EXCILL2: Extremal Combinatorics at Illinois

March 16–18, 2013

A conference hosted by the Department of Mathematics
University of Illinois at Urbana-Champaign

`http://www.math.uiuc.edu/excill2/`

Organizers: J. Balogh, A. Kostochka, B. Lidický, and D.B. West

March 27, 2013

Conference Program

Saturday, Mar 16

8:50	Opening remarks
9:00	Béla Bollobás, *Bootstrap Percolation - Problems, Results and Conjectures*
10:00	coffee
10:25	Benny Sudakov, *Counting and packing Hamilton cycles*
11:00	Paul N. Balister, *Controllability, matchings, and the Karp-Sipser algorithm on random graphs*
11:35	Penny Haxell, *Extremal hypergraphs for packing and covering*
12:10	Andrzej Ruciński, *On Two Hamiltonian Problems For Triple Systems*
12:45	lunch
2:15	Alexander Razborov, *Flag Algebras: an Interim Report*
3:15	Sergey Norin, *Finitely-forcible graphons*
3:50	conference photo
3:51	coffee
4:15	Dhruv Mubayi, *Hypergraph Ramsey Problems*
4:50	Tao Jiang, *Hypergraph Turán and Ramsey results on linear cycles*
5:25	Jacques Verstraëte, *On independent sets in locally sparse hypergraphs*
6:00	break
6:15	Pizza reception and Poster session

Sunday, Mar 17

9:00	Xuding Zhu, *Total weight choosability of graphs*
10:00	coffee
10:25	William T. Trotter, *Tree-width and Dimension*
11:00	Vladimir Nikiforov, *Asymptotic Ramsey numbers of books*
11:35	Gábor N. Sárközy, *Coverings by monochromatic pieces*
12:10	Hal Kierstead, *Progress on directed versions of the Hajnal-Szemerédi Theorem*
12:45	lunch
2:15	Wojciech Samotij, *Typical structure of graph homomorphisms*
2:50	David Galvin, *Some extremal questions for coloring*
3:25	coffee
4:00	Choongbum Lee, *Long paths and cycles in random subgraphs of graphs with large minimum degree*
4:35	John Lenz, *Spectral extremal problems for hypergraphs*
5:10	Guantao Chen, *Reed-Frost transition on dense graphs*
5:45	end
6:30	Dinner reception

Monday, Mar 18

9:00	Zoltán Füredi, *A discrete isodiametric result: the Erdős-Ko-Rado theorem for multisets*
9:35	Daniel Král', *Quasirandomness of permutations*
10:10	coffee
10:35	Allan Siu Lun Lo, *Proof of the 1-factorization and Hamilton decomposition conjectures*
11:10	Richard Mycroft, *Perfect matchings in dense hypergraphs*
11:45	László Babai, *Symmetry vs. regularity*
12:45	lunch

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Béla Bollobás

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The University of Memphis and Cambridge University

Bootstrap Percolation – Problems, Results and Conjectures

Bootstrap percolation is one of the simplest cellular automata around: it can be viewed as a very simple model of the spread of an infection, and is also closely related to the Ising model. In the past three decades, much work has been done on bootstrap percolation on finite grids of a fixed dimension, in which the initially infected set A is obtained by selecting its vertices at random, with the same probability p, independently of all other choices. The focus has been on the *critical probability* p_c, the value of p at which the probability of *percolation* (eventual full infection) is 1/2, say.

Although bootstrap percolation used to be the hunting ground of statistical physicists and probabilists only, it really belongs to probabilistic combinatorics. My aim in this talk is to review of some of the basic results concerning critical probabilities due to Aizenman, Lebowitz, Schonman, Cerf, Cirillo, Manzo, Holroyd and others, and say a few words about the more recent results proved by Balogh, Morris, Duminil-Copin and myself. I also hope to mention some very recent results I have obtained with Holmgren, Smith, Uzzell and Balister on the time a random initial set takes to percolate. In addition to the 'proper' results, I shall mention several lightweight problems and difficult conjectures.

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