THE Crafoord PRIZE

The Crafoord *Prize*

1982–2016

Anna-Greta and
Holger Crafoord Fund

The Anna-Greta and Holger Crafoord Fund

PHOTO: MARKUS MARCETIC

BACK ROW: BARBARA CANNON, STAFFAN NORMARK, OVE ERIKSSON, WALTER FISCHER. **FRONT ROW:** TOMOKO OHTA, H.M. KING CARL XVI GUSTAF OF SWEDEN, H.M. QUEEN SILVIA OF SWEDEN AND EBBA FISCHER.

The Fund was established in 1980 by a donation to the Royal Swedish Academy of Sciences from Anna-Greta and Holger Crafoord. The Crafoord Prize was awarded for the first time in 1982. The purpose of the Fund is to promote basic scientific research worldwide in the following disciplines:

MATHEMATICS AND ASTRONOMY

GEOSCIENCES

BIOSCIENCES WITH EMPHASIS ON ECOLOGY

POLYARTHRITIS

Support to research takes the form of an international prize awarded annually to outstandig scientists, and of research grants to individuals or institutions in Sweden. Both awards and grants are made according to the following order:

year 1: Mathematics and Astronomy
year 2: Geosciences
year 3: Biosciences
year 4: Mathematics and Astronomy
year 5: Geosciences
year 6: Biosciences
etc.

The prize in Polyarthritis is awarded only when an investigation by the Academy's Class for medical sciences has shown that scientific progress in this field has been such that an award is justified. Part of the Fund is reserved for appropriate research projects at the Academy's institutes.

The Crafoord Prize presently amounts to SEK 6 million, the prizes in Mathematics and Astronomy are awarded with SEK 6 million each. In addition to the prize, financial support is granted to other researchers in the same field in which the prize is awarded for that year. Announcement of the Laureate/-s is made in mid-January each year.

Nominations

The Academy invites scientists from all over the world to nominate candidates for the prize. The received nominations are then reviewed and assessed by a prize committee consisting of members from the appropriate Academy classes. The prize should be awarded to one recipient, but may, if necessary, be divided among up to three recipients. At the same time, grant allocations are announced, and may be applied for both by individuals and by institutions in Sweden. Grant applications can be made for scientific equipment and research, publication of scientific works, scientific conferences and symposia, studies outside of Sweden for Swedish researchers, and activities to further research within the field of research covered by the prize.

On the basis of reports from the prize committee and the appropriate Academy class, decisions concerning laureate(s) and grant discipline are made by the Academy in mid-January of the year in which the prize is to be awarded.

Crafoord Days

The Crafoord Prize is presented at a ceremony held by the Royal Swedish Academy of Sciences during the Crafoord Days in May.

During the Crafoord Days the Academy organizes an international scientific symposium on a subject from the chosen discipline of the year, and the laureate(s) gives a public lecture, the Crafoord Lecture.

The Crafoord Prize in Mathematic 2016

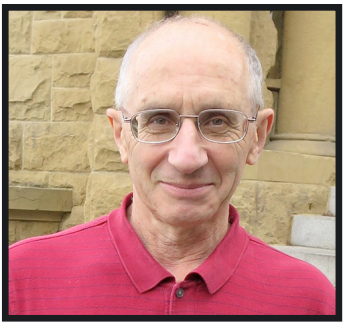


PHOTO: ROSE STAUDER

YAKOV ELIASHBERG, born 1946 in S:t Petersburg, Russia, Ph.D. at Leningrad State University 1972. Herald L. and Caroline L. Ritch Professor of mathematics at Stanford University, CA, USA, *"for the development of contact and symplectic topology and groundbreaking discoveries of rigidity and flexibility phenomena"*.

