

MATHEMATICS DEPARTMENT SEMINAR SCHEDULE
November 12 – November 16, 2001

All seminars are held in Boyd Graduate Studies unless otherwise noted.

MONDAY, November 12, 2001

Group Representation & Cohomology

2:30 - 3:30 p.m., Room 410

Speaker: Graham Matthews, University of Georgia

Title of talk: *"Representations of the Symmetric Groups"*

Special Computational Topology/Geometry Seminar

2:30 p.m., Room 303

Speaker: Saugata Basu, Georgia Institute of Technology

Title of talk: *"On the topological complexity of semi-algebraic sets"*

Abstract: I will describe some recent results refining the Oleinik-Petrovsky-Thom-Milnor bound on the sum of Betti numbers of semi-algebraic sets, leading to tight bounds on the individual Betti numbers separately and algorithms for computing them. I will also describe certain connections between the topological complexity of semi-algebraic sets and the combinatorial complexity of arrangements used in computational geometry.

Faculty and Graduate Social

3:00 p.m., Room 409

Coffee, Tea, Cookies

Teacher Education Seminar

3:30-4:30 pm, Room 302 Boyd

Speaker: Tom Cooney, Department of Mathematics Education, University of Georgia

Title of talk: *"Examining the Mathematics in Mathematics Teacher Education"*

Abstract: Linkages between the historical development of mathematics (especially the emphasis on mathematical formalism) and the teaching of mathematics will be made. Implications of research from around the world on teacher's knowledge and beliefs for reform in the teaching of mathematics will be considered. As a result of these analyses, three principles for teaching mathematics to teachers will be presented and illustrated.

Number Theory

3:30 p.m., Room 304

Speaker: Andrew Granville, University of Georgia

Title of talk: *"Cycle lengths in permutations are Poisson distributed"*

Topology

No Meeting this week

TUESDAY, November 13, 2001

VIGRE Seminar

Room 302, 2:00 p.m.-3:15 p.m.

No Meeting today, Please see Thursday, November 15, 2001

Algebraic Geometry

3:30 p.m., Room 326

Speaker: Bill Graham, University of Georgia

Title of talk: CANCELLED "Schubert varieties"

Abstract: Equivariant K-theory is a tool which can be used to study Schubert varieties and their singularities; it also leads to some problems of combinatorial interest. In this talk I will give a brief introduction to equivariant K-theory and then discuss some results specific to Schubert varieties.

Student Number Theory

3:30 p.m., Room 303

No Meeting this week

WEDNESDAY, November 14, 2001

Group Representation & Cohomology

2:30 - 3:30 p.m., Room 410

Speaker: Kenyon Platt, University of Georgia

Title of talk: 'Representations of the Symmetric Groups'

Faculty and Graduate Social

3:00 p.m., Room 409

Coffee, Tea, Cookies

Representation Theory

3:30 p.m., Room 302

Speaker: TBA

Title of talk: "TBA"

Numerical Analysis

3:30 - 4:30 p.m., Rm. 410

Speaker: Victoria Baramidze, University of Georgia

Title of talk: "Spherical Splines"

Abstract: In this talk, spherical splines on 3-sphere will be introduced. First, we discuss how to triangulate the scattered data locations on the 3-sphere. Then Bezier polynomials defined on spherical triangle will be defined. De Casteljau's algorithm for evaluating the spherical Bezier polynomials will be given. We end this talk by explaining the smoothness conditions for connecting Bezier polynomials.

Arithmetic Geometry

3:30 p.m., Room 304

Speaker: Stephen Donnelly, University of Georgia

Title of talk: "*Construction of Elliptic Curves whose Tate-Shafarevich Group has large l -rank*", continued

CATS

Combinatorics, Algorithms, and Theoretical Computer Science Seminar

<http://www.cs.uga.edu/~rwr/seminar.html>

4:40 p.m., Rm. 306

Speaker: Jian Wang

Title of talk: "*Dynamic Programming Algorithms For Global and Local Sequence Alignment*"

Abstract: In this talk, we will discuss how to use the dynamic programming approach to solve inexact matching and alignment problems that are of great importance in molecular and evolutionary biology. A (global) alignment of two strings s_1 and s_2 is obtained by first inserting chosen spaces (or dashes), either into or at the ends of s_1 and s_2 , and then placing the two resulting strings one above the other so that every character or space in either string is opposite a unique character or a unique space in the other string. The local alignment problem for two strings s_1 and s_2 is to find substrings a and b of s_1 and s_2 whose similarity (optimal global alignment value) is maximum over all pairs of substrings from s_1 and s_2 . We will show how to apply the dynamic programming approach to solve for global and local alignments of two strings. We will also demonstrate that using the dynamic programming approach we can solve both the global and local alignment problems in time $O(mn)$, where m and n are the lengths of the two strings.

THURSDAY, November 15, 2001

VIGRE Seminar

Room 302, 2:00 p.m.-3:15 p.m.

Speaker: Rob Ghrist, Georgia Tech

Title of talk: *TBA*

Analysis

3:30 p.m., Room 304

Speaker: Michael Lacey

Title: '*Carleson's theorem w/ quadratic phase*'

Abstract: I will discuss the proof of the L^2 boundedness

of the maximal operator $\sup_{a,b} \left| \int e^{i(ay+by^2)} f(x-y) \frac{dy}{y} \right|$
The sup over a alone is Carleson's theorem on Fourier series, over b alone is an observation of E.M. Stein.

FRIDAY, November 16, 2001

Geometry Seminar

2:30 p.m., Room 322

Speaker: Heunggi Park, University of Georgia

Title of talk: "The kinematic formula for real subspaces of complex space forms, Part 2"

Upcoming Seminars

MONDAY, November 19, 2001

Colloquium

3:30 p.m., Room 304

Speaker: Ken Ono, University of Wisconsin at Madison

Title of talk: 'Values of modular functions and divisors of modular forms'

Abstract: The values and the coefficients of the modular function $j(z)$ play a variety of important roles in number theory and representation theory. For example, its values generate class fields in algebraic number theory, and its coefficients are the degrees of the graded representation of the Monster group. In this lecture I will describe recent work with Jan Bruinier and Winfried Kohnen. I will introduce a specific sequence of modular functions j_n whose arithmetic literally dictates the behavior of all modular forms on $SL_2(\mathbb{Z})$. The corollaries include:

- Borcherds type infinite products for generic forms,
- Universal recursions for Fourier expansions of all forms,
- p -adic class number formulas.

WEDNESDAY, November 28, 2001

Teacher Education Seminar

3:30-4:30 pm, Room 328 Boyd

Speaker: TBA

Title of talk: "TBA"

Abstract: TBA

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