

FLOW-ERCOFTAC Summer School: Flow Control and Optimization

General information

Lectures will be given in room **E51, Osquarsbacke 14** at the main KTH Campus.

Lunch will be served at the **restaurant Quantum, Osquardas väg 4**, also at the main KTH Campus.

Lecture programme

Monday, June 29

9-13 **Hydrodynamic stability:** *Luca Brandt, Linné FLOW Centre, KTH*
Modal and non-modal stability

15-18 **Optimal control I:** *Carlo Cossu, Ecole Polytechnique, France*
Introduction to constrained optimization.

Tuesday, June 30

9-12 **Optimal control II:** *Carlo Cossu, Ecole Polytechnique, France*
Sensitivity and adjoint-based optimization. Open-loop control.

14-17 **Numerical methods I:** *Peter Schmid, Ecole Polytechnique, France*
Global mode analysis; direct and adjoint approaches; iterative methods.

Wednesday, July 1

9-12 **Feedback control I:** *Clarence W. Rowley, Princeton, USA*
Fundamentals of feedback control

14-17 **Model reduction I:** *Clarence W. Rowley, Princeton, USA*
POD modes and balanced truncation for linear systems

Thursday, July 2

9-12 **Experimental methods:** *Kwing-So Choi, University of Nottingham, UK*
Experimental approaches to flow control

14-17 **Feedback control II:** *Clarence W. Rowley, Princeton, USA*
Optimal feedback control

Friday, July 3

9-12 **Numerical methods II:** *Peter Schmid, Ecole Polytechnique, France*
Numerical techniques for flow control and model reduction.

14-17 **Model reduction II:** *Bernd Noack, Berlin Institute of Technology, Germany*
Dynamic and stochastic closures of nonlinear systems:
From mean-field to statistical physics approaches. Nonlinear attractor/turbulence control.