YAKOV ELIASHBERG,
STANFORD UNIVERSITY, CA, USA

The Crafoord Prize in Astronomy 2016

PHOTO: MARGARET KERR

ROY KERR, UNIVERSITY OF CANTERBURY, CHRISTCHURCH, NEW ZEALAND

PHOTO: DAVID STRIKER

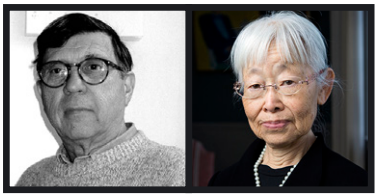
ROGER BLANDFORD, STANFORD UNIVERSITY, CA, USA

ROY KERR, born 1934 in Kurow, New Zeeland. Ph.D. 1959 at University of Cambridge, UK. Emeritus Professor at University of Canterbury, New Zeeland and **ROGER BLANDFORD**, born 1949 in Grantham, UK. Ph.D. 1974 at University of Cambridge, UK. Luke Blossom Professor in the School of Humanities and Sciences, Stanford University, CA, USA, *"for fundamental work concerning rotating black holes and their astrophysical consequences"*.

PRIZES AWARDED
1982–2015

Prizes awarded

2015 BIOSCIENCES



RICHARD LEWONTIN TOMOKO OHTA

PHOTO LEWONTIN: HARVARD UNIVERSITY
PHOTO OHTA: MARKUS MARCETIC

RICHARD LEWONTIN, US citizen. Born 1929 in New York, USA. Ph.D. 1954 from Columbia University, NY, USA. Emeritus Professor at Harvard University, MA, USA and **TOMOKO OHTA**, Japanese citizen. Born 1933 in Miyoshi, Japan. Ph.D. 1967 from North Carolina State University, NC, USA. Emeritus Professor at the National Institute of Genetics, Mishima, Japan, *"for their pioneering analyses and fundamental contributions to the understanding of genetic polymorphism"*.

2014 GEOSCIENCES

PETER MOLNAR

PHOTO: MARKUS MARCETIC

PETER MOLNAR, US citizen. Ph.D. 1970 from Columbia University, NY, USA. Professor in Geological Sciences at University of Colorado Boulder, CO, USA, *"for his ground-breaking contribution to the understanding of global tectonics, in particular the deformation of continents and the structure and evolution of mountain ranges, as well as the impact of tectonic processes on ocean-atmosphere circulation and climate."*

2013 POLYARTHRITIS

PETER K. GREGERSEN
LARS KLARESKOG
ROBERT J. WINCHESTER

PHOTO GREGERSEN, KLARESKOG AND WINCHESTER: MARKUS MARCETIC

PETER K. GREGERSEN, The Feinstein Institute for Medical Research, Manhasset, NY, USA, **ROBERT J. WINCHESTER**, Columbia University, New York, NY, USA and **LARS KLARESKOG**, Karolinska Institutet, Stockholm, Sweden, *"for their discoveries concerning the role of different genetic factors and their interactions with environmental factors in the pathogenesis, diagnosis and clinical management of rheumatoid arthritis"*.

2012 MATHEMATICS

JEAN BOURGAIN TERENCE TAO

PHOTO BOURGAIN AND TAO: JAN NORDÉN

JEAN BOURGAIN, Institute for Advanced Study, Princeton, NJ, USA and **TERENCE TAO**, University of California, Los Angeles, CA, USA, *"for their brilliant and ground-breaking work in harmonic analysis, partial differential equations, ergodic theory, number theory, combinatorics, functional analysis and theoretical computer science"*.

2012 ASTRONOMY

REINHARD GENZEL ANDREA GHEZ

PHOTO GENZEL AND GEHZ: JAN NORDÉN

REINHARD GENZEL, Max-Planck-Institut für extraterrestrische Physik, Garching, Germany and **ANDREA GHEZ**, University of California, Los Angeles, CA, USA, *"for their observations of the stars orbiting the galactic centre, indicating the presence of a supermassive black hole"*.

2011 BIOSCIENCES

ILKKA HANSKI

PHOTO: MARKUS MARCETIC

ILKKA HANSKI, University of Helsinki, Finland, *"for his pioneering studies on how spatial variation affects the dynamics of animal and plant populations"*.

2010 GEOSCIENCES

WALTER MUNK

PHOTO: MARKUS MARCETIC

WALTER MUNK, Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA, USA, *"for his pioneering and fundamental contributions to our understanding of ocean circulation, tides and waves, and their role in the Earth's dynamics"*.

