

**Johann Radon Institute for  
Computational and Applied Mathematics  
der  
Österreichischen Akademie der Wissenschaften**

# **Group Seminar**

Group: Analysis of Partial Differential Equations  
START-Project

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*RICAM*

## **“Domain Decomposition Methods for Local and Nonlocal Total Varia- tion Minimization”**

Nonlocal methods became recently important in image processing due to the fact that they preserve fine structure, texture and details of images. As an introduction into nonlocal methods we recall the nonlocal means filter by Buades et al. and present the nonlocal total variation minimization. In the last years efficient methods for performing nonlocal total variation minimization for image processing problems of small or medium size have been presented in the literature. Unfortunately the minimization of nonlocal total variation is connected with high computational cost. Hence these methods are not able to solve in real-time large problems. For such problems we need to address methods which allow us to reduce the problem to a finite sequence of subproblems of a more manageable size. With this aim we present domain decomposition methods for both total variation minimization and nonlocal total variation minimization. We will analyse their convergence properties. In particular we are able to present a sketch of their convergence proofs.

**Tuesday, February 02, 2010, 13:30  
Johannes Kepler Universität, HF136**