

Winter 2009
University of Michigan-Department of Mathematics
<http://www.math.lsa.umich.edu/seminars/index.shtml>
Ann Arbor, MI 48109-1043
January 5th – January 11th

Monday, January 5

- 3:10-4:00pm **Topics in Algebraic Geometry Seminar** --- TBA --- 2866 EH
3:10-5:00pm **Group Theory/Lie Theory/Number Theory Seminar** --- Not meeting this week --- 4096 EH
4:10-5:00pm **Several Complex Variables and Complex Dynamics Seminar** --- TBA --- 3096 EH
4:10-5:00pm **Student Combinatorics** --- Not meeting this week --- 3866 EH
4:10-6:00pm **Geometry and Physics Seminar** --- Alessandro Chiodo (Grenoble) *Landau-Ginzburg/Calabi-Yau correspondence for quintic three-folds via symplectic transformations* --- 4088 EH
5:15-6:30pm **Teaching Mathematics** --- Not meeting this week --- 3096 EH

Tuesday, January 6

- 2:10-3:00pm **"What is ... " Seminar** --- Not meeting this week --- 3096 EH
3:10-4:00pm **Algebra Seminar** --- TBA --- 3096 EH
3:10-4:00pm **Geometry Seminar** --- TBA --- 4096 EH
3:10-4:00pm **Student Algebraic Geometry Seminar** --- TBA --- 3088 EH
4:10-5:00pm **Colloquium** --- Not meeting this week --- 1360EH
4:10-5:00pm **Student AIM Seminar** --- TBA --- 3088 EH

Wednesday, January 7

- 3:10-4:00pm **Geometric Function Theory Seminar** --- TBA --- 4096 EH
3:10-4:00pm **Student Representation Theory Seminar** --- TBA --- 3096 EH
3:10-4:00pm **Student Arithmetic Seminar** --- TBA --- 3866 EH
4:10-5:00pm **RTG Working Seminar in Several Complex Variables and Complex Dynamics** --- TBA --- 3096 EH
4:10-6:00pm **Algebraic Geometry Seminar** --- Matt DeLand (Columbia) *Cubic hypersurfaces are rationally simply connected* --- 3088 EH

Thursday, January 8

- 3:10-4:00pm **Commutative Algebra Seminar** --- TBA --- 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** --- TBA --- 3096 EH
4:10-6:00pm **RTG Study Seminar** --- TBA --- 3866 EH

Friday, January 9

- 11:10-12:00pm **Theoretical Computer Science Seminar** --- TBA --- Room TBA
3:10-4:00pm **Applied and Interdisciplinary Mathematics Seminar** --- Albert Cohen (MSU) *A Probabilistic Analysis of Two Dimensional Grain Growth* --- 1084 EH
3:10-4:00pm **Student Geometry/Topology** --- TBA --- 3096 EH
4:10-5:00pm **Combinatorics** --- Thomas Lam (Harvard) *Total positivity, Toeplitz matrices, and loop groups* --- 3866 EH

ABSTRACTS FOR THE WEEK OF JAN. 5 – JAN. 11, 2009

Geometry and Physics Seminar
Monday, January 5, 4:10-6:00pm
4088 EH

Alessandro Chiodo (Grenoble)

Landau-Ginzburg/Calabi-Yau correspondence for quintic three-folds via symplectic transformations

This talk is based on work in collaboration with Yongbin Ruan. We compute the Fan-Jarvis-Ruan-Witten theory in genus zero for quintic polynomials in five variables and show that it is encoded into an L-function satisfying the same Picard-Fuchs equation as that of the quintic three-fold. This implies that the two L-functions define two bases of the solution space of the Picard-Fuchs equation. Then, we establish a form of Landau-Ginzburg/Calabi-Yau correspondence by computing explicitly the change of basis matrix (symplectic transformation).

Algebraic Geometry Seminar
Wednesday, January 7, 4:10-6:00pm
3088 EH

Matt DeLand (Columbia)

Cubic hypersurfaces are rationally simply connected

Rational simple connectedness is an analog of simple connectedness for complex varieties having important applications:

every 2-parameter family of rationally simply connected varieties has a rational section, and a 1-parameter family has so many rational sections that they approximate every power series section to arbitrary order. Unfortunately rational simple connectedness is very hard to prove. It is known only for homogeneous spaces and also for some projective hypersurfaces satisfying a list of hypotheses. My new approach works by studying a canonically defined foliation on the moduli space of rational curves on the variety. By proving integrability of this foliation, I prove all smooth cubic hypersurfaces in \mathbb{CP}^n are rationally simply connected for $n \geq 9$ (it does not hold for $n \leq 8$). No familiarity with rational connectedness or rational simple connectedness will be assumed.

Combinatorics
Friday, January 9, 4:10-5:00pm
3866 EH

Thomas Lam (Harvard)

Total positivity, Toeplitz matrices, and loop groups

A real matrix is totally nonnegative if every minor of it is nonnegative. The classical Edrei-Thoma theorem classifies totally nonnegative infinite Toeplitz matrices, and is related to problems in representation theory, combinatorics and probability. I will discuss progress towards two variations on this theorem to block-Toeplitz matrices, and to finite Toeplitz matrices. Both of these variations connect the classical theory to loop groups.

Part of this talk will be based on joint work with Pavlo Pylyavskyy.