2009 POLYARTHRITIS

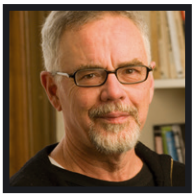
CHARLES DINARELLO, University of Colorado School of Medicine, Denver, CO, USA, **TADAMITSU KISHIMOTO**, Osaka University, Japan and **TOSHIO HIRANO**, Osaka University, Japan, *"for their pioneering work to isolate interleukins, determine their properties and explore their role in the onset of inflammatory diseases"*.

2008 MATHEMATICS AND ASTRONOMY


MAXIM KONTSEVICH


EDWARD WITTEN

MAXIM KONTSEVICH, IHÉS, France, and **EDWARD WITTEN**, Institute for Advanced Study, Princeton, NJ, USA, *"for their important contributions to mathematics inspired by modern theoretical physics"*, and **RASHID ALIEVICH SUNYAEV**, Max-Planck-Institute for Astrophysics, Garching, Germany, *"for his decisive contributions to highenergy astrophysics and cosmology, in particular processes and dynamics around black holes and neutron stars and demonstration of the diagnostic power of structures in the background radiation"*.


ROBERT L. TRIVERS

2007 BIOSCIENCES

ROBERT L. TRIVERS, Rutgers University, New Brunswick, NJ, USA, *"for his fundamental analysis of social evolution, conflict and cooperation"*.


WALLACE S. BROECKER

2006 GEOSCIENCES

WALLACE S. BROECKER, Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY, USA, *"for his innovative and pioneering research on the operation of the global carbon cycle within the ocean atmosphere-biosphere system, and its interaction with climate"*.

2005 MATHEMATICS AND ASTRONOMY

JAMES E. GUNN and **P. JAMES E. PEEBLES**, Princeton University, NJ, USA, and **SIR MARTIN J. REES**, Cambridge University, UK, *"for contributions towards understanding the large-scale structure of the Universe"*.

2004 POLYARTHRITIS

EUGENE C. BUTCHER, Stanford University, CA, USA, and **TIMOTHY A. SPRINGER**, Harvard Medical School, Boston, MA, USA, *"for their studies on the molecular mechanisms involved in migration of white blood cells in health and disease"*.

2003 BIOSCIENCES

CARL R. WOESE, University of Illinois (UIUC), IL, USA, *"for his discovery of a third domain of life"*.

2002 GEOSCIENCES

DAN P. MCKENZIE, University of Cambridge, UK, *"for fundamental contributions to the understanding of the dynamics of the lithosphere, particularly plate tectonics, sedimentary basin formation and mantle melting"*.

2001 MATHEMATICS AND ASTRONOMY

ALAIN CONNES, IHÉS and Collège de France, France, *"for his penetrating work on the theory of operator algebras and for having been a founder of the non-commutative geometry"*.

2000 POLYARTHRITIS

RAVINDER N. MAINI and **MARC FELDMANN**, both of the Kennedy Institute of Rheumatology, London, UK, *"for their definition of TNF-alpha as a therapeutic target in rheumatoid arthritis"*.

1999 BIOSCIENCES

JOHN MAYNARD SMITH, University of Sussex, UK, **ERNST MAYR**, Harvard University, Cambridge MA, USA, and **GEORGE C. WILLIAMS**, State University of New York (SBU), NY, USA, *"for their fundamental contributions to the conceptual development of evolutionary biology"*.

ERNST MAYR

1998 GEOSCIENCES

DON L. ANDERSON, California Institute of Technology, Pasadena CA, USA, and **ADAM M. DZIEWONSKI**, Harvard University, Cambridge MA, USA, *"for their fundamental contributions to our knowledge of the structures and processes in the interior of the Earth"*.

1997 MATHEMATICS AND ASTRONOMY

FRED HOYLE, University of Cambridge, UK, and **EDWIN E. SALPETER**, Cornell University, Ithaca, NY, USA, *"for their pioneering contributions to the study of nuclear processes in stars and stellar evolution"*.

1996 BIOSCIENCES

LORD ROBERT M. MAY, University of Oxford, UK, *"for his pioneering ecological research concerning theoretical analysis of the dynamics of populations, communities and ecosystems"*.

