

IntComSin Colloquium

January 9th, 2025, FAU Erlangen-Nürnberg

Speaker: Marco Bresciani (FAU Erlangen-Nürnberg)

Title: Variational models with Eulerian-Lagrangian formulation allowing for material failure

Abstract:

Variational models featuring Eulerian-Lagrangian formulations arise naturally in many multiphysics problems such as the modeling of nematic and ferromagnetic elastomers.

In this talk, we discuss the existence of equilibrium configurations for such models in connection with the phenomena of cavitation, i.e., the abrupt formation of voids inside of solids in response to mechanical stresses. First, we investigate the purely elastic setting, where cavitation is a priori excluded, and we establish the existence of both minimizers and rate-independent quasistatic evolutions driven by time-dependent applied loads. Eventually, we address the extension of the existence theory for the static problem to a framework allowing for cavitation.

The talk is based on joint work with Manuel Friedrich (FAU Erlangen-Nürnberg), Carlos Mora-Corral (Universidad Autónoma de Madrid), and Bianca Stroffolini (Università di Napoli Federico II).