) Duncan Lorimer (USA) Maura McLaughlin (USA)	Patrick Cramer (Germany) Eva Nogales (USA)	Vladimir Drinfeld (USA) Shing-Tung Yau (PRC)
2022	Lennart Lindegren (Sweden) Michael Perryman (Ireland)	Paul A Negulescu (USA) Michael J Welsh (USA)	Noga Alon (USA) Ehud Hrushovski (UK)
2021	Victoria M Kaspi (Canada) Chryssa Kouveliotou (USA)	Scott D Emr (USA)	Jean-Michel Bismut (France) Jeff Cheeger (USA)
2020	Roger D Blandford (USA)	Gero Miesenböck (UK) Peter Hegemann (Germany) Georg Nagel (Germany)	Alexander Beilinson (USA) David Kazhdan (Israel)
2019	Edward C Stone (USA)	Maria Jasin (USA)	Michel Talagrand (France)
2018	Jean-Loup Puget (France)	Mary-Claire King (USA)	Luis A Caffarelli (USA)
2017	Simon D M White (Germany)	Ian R Gibbons (USA) Ronald D Vale (USA)	János Kollár (USA) Claire Voisin (France)
2016	Ronald W P Drever (UK) Kip S Thorne (USA) Rainer Weiss (USA)	Adrian P Bird (UK) Huda Y Zoghbi (USA)	Nigel J Hitchin (UK)
2015	Willian J Borucki (USA)	Bonnie L Bassler (USA) E Peter Greenberg (USA)	Gerd Faltings (Germany) Henryk Iwaniec (USA)
2014	Daniel Eisenstein (USA) Shaun Cole (UK) John A Peacock (UK)	Kazutoshi Mori (Japan) Peter Walter (USA)	George Lusztig (USA)
2013	Steven A Balbus (UK) John F Hawley (USA)	Jeffrey C Hall (USA) Michael Rosbash (USA) Michael W Young (USA)	David L Donoho (USA)

The Shaw Laureates 2004–24 (Cont'd)

	Astronomy	Life Science and Medicine	Mathematical Sciences
2012	David C Jewitt (USA) Jane Luu (USA)	Franz-Ulrich Hartl (Germany) Arthur L Horwich (USA)	Maxim Kontsevich (France)
2011	Enrico Costa (Italy) Gerald J Fishman (USA)	Jules A Hoffmann (France) Ruslan M Medzhitov (USA) Bruce A Beutler (USA)	Demetrios Christodoulou (Switzerland) Richard S Hamilton (USA)
2010	Charles L Bennett (USA) Lyman A Page Jr (USA) David N Spergel (USA)	David Julius (USA)	Jean Bourgain (USA)
2009	Frank H Shu (USA)	Douglas L Coleman (USA) Jeffrey M Friedman (USA)	Simon K Donaldson (UK) Clifford H Taubes (USA)
2008	Reinhard Genzel (Germany)	Ian Wilmot (UK) Keith H S Campbell (UK) Shinya Yamanaka (Japan)	Vladimir Arnold (Russia) Ludwig Faddeev (Russia)
2007	Peter Goldreich (USA)	Robert Lefkowitz (USA)	Robert Langlands (USA) Richard Taylor (UK)
2006	Saul Perlmutter (USA) Adam Riess (USA) Brian Schmidt (Australia)	Xiaodong Wang (USA)	David Mumford (USA) Wentsun Wu (PRC)
2005	Geoffrey Marcy (USA) Michel Mayor (Switzerland)	Michael Berridge (UK)	Andrew John Wiles (UK)
2004	P James E Peebles (USA)	Two prizes awarded: (1) Stanley N Cohen (USA) Herbert W Boyer (USA) Yuet-Wai Kan (USA) (2) Richard Doll (UK)	Shiing-Shen Chern (PRC)

Note: Award may not be shared equally. For details, please refer to Announcement and Citation on the Shaw Prize website (www.shawprize.org)
Countries mentioned above refer to the sites of the work places of the Laureates at the time of the award.