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FAU MoD Workshop

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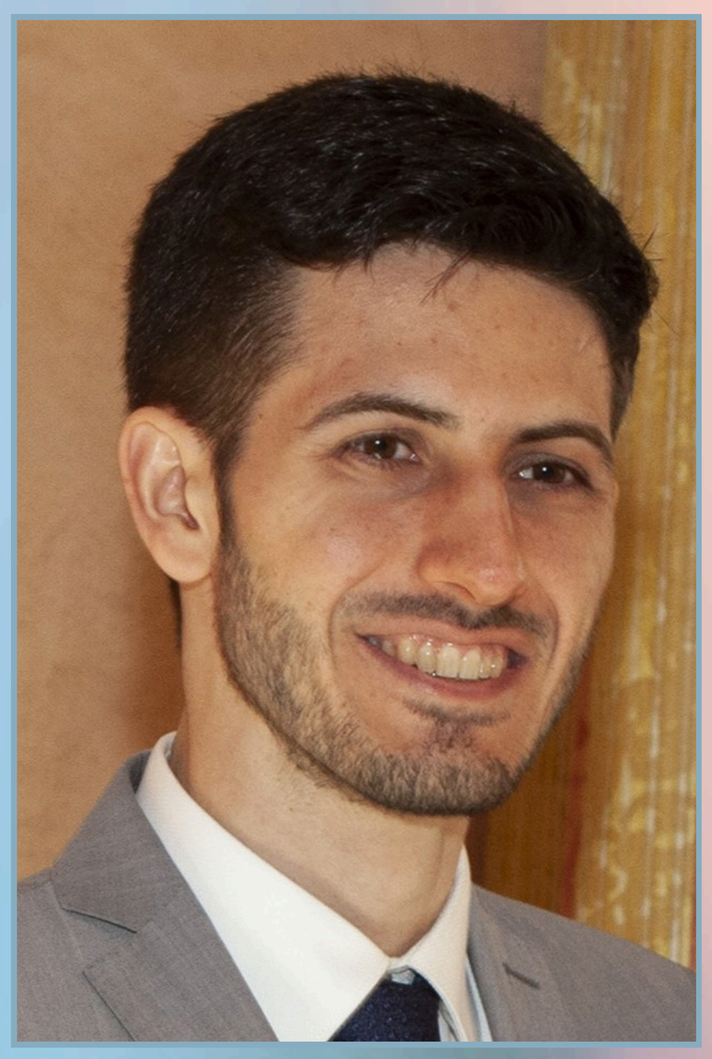

Lorenzo Liverani

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HYCO: Hybrid-Cooperative Learning for PDEs

In this talk, I will present the Hybrid-Cooperative Learning strategy (HYCO), a modeling framework that iteratively integrates physics based and data-driven models through a mutual regularization mechanism. (...)

Through several numerical experiments on both static and time-dependent problems, I will demonstrate that HYCO is a promising architecture, outperforming classical physics-based and data-driven methods and recovering accurate solutions and model parameters even under ill-posed conditions. This is ongoing work with E. Zuazua and M. Steynberg.

WHEN

Tue. **September 23, 2025**
11:30H
(Berlin time)

WHERE

On-site / Online

FAU. Friedrich-Alexander-Universität Erlangen-Nürnberg
Room H12
Felix-Klein building
Cauerstraße 11
91058 Erlangen
Bavaria, Germany

Live streaming:
www.fau.tv/fau-mod-livestream-2025

Hagen Holthusen

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A Neural Network Companion to Inelasticity

Neural networks have become ubiquitous in science, helping us uncover patterns in complex data sets — from social interactions to medical image analysis. (...)

Importantly, even within the same material class, inelastic behaviour can differ significantly — aluminium and titanium, for instance, show markedly different irreversible responses. This highlights the crucial trade-off between the interpretability and expressivity of neural networks when modelling complex, inelastic materials: a network must be flexible enough to capture material-specific features, yet structured enough to remain interpretable and physically meaningful.