

---

**ALEXANDRE NOLL MARQUES, MIT**

*Solving flow problems to high order of accuracy with embedded boundaries*

In this talk I present a new method to solve flow problems with computational grids that are not aligned with boundaries and interfaces. In many applications, flexible boundaries, or interfaces between different phases, interact dynamically with the underlying flow and change over time. These applications pose many challenges to numerical methods that rely on body-fitted grids, sparking the interest in methods where boundaries and interfaces are embedded into simple computational grids. The key features that distinguish the new method from other embedded boundary methods are (i) high order of accuracy, (ii) compact discretization stencils, (iii) cost-effectiveness, and (iv) robustness. I discuss the details of a fourth implementation of the method for elliptic equations with discontinuity interfaces, and show applications to incompressible flows.