



## Einladung zum Oberseminar Stochastik

Am Mittwoch, 22.01.2025, um **17:45 Uhr**, im Seminarraum 1  
(Raum 005) der Abteilung Mathematik, Weyertal 86-90, 50931 Köln  
spricht:

**Dr. Elena Magnanini**  
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zum Thema

### **A Markovian particle system with coagulation**

**Abstract:**

We consider a coagulation particle process (the spatial Marcus-Lushnikov process), where pairs of particles merge after independent exponential random times into single particles. Particles are provided with a mass and a position, and the mass of the new particle equals the sum of the two old ones.

The coagulation mechanism is regulated by a kernel, that is a positive symmetric function of the two particles. Depending on the choice of this function, clusters whose masses are on a significantly larger scale than most others in the system, could emerge in finite time. This kind of phase transition is known as gelation.

We provide sufficient criteria for gelation extending (and sometimes improving) results related to the classical Marcus-Lushnikov process. In some special cases, the cluster coagulation process can be coupled with an inhomogeneous random graph. In this context we are able to identify an upper bound for the gelation time in terms of the critical parameter that determines the appearance of a giant component in the inhomogeneous random graph. We complete our analysis by showing that the trajectories associated with the process concentrate on solutions of an infinite system of measure valued differential equations that generalize the Flory equation. Joint work with L. Andreis and T. Iyer.

Alle Interessenten sind herzlich eingeladen.

Die Dozenten der Stochastik