MATHEMATICS DEPARTMENT SEMINAR SCHEDULE
March 10 – March 14, 2003

All seminars are held in Boyd Graduate Studies unless otherwise noted

MONDAY, March 10, 2003

VIGRE Research Group
10:30-12:30, Room 524
Speaker: Ivan Cheltsov, University of Georgia
Title of talk: *"Birational geometry of 3-folds"*

Group Representation and Cohomology
2:30p.m., Room 410
Speaker: Jon Carlson, University of Georgia
Title of talk: *Cohomology Products*

Topology
2:30p.m.Room 326
No Meeting this week

Faculty and Graduate Social
3:00p.m., Room 409
Coffee, Cookies, Tea

Analysis
3:30, Room 322
No Meeting this week

TUESDAY, March 11, 2003

VIGRE
2:00-3:15 p.m., Room 304
Speaker: Tawanda Gwena, University of Georgia
Title: *Rational surfaces with emphasis on the Cubic Surface*
Abstract: I will talk about rational surfaces with an emphasis on the cubic surface and del Pezzo surfaces. My main focus will be on the cubic surface, both as cubic surface and as a blowup of the projective plane. I will also show the amazing fact that there are exactly 27 lines on a general smooth cubic surface and how they are configured. Finally I will talk about del Pezzo surfaces (which are also blowups of projective plane, and rational).

Student Number Theory
3:30 p.m., Room 222
Speaker: Xander Faber**,** University of Georgia
Title of talk: *Tentatively--The abc conjecture and Wieferich primes*

WEDNESDAY, March 12, 2003

Wavelet Analysis
10:10-11:10 a.m., Room 524
Speaker: Kyunglim Nam, University of Georgia
Title of talk: *Tight frames with Minimum Support.*

Graduate Student Teaching Seminar
2:30 p.m., Room 302
No Meeting this week

Algebraic Geometry
2:30 p.m., Room 303
Speaker: Vitaly Vologodsky , University of Georgia
Title of talk: *The Fibers of the Extended Jacobi Map*
Abstract: The extended Jacobi map is the morphism from the Deligne-Mumford moduli space of stable curves to the Voronoi compactification of the moduli of principally polarized abelian varieties. The map sends stable curves to their compactified Jacobians. By the famous Torelli's theorem the map is injective on the open dense subset corresponding to smooth curves. I will present an easy condition on the dual graph of a curve which characterize the locus where the fibers of the extended Jacobi map have positive dimension.

Problem Solving Group
2:30 p.m., Room 322

Faculty and Graduate Social
3:00 p.m., Room 409
Coffee, Tea, Cookies

Numerical Analysis
3:30 p.m., Room 410
Speaker: TBA
Title of talk: *TBA*

Lie Theory
3:30 p.m., Room 303
No Meeting this week

Arithmetic Geometry/Number Theory
3:30 p.m., Room 304
Speaker: Matt Baker, University of Georgia
Title: *Polynomial-time primality testing*
Abstract: We will discuss the recent improvement by H.W. Lenstra, Jr. to the Agrawal-Kayal-Saxena algorithm for determining primality in polynomial time. The improvement requires slightly more algebra than the original method, but deep results from analytic number theory are no longer needed to prove that the algorithm runs in polynomial time. Thus this method is truly "elementary". We will follow the exposition of Schoof (which was itself influenced by lectures of Pomerance), which is available on the web at http://www.mat.uniroma2.it/~schoof/

Math Club Meeting
4:30-6:00 p.m., Room 304
Speaker: Dino Lorenzini, University of Georgia
Title of talk: *Pi Day is Friday*

FRIDAY, March 14, 2003

Special Joint CATS/Geometry Seminar
There are two talks, each 45 minutes long
2:20 p.m., Room 322
Speaker: Leo Liu, UNC
Title of talk: *Testing Homotopy for Paths in the Plane*
Abstract: We present an efficient algorithm to test if two given paths are homotopic; that is, whether they wind around obstacles in the plane in the same way. For paths specified by n line segments with obstacles described by n points, several standard ways achieve quadratic running time. For simple paths, our algorithm runs in $O(n\log{n})$ time, which we show is tight. For self-intersecting paths, the problem is related to Hopcroft's problem; our algorithm runs in $O(n^(2/3)\log{n})$ time.

Reference:
Sergio Cabello, Yuanxin Liu, Andrea Mantler, and Jack Snoeyink. Testing homotopy for paths in the plane. Discrete and Computational Geometry, Special Issue on the 2002 Symposium on Computational Geometry. To appear.

Second Talk:
Speaker: Andrea Mantler, UNC.
Title of talk: *Ununfoldable Polyhedra with Convex Faces*
Abstract: Unfolding a convex polyhedron into a simple planar polygon is a well-studied problem. We study the limits of unfoldability by studying nonconvex polyhedra with the same combinatorial structure as convex polyhedra. In particular, we give two examples of polyhedra, one with 24 convex faces and one with 36 triangular faces, that cannot be unfolded by cutting along edges. We further show that such a polyhedron can indeed be unfolded if cuts are allowed to cross faces. Finally, we prove that "open" polyhedra with triangular faces may not be unfoldable no matter how they are cut.

Reference:
Marshall Bern, Erik Demaine, David Eppstein, Eric Kuo, Andrea Mantler, and Jack Snoeyink. Ununfoldable polyhedra with convex faces. Computational Geometry Theory and Applications, Special Issue on the 4th CGC Workshop on Computational Geometry, 24(2):51-62, February 2003.

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Upcoming Events

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MONDAY, March 31, 2003

Cantrell Lecture Series
4:00 p.m., Room 202, Physics
Speaker: Dr. Joan Birman, Barnard College, Columbia University
Title of talk: *Scientific publication: a mathematician's viewpoint*
Abstract: Digital computers have brought enormous changes in the way mathematicians work. One of them relates to an issue which sounds trivial, even though it is not: the art of mathematical typesetting died just as budget problems forced universities to cut back secretarial support. Mathematicians had to learn how to type their own papers! That lead to an interesting mathematical problem which was solved by Donald Knuth, the inventor of a new "language" called "Tex". In this talk I'll discuss Tex, how it works and how it has lead to a small revolution in mathematical publishing (which the commercial publishers are just beginning to appreciate). I'll describe the process by which math journals are created, and the multiple roles that mathematicians play in that process. I'll discuss the new economic pressures. In particular I'll tell you about two new professional journals which just may be winning a battle which has the potential to put the giants in the scientific publishing world out of business.