

## Talk announcement

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# Isogeometric multigrid methods for the biharmonic equation on multi-patch domains

Conforming Galerkin discretizations of fourth-order partial differential equations, such as the biharmonic equation, require globally  $C^1$ -smooth function spaces. While Isogeometric Analysis (IGA) naturally provides high regularity within individual patches, enforcing  $C^1$ -smoothness across complex, multi-patch geometries remains a challenge. In this presentation, we address this by utilizing the class of analysis-suitable  $G^1$  (AS- $G^1$ ) multi-patch discretizations. We construct a global quasi-interpolation operator built from patch-local tensor-product projections, which are modified with localized correction terms to reproduce the correct traces and transversal derivatives along all patch interfaces. Using this quasi-interpolator, we establish  $p$ -robust approximation error estimates. Finally, we show how these  $p$ -robust theoretical bounds are applied to the convergence analysis of high-order iterative solvers, such as multigrid methods.