ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Prof. Marco Picasso
Mathematics Institute of Computational Science and Engineering - MATHICSE

SEMINAR OF NUMERICAL ANALYSIS

- **WEDNESDAY 27 NOVEMBER 2013 - 16 h 15, ROOM GR A3 30**

Prof. Pierre GREMAUD *(North Carolina State University, Raleigh, USA)* will present a seminar entitled:

"*Physiological boundary conditions for hemodynamics*"

Abstract:

A common goal in computational hemodynamics is the prediction of local blood flow downstream from stem arteries in which measurements are available. Due to computational complexity and uncertainties about the geometry and topology of the vasculature, such calculations are typically performed in a relatively small number of contiguous vessels. At the downstream edge of the computational domain, outflow boundary conditions have to be imposed. Choices of parameter values and type of conditions strongly impact the results, putting in question the significance of the entire modeling endeavor.
We will discuss a new type of outflow boundary conditions allowing for a reduced reliance on calibration which is a major obstacle toward reliable patient specific simulations. Our approach allows the computation of the impedance of tiered structured vascular trees. It extends previous work from periodic to generic transient flows and relies on Laplace transforms and convolution quadratures.
Joint work with Will Cousins (MIT) and Daniel Tartakovsky (UCSD)

Lausanne, 31 October 2013/MP/cr
