ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

*Prof. Alfio Quarteroni*
*Mathematics Institute of Computational Science and Engineering - MATHICSE*

---

# *SEMINAR OF NUMERICAL ANALYSIS*

➢ **WEDNESDAY 18 MAY 2011 - ROOM MA A110 - 16h15**

*Prof. Raimund Bürger, (Univeristy of Concepcion, Chile)* will present a seminar intitled:

## "Difference schemes stabilized by discrete mollification for degenerate parabolic equations in two space dimensions"

Abstract:

The discrete mollification method is a convolution-based filtering procedure for the regularization of ill-posed problems. This method is applied here to stabilize explicit schemes, which were first analyzed by Karlsen and Risebro (M2AN 35 (2001), 239-269), for the solution of initial value problems of strongly degenerate parabolic PDEs in two space dimensions. Two new schemes are proposed, which are based on direction-wise and two-dimensional discrete mollification of the second partial derivatives forming the Laplacian of the diffusion function, respectively. The mollified schemes permit to use substantially larger time steps than the original (basic) scheme.

It is proven that both schemes converge to the unique entropy solution of the initial value problem. Numerical examples demonstrate that the mollified schemes are competitive in efficiency, and in many cases significantly more efficient, than the basic scheme.

*This presentation is based on joint work with Carlos D. Acosta (Universidad Nacional de Colombia, Sede Manizales).*

Lausanne, April 8, 2011/AQ/RR/cr

---