Large deviations of triangle counts in the binomial random graph II

Wojciech Samotij (Tel Aviv University)

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Abstract: Suppose that $Y_1, \dots, Y_N$ are i.i.d.(independent identically distributed) random variables and let $X = Y_1 + \cdots + Y_N$. The classical theory of large deviations allows one to accurately estimate the probability of the tail events $X < (1-c)E[X]$ and $X > (1+c)E[X]$ for any positive c. However, the methods involved strongly rely on the fact that X is a linear function of the independent variables $Y_1, \dots, Y_N$. There has been considerable interest-both theoretical and practical-in developing tools for estimating such tail probabilities also when X is a nonlinear function of the Y_i. One archetypal example studied by both the combinatorics and the probability communities is when X is the number of triangles in the binomial random graph $G(n,p)$.
Talk 2: We will present a complete solution to the upper tail problem for triangle counts in G(n,p) that was obtained recently in a joint work with Matan Harel and Frank Mousset.

About the speaker: Wojciech Samotij is an associate professor at Tel Aviv University. He received his PhD in 2010 at University of Illinois at Urbana-Champaign under the supervision of József Balogh. He was a fellow of the Trinity College at the University of Cambridge and a postdoc at Tel Aviv University between 2010-2014. His areas of interest include various branches of extremal and probabilistic combinatorics and Ramsey theory, as well as some topics in statistical mechanics and additive number theory. Samotij received the 2013 Kuratowski Prize, the 2013 European Prize in Combinatorics and the 2016 George Pólya Prize.