

## **Anisotropic Finite Element Methods for 3D Problems with Mixed Boundary Conditions**

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joint work with Serge Nicaise†

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We develop anisotropic finite element methods for elliptic equations in general polyhedral domains with mixed boundary conditions. We first discuss the regularity results for the Dirichlet problem and the problem with the mixed boundary condition. Then we review the principles for graded mesh algorithms that will lead to anisotropic finite element methods to approximate the vertex and edge singularities in these problems. We shall also discuss other aspects of these anisotropic meshes.