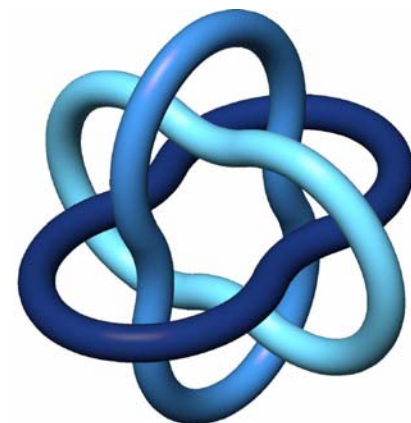


CARL FRIEDRICH GAUSS PRIZE FOR APPLICATIONS OF MATHEMATICS



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>

CARL FRIEDRICH GAUSS PRIZE FOR APPLICATIONS OF MATHEMATICS

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 MATHEMATICS

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?



1840 painted by
Christian Albrecht Jensen

magnetism

1 Gauss =
unit of the
magnetic field

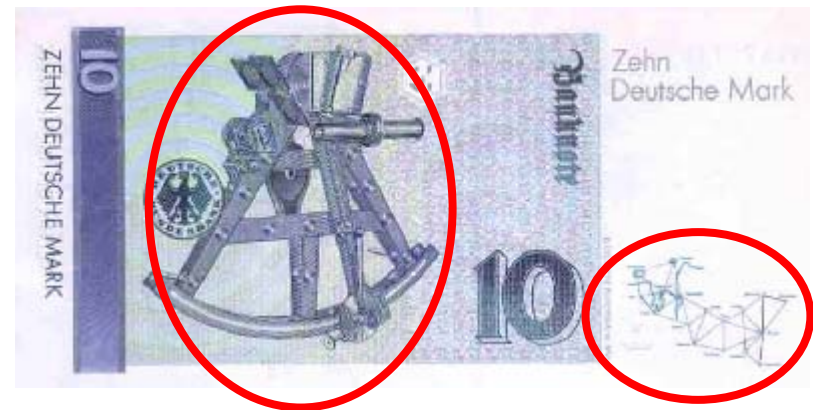
prediction of the
reappearance
of the asteroid Ceres



least squares



Gauss curve



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.



CARL FRIEDRICH GAUSS PRIZE FOR APPLICATIONS OF MATHEMATICS

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.

