Dissertation topic:
High order 3D Arbitrary Lagrangian-Eulerian methods for simulations of plasma instabilities

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Abstract:
Moving mesh methods (also known as the Arbitrary Lagrangian-Eulerian or ALE approach) are useful to avoid unnecessary solution smearing. Combined with high order discretisations they can offer unmatched accuracy even when using coarser computational meshes. These properties can be very useful in simulating high shear flows, such as instabilities in dense plasmas. The purpose of this project will be the development of such numerical methods with focus on robustness (mesh optimization) and efficiency (implementation on parallel computing hardware).