ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Prof. Annalisa Buffa
Institute of Mathematics

➢ **WEDNESDAY 26 APRIL 2017 - ROOM ME D0 1418 - 16:15**

Prof. Stefan SAUTER (Institut für Mathematik
Universität Zürich) will present a seminar entitled:

« A Family of Crouzeix-Raviart Non-Conforming Finite Elements in Two- and Three Spatial Dimensions»

Abstract:

In this talk we will present a family of non-conforming "Crouzeix-Raviart" type finite elements in two and three dimensions. They consist of local polynomials of maximal degree p on simplicial finite element meshes while certain jump conditions are imposed across adjacent simplices.
We will prove optimal a priori estimates for these finite elements. The characterization of this space via jump conditions goes back to the seminal paper of Crouzeix and Raviart in 1973. However, the definition is implicit and the derivation of an explicit representation of the local basis functions for general p in 3D was an open problem.
We present explicit representations for these functions by developing some theoretical tools for fully symmetric and reflection symmetric orthogonal polynomials on triangles and their representation.
Finally we will analyze the linear independence of these sets of functions and discuss the question whether they span the whole non-conforming space.

This talk comprises joint work with P. Ciarlet Jr., ENSTA, Paris
and Charles F. Dunkl, Virginia Tech.

Lausanne, 30 March 2017/AB/ppv
