CARL FRIEDRICH GAUSS PRIZE FOR APPLICATIONS OF MATHEMATICS

First Award
Opening Ceremony, ICM 2006, Madrid, Spain
August 22, 2006

Martin Grötschel
- Institut für Mathematik, Technische Universität Berlin (TUB)
- DFG-Forschungszentrum MATHEON “Mathematik für Schlüsseltechnologien”
- Konrad-Zuse-Zentrum für Informationstechnik Berlin (ZIB)

groetschel@zib.de http://www.zib.de/groetschel
From the Statutes:

The IMU *Carl Friedrich Gauss Prize* for applications of mathematics is to be awarded for outstanding

- mathematical contributions that have found significant practical applications outside of mathematics, or

- achievements that made the application of mathematical methods to areas outside of mathematics possible in an innovative way, e.g., via new modelling techniques or the design and implementation of algorithms.
CARL FRIEDRICH GAUSS PRIZE FOR APPLICATIONS OF MATHEMATICALS

From the Statutes:

- The *Carl Friedrich Gauss Prize* is given, in particular, for the impact the work of the prize winner has had in practice.

- Since the practical usefulness of mathematical results is often not immediately visible and since the applicability and importance for practice may only be realized after a long time lag, no age limit should restrict the choice of a prize winner.
Why is the prize called Gauss Prize?

magnetism
1 Gauss = unit of the magnetic field

Gauss curve

prediction of the reappearance of the asteroid Ceres

least squares

geodesy/land survey
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About 30 highly deserving colleagues from all areas of mathematics, pure and applied, have been suggested for this award.
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From the Statutes:

- The International Mathematical Union appoints a Carl Friedrich Gauss Prize Committee in analogy to its other Prize Committees. The Carl Friedrich Gauss Prize Committee reports its choice to the IMU president.
The Gauss Prize Committee

- Robert E. Bixby (USA)
- Frank den Hollander (The Netherlands)
- Martin Grötschel (Germany, chair)
- Stephane Mallat (France)
- Ian Sloan (Australia)

appointed by the IMU Executive Committee.
The Medal

Gauss Prize medal
designed by Jan Arnold

Ceres

least squares
The Winner

The International Mathematical Union (IMU) and the Deutsche Mathematiker-Vereinigung (DMV) jointly award the Carl Friedrich Gauss Prize for Applications of Mathematics to Professor Dr. Kiyoshi Itô for laying the foundations of the Theory of Stochastic Differential Equations and Stochastic Analysis. Itô’s work has emerged as one of the major mathematical innovations of the 20th century and has found a wide range of applications outside of mathematics. Itô calculus has become a key tool in areas such as engineering (e.g., filtering, stability, and control in the presence of noise), physics (e.g., turbulence and conformal field theory), and biology (e.g., population dynamics). It is at present of particular importance in economics and finance with option pricing as a prime example.

Madrid, August 22, 2006

Sir John Ball
President of IMU

Günter M. Ziegler
President of DMV
The Gauss Prize to K. Itô: applications outside of mathematics

- engineering: e.g., filtering, stability, and control in the presence of noise
- physics: e.g., turbulence and conformal field theory
- biology: e.g., population dynamics
- economics: e.g., option pricing

Further applications and details will be reported in the Gauss Prize Lecture

by Hans Föllmer (Humboldt University Berlin)
Wednesday, August 23, 2006, 14:00 – 14:45
lecture room A
Kiyoshi Itô

Kiyosi Itô
Born: Sept. 7, 1915, Mie, Japan
Professor Emeritus, Kyoto University.

Doctor of Science, Tokyo Imperial University

Honorary doctoral degrees: Université Paris VI; ETH, Zurich; University of Warwick

Memberships: Académie des Sciences, France; Japan Academy; National Academy of Sciences, USA
Kiyoshi Ito 1942

Government Statistical Bureau, Japan, 1942
Kiyoshi Itô 1954

Fellow at the Institute of Advanced Study, Princeton 1954
Kiyoshi Itô 1978

Cornell University, 1978
Kiyoshi Itô 1995

1995, Eightieth Birthday Lecture, Kyoto University
Kiyoshi Itô 2005

The 2005 ABEL SYMPOSIUM

Stochastic Analysis and Applications
- A Symposium in Honor of Kiyosi Itô’s 90th Birthday

July 29th – August 4th
Oslo, Norway
Kiyoshi Itô 2006

For health reasons, Prof. Itô is unfortunately unable to be present at this award ceremony.

The IMU President Sir John Ball will personally take the Gauss Medal to Kyoto after ICM 2006 and present it to Prof. Itô at a special ceremony.
Kiyoshi Itô’s wife and 3 daughters

1954

1976
Kiyoshi Ito’s daughter Junko

Junko Ito
Professor and Chair, Linguistics
University of California
Santa Cruz, CA
USA

will accept the Gauss Prize
on behalf of her father.
Kiyoshi Itô
Professor Emeritus, Kyoto University

Winner of the 2006 Carl Friedrich Gauss Prize for Applications of Mathematics