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# VIRTUAL ELEMENTS FOR PARTIAL DIFFERENTIAL EQUATIONS ON POLYTOPAL MESHES

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## MINISYMPOSIUM

The minisymposium aims at gathering researchers who develop and implement novel discretization techniques that extend the domain of classic finite element approaches and make use of general polygonal/polyhedral meshes, with particular focus on the Virtual Element Method. These technologies also include continuous and discontinuous Galerkin methods on polytopal meshes, structure-preserving mimetic discretizations, hybrid high-order methods, to name a few.

In the last decade, a sustained development of the virtual element method (VEM) as a new approximation technology has taken place. It has been applied to solid and fluid mechanics problems. VEM meshes with convex and concave elements offer greater flexibility in mesh design and allow efficient strategies for adaptivity. In the context of computational mechanics problems involving internal interface and moving discontinuities, such as in the simulation of layered and fractured materials, the versatility of these methods allows for taming the geometric complexity by providing robustness for rough heterogeneities and mesh distortions. Due to its versatility, the approach is evolving and is finding applications in engineering and computational mathematics. It is constantly extended to new fields.
Engineering applications are on:
- elasticity for small and inelastic deformations,
- plasticity across the scales,
- fracture mechanics in two and three dimensions,
- homogenization techniques,
- plate problems- contact mechanics,
- coupled and multi-scale problems,
- General polyhedral meshing including cut-cell techniques and hybrid meshing
- Mesh adaptivity, coarsening, and aggregation strategies
- Image-based modeling including computed tomography
- Rapid design-to-simulation workflows
- Topology and shape optimization
- Space-time formulations

The minisymposium welcomes contributions from the theoretical, computational and application viewpoints, with the hope that it can serve as a forum for the exchange of new ideas.