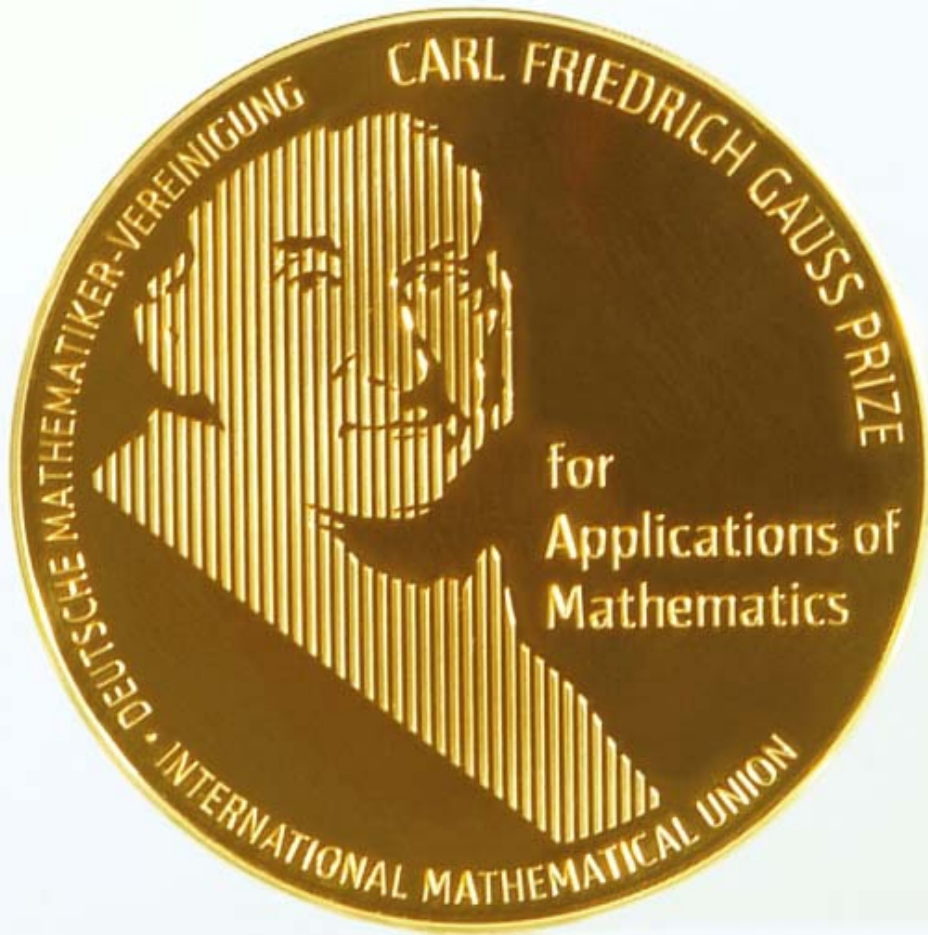


The Gauss Prize Committee

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

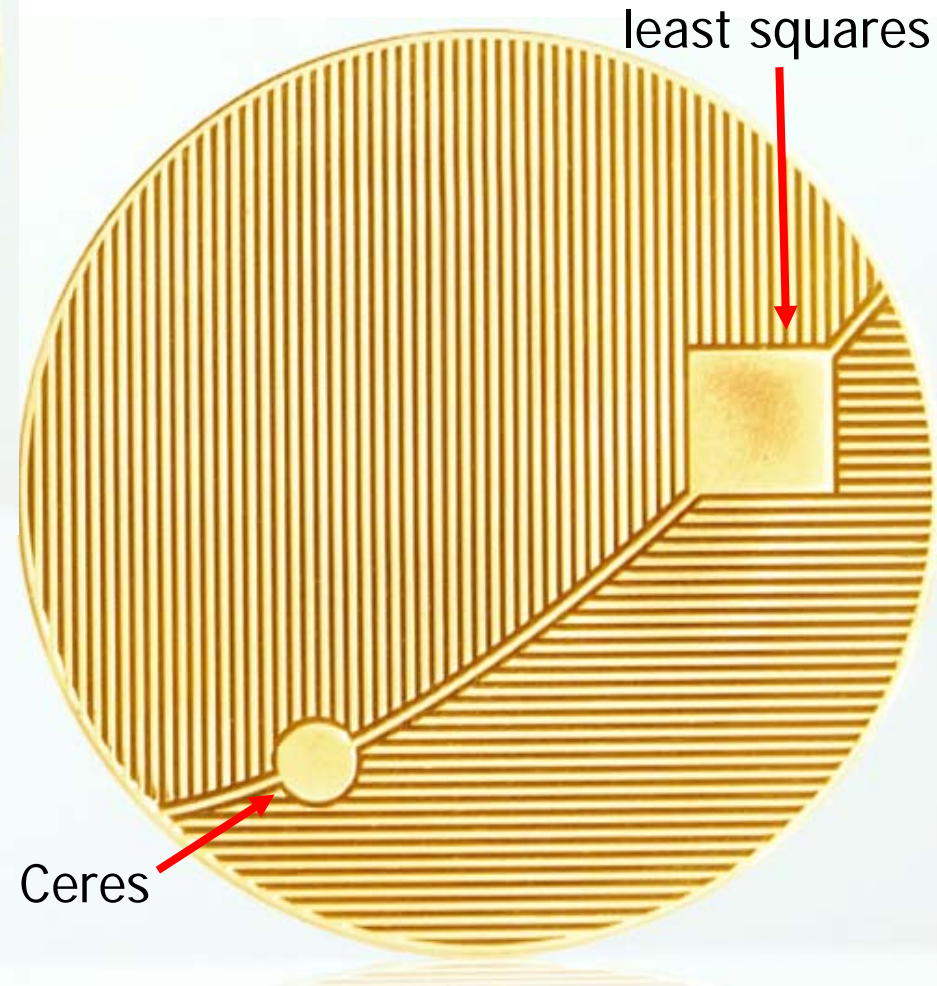
appointed by the IMU Executive Committee.





