



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week September 27th – October 1st, 2010

TUESDAY, 28th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:00PM, SURGE 268

TOPOLOGY (Julie Bergner, UCR)
"Introduction to Simplicial Methods"

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

12:40-2:00PM, SURGE 277

INTERSECTION THEORY (Ziv Ran)

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (James Stafney, UCR)
"A Tauberian Theorem and the Eigenvalues of the Dirichlet Laplacian"

WEDNESDAY, 29th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)
"Depth and Vanishing of Ext"

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (James Kelliher, UCR)
"On Properties of the Flow for Weak Solutions to the 2D Euler Equations"

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Fred Wilhelm/Julie Bergner)
"Introduction and Motivation"

THURSDAY, 30th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Sung Rak Choi, UCR)
"Base Locus and the Minimal Model Program"

10:10-11:00AM, SURGE 277*

OPERATOR ALGEBRAS AND RELATED TOPICS (Marta Asaeda, Feng Xu)

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP (Mike Maroun, UCR)
"Number theoretic connections to the solution of a certain delay differential equation"

12:40-2:00PM, SURGE 284

LIE THEORY (Matthew Bennett, UCR)
"Homomorphisms between Global Weyl Models"

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS (John Quinn, UCR)
"Fourier transforms in L^p spaces"

FRIDAY, 1st

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Bun Wong, UCR)
"Organizational Meeting"

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (David Rush)



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Commutative Algebra

Jason McCullough
(UCR)

“Depth and Vanishing of Ext”

Abstract: This will be the first day of a working seminar in commutative algebra. This quarter I'll be working toward some open problems in local cohomology. This is not an introductory seminar and I'm assuming background in commutative algebra and homological algebra - however, everything I'm assuming is contained in the notes on my webpage. With that said, anyone is welcome to attend. This week, I'm going to define the depth of a module with respect to an ideal and use the vanishing of $\text{Ext}^i(A/I, M)$ to characterize it.

Wednesday, September 29th, 2010

Surge 277

11:10-12:00pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Lie Theory

Matthew Bennet
(UCR)

“Homomorphisms between Global Weyl Modules”

Abstract: Global Weyl modules, for generalized loop algebras $\mathfrak{g} \otimes A$, where \mathfrak{g} is a simple finite dimensional Lie algebra and A is an associative commutative algebra, have been defined and studied for any dominant integral weight λ . We show that the space of morphisms between Global Weyl modules shares some properties with the space of morphisms between Verma modules.

Thursday, September 30th, 2010

Surge 284

12:40-2:00pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week October 4th – October 8th, 2010

TUESDAY, 5th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:00PM, SURGE 268

TOPOLOGY (Julie Bergner, UCR)

“Introduction to Simplicial Methods - 2”

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

12:40-2:00PM, SURGE 277

INTERSECTION THEORY (Ziv Ran)

3:40-4:30PM, SURGE 268

FUNCTIONAL ANALYSIS (James Stafney, UCR)

“Heat Kernels and Semigroups of Operators”

WEDNESDAY, 6th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)

“The Koszul Complex, Free Resolutions, and the Auslander-Buchsbaum Theorem”

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (James Kelliher, UCR)

“On Properties of the Flow of Weak Solutions to the 2D Euler Equations – Part II”

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Barbara Herzog, UCR)

TBA

THURSDAY, 7th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

Informal, intermediate-level student participation seminar following Lazarsfeld’s book “Positivity in Algebraic Geometry”

10:10-11:00AM, SURGE 284

OPERATOR ALGEBRAS AND RELATED TOPICS (Marta Asaeda, Feng Xu)

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP (Robert G. Niemeyer, UCR)

“Billiards on Other Fractal Tables”

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS (Jonathan Sarhad, UCR)

“Evolution Equation in Metric Graphs: Quantum Graphs and Contraction Semigroups”

FRIDAY, 8th

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Curtis Pro, UCR)

“On the Rigidity of the Riemannian Submersions of Non-Negatively Curved Manifolds”

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (David Rush)



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week October 11th – 15th, 2010

TUESDAY, 12th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:00PM, SURGE 268

TOPOLOGY (Chris Carlson, UCR)
"Spectral Sequences"

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari, UCR)

"An Application of Global Weyl Modules to Invariant Theory"

12:40-2:00PM, SURGE 277

INTERSECTION THEORY (Ziv Ran)

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (Victor Shapiro, UCR)
"History, Number Theory, Trig Series"

WEDNESDAY, 13th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)
"Koszul Comology and Cohen-Macaulay Modules"

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (Juhi Jang, UCR)

"Existence Theory of Compressible Euler Equations in a Vacuum"

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Fred Wilhelm/Julie Bergner)
TBA

THURSDAY, 14th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP (Jonathan Sarhad, UCR)

"The Heat Kernel on a Compact Interval via the Method of Images"

