

METHODS AND SOLVERS FOR ISOGEOMETRIC ANALYSIS

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ABSTRACT

Isogeometric analysis provides a high-order framework for the numerical solution of PDEs. Originally motivated by the integration of numerical simulation with CAD-based geometry, it has shown significant potential as a flexible methodology based on smooth high-degree spline spaces. At the same time, this methodology raises significant theoretical and computational challenges, including structure-preserving discretizations, smooth spline spaces on triangulations and unstructured meshes, immersed methods for complex geometries, local refinement techniques, efficient operator formation, and robust solvers for the resulting linear systems. This minisymposium aims to present and discuss recent advances in these areas. The minisymposium also aims to foster interaction between the isogeometric analysis community and the broader spectral and high-order methods community.

SPEAKERS

1. Stefan Takacs (JKU Linz): *An Isogeometric Tearing and Interconnecting method for conforming discretizations of the biharmonic problem.*
2. Carlotta Giannelli (University of Florence): *Volumetric parameterization learning for adaptive isogeometric simulation.*
3. Mario Kapl (Carinthia University of Applied Sciences): *An Isogeometric Tearing and Interconnecting (IETI) method for solving high order partial differential equations over planar multi-patch geometries.*

4. Carla Manni (University of Roma Tor Vergata): *Exploiting smoothness in quadrature for triangular macro-elements.*
5. Jan Grošelj (University of Ljubljana): *High-order macro-elements on triangulations: from representation to approximation.*
6. Yannis D. Voet (EPFL): *Deflation-based preconditioning for immersed finite element methods*
7. Cesare Bracco (University of Florence): *Adaptive Almost- C^1 spline spaces for isogeometric methods.*
8. Margarita Chasapi (RWTH Aachen University): *Spline-based optimization of a discrete loss for inverse problems.*
9. Giovanni Varetto (University of Pavia): *Preconditioning the mass matrix for isogeometric immersed method.*