Gauss Prize medal
designed by Jan Arnold

The Medal



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 Itô 1942



Government Statistical Bureau, Japan, 1942



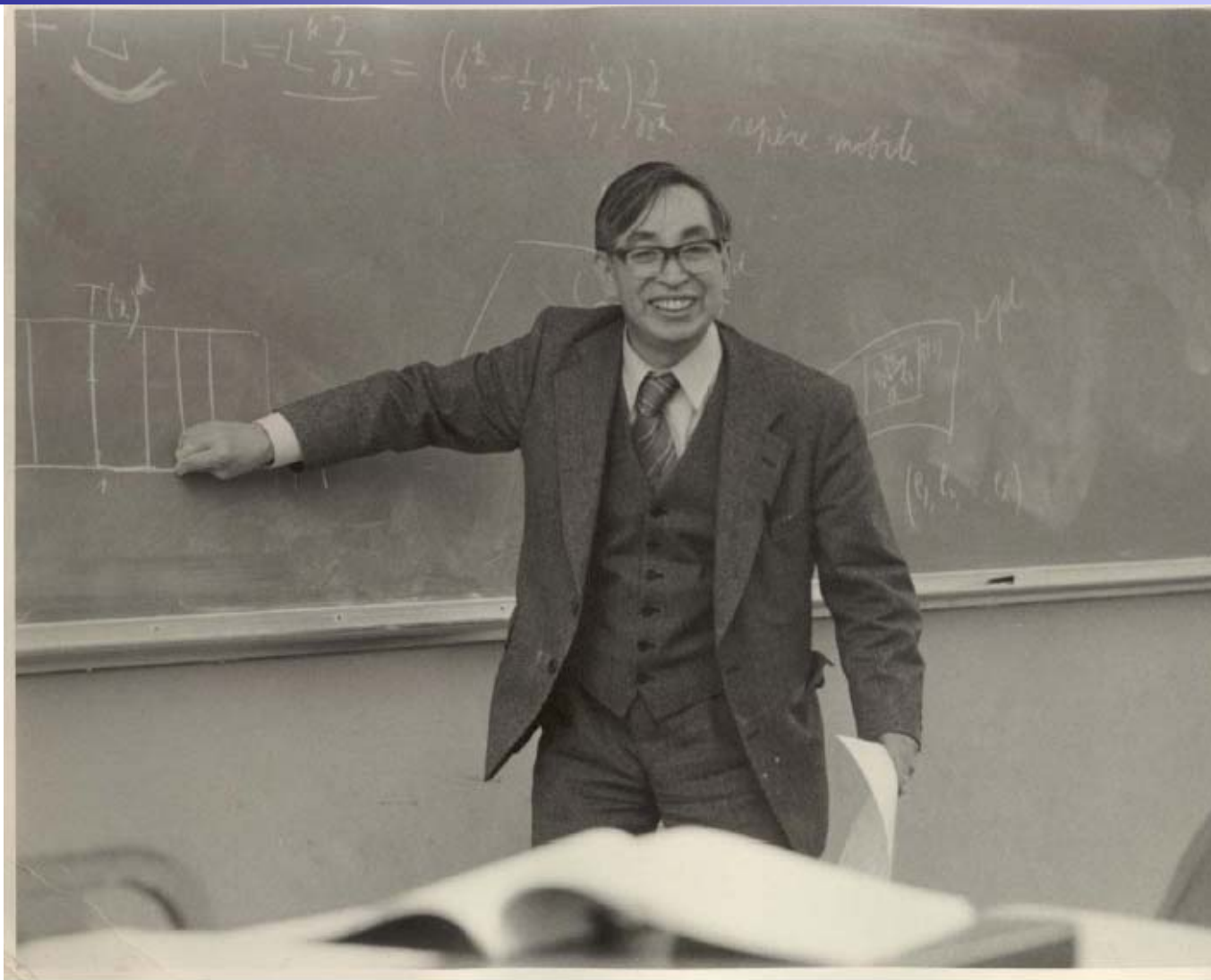
Kiyoshi Itô 1954



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 Itô's daughter Junko

Junko Itô

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**

