

**MATHEMATICS DEPARTMENT SEMINAR SCHEDULE**  
**January 20 – January 24, 2003**

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

**MONDAY, January 20, 2003**

**University Holiday**

**Group Representation and Cohomology**

*Seminar has been moved to Wednesday, January 22, 2003, 3:30 p.m., this week only.*

**TUESDAY, January 21, 2003**

**VIGRE**

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

**Speaker:** Vitali Vologodsky, University of Georgia

**Title of talk:** *Maps between moduli spaces*

**Student Number Theory**

3:30 p.m., Room 303

**Speaker:** Charles Pooh, University of Georgia

**Title of talk:** *It's as easy as abc*

**Numerical Analysis**

3:30 p.m., Room 322

**Speaker:** Gerard Awanou, University of Georgia

**Title of talk:** *Spline Approximations of the 3D Navier-Stokes Equations*

**Abstract:** We consider numerical approximations of the 3D Navier-Stokes equations in velocity-pressure formulation. The pressure is eliminated from the equations by using a space of velocity fields which are divergence free. The later is discretized by means of splines of arbitrary degree and arbitrary smoothness. Energy arguments are used to derive the discrete equations satisfied by the equations. The pressure term is computed by solving a Poisson problem with Neumann boundary.

**WEDNESDAY, January 22, 2003**

**Wavelet Analysis**

10:10-11:10 a.m., Room 542

**Speaker:** Haipeng Liu, University of Georgia

**Title of talk:** *Regular compactly supported wavelets in sobolev spaces*

### **Graduate Student Seminar**

2:30 p.m., Room 302

**Speaker:** Brad Findell, UGA Department of Mathematics Education

**Title of talk:** *More on the Concept of Mathematical Proficiency*

**Abstract:** According to the National Research Council, mathematical proficiency consists of five intertwined strands:

- 1) conceptual understanding -- comprehension of mathematical concepts, operations, and relations
- 2) procedural fluency -- skill in carrying out procedures flexibly, accurately, efficiently, and appropriately
- 3) strategic competence -- ability to formulate, represent, and solve mathematical problems
- 4) adaptive reasoning -- capacity for logical thought, reflection, explanation, and justification
- 5) productive disposition -- habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy.

### **Algebraic Geometry**

2:30 p.m., Room 303

**Speaker:** Markus Hunziker, University of Georgia

**Title of talk:** *Resolutions and Hilbert series of determinantal varieties: A representation theoretic approach*

**Abstract:** The Hilbert series of the graded ring associated to a projective variety contains a lot of information about the variety, e.g., dimension, degree, arithmetic genus etc. If the variety is nice then the Hilbert series can be uniquely written in the form  $h(t)=f(t)/(1-t)^n$ , where  $f(t)$  is a polynomial with non-negative integer coefficients and  $f(1)$  is not equal to zero.

In this talk we consider the Hilbert series of determinantal varieties (including symmetric and skew-symmetric determinantal varieties). These varieties arise naturally in many branches of mathematics, e.g., in classical invariant theory. I will give a formula for the coefficients of the numerator  $f(t)$  of the Hilbert series as dimensions of representations of certain compact Lie groups.

The presented work is joint work with Tom Enright and is an extension of previous work by Enright and Willenbring.

### **Faculty and Graduate Social**

3:00 p.m., Room 409

Coffee, Tea, Cookies

### **Group Representation and Cohomology**

3:30 p.m., Room 322

**Speaker:** Jon Carlson, University of Georgia

**Title of talk:** *Group Cohomology*

**Lie Theory**

3:30 p.m., Room 303

*No meeting this week*

**Numerical Analysis**

*Seminar has been moved to Tuesday, January 21, 2003 for this week only.*

**Arithmetic Geometry**

3:30 p.m., Room 222

**Speaker:** Dino Lorenzini, University of Georgia

**Title of talk:** *A property of morphisms of group schemes*

**Abstract:** I will give a short introduction to group schemes and their Lie algebras, and then will discuss a theorem of Raynaud linking several invariants associated with a morphism of smooth group schemes over a discrete valuation rings. (For number theorists not fluent in algebraic geometry, an elliptic curve is a group scheme over a field, and its Neron model is a group scheme over a discrete valuation ring. I will try to make the talk not too heavy on algebraic geometry.)

**FRIDAY, January 24, 2003****Geometry**

2:30 p.m., Room 322

**Speaker:** Malcom Adams, University of Georgia

**Title of talk:** *Introduction to integrable Hamiltonian systems*