FLOW-ERCOFTAC Summer school in Flow Control and Optimization

June 29-July 3, 2009
KTH Royal Institute of Technology
Stockholm, Sweden
Linné FLOW Centre, KTH Mechanics

http://www.flow.kth.se/graduateschool

Scope:

A major step forward for the fluid mechanics community, still in its infancy, is the ability to actively control fluid flows. Thanks to the increased computational, experimental and micro-manufacturing capabilities, as well as to enhanced inter-disciplinary collaborations, it is now possible to manipulate the flow to optimize specific design targets. There are indeed high expectations within the fluid mechanics community that flow control will allow fluid mechanics to be ruled, thus making it work to our advantage rather than just being subjected to analysis.

Currently there is no coordination, within Europe, of the training and research efforts in the emerging field of flow control. The main motivation for the proposed summer school is, therefore, that flow control, design and optimization have to be an important part of the training and research of the future scientists and engineers working on fluid-flow systems. Flow control is an interdisciplinary research activity that has the strong potential to improve the efficiency of transport systems, increase the stability of combustion systems, reduce the energy losses in high-speed machines and diminish the emission of harmful gases.

Invited Teachers:

Prof. **Bernd Noack**,
TU Berlin, Germany

Prof. **Clarence Rowley**,
Princeton University, USA

Prof. **Carlo Cossu, LadHyX,**
Ecole Polytechnique, France

Prof. **Peter Schmid**, LadHyX,
Ecole Polytechnique, France

Prof. **Kwing-So Choi**,
University of Nottingham, UK

Prof. **Luca Brandt**,
Linné FLOW Centre, KTH

Topics:

The summer school will cover the following topics in the area of Flow Control and Optimization:

- Introduction to Hydrodynamic Stability.
- Optimal Control.
- Feedback Control.
- Model reduction.
- Numerical Methods for Control.
- Design and Optimisation.
- Experimental Methods for flow Control.
- Application to Fluid-flow Systems.

Location and outline:

Lectures will be given between June 29-July 3, 2009, the week after the IUTAM Symposium on Laminar-Turbulent Transition, also at host by the the Linné FLOW Centre.

The Course will be held in the main campus of KTH Stockholm, conveniently located in the city center of Stockholm, Sweden. A project will be performed by pairs of student and sent electronically to the teachers for the final evaluation.

Registration:

The course is free of charge and a limited number of ERCOFTAC scholarships for graduate students to come and attend are available. Interested students are invited to contact Luca Brandt, luca@mech.kth.se. For further information please visit the homepage of the Linné FLOW Centre (http://www.flow.kth.se).
The number of participants is limited to 40 students.

Contact:

Dr. Luca Brandt,
Director of Studies, Linné Flow Centre, KTH Mechanics
SE-100 44 Stockholm, Sweden, luca@mech.kth.se