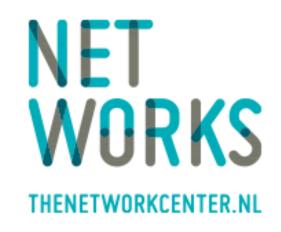
Interacting Particle Systems on Random Graphs

Frank den Hollander & Federico Capannoli Leiden University, The Netherlands





Mini-course at the Brazilian School of Probability, 5–9 August 2024, Salvador, Bahia, Brazil.

STRUCTURE:

- Frank den Hollander:
- 4 lectures of 75 minutes each.
- Federico Capannoli:
- 2 exercise sessions of 60 minutes each.

OUTLINE:

- ► Lecture 1. Background and motivation for IPS on Z^d, d ≥ 1. From micro to macro. Phase transitions, critical phenomena. Key questions, core tools.
- ► Exercise session A. Exercises about IPS.
- ► Lecture 2. SIM: Stochastic Ising Model.
- ► Lecture 3. VM: Voter Model.
- ► Exercise session B. Exercises about VM.
- ► Lecture 4. CP: Contact Process.

In Lectures 2-4, IPS on three classes of random graphs will be considered:

- CM: Configuration Model.
- HER: Homogeneous Erdős-Rényi Random Graph.
- IER: Inhomogeneous Erdős-Rényi Random Graph.

GOALS:

- Sketch what is known and not known about IPS on RG.
- Highlight the role of sparse versus dense graphs.
- Exhibit the relevant time scales for critical phenomena and identify how these depend on the size of the graph.
- List some open problems and indicate some lines of future research.



The content of this mini-course is a personal snapshot of an interesting area of research that is developing rapidly.