Dr. Gilles Vilmart (ENS Cachan Bretagne, France) will present a seminar intitled:

"PIROCK: a swiss-knife implicit-explicit orthogonal Runge-Kutta Chebyshev integrator for stiff diffusion-advection-reaction problems with or without noise."

We introduce a partitioned Runge-Kutta (PRK) implicit-explicit (IMEX) extension of the order two orthogonal Chebyshev scheme (ROCK2) for the time integration of diffusion-advection-reaction problems with possibly severely stiff reaction terms. The diffusion terms are treated using the explicit stabilized integrator ROCK2, while the stiff reaction terms and the advection terms are treated separately, respectively implicitly and explicitly. The aim of the second order PIROCK method is to provide a single flexible code that can handle various regimes of reaction stiffness and a wide range of Peclet numbers. Furthermore, the code and algorithm allow to integrate the aforementioned problems in the presence of noise and to treat stiff Itô stochastic systems of differential equations.

This is joint work with Assyr Abdulle.

Lausanne, 26 September 2012/AA/vl

The seminars taking place at the Section of Mathematics are announced on internet address:
http://mathicse.epfl.ch/seminars