ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

# Invitation to the Doctoral Seminar

**Prof. Olga Mula**
Universität Wien

**"Funny things happening in Neural Galerkin Schemes"**

HS 8 | Thursday, 15 October 2026 | 10:00 a.m.

**Abstract**
Neural Galerkin is a nonlinear counterpart of classical dynamical approximation strategies for time-dependent PDEs. It approximates solutions by neural networks whose weights evolve in time. At first glance, the method is general, elegant, easy to implement, and it indeed has enjoyed notable empirical success. A closer look, however, quickly leads to funny behaviors and troubles: Formulating Neural Galerkin at a proper functional level and connecting it rigorously to practical algorithms raises a number of very subtle challenges. Some stem from sampling issues; others arise from the fact that neural network classes are, mathematically speaking, not particularly well-behaved sets. In this talk, I will illustrate several of these troubles, explain where they come from, and discuss why they are not mere technical nuisances but key conceptual elements to understand when working with neural network approximations.

Caroline Geiersbach and the Department of Mathematics look forward to seeing you at the talk!