

The Combinatorics Seminar

SPRING 2018

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Organizers: Laura Anderson, Michael Dobbins, and Thomas Zaslavsky.

▪ **Tuesday, January 16**

No meeting planned at present.

▪ **Tuesday, January 23**

Speaker: Steven Simon (Bard) **Cancelled**

Title: Hyperplane Equipartitions Plus Constraints

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, January 30**

No seminar today.

▪ **Tuesday, February 6**

Speaker: Michael Dobbins (Binghamton)

Title: Shellability is NP-Complete

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, February 13**

Speaker: Ting Su (Binghamton)

Title: A Classification of Stringent Hyperfields

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, February 20**

Speaker: Florian Frick (Cornell)

Title: Intersections of Finite Sets: Geometry and Topology

Time: 1:15 - 2:15

Room: WH-100E

▪ **Thursday, February 22 (in the Geometry/Topology Seminar; note special day and times)**

Speaker: Olakunle Abawonse (Binghamton)

Title: Topology of the Grünbaum–Hadwiger–Ramos Hyperplane Mass Partition Problem

Time: 2:50 - 3:50

Title: Hyperplane Mass Partitions Via Relative Equivariant Obstruction Theory

Time: 4:15 - 5:15

Room: WH-100E

▪ **Tuesday, February 27**

Speaker: Benjamin Blum-Smith (NYU)

Title: When Do Integer Permutation Invariants Form a Free Module Over the Symmetric Polynomials? An Application of Combinatorics to Invariant Theory

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, March 13 (joint with the Algebra Seminar)**

Speaker: Victor Reiner (Minnesota)

Title: Finite General Linear Groups and Symmetric Groups

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, March 20**

Speaker: Thomas Zaslavsky (Binghamton)

Title: Circle Problems in Signed Graphs

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, March 27 (joint with the Algebra Seminar)**

Speaker: Farbod Shokrieh (Cornell)

Title: Effective Divisor Classes on Graphs

Time: 1:15 - 2:15

Room: WH-100E

▪ **Monday, April 2**

Speaker: Stefan van Zwam (Louisiana State)

Title: A Stroll through Partial Fields

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, April 10**

Speaker: Jacob Matherne (U. Mass. Amherst)

Title: Singular Hodge Theory of Matroids

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, April 17**

Speaker: Richard Behr

Title: Edge Coloring and Special Edges of Signed Graphs

Time: 12:00 - 1:00 and 1:15 - 2:15

Room: OR-100D and WH-100E (respectively)

▪ **Tuesday, April 24 (joint with the Geometry/Topology Seminar)**

Speaker: Robert Connelly (Cornell)

Title: Tensegrities: Geometric Structures Suspended in Midair

Time: 1:15 - 2:15

Room: WH-100E

▪ **Tuesday, May 1 (joint with the Geometry/Topology Seminar)**

Speaker: Boris Bukh (Carnegie Mellon)

Title: Topological Version of Pach's Overlap Theorem

Time: 1:15 - 2:15

Room: WH-100E Consider the collection of all the simplices spanned by some n -point set in \mathbf{R}^d . There are several results showing that simplices defined in this way must overlap very much. In this talk I focus on the generalization of these results to 'curvy' simplices. Specifically, Pach showed that every $d+1$ sets of points, Q_1, \dots, Q_{d+1} , in \mathbf{R}^d contain linearly-sized subsets P_i in Q_i such that all the transversal simplices that they span intersect. In joint work with Alfredo Hubard, we show, by means of an example, that a topological extension of Pach's theorem does not hold with subsets of size $C(\log n)^{1/(d-1)}$. We show that this is tight in dimension 2, for all surfaces other

than S^2 . Surprisingly, the optimal bound for S^2 is $(\log n)^{1/2}$. This improves upon results of Barany, Meshulam, Nevo, Tancer.

▪ **Tuesday, May 8**

Speaker: Jim Lawrence (George Mason)

Title: Interval Posets, Parity Representations, Binary Partitions, and Antiprisms

Time: 3:00 - 4:00 (**Note special time.**)

Room: WH-100E Given a poset (a partially ordered set), one obtains another poset by considering the collection of intervals of the first, partially ordered by inclusion. (There are various possibilities, depending, for instance, upon whether one considers the empty set as being an “interval.”) This construction has found use in the study of convex polytopes and other places. I describe a new method of representation of posets by utilizing certain geometric complexes in \mathbf{R}^d having vertices in \mathbf{Z}^d . The striking feature of this method of representation is that taking the interval poset corresponds to dilation by a factor of 2 of the geometric complex. I explore connections with the integer partitions of powers of 2 into powers of 2.

Past Semesters:

[Fall 2017](#) | [Spring 2017](#) | [Fall 2016](#) | [Spring-Summer 2016](#) | [Fall 2015](#) | [Spring 2015](#) | [Fall 2014](#) | [Spring-Summer 2014](#) | [Fall 2013](#) | [Spring-Summer 2013](#) | [Fall 2012](#) | [Spring 2012](#) | [Fall 2011](#) | [Spring-Summer 2011](#) | [Fall 2010](#) | [Spring-Summer 2010](#) | [Fall 2009](#) | [Spring-Summer 2009](#) | [Fall 2008](#) | [Spring 2008](#) | [Fall 2007](#) | [Spring 2007](#) | [Fall 2006](#) | [Spring 2006](#) | [Fall 2005](#) | [Spring 2005](#) | [Fall 2004](#) | [Spring 2004](#) | [Fall 2003](#) | [Spring 2003](#) | [Fall 2002](#) | [Spring 2002](#) | [Fall 2001](#) | [Spring 2001](#) | [Fall 2000](#) | [Spring 2000](#) | [Fall 1999](#) | [Spring 1999](#) | [Fall 1998](#) |

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Last update: **2020/01/29 19:03**

