

**LECTURES** will start on **Monday July 11 at 10 am**

**Day 1 schedule:**

welcome & info 9:45

Lectures 10-11:30 - break - 11-12:45 (day 1)

\*lunch\*

Exercise sessions (one-hour) and team work.

**Lectures: daily schedule**

**WEEK 1 (Gabor Lugosi)**

Days 1 & 2: Concentration inequalities.

Chernoff bounds: Hoeffding, Efron-Stein, and McDiarmid's inequalities.

Days 3 & 4: The hidden clique problem.

Introduction to Erdős-Rényi random graphs, clique number, first and second moment methods, spectral methods.

Day 5: Root finding and root-bit estimation in uniform random recursive trees.

**WEEK 2 (Luc Devroe)**

Day 1: Galton-Watson trees. Basic properties. Simply generated trees.

Spine decomposition of trees conditioned to be of size  $n$ . The continuum random tree and convergence to the Brownian excursion.

Day 2: Random graphs including birth of the giant, size of the giant, and connectivity. Erdos-Renyi graphs,  $k$ -out graphs and other models.

Day 3: Random binary search tree, uniform random recursive tree, preferential attachment trees.

Day 4: Root bit estimation in the Ising model. Solvability and census solvability. Information-theoretic lower bounds. Relationship with Galton-Watson trees.

-----  
**Typed lecture notes with exercises will be made available on day 1.**

Further material can be made available to participants on the school website.

-----