

19 January 2012

THE CRAFOORD PRIZE IN **MATHEMATICS** 2012 AND THE CRAFOORD PRIZE IN **ASTRONOMY** 2012

The Royal Swedish Academy of Sciences has decided to award the Crafoord Prize in Mathematics 2012 to

JEAN BOURGAIN

Institute for Advanced Study, Princeton, NJ, USA, and

TERENCE TAO

University of California, Los Angeles, CA, USA,

“for their brilliant and groundbreaking work in harmonic analysis, partial differential equations, ergodic theory, number theory, combinatorics, functional analysis and theoretical computer science”.

The masters of mathematics

This year's Crafoord Prize Laureates have solved an impressive number of important problems in mathematics. Their deep mathematical erudition and exceptional problem-solving ability have enabled them to discover many new and fruitful connections and to make fundamental contributions to current research in several branches of mathematics.

On their own and jointly with others, **Jean Bourgain** and **Terence Tao** have made important contributions to many fields of mathematics – from number theory to the theory of non-linear waves. The majority of their most fundamental results are in the field of mathematical analysis. They have developed and used the toolbox of analysis in groundbreaking and surprising ways. Their ability to change perspective and view problems from new angles has led to many remarkable insights, attracting a great deal of attention among researchers worldwide.

Jean Bourgain, Belgian citizen. Born 1954 in Ostende, Belgium. Ph.D. 1977 at Vrije Universiteit Brussels, Belgium. Professor at Institute for Advanced Study, Princeton, NJ, USA.
www.math.ias.edu/people/faculty/bourgain

Terence Tao, Australian and American citizen. Born 1975 in Adelaide, Australia. Ph.D. 1996 at Princeton University, NJ, USA. Professor at University of California, Los Angeles, CA, USA.
www.math.ucla.edu/~tao/

Prize amount: SEK 4 million per prize, equalling a total of SEK 8 million.

The Prize award ceremony is held in Lund on 15 May 2012 in the presence of H.M. the King and H.M. the Queen of Sweden.

The Crafoord Days 14–15 May 2012, Lund: Prize symposia in mathematics and in astronomy 14 May, and Prize lectures and Prize award ceremony 15 May.

More information, Video News Releases and newly recorded interviews with the Laureates: <http://kva.se> och www.crafoordprize.se

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

The Royal Swedish Academy of Sciences has decided to award the Crafoord Prize in Astronomy 2012 to

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”.

The dark heart of the Milky Way

This year's Crafoord Prize Laureates have found the most reliable evidence to date that supermassive black holes really exist. For decades Reinhard Genzel and Andrea Ghez, with their research teams, have tracked stars around the centre of the Milky Way galaxy. Separately, they both arrived at the same conclusion: in our home galaxy resides a giant black hole called Sagittarius A*.

Black holes are impossible to observe directly – everything in their vicinity vanishes into them, virtually nothing is let out. The only way of exploring black holes is to investigate the effects their gravitation has on the surroundings. From the motions of stars around the centre of the Milky Way, **Reinhard Genzel** and **Andrea Ghez**, and their colleagues, estimated the mass of Sagittarius A* at nearly four million times solar masses. Sagittarius A* is our closest supermassive black hole. It allows astronomers to better investigate gravity and explore the limitations of the theory of relativity.

Reinhard Genzel, German citizen. Born 1952 in Bad Homburg vor der Höhe, Germany. Ph.D. 1978 at Universität Bonn, Germany. Professor at University of California, Berkeley, CA, USA and Scientific Director of Max-Planck-Institut für extraterrestrische Physik, Garching, Germany.
www.mpg.de/463069/extraterrestrische_physik_wissM1

Andrea Ghez, American citizen. Born 1965 in New York City, NY, USA. Ph.D. 1992 at California Institute of Technology, Pasadena, CA, USA. Professor at University of California, Los Angeles, CA, USA.
www.astro.ucla.edu/~ghez/