

Felix Otto **Wednesday, July 16, 17:00–18:00, Auditorium**
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Pattern formation and partial differential equations

Abstract: Partial differential equations (PDEs) like the Cahn-Hilliard equation or the Kuramoto-Sivashinsky equation have been proposed to model some of the pattern formation in nature. Numerical simulations reveal that solutions of these deterministic equations have indeed stationary or self-similar statistics, which are independent of the system size and of the details of the initial data.

We show how PDE-methods can be used to understand some aspects of this universal behavior. In case of the Cahn-Hilliard equation, the method makes use of its gradient flow structure and a property of the energy landscape. In case of the Kuramoto-Sivashinsky equation, the method relies on a new result on solutions to the inhomogeneous inviscid Burgers' equation, one of the simplest singularity-forming equations.