

MATHEMATICS DEPARTMENT SEMINAR SCHEDULE

October 28 – November 1, 2002

All seminars are held in Boyd Graduate Studies unless otherwise noted

MONDAY, October 28, 2002

Group Representation & Cohomology

2:30p.m., Room 410

Speaker: Kenyon Platt, University of Georgia

Title of talk: *"Blocks of Modular Representations"*

Topology

2:30p.m. Room 326

Speaker: Nancy Wrinkle, University of Georgia

Title of talk: *"An introduction to Ozsvath-Szabo invariants of 3-manifolds"*, continued

Faculty and Graduate Social

3:00 p.m., Room 409

Coffee, Tea, Cookies

Analysis

3:30pm, Room 222

No Meeting this week

Cats

4:40 p.m., Room 306

Speaker: Jonathan Myers, Educ. Prog. Specialist, Dept. of Biochemistry & Molecular Biology

Title of talk: *"Eulerian Path Approach to DNA Fragment Assembly"*

Abstract: DNA sequences have been viewed as the encryption of the mechanisms of life for many years. However, efficient analysis of the encryption functionality requires mapping of the sequences to the related functionality. The limitations of DNA sequencing, requiring fragment lengths to be less than 1000 for practical error rates, causes a great problem when genomes are of sizes in the millions. The most successful approach to solving this problem involves the three-phase DNA fragment assembly approach, "Overlap-Layout-Consensus". One area of shortcoming is the problem of repeated subsequences, since by definition the goal is to find a consensus sequence.

The Eulerian approach involves a different graphical representation of the DNA fragment relation. Instead of noting fragments as vertices, each edge represents a substring of the overall sequence. The reason for this change is for storing repeat segments as a single edge. With this complete, traversing the graph to define the source sequence becomes similar to the Eulerian path problem. The talk will discuss the steps used in forming both the perspective this graph holds and the analysis of its complexity.

TUESDAY, October 29, 2002

VIGRE

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

Speaker: Robert Varley, University of Georgia

Title of talk: "*Solving Maxwell's equations*"

Abstract: Maxwell's equations govern the propagation of light. I will give the classical formulation of Maxwell's equations in terms of div and curl, and examples of what the solutions look like. I will indicate some aspects of the history of these equations, their continuing place within mathematical physics, and "particle/wave duality". Then I will discuss various solution methods for Maxwell's equations and feature the method based on "symmetric hyperbolic systems" of 1st order linear pde's (following K.O. Friedrichs and Fritz John).

Algebraic Geometry

3:30 p.m., Room 326

Speaker: Daniele Arcara, University of Georgia

Title of talk: "*The strange duality conjecture*"

Abstract: The strange duality conjecture is a statement well known by physicists that mathematicians have not been able to prove yet. It involves linear systems of ample divisors (the generalized theta divisors) on moduli spaces of vector bundles on curves. After a short introduction, I shall state the conjecture and present arguments in its favor.

Student Number Theory

3:30 p.m., Room 303

Speaker: TBA

Title of talk: "*TBA*"

WEDNESDAY, October 30, 2002

Wavelet Analysis

10:10 – 11:00 a.m., Room 410

Speaker: Kyunglim Nam, University of Georgia

Title of talk: "*Inter-orthogonality among tight frames*"

Graduate Teaching Seminar

2:30 p.m., Room 303

Speaker: Joe Fu, University of Georgia

Title of talk: "*Teaching precalculus at UGA*"

Faculty and Graduate Social

3:00 p.m., Room 409

Coffee, Tea, Cookies

Numerical Analysis

3:30pm, Room 410

Speaker: MingJun Lai , University of Georgia

Title of talk: “ *The strengthened Cauchy-Schwarz inequality*”

Lie Theory

3:30 p.m., Room 302

Speaker: J.M. Landsberg, Georgia Tech

Title: “*Series of Lie groups, after Freudenthal, Zak, Deligne and Vogel*”

Abstract: I will discuss various ways Lie groups have been organized into "series", with emphasis on the geometric models of Freudenthal and the categorical models of Deligne and Vogel. In recent work with L. Manivel these perspectives provided the inspiration to obtain new geometric insight into the structure of nilpotent orbits and to prove striking formulas, including vast generalizations of the Deligne dimension formulas for the exceptional groups (Deligne obtained the formulas via computer experiments), and new formulas for dimensions of nilpotent orbits and degrees of unipotent characters.

Number Theory

3:30 p.m., Room 304

Speaker: Robert Rumely and Steve Donnelly, University of Georgia

Title of talk: “*An overview of Kolyvagin's theorem*” (continued)

THURSDAY, October 31, 2002

Fall Break – No classes

FRIDAY, November 1, 2002

Fall Break - No classes

Geometry

2:30 p.m., Room 322

No Meeting this week