

Fall 2008
University of Michigan-Department of Mathematics
<http://www.math.lsa.umich.edu/seminars/index.shtml>
Ann Arbor, MI 48109-1043

November 24th – November 30th

Monday, November 24

- 3:10-4:00pm **Topics in Algebraic Geometry Seminar** --- Amanda Knecht (UM) *The Graber, Harris, Starr Theorem at Last* --- 2866 EH
- 3:10-5:00pm **Group Theory/Lie Theory/Number Theory Seminar** --- Kirsten Eisentraeger (Penn State) *Descent on elliptic curves and Hilbert's Tenth Problem* --- 4096 EH
- 4:10-5:00pm **Several Complex Variables and Complex Dynamics Seminar** --- Not meeting this week --- 3096 EH
- 4:10-5:00pm **Student Combinatorics** --- Kelli Talaska (UM) *Total positivity and cluster algebras* --- 3866 EH
- 5:15-6:30pm **Teaching Mathematics** --- Scott Baldrige (Louisiana State U) *Elementary Algebra for Teachers* --- 3096 EH

Tuesday, November 25

- 2:10-3:00pm **"What is ... " Seminar** --- Not meeting this week --- 3096 EH
- 3:10-4:00pm **Algebra Seminar** --- Not meeting this week --- 3096 EH
- 3:10-4:00pm **Geometry Seminar** --- Scott Baldrige (Louisiana State U) *Circle actions, exotic blowups of CP^2 , and knot Floer homology from cube diagrams* --- 4096 EH
- 3:10-4:00pm **Student Algebraic Geometry Seminar** --- TBA --- 3088 EH
- 4:10-5:00pm **Colloquium** --- Not meeting this week --- 1360 EH
- 4:10-5:00pm **Student AIM Seminar** --- TBA --- 3088 EH

Wednesday, November 26

- 3:10-4:00pm **Geometric Function Theory Seminar** --- TBA --- 4096 EH
- 3:10-4:00pm **Student Representation Theory Seminar** --- Not meeting this week --- 3096 EH
- 3:10-4:00pm **Student Arithmetic Seminar** --- Not meeting this week --- 3866 EH
- 4:10-5:00pm **RTG Working Seminar in Several Complex Variables and Complex Dynamics** --- Not meeting this week --- 3096 EH
- 4:10-6:00pm **Algebraic Geometry Seminar** --- Not meeting this week --- 3088 EH

Thursday, November 27

- 3:10-4:00pm **Commutative Algebra Seminar** --- Not meeting this week --- 3096 EH
- 3:10-4:00pm **Financial/Actuarial Mathematics Seminar** --- Not meeting this week --- 3088 EH
- 3:10-4:00pm **Topology Seminar** --- Not meeting this week --- 4096 EH
- 4:10-5:00pm **Differential Equations** --- Not meeting this week --- 4088 EH
- 4:10-5:00pm **Math Club** --- Not meeting this week --- 2nd floor Nesbitt Common Room
- 4:10-5:00pm **Reading Group in Probabilistic Methods in Geometric Functional Analysis and Combinatorics** --- Not meeting this week --- 3096 EH
- 4:10-6:00pm **RTG Study Seminar** --- Not meeting this week --- 3866 EH
- 4:10-6:00pm **Geometry and Physics Seminar** --- Not meeting this week --- 4096 EH

Friday, November 28

- 11:10-12:00pm **Theoretical Computer Science Seminar** --- Not meeting this week --- CSE 3941
- 3:10-4:00pm **Applied and Interdisciplinary Mathematics Seminar** --- Not meeting this week --- 1084 EH
- 3:10-4:00pm **Student Geometry/Topology** --- Not meeting this week --- 3096 EH
- 4:10-5:00pm **Combinatorics** --- Not meeting this week --- 3866 EH

ABSTRACTS FOR THE WEEK OF NOV. 24 – NOV. 30, 2008

Group Theory/Lie Theory/Number Theory Seminar
Monday, November 24, 3:10-5:00pm
4096 EH
Kirsten Eisentraeger (Penn State)
Descent on elliptic curves and Hilbert's Tenth Problem

We will use descent via an isogeny on an elliptic curve to construct two subrings of the rational numbers, which are complementary in a strong sense, and for which Hilbert's Tenth Problem is undecidable. This method further develops that of Poonen who used elliptic divisibility sequences to obtain undecidability results for some large subrings of the rational numbers. This is joint work with Graham Everest.

Teaching Mathematics
Monday, November 24, 5:15-6:30pm
3096 EH
Scott Baldrige (Louisiana State U)
Elementary Algebra for Teachers

My textbook, *Elementary Mathematics for Teachers*, with Tom Parker is about the development of real numbers and the real number line in Grades K-7. In *Elementary Geometry for Teachers*, two of the main goals are careful developments of measurement and the coordinate plane. In this talk I will describe some of the thinking that went into both books, and how the trajectory of the books naturally leads to a third course to help prospective elementary and middle school teachers understand algebra in a way that they can implement in their classrooms.

Geometry Seminar
Tuesday, November 25, 3:10-4:00pm
4096 EH
Scott Baldrige (Louisiana State U)
Circle actions, exotic blowups of CP^2 , and knot Floer homology from cube diagrams

A famous conjecture in symplectic topology is that if $Y \times S^1$ is a symplectic 4-manifold, then the 3-manifold Y fibers over the circle. Another seemingly different conjecture in 4-manifold theory is whether there exists a symplectic 4-manifold that is homeomorphic but not diffeomorphic to the projective plane CP^2 . The projective plane is one of the oldest known, most used, most studied algebraic-geometric objects in all of mathematics, so this too is an important question. In the first half of the talk I will describe my research on these conjectures, how my work on Seiberg-Witten invariants of 4-manifolds with circle actions prepared the way for my discovery of exotic blowups of CP^2 , and some implications this research might have for 4-manifold topology. In the second half of the talk I will introduce the audience to the notion of a cube diagram---a surprisingly subtle, extremely powerful new way to represent a knot or link. I will also describe a combinatorically-defined homology theory constructed out of cube diagrams that is equivalent to knot Floer homology, one of the strongest known knot invariants.

