



# MATHEMATICS



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## MATH LIBRARY

### Research Seminars: Algebra

Spring 2012

**Time & Location:** All talks are on Wednesdays in Gibson 414 at 3:00 P.M. unless otherwise noted.

**Organizer:** [Mahir Can](#)

*January 18*

**Topic**

**Speaker** | INSTITUTION

**Abstract:** TBA

*January 25*

**The Alpha Problems for Fat Points**

**Susan Cooper** | CENTRAL MICHIGAN UNIVERSITY

**Abstract:**

Central to many problems in algebraic geometry and commutative algebra is the fact that symbolic and regular powers of an ideal are in general not the same. Harbourne and Huneke recently formulated a number of conjectures that relate these powers of an ideal of fat points in projective space. In this talk we will look at some of these conjectures and report on progress made for a variety of configurations of points. The results come from two joint projects - one joint with C. Bocci and B. Harbourne and the other joint with S. G. Hartke.

Location: TBA

Time: 3:00 PM

*February 1*

## Topic

**Speaker** | INSTITUTION

**Abstract:** TBA

*February 8*

## K-orbits on $G/B$ , Richardson varieties and a positive rule for $(p,q)$ -Schubert constants

**Ben Wyser** | UNIVERSITY OF GEORGIA, ATHENS

### Abstract:

For  $G$  a complex, reductive algebraic group, the fixed point subgroup of an involution of  $G$  is typically denoted  $K$ , and is referred to as a symmetric subgroup.  $K$  acts on the flag variety  $G/B$  (by left translations) with finitely many orbits. The geometry of such orbits and their closures is important in the infinite-dimensional representation theory of real forms of  $G$ .

One interesting example of a symmetric pair is  $(G,K) = (GL(p+q), GL(p) \times GL(q))$ . Restricting attention to this example, I will discuss a recent result which establishes that a number of the  $K$ -orbit closures in this case coincide with certain Richardson varieties. When combined with a theorem of M. Brion on expressing the class of such an orbit closure in the Schubert basis, this observation implies a positive (in fact, multiplicity-free) rule for certain Schubert structure constants  $c_{\{u,v\}^w}$  --- those for which  $u,v$  form what I refer to as a " $(p,q)$ -pair".

*February 15*

## Cauchy's Theorem for Hopf Algebras

**Yorck Sommerhauser** | UNIVERSITY OF SOUTH ALABAMA

### Abstract:

Cauchy's theorem states that a finite group contains an element of prime order for every prime that divides the order of the group. Since the exponent of a group is the least common multiple of the orders of all its elements, this can be reformulated by saying that a prime that divides the order of a group also divides its exponent. It was an open conjecture by P. Etingof and S. Gelaki that this result, in this formulation, holds also for semisimple Hopf algebras. In the talk, we present a proof of this conjecture, which is joint work with Y. Kashina and Y. Zhu.

The talk is intended for a general audience; in particular, no knowledge of Hopf algebras will be assumed. We will therefore begin by explaining what a Hopf algebra is and how the exponent of a Hopf algebra can be defined. We will then explain how the analogue of Cauchy's theorem can be deduced from the theory of higher Frobenius-Schur indicators.

*February 22*

## Topic

**Speaker** | INSTITUTION

**Abstract:** TBA

*February 29*

Topic

**Speaker** | INSTITUTION

**Abstract:** TBA

*March 7*

Topic

**Fabrizio Zanello** | MICHIGAN STATE UNIVERSITY

**Abstract:** TBA

*March 14*

Topic

**Speaker** | INSTITUTION

**Abstract:** TBA

*March 21*

Topic

**Speaker** | INSTITUTION

**Abstract:** TBA

*March 28*

Topic

**Mark Skandera** | LEHIGH UNIVERSITY

**Abstract:** TBA

*April 4*

Topic

**Adam Van Tuyl** | LAKEHEAD UNIVERSITY, CANADA

**Abstract:** TBA

*April 11*

Topic

**Speaker** | INSTITUTION

**Abstract:** TBA

*April 18*

Topic

**Joerge Feldvoss** | UNIVERSITY OF SOUTH ALABAMA

**Abstract:** TBA

*April 25*

Topic

**Speaker** | INSTITUTION

**Abstract:** TBA

*May 9*

Topic

**Mike Siddoway** | COLORADO COLLEGE

**Abstract:** TBA

[Next Semester, Fall 2012 »](#)