

MATHEMATICS DEPARTMENT SEMINAR SCHEDULE
February 11 – February 15, 2002

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

MONDAY, February 11, 2002

Faculty and Graduate Social

3:00 p.m., Room 409

Coffee, Tea and Cookies

Group Representation & Cohomology

*(joint meeting with *Lie Theory Seminar)*

2:30-3:30p.m., Room 302

Speaker: Dan Nakano, University of Georgia

Title of talk: *"Lie algebra cohomology and nilpotent orbits III"*

Topology

3:00 p.m., Room 322

Speaker: Jason Cantarella, University of Georgia

Title of talk: *"On Ropelength-Critical Knots"*

Abstract: There has been plenty of interest in knots minimizing the quotient of length and "thickness", where thickness is the radius of the largest embedded tubular neighborhood around the knot. In this talk, we consider the idea of ropelength-critical configurations. We present a preliminary version of a criticality condition for knots and links based on ideas in rigidity theory. A nice consequence of this work should be the theorem that every knot in the form $K \# -K$ has a ropelength-critical configuration with two straight segments "bridging" a central opening. This talk describes joint work with Joe Fu, Rob Kusner, and John Sullivan.

4:00p.m., Room 322

Speaker: Margaret Symington

Title: *"Almost toric symplectic four-manifolds and beyond." (Continued)*

Number Theory

3:30 p.m., Room 304

Speaker: Tom Tucker, University of Georgia

Title of talk: *"Some simple questions about Diophantine Equations"*

Numerical Analysis

3:30 p.m., Room 410

Speaker: Okkyung Cho, University of Georgia

Title of talk: *"Biorthogonal Wavelets" (cont.)*

Lie Theory

3:30 p.m., Room 302

**Please see Group Representations & Cohomology Seminar*

CATS

4:40 p.m., Room 308

No Meeting this week

TUESDAY, February 12, 2002

VIGRE

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

Speaker: Robert Varley, University of Georgia

Title of talk: *Wave equations in mathematics and physics*

Abstract: By 1865 Maxwell had unified the electric and magnetic forces in the electromagnetic wave equations, which turned out to include the theory of light. The symmetry of Maxwell's equations with respect to global Lorentz transformations and local phase multiplications are key features of the electromagnetic theory. I will describe the U(1) gauge theory point of view which leads to a single expression, the Maxwell Lagrangian, that generates Maxwell's system of equations.

More than 100 years later Weinberg unified the electromagnetic force and the weak nuclear force (responsible for beta decay) in the electroweak wave equations. I will briefly describe this development, which is based on SU(2)xU(1) gauge theory together with a symmetry-breaking mechanism called the Higgs field. I will try to explain the phrase: "The gauge bosons ate the Higgs particles and thereby acquired mass."

Algebraic Geometry

3:30 p.m., Room 326

Speaker: Daniele Arcara, University of Georgia

Title of talk: *"Rank Two Vector Bundles on Singular Curves"*

Abstract: We generalize Bertram's work on rank two vector bundles to an irreducible singular curve C with a node. We resolve the indeterminacy of the rational map $\phi: \mathbb{P}(\text{Ext}^1_C(L, \mathcal{O}_C)) \dashrightarrow \overline{\{\mathcal{S}\mathcal{U}\}_C(2,L)}$ via a finite number of blow-ups with smooth centers.

Here, $\text{Ext}^1_C(L, \mathcal{O}_C)$ is the vector space of extensions of a line bundle L by \mathcal{O}_C , $\{\mathcal{S}\mathcal{U}\}_C(2,L)$ is the moduli space of (S-equivalence classes) of locally-free sheaves of rank two with determinant L , and $\overline{\{\mathcal{S}\mathcal{U}\}_C(2,L)}$ is a compactification of $\{\mathcal{S}\mathcal{U}\}_C(2,L)$ by torsion-free sheaves.

Analysis

3:30 p.m., Room 304

No Meeting this week

Student Number Theory

3:30 p.m., Room 302

Speaker: Eric Pine, University of Georgia

Title of talk: *“How close are we to finding a taxicab?”*

WEDNESDAY, February 13, 2002

Group Representation and Cohomology

Room 410, 2:30 - 3:20

Speaker: Dave Hemmer, University of Georgia

Title of talk: *“Erdmann's proof of the Grabmeier correspondence for Young modules of the symmetric group.”*

UGA Math Club Problem Solving Group

2:30 p.m., Room 302

Faculty and Graduate Social

3:00 p.m., Room 409

Coffee, Tea, Cookies

Arithmetic Geometry

3:30 p.m., Room 304

Speaker: Jim Blair, University of Georgia

Title of talk: *“Montgomery's paper on the Pair Correlation conjecture”*

FRIDAY, FEBRUARY 15, 2002

Geometry

2:30 p.m., Room 322

Speaker: TBA

Title of talk: *“TBA”*

Upcoming Seminars

Wednesday, February 20, 2002

Teacher Education Seminar

2:30 - 3:30 pm, Room 326

Speakers: Denise Mewborn, Paola Sztajn, and Dorothy White, Department of Mathematics Education

Subject of talk: Speakers will talk about the mathematics methods courses for prospective elementary school teachers, EMAT 3400 and 3410.

Tuesday, February 26, 2002

Teacher Education Seminar

2:30 - 3:30 pm, Room 326

Speakers: Martha Alleksaht-Snider, Department of Elementary Education,

Subject of talk: Will talk about the preparation of elementary school teachers

Thursday, February 28, 2002

Colloquium

3:30 p. m., Room 304

Speaker: Carl Pomerance (formerly a UGA faculty member, now at Lucent Technologies)

Title of talk: *"Primitive roots"*

Abstract: Are there infinitely many primes p (such as $p=7$) where $p-1$ is the length of the repeat for the periodic decimal for $1/p$? That there are is a special case of Artin's primitive root conjecture: For any integer g not equal to -1 or a square, there are infinitely many primes p with g generating the multiplicative group modulo p . This talk will review some of the very intriguing partial results concerning Artin's conjecture, discuss some new problems about primitive roots, and discuss a natural generalization of the concept of primitive roots to composite moduli. Various parts of this talk represent joint work with Shuguang Li (of the University of Hawaii and a former UGA graduate student) and Mari Campbell (a current Berkeley graduate student).