

Institut für Diskrete Mathematik

## Combinatorics Seminar

Friday 11th June 14:15

Online meeting (Webex)

# Majority dynamics on sparse random graphs

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*Majority dynamics* on a graph  $G$  is a deterministic process such that every vertex updates its  $\pm 1$ -assignment according to the majority assignment on its neighbor simultaneously at each step. Benjamini, Chan, O'Donnell, Tamuz and Tan conjectured that, in the Erdős–Rényi random graph  $G(n, p)$ , the random initial  $\pm 1$ -assignment converges to a 99%-agreement with high probability whenever  $p = \omega(1/n)$ .

This conjecture was first confirmed for  $p \geq \lambda n^{-1/2}$  for a large constant  $\lambda$  by Fountoulakis, Kang and Makai. Although this result has been reproved recently by Tran and Vu and by Berkowitz and Devlin, it was unknown whether the conjecture holds for  $p < \lambda n^{-1/2}$ . We break this  $\Omega(n^{-1/2})$ -barrier by proving the conjecture for sparser random graphs  $G(n, p)$ , where  $\lambda' n^{-3/5} \log n \leq p \leq \lambda n^{-1/2}$  with a large constant  $\lambda' > 0$ .

Joint work with Debsoumya Chakraborti, Jeong Han Kim and Tuan Tran.

Meeting link:

<https://tugraz.webex.com/tugraz/j.php?MTID=me01f43109c693c884b459339d643d7d9>

Meeting number: 121 128 5385

Joshua Erde, Mihyun Kang