LORD ROBERT M. MAY

1995 GEOSCIENCES

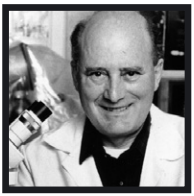
NICHOLAS SHACKLETON (LEFT) AND WILLI DANSGAARD (RIGHT)

WILLI DANSGAARD, Københavns Universitet, Denmark, and **NICHOLAS SHACKLETON**, University of Cambridge, UK, *"for their fundamental work on developing and apply ing isotope geological analysis methods for the study of climatic variations during the Quater- nary period"*.

1994 MATHEMATICS AND ASTRONOMY

SIMON DONALDSON, University of Oxford, UK, *"for his fundamental investigations in four-dimensional geometry through application of instantons, in particular his discovery of new differential invariants"*, and **SHING-TUNG YAU**, Harvard University, Cambridge, MA, USA, *"for his development of non-linear techniques in differential geometry leading to the solution of several outstanding problems"*.

1993 BIOSCIENCES



SEYMOUR BENZER

SEYMOUR BENZER, California Institute of Technology, Pasadena, CA, USA *"for his pioneering genetical and neurophysiological studies on behavioural mutants in the fruit fly, Drosophila melanogaster"*, and **WILLIAM D. HAMILTON**, University of Oxford, UK, *"for his theories concerning kin selection and genetic relationship as a prerequisite for the evolution of altruistic behavior"*.

1992 GEOSCIENCES

ADOLF SEILACHER, Institut und Museum für Geologie und Paläontologie, Tübingen, Germany, *"for his innovative research concerning the evolution of life in interaction with the environment as documented in the geological record"*.

1991 MATHEMATICS AND ASTRONOMY

ALLAN R. SANDAGE

ALLAN R. SANDAGE, The Observatories of the Carnegie Institution of Washington, Pasadena, CA, USA, *"for his very important contributions to the study of galaxies, their populations of stars, clusters and nebulae, their evolution, the velocity-distance relation (or Hubble relation), and its evolution over time"*.

1990 BIOSCIENCES


PAUL R. EHRLICH

PAUL R. EHRLICH, Stanford University, CA, USA, *"for his research on the dynamics and genetics of fragmented populations and the importance of the distribution pattern for their survival probabilities"*, and **EDWARD O. WILSON**, Harvard University, Cambridge, MA, USA, *"for the theory of island biogeography and other research on species diversity and community dynamics on islands and in other habitats with differing degrees of isolation"*.

1989 GEOSCIENCES

JAMES VAN ALLEN, University of Iowa, Iowa City, IA, USA *"for his pioneering exploration of space, in particular the discovery of the energetic particles trapped in the geomagnetic field which forms the radiation belts – the Van Allen belts – around our planet Earth"*.

1988 MATHEMATICS AND ASTRONOMY

PIERRE DELIGNE, Institute for Advanced Study, Princeton, NJ, USA and **ALEXANDRE GROTHENDIECK**, Université des Sciences et Techniques du Languedoc, France, *"for their fundamental research in algebraic geometry"*. (Mr Grothendieck declined his prize.)

1987 BIOSCIENCES

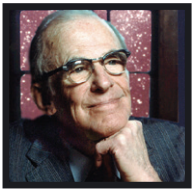

EUGENE P. ODUM HOWARD T. ODUM

EUGENE P. ODUM, University of Georgia, Athens, GA, USA and **HOWARD T. ODUM**, University of Florida, Gainesville, FL, USA, *"for their pioneering contributions within the field of ecosystem ecology"*.

1986 GEOSCIENCES

CLAUDE J. ALLÉGRE, Université de Paris, France, and **GERALD J. WASSERBURG**, California Institute of Technology, Pasadena, CA, USA, *"for their pioneering studies of isotope geochemical relations and the geological interpretations that these results permit"*.

1985 MATHEMATICS AND ASTRONOMY


LYMAN SPITZER JR

LYMAN SPITZER JR, Princeton University, NJ, USA, *"for his fundamental pioneering studies of practically every aspect of the interstellar medium, culminating in the results obtained using the Copernicus satellite"*.

