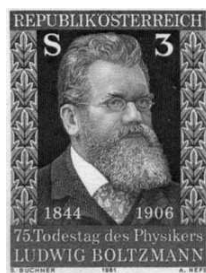


**Ludwig Boltzmann (1844-1906)**  
Atoms, Irreversibility and Entropy after 100  
Years  
An Appraisal of Boltzmann's Ideas  
Symposium at the Department of  
Mathematics, LMU, 3 days in Sept/Oct. 2006

**Organizers**

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Ludwig Boltzmann, the founder of modern atomism and of statistical reasoning in physics, was from 1890 to 1894 a professor at the University of

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Munich, where he had his own institute of theoretical physics. Having found an agreeable collection of mathematicians and physicists – the “Hofbräuhausgesellschaft” –to discuss with, he looked upon the time he spent in Munich with great satisfaction. In a letter to Felix Klein in 1889 he wrote: “ Just when I received your dear letter I had another neurasthenic attack, as I often do in Vienna, although I was spared them altogether in Munich. With it came the fear that the whole H-curve was nonsense.“

A hundred years after Boltzmann’s death in Duino (Italy), Boltzmann’s ideas remain, paradoxically, both controversial and canonical. The purpose of this international symposium is to appraise Boltzmann’s achievements by gathering ca. 60 scientists working in the foundations of statistical mechanics and quantum mechanics (mathematicians, physicists and philosophers of natural sciences) and to stimulate a discussion about the present status of Boltzmann’s ideas, with reports on recent (or not so recent but important) results and perspectives for future developments. In so doing, we wish to celebrate Boltzmann’s work on the atomistic explanation of the irreversible behavior of thermodynamic systems, as well as of their equilibrium properties. His ideas are–not surprisingly–as relevant to modern physics as they were in Boltzmann’s day.

## 1 Topics

1. Boltzmann Equation
  - (a) Properties, Applications and Numerics
  - (b) Mathematical Aspects
  - (c) Microscopic Derivation
2. Foundations of Statistical Mechanics
  - (a) Ergodicity
    - i. Many particles systems
    - ii. Chaoticity
  - (b) Gibbs versus Boltzmann
3. Brownian Motion
  - (a) Experiments

- (b) Microscopic Derivation
- (c) In Quantum Mechanics

4. Entropy

- (a) Entropy Increase and Irreversibility
- (b) Fluctuation Theory
- (c) Quantum Entropy

5. Probability and Physics