

Berlin Mathematics Research Center

MATH+

Berlin Mathematical School

BMS



Kovalevskaya Colloquium

Friday 29 November 2019 at 14:15

Tea & Cookies starting at 13:00

Loft, Urania, An der Urania 17, 10787 Berlin

Barbara Zwicknagl

(HU Berlin)

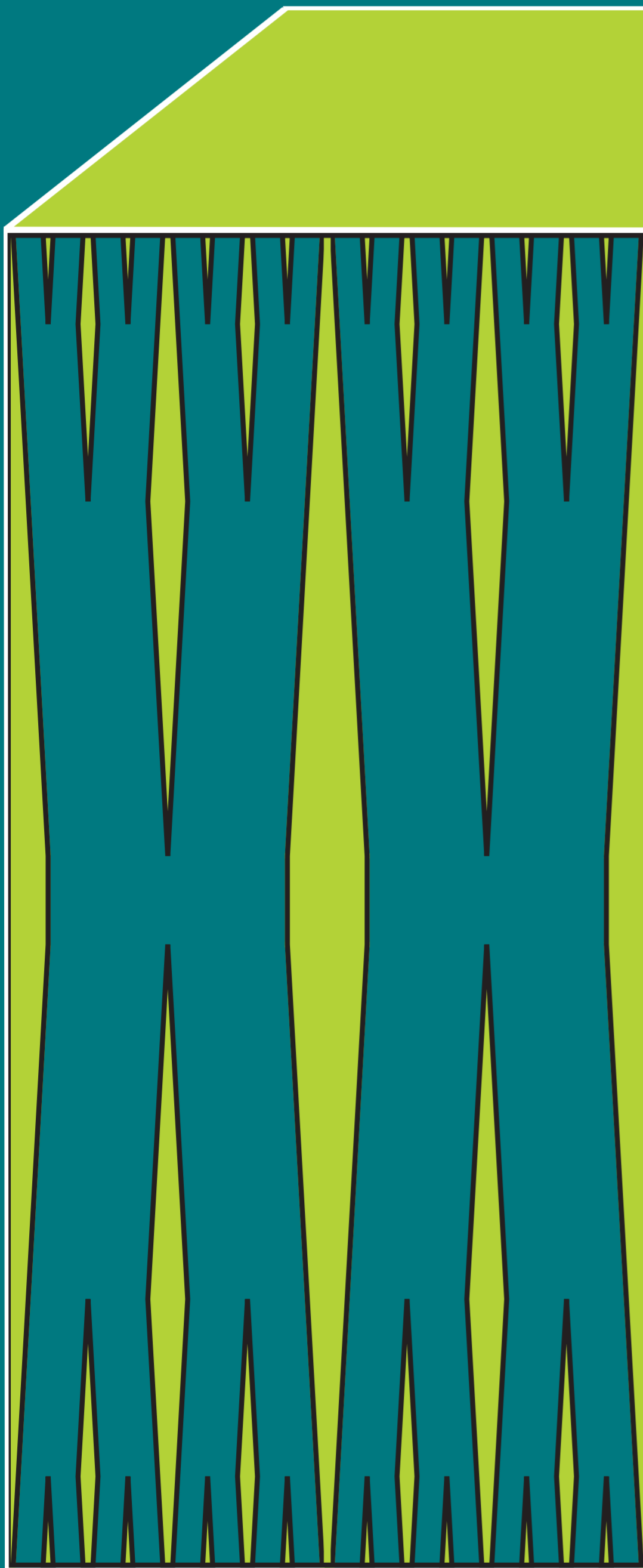
Mathematical variations on pattern formation in smart materials

In her talk, Barbara Zwicknagl will discuss energy-driven pattern formation in materials by the example of shape memory alloys, which constitute a fascinating class of smart materials. These materials "remember" their original shape: Even if they are deformed at low temperature they return to their original memorized shape when heated above a critical temperature. This effect is based on a solid-solid phase transformation.

The macroscopic behavior of these and many other materials is closely linked to their microstructures. The latter are often modeled mathematically in the framework of the calculus of variations. This approach typically leads to the study of non-convex functionals with singular perturbations.

In this talk, modern techniques and recent results of the mathematical analysis of such functionals will be discussed, and applications in particular to shape memory alloys will be outlined.

Barbara Zwicknagl received her Ph.D. from the University of Bonn in 2011 after studying Mathematics in Göttingen, San Diego, Leipzig, and Bonn. She spent two years at Carnegie Mellon University (Pittsburgh, PA, USA) before returning to Bonn as a postdoc. After holding positions at the University of Würzburg and the TU Berlin, she joined the HU Berlin in October 2019. Her fields of interest lie in applied analysis, in particular in the calculus of variations and approximation theory, often motivated by problems from materials sciences or the natural sciences.



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