

## Abstracts:

### Phase Transitions in a Nonlocal Fokker-Planck Equation

Prof. Dr. Barbara Niethammer (University of Bonn)

I will discuss a nonlocal Fokker-Planck equation that describes energy minimisation in a double well-potential and is driven by a time-dependent constraint. Via formal asymptotic analysis we identify different small parameter regimes that correspond to hysteretic and non-hysteretic phase transitions respectively. For the fast reaction regime that is related to Kramers-type phase transitions I will also indicate how one can rigorously derive a rate-independent evolution equation in a small parameter limit.

This is joint work with Michael Herrmann and Juan Velazquez.

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### A new perspective on adaptive hierarchical B-splines

Prof. Dr. Pedro Morin (University of Santa Fe, Argentina)

We introduce a type of hierarchical spline spaces based on a parent-children relation, with two main features. First, the construction and handling is convenient for implementation, and secondly, they are well suited for the theoretical analysis of adaptive isogeometric methods.

The framework that we provide makes it simple to create hierarchical basis with control on the overlapping, which is necessary to close theoretical arguments in the proofs of convergence of adaptive methods.

In order to guarantee linear independence, and to control the overlapping of the basis functions, some functions additional to those initially marked must be refined. With our framework and refinement procedures, the number of additional functions is linearly bounded by the number of marked functions.

We apply this framework to prove optimal complexity of an adaptive method for linear problems.