

MATHEMATICS DEPARTMENT SEMINAR SCHEDULE

March 31 – April 4, 2003

All seminars are held in Boyd Graduate Studies unless otherwise noted

MONDAY, March 31, 2003

Group Representation and Cohomology

2:30p.m., Room 410

Speaker: Kenyon Platt, University of Georgia

Title of talk: *Cohomology Products*

Topology

2:30p.m. Room 326

Speaker: Jennifer Schultens (Emory University)

Title of talk: *Some topology and algebra of graph manifolds*

Faculty and Graduate Social

3:30 p.m., Physics Bldg., Lobby outside of Room 202

Refreshments preceding Cantrell Lecture Series

Cantrell Lecture Series

4:00 p.m. Physics Bldg., Room 202

Speaker: Prof. 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 led 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 led 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.

TUESDAY, April 1, 2003

VIGRE

2:00-3:15 p.m., Room 304

Speaker: Markus Hunziker, University of Georgia

Title of talk: *The icosahedron and E_8*

Abstract: The icosahedron and its symmetries appear in many branches of mathematics, e.g., in the classification of finite simple groups, in singularity theory, in representation theory, etc. Many of these appearances show that there is an amazing relationship

between the icosahedron and E_8 , which is the largest of the exceptional simple Lie groups. In this talk I will explain with several examples how the icosahedron and E_8 are related.

Student Number Theory

3:30 p.m., Room 222

No Meeting this week

Analysis

3:30, Room 322

No Meeting this week

Faculty and Graduate Social

3:30 p.m., Physics Bldg., Lobby outside of Room 202

Refreshments preceding Cantrell Lecture Series

Cantrell Lecture Series

4:00 p.m. Physics Bldg., Room 202

Speaker: Prof. Joan Birman, Barnard College, Columbia University

Title of talk: *Recognizing the Unknot*

Abstract: The problem of recognizing the unknot is a rare mathematical problem because it can be explained in 30 seconds, yet 150 years after it was first understood as a serious mathematical problem it is still unclear whether a polynomial-time algorithm exists. We will review the literature, discuss how it was proved that the problem is both NP and co-NP, and discuss present efforts to find a polynomial-time algorithm.

WEDNESDAY, April 2, 2003

Wavelet Analysis

10:10-11:10 a.m., Room 524

Speaker: Kyunglim Nam, University of Georgia

Title of talk: *FFT method.*

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", cont.

Problem Solving Group

2:30 p.m., Room 322

Numerical Analysis

3:30 p.m., Room 410

*No Meeting this week***Faculty and Graduate Social****Please note change in time*

3:30 p.m., Room 409

Coffee, Cookies, Tea

Cantrell Lecture Series

4:00 p.m., Boyd Graduate Studies, Room 328

Speaker: Prof. Joan Birman, Barnard College, Columbia University**Title of talk:** *Stabilization in the braid groups*

Abstract: Solved problems abound in topology where there is a notion of "stabilization". Examples: the Reidemeister-Singer Theorem relating any two Heegaard splittings of a 3-manifold, the Kirby Calculus relating any two surgery presentations of a 3-manifold, and Markov's Theorem, relating any two closed braid representatives of a knot. This talk will report on new joint work with William Menasco. Our main result is "Markov's Theorem Without Stabilization." We replace the stabilization move in the Markov theorem by finitely many moves which are strictly "complexity" reducing (and non-increasing on braid index). The statement of the theorem is too messy for this abstract, which is another way of saying that it's a very hard problem to decide when two knot diagrams determine the same knot type! As an application we solve a classical open problem about knots transverse to the standard contact structure.

Lie Theory

3:30 p.m., Room 303

*No Meeting this week***Arithmetic Geometry/Number Theory**

3:30 p.m., Room 304

Speaker: TBA**Title:** *TBA***VIGRE Research Group**

4:30 p.m., Room 410

Speaker: Ivan Cheltsov, University of Georgia**Title of talk:** *"Birational geometry of 3-folds"***THURSDAY, April 3, 2003****Faculty and Graduate Social**

3:00 p.m., Room 409

Coffee, Cookies, Tea

Colloquium

3:30 p.m., Room 304

Speaker: Andrew Sornborger, Biomathematical Sciences Department Mt. Sinai School of Medicine, New York, NY

Title of talk: *Estimating dynamical response in multivariate stimulus-response data*

Abstract: Perhaps the majority of experiments in biology and medicine are based on a stimulus-response paradigm. Repeated measurements of the response to one or many stimuli are made for the purpose of improving the signal-to-noise ratio in estimates of the response. In this talk, I will present and discuss the estimation of signals in such stimulus-response data using a multivariate, local inverse problem approach in the frequency domain. I will then go on to show results from the application of our methods to the analysis of optical imaging data of the intrinsic (blood related) signal in primary visual cortex in the cat.

FRIDAY, April 4, 2003**Geometry**

2:30 p.m., Room 322

Speaker: Aaron Abrams and Joe Fu, University of Georgia

Title of talk: *Manifolds-with-boundary having nonpositive curvature in the Alexandrov sense, cont'd*