

**MATHEMATICS DEPARTMENT SEMINAR SCHEDULE**  
**January 14 - 18, 2002**

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

**MONDAY, January 14, 2002**

**Group Representation and Cohomology**

(Joint meeting with the Representation Theory Seminar)

Room 302, 2:30 - 3:20

**Speaker:** Chris Bendel, University of Wisconsin, Stout

**Title of talk:** *“Cohomological varieties for restricted Lie algebras and infinitesimal group schemes”*

**Topology**

3:00 p.m. – 5:00 p.m., Room 303

*No Meeting This Week*

**Faculty and Graduate Social**

3:00 p.m., Room 409

Coffee, Tea, Cookies

**Number Theory**

3:30 p.m., Room 304

**Speaker:** Andrew Granville, University of Georgia

**Title of talk:** *“Overview of the  $\zeta$  function and quantum physics”*

**Numerical Analysis**

3:30 - 5:00, Rm., 410

**Speaker:** Okkyung Cho, University of Georgia

**Title of talk:** *“Biorthogonal wavelets”*

**Abstract:** We present results on biorthogonal wavelets from the paper by Cohen, Daubechies, and Feauveau.

**CATS**

4:40 p.m., Room 306

**Speaker:** Rod Canfield, University of Georgia, Dept. of Computer Science

**Title of talk:** *“Matchings in Bipartite Graphs”*

**Abstract:** We'll explain what a matching in a bipartite graph is. Then, we'll state and prove Hall's Theorem and Sperner's Theorem.

## TUESDAY, January 15, 2002

### VIGRE

2:00 p.m. – 3:15 p.m.

Room 302

**Speaker:** Valery Alexeev, University of Georgia

**Title of talk:** *"Stable n-pointed curves"*

**Abstract:**  $M_{0,n}$  is the parameter space for the set of  $n$  ordered points on the projective line. For example,  $M_{0,4}$  is just  $\mathbb{C}$  minus 0 and 1. Of course, this space is not compact for  $n > 3$ . There is a remarkable compactification, due to Knudsen, of this space, where every boundary point corresponds to a singular (but very simple) curve, again together with  $n$  marked points.

Notwithstanding the simple definition, these spaces have a rich and beautiful structure, and are an object of active current research. The purpose of the VIGRE research group led by Bill Rulla and myself will be 1) to teach interested students some algebraic geometry on this concrete example, and 2) to hopefully make a stab at some of the open problems, of which there is a long list.

### Algebraic Geometry

3:30 - 5:00p.m., Room 326

**Speaker:** Valery Alexeev, University of Georgia

**Title of talk:** *"Stable varieties with reductive group action"*

**Abstract:** I will talk on a joint work, in progress, with M. Brion. We extend from the case of toric varieties to the case of varieties with action by an arbitrary reductive group the theory of stable varieties and pairs, including study of their singularities, degenerations and moduli. I will start with an overview of reductive groups and their representations, and with some stimulating examples.

### Analysis

3:30 p.m., Room 410

**Speaker:** Ed Azoff, University of Georgia

**Title of talk:** *"On completely positive maps"*

**Abstract:** A map  $\phi$  from  $M_n$  to itself is  $k$ -positive in case its tensor product with the identity defines a positive map from  $M_n$  tensor  $M_k$  to itself.  $\phi$  is completely positive if it is  $k$ -positive for all  $k$ . The concept was introduced by W. Stinespring in 1955. The search for the minimal value of  $k$  (as a function of  $n$ ) such that  $k$ -positivity implies complete positivity culminated in a recent paper of R. Timoney. I will outline a variant of Timoney's proof due to J. Li and Z. Pan which forges a surprising connection between complete positivity and invariant subspaces.

### Student Number Theory

3:30 p.m., Room 303

*No Meeting This Week*

## **WEDNESDAY, January 16, 2002**

### **Group Representation and Cohomology**

Room 410, 2:30 - 3:20

**Speaker:** Chris Bendel, University of Wisconsin, Stout

**Title of talk:** “*Cohomology and projectivity of modules for finite group schemes*”

### **Faculty and Graduate Social**

3:00 p.m., Room 409

Coffee, Tea, Cookies

## **FRIDAY, January 18, 2002**

### **Geometry**

2:30 p.m., Room 323

**Speaker:** Joe Fu, University of Georgia

**Title of talk:** “*Convex valuations invariant under the translation and unitary groups*”  
(after S. Alesker)