



## **Einladung zum Vortrag**

von

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### **Geometric functionals of fractal percolation**

Fractal percolation is a family of random sets suggested by Mandelbrot in the seventies to model certain aspects of turbulence. They are known to undergo a very sharp phase transition from a totally disconnected to a percolating regime, when the continuous parameter of the models passes some threshold. The exact values of these percolation thresholds remain unknown until today, and the known rigorous upper and lower bounds are still rather far from each other.

In the recent physics literature (see e.g. Mecke, Neher, Wagner, J. Stat. Mech. 2008; Klatt, Schröder-Turk, Mecke, J. Stat. Mech. 2017) the idea is explored that the sharp topological transition at the threshold in percolation models should be visible in geometric functionals such as the (expected) Euler characteristic of these sets. Indeed, simulations suggest a close relation between percolation thresholds and the zeros of the Euler characteristic (as a function of the model parameter) in many percolation models. Motivated by the desire to find better bounds on percolation thresholds for fractal percolation, we study the expectations of some geometric functionals of the construction steps of fractal percolation (or rather their rescaled limits). These functionals are closely related to fractal curvatures. We obtain explicit formulas for some of these limit functionals including some rescaled Euler characteristic and compare them to the known bounds for percolation thresholds. Also the influence of the choice of the approximating sequences is discussed, giving some interesting insights.

Joint work in progress with Michael Klatt.

**Termin: Freitag, 04. Mai 2018, 14:30 Uhr**

**Ort: Universität Ulm, Helmholtzstr. 18, Raum 220**

Der Vortrag findet im Rahmen des Mathematischen Kolloquiums statt.  
Interessenten sind herzlich eingeladen.

gez. E. Spodarev