



The Erwin Schrödinger International  
Institute for Mathematical Physics

Boltzmanngasse 9/2  
A-1090 Vienna, Austria

**LUDWIG BOLTZMANN (1844–1906)**

# Boltzmann's Legacy

## An International Symposium

at the

## Erwin Schrödinger Institute for Mathematical Physics

In commemoration of Ludwig Boltzmann's death on September 5, 1906,  
during his summer vacation in Duino near Trieste

**Wednesday, June 7 to Friday, June 9, 2006**

**Erwin Schrödinger Institute, Boltzmanngasse 9, 1090 Vienna**

**Organizing Committee: G. Gallavotti, A. Kupiainen, W.L. Reiter,  
K. Schmidt, J. Schwermer, J. Yngvason**

This Symposium is dedicated to Boltzmann's lasting legacy in kinetic theory, thermodynamics and statistical mechanics, and to his influence as a philosopher of science.

A series of lectures will outline some recent developments in physics and mathematics related to Boltzmann's work as well as his influence from the point of view of history and philosophy of science.

### **Invited Speakers:**

E.G.D. Cohen, Rockefeller University, New York  
Nadine de Courtenay, CNRS, Paris  
Christoph Dellago, Universität Wien  
Michael E. Fisher, University of Maryland  
Giovanni Gallavotti, Università di Roma 'La Sapienza'  
Oscar E. Lanford III, ETH Zürich  
Joel L. Lebowitz, Rutgers University  
Elliott H. Lieb, Princeton University

Donald S. Ornstein, Stanford University  
Jürgen Renn, MPI für Wissenschaftsgeschichte, Berlin  
David Ruelle, IHES, Bures-sur-Yvette  
Peter Schuster, Universität Wien  
Herbert Spohn, TU München  
Cédric Villani, ENS Lyon  
Anton Zeilinger, Universität Wien

The Symposium is accompanied by an exhibition on Ludwig Boltzmann, organized by the Österreichische Zentralbibliothek für Physik.

Further details will be available on the web-page <http://www.esi.ac.at/activities/Boltzmann2006.html>

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**In co-operation with: The University of Vienna, the City of Vienna and the Austrian Physical Society**

**Supported by: The Austrian Federal Ministry of Education, Culture and Science**

# PROGRAMME

## Wednesday, 7th June 2006

Großer Hörsaal, Institut für Experimentalphysik, Strudlhofgasse 4, 1090 Vienna

### Opening Ceremony

Chair: Walter Thirring, Universität Wien

10:30 Georg Winckler, Rektor, Universität Wien  
Walter Kutschera, Dekan der Fakultät für Physik, Universität Wien  
Klaus Schmidt, President of the ESI

11:00 Jakob Yngvason, Universität Wien: *Boltzmann's legacy from the point of view of a mathematical physicist*

11:30 Anton Zeilinger, Universität Wien: *Boltzmann's legacy from the point of view of an experimentalist*

### Afternoon Session

14:00 Joel L. Lebowitz, Rutgers University: *On the role of Boltzmann's entropy in the time evolution of macroscopic systems*

15:00 Elliott H. Lieb, Princeton University: *What if Boltzmann had known about quantum mechanics – and other questions*

16:00 Coffee

16:30 David Ruelle, IHES, Bures-sur-Yvette: *Is entropy production local in infinite classical systems?*

17:30 End of session

### Evening Programme: Wiener Vorlesung, Audimax, Technische Universität Wien, Getreidemarkt 9, 1060 Vienna

19:30 Jürgen Renn, MPI für Wissenschaftsgeschichte, Berlin: *Boltzmann und das Ende des mechanischen Weltbildes*

## Thursday, 8th June 2006

Boltzmann Lecture Hall, Erwin Schrödinger Institute, Boltzmannngasse 9, 1090 Vienna

### Morning Session

09:00 Michael E. Fisher, University of Maryland: *Atoms and ions; Universality, singularity and particularity: lessons from a half-century of statistical physics*

10:00 Oscar E. Lanford III, ETH Zürich: *Deriving the Boltzmann equation from microscopic hard-sphere dynamics*

11:00 Coffee

11:30 Herbert Spohn, TU München: *The Boltzmann transport-equation for weakly nonlinear lattice dynamics*

12:30 Lunch break

### Afternoon Session

15:00 Christoph Dellago, Universität Wien: *From hard spheres to soft matter: Boltzmann's legacy for the computational physicist*

16:00 Giovanni Gallavotti, Università di Roma 'La Sapienza': *Chaoticity as a unifying principle of equilibrium and nonequilibrium statistical mechanics*

17:00 Coffee

17:30 Session organized by Joel L. Lebowitz, Rutgers University: *Human Rights and Social Responsibilities of Scientists*

18:30 End of session

## Friday, 9th June 2006

Boltzmann Lecture Hall, Erwin Schrödinger Institute, Boltzmannngasse 9, 1090 Vienna

### Morning Session

09:00 Peter Schuster, Universität Wien: *Boltzmann and evolution — basic questions of biology seen with atomistic glasses*

10:00 Nadine de Courtenay, CNRS, Paris: *Boltzmann's philosophy of science: a technical adventure*

11:00 Coffee

11:30 Cédric Villani, ENS, Lyon: *Beyond the H-Theorem: Boltzmann's entropy in today's mathematics, from partial differential equations to geometry*

12:30 Lunch break

### Afternoon Session

15:00 Donald S. Ornstein, Stanford University: *Random or determined?*

16:00 E.G.D. Cohen, Rockefeller University, New York: *Entropy, probability and dynamics*

17:00 Closing Ceremony