

Gerhard Wanner

Monday, December 8th, 15:45, Lecture hall K1

On the discovery of Lagrange multipliers and Lagrange mechanics

The talk explains how

- A thick book on statics (Varignon 1725),
- a letter by Johann Bernoulli to Varignon (1715),
- Euler's *Methodus* (1744, on variational calculus),
- and d'Alembert's *Dynamique* from 1743,

led to the famous *Mécanique analytique* (1788, 1811) by Lagrange, in which, in the first part, the advantage of the *methods of multipliers* is demonstrated at many examples and, in the second part, the equations of Lagrange dynamics are derived from the principle of least action.

In the last part of the talk we show the connection of the ideas of Euler and Lagrange with problems of *optimal control* (Carathéodory, Pontryagin).

About the speaker

Professor Gerhard Wanner (Université de Genève, Switzerland) is a distinguished expert in numerical analysis and theory of ordinary differential equations. His books such as Hairer, Lubich, Wanner: *Geometric numerical integration, Structure-preserving algorithms for ordinary differential equations*; Hairer, Wanner: *Solving ordinary differential equations II Stiff and differential-algebraic problems* and Hairer, Nørsett, Wanner: *Solving ordinary differential equations I Nonstiff problems* became classics in the given field. He served as President of Section VII of the Swiss Academy of Natural Sciences, Head of Department, and President of the Swiss Mathematical Society.

Colloquium lecture

The colloquium lecture is organized on the occasion on what would have been the 85th birthday of Jindřich Nečas (1929-2002). Jindřich Nečas was an outstanding Czech mathematician who made fundamental contribution to the theory of partial differential equations. His book *Les méthodes directes en théorie des équations elliptique* published 1967 in French, has become a standard reference for the mathematical theory of linear elliptic equations and systems.

Further information

<http://mod.karlin.mff.cuni.cz/colloquium>