12:40-2:00PM, SURGE 284

LIE THEORY (Apoorva Khare, Yale University)

"Koszulity of Blocks in Category O over Generalized Weyl Algebras"

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS (Robert G. Niemeyer, UCR)

"Flat Surfaces I – an Introduction to the Subject"

FRIDAY, 15th

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Lina Lee, UCR)

"On the Invariant Metrics"

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (David Rush)

Other – Information on Reg.

marta@math.ucr.edu

Operator Algebras and Related Topics (Marta Asaeda)

**contact Marta weekly for info as this seminar meets at different days/times/places each week.



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Lie Theory

Apoorva Khare
(Yale University)

“Koszulity of Blocks in Category O over Generalized Weyl Algebras”

Abstract: Generalized Weyl algebras (GWAs) include well-known examples such as the Weyl algebra and classical and quantum $s(2)$. At the same time, they contain "non-Noetherian examples" such as continuous Hecke algebras (defined by Etingof, Gan, and Ginzburg). We study blocks of the BGG category O over a GWA, with finitely many simple objects. We compute the Ext-quiver (with relations) of the endomorphism algebra of the projective generator. We also show that this algebra is Koszul and satisfies the Strong Kazhdan-Lusztig condition.

Thursday, October 14th, 2010

Surge 284

1:00-2:00pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week October 18th – 22nd, 2010

TUESDAY, 19th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:00PM, SURGE 268

TOPOLOGY (Azadeh Rafizadeh, UCR)

“Twisted Alexander polynomials and fiberability”

12:40-2:00PM, SURGE 284

LIE THEORY (Eric Friedlander, USC)

“Constructions of finite group schemes”

*12:40-1:30PM, HMNSS 1405

SPECIAL SEMINAR (Susan Friedlander, USC)

“Global Well-Posedness for a Class of Active Scalar Equations”

12:40-2:00PM, SURGE 277

INTERSECTION THEORY (Ziv Ran)

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (M. M. Rao)

*4:10-5:00PM, SURGE 284

R. BLOCK DISTINGUISHED LECTURE SERIES (Eric Friedlander, USC)

“Elementary modular representation theory”

WEDNESDAY, 20th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)

“Hartshorne’s Connectedness Theorem and Injective Hulls”

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (James Kelliher/Qi Zhang)

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Fred Wilhelm/Julie Bergner, UCR)

Discussion

THURSDAY, 21st

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP (Hafedh Herichi, UCR)

“On the invertibility of the spectral operator”

12:40-2:00PM, SURGE 284

LIE THEORY (Sam Chamberlin, UCR)

“Integral Bases for the Universal Enveloping Algebra of $\mathfrak{g} \otimes A$ ”

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS (Nishu Lal, UCR)

“Product structure of the spectral zeta function of the Sturm-Liouville operator on fractals”

FRIDAY, 22nd

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Zhang-Dan Guan, UCR)

“Hilbert Seventh Problem and the Classification of Compact Complex Solvmanifolds”

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (Kuei-Nuan Lin, UCR)

“Rees Algebras and Diagonal Ideals”

Other – Information on Req.

marta@math.ucr.edu

Operator Algebras and Related Topics (Marta Asaeda)

**contact Marta weekly for info as this seminar meets at different days/times/places each week.



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Lie Theory

Samuel Chamberlin
(UCR)

“Integral Bases for the Universal Enveloping Algebra of
 $\mathfrak{g} \otimes A$ ”

Abstract:

Given a finite dimensional simple Lie algebra \mathfrak{g} over \mathbf{C} and a commutative associative \mathbf{C} -algebra with unity A , we exhibit a \mathbf{Z} -form for the universal enveloping algebra of $\mathfrak{g} \otimes A$ and an explicit \mathbf{Z} -basis for this \mathbf{Z} -form. We also produce explicit commutation formulas in the universal enveloping algebra of $\mathfrak{sl}_2 \otimes A$ that allow us to write certain elements in Poincaré-Birkhoff-Witt order.

Thursday, October 21st, 2010

Surge 284

1:00-2:00pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week October 25th – 29th, 2010

TUESDAY, 26th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

10:10-11:00AM, SURGE 284

OPERATOR ALGEBRAS AND RELATED TOPICS (Marta Asaeda, UCR)
"Operator Algebras for Complete Beginners"

11:10-12:00PM, SURGE 268

TOPOLOGY (Michael Williams, UCR)

"Background Talk 1: Some topics in 3-dimensional topology"

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (Distinguished Emeritus, Victor Shapiro, UCR)
"History and uniqueness of trig series"

WEDNESDAY, 27th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (John Dusel, UCR)

"An Exposition of 'On Character Sums and Primitive Roots', by D.A. Burgess (1962)"

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (Gung Min Gie, UCR)

"Boundary layer analysis of some singular perturbation problems"

