



## Einladung zum Oberseminar Stochastik

**ONLINE Vortrag über Zoom** - (Zugangsdaten werden noch mitgeteilt)  
am Donnerstag, 23.04.2020 ab **17:45 Uhr**

**Prof. Dr. Joachim Krug**  
(Universität zu Köln)  
zum Thema

### **The paths not taken: Evolutionary accessibility in random fitness landscapes**

Biological evolution can be conceptualized as a search process in the space of gene sequences guided by the fitness landscape, a mapping that assigns a measure of reproductive value to each genotype. For a long time after their introduction almost a century ago, fitness landscapes have played a largely metaphorical role, but in recent years the increasing availability of empirical data sets has invigorated the field and motivated new mathematical questions. After a general introduction into the biological context, the talk will define probabilistic models of fitness landscapes as random functions on hypercubes and Hamming graphs. A path in a fitness landscape is a sequence of genotypes connected by single mutational transitions, which is said to be accessible if the fitness values encountered along the path increase monotonically. The existence of accessible paths between genotypes at a distance linear in the sequence length defines a novel type of percolation problem known as accessibility percolation. For the case of independent and identically distributed fitness values, percolation occurs at a threshold value of the fitness difference between the initial and final genotype which can be computed from the adjacency matrix of the graph of mutational transitions at a single genetic locus.

Alle Interessenten sind herzlich eingeladen.

Die Dozenten der Stochastik