1984 BIOSCIENCES

DANIEL H. JANZEN, University of Pennsylvania, Philadelphia, PA, USA, *"for his imaginative and stimulating studies on co-evolution which has inspired many researchers to further work in this field"*.

1983 GEOSCIENCES

EDVARD N. LORENZ, Massachusetts Institute of Technology, Cambridge, MA, USA, and **HENRY STOMMEL**, Woods Hole Oceanographic Institution, MA, USA, *"for their fundamental contributions to the field of geophysical hydrodynamics, which in a unique way have contributed to a deeper understanding of the large-scale motions of the atmosphere and the sea"*.

1982 MATHEMATICS AND ASTRONOMY

VLADIMIR I. ARNOLD, Moscow State University, Soviet Union, and **LOUIS NIRENBERG**, New York University, NY, USA, *"for their outstanding achievements in the theory of non-linear differential equations"*.


VLADIMIR I. ARNOLD


LOUIS NIRENBERG AND KING CARL XVI GUSTAF

Anna-Greta and Holger Crafoord

HOLGER AND ANNA-GRETA CRAFOORD

Holger Crafoord (1908–1982) was prominent in Swedish industry and commerce. He began his career with AB Åkerlund & Rausing and devoted a larger part of his working life to this company. In 1964, Holger Crafoord founded Gambro AB in Lund, Sweden, where the technique of manufacturing the artificial kidney was developed. This remarkable dialyser soon became world famous. Since then, a series of medical instruments has been introduced on the world market making Gambro a leading company in this field.

In 1980, Holger Crafoord founded the Crafoord Foundation, which annually contributes greatly to the Anna-Greta and Holger Crafoord Fund.

Holger Crafoord became an honorary doctor of economics in 1972 and in 1976 an honorary doctor of medicine at Lund University.

Anna-Greta Crafoord (1914–1994) took, as Holger Crafoord's wife, part in the development of Gambro AB. Through generous donations and a strong commitment in the society around her, she contributed to the scientific and cultural life. In 1986 she founded the Anna-Greta Crafoord foundation for rheumatological research and in 1987 Anna- Greta Crafoord became an honorary doctor of medicine at Lund University.

Over the years, the Crafoords have furthered both science and culture in many ways and it is noteworthy that research in the natural sciences has received an important measure of support from the Anna-Greta and Holger Crafoord Fund.

THE ROYAL SWEDISH ACADEMY OF SCIENCES is an independent, nongovernmental organization whose aim is to promote the sciences and strengthen their influence in society. Traditionally, the Academy takes a special responsibility for the natural sciences and mathematics, and strives to increase exchanges between various disciplines.

The activities of the Academy are aimed mainly at

- spreading knowledge of discoveries and problems in current research
- providing support for young researchers
- rewarding outstanding contributions in research
- stimulating interest in mathematics and the natural sciences in schools
- spreading scientific and popular-scientific information in various forms
- offering unique research environments
- maintaining contact with foreign academies, learned societies and other international scientific organisations
- representing the sciences in society
- carrying out independent analyses and evaluations based on scientific grounds on issues of importance for society

THE ACADEMY HAS has about 450 Swedish members and 175 foreign members. The Swedish members are active within Classes and committees. They initiate investigations, responses to government proposals, conferences and seminars. Once a month, the Academy holds a General Meeting, with a connected public lecture.

THE ACADEMY´S OWN INSTITUTES offer unique research environments for botany, ecological economics, the history of science and mathematics.

IN ADDITION TO THE CRAFOORD PRIZE, the Academy annually awards a number of prizes, the best known of which are the Nobel Prizes in Physics and Chemistry and the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel. Others are the Söderberg Prize and the Göran Gustafsson Prize. The latter are awarded to outstanding young researchers and are a combination of a personal prize and a research grant. The Academy also supports researchers through scholarships and mentoring programmes, and is engaged in appointing many promising young researchers to long-term positions that are financed by foundations.

THROUGH ITS VARIOUS COMMITTEES, the Academy also works for the development of a society based on scientific grounds. Great interest in environmental and educational issues has resulted in a wide variety of Academy activities in these areas.

KUNGL. VETENSKAPS-AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES

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