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Barbara Herzog, UCR/Philip Hackney, UCR)

Herzog: "Rational Spaces cont'd" & Hackney: "Commutative cochain algebras"

THURSDAY, 28th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP (Prof. Zair Ibragimov, CSUF)

"Canonical decompositions of ultrametric spaces"

12:40-2:00PM, SURGE 284

LIE THEORY (Wee Liang Gan, UCR)

"Necklace Lie bialgebra"

*2:00-3:30PM, SURGE 284

INTERSECTION THEORY (Ziv Ran)

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS (Prof. Zair Ibragimov, CSUF)

"Hyperbolization of hyperspaces"

FRIDAY, 29th

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Bun Wong, UCR)

"Curvature and rational connectedness on complex manifolds"

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (Kuei-Nuan Lin, UCR)

"Rees Algebras of Diagonal Ideals (II)"



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Fractal Research Group

Zair Ibragimov
(CSUF)

“Canonical decompositions of ultrametric spaces”

Abstract: We discuss metric tree associated with ultrametric spaces based on their canonical decompositions.

Well-known examples of ultrametric spaces are the field of p -adic numbers. We begin the talk by discussing the metric tree construction for the p -adic integers and then discuss similar constructions for arbitrary compact ultrametric spaces.

Thursday, October 28th, 2010

Surge 284

11:10-12:30pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Mathematical Physics

Zair Ibragimov
(CSUF)

“Hyperbolization of hyperspaces”

Abstract: A hyperspace of a metric space is the collections of its non-degenerate subsets and can be thought of as families of coverings of the space at every scale. By studying the asymptotic properties of the hyperspaces one hopes to gain some information about the space. Hyperbolization of hyperspaces (in the sense of Gromov) is a way to investigate their asymptotic behavior. After discussing the notion of Gromov hyperbolicity, we describe a procedure to hyperbolize hyperspaces of ultrametric spaces. We then discuss the procedure for arbitrary metric spaces and discuss associated extension operators.

Thursday, October 28th, 2010

Surge 284

3:40-5:00pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

COLLOQUIUM

Jacob Greenstein
(UCR)

"Quantum Deformations, old and new"

Abstract:

There are two traditional sources of quantum algebras. One is provided by non-commutative deformations of (commutative) algebras of functions on a Lie group or more generally on a suitable manifold (or algebraic variety), together with its natural Poisson structure. The other ("dual") is provided by "quantizing" already non-commutative objects, namely universal enveloping algebras of simple finite dimensional Lie algebras (or their generalizations known as Kac-Moody Lie algebras). One important property of these deformations is their "flatness": the deformation parameter can be specialized and the resulting objects share many properties. In particular, quantum algebras admit very remarkable bases (called Lusztig's canonical bases) which are preserved by natural symmetries and are compatible with specialization. In the present talk, I will review these notions and discuss some new quantum deformations discovered when we attempted to understand Lusztig's geometric construction of canonical bases for non-simply laced Lie algebras from the algebraic point of view (joint work with A. Berenstein).

Wednesday, October 27th, 2010

Surge 284

4:10-5:00pm

Tea Time at 3:40pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week of November 1st – 5th, 2010

TUESDAY, 2nd

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

10:10-11:00AM, SURGE 284

OPERATOR ALGEBRAS AND RELATED TOPICS (Marta Asaeda)

11:10-12:00PM, SURGE 268

TOPOLOGY (Michael Williams, UCR)

“Background Talk 2: Dehn surger on knots and links”

12:40-2:00PM, SURGE 284

LIE THEORY (Akaki Tikaradze, University of Toledo)

“Modular representations of almost commutative algebras”

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (James Stafney, UCR)

“Pisot Numbers and Theorem of Pisot”

WEDNESDAY, 3rd

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)

“Minimal Injective Resolutions and Gorenstein Rings”

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (Walter Rusin, USC)

“Minimal initial data for potential Navier-Stokes singularities”

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Philip Hackney, UCR)

“Commutative cochain algebras, cont’d”

THURSDAY, 4th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP (Robert G. Niemeyer, UCR)

“Flat surfaces II – an introduction to the subject”

12:40-2:00PM, SURGE 284

LIE THEORY (Irfan Bagci, UCR)

“Cohomology of Restricted Lie Superalgebras”

2:00-3:30PM, SURGE 284

INTERSECTION THEORY (Ziv Ran)

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS (Hafedh Herichi, UCR)

“On the invertibility of the spectral operator, part 2”

FRIDAY, 5th

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Owen Dearnicott, UCR)

“Equations with Quaternions”

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (David Rush)



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Lie Theory

Akaki Tikaradze
(University of Toledo)

“Hyperbolization of hyperspaces”

Abstract: Examples of almost commutative algebras are abundant in representation theory. In positive characteristic, these algebras tend to be finite over their centers. In this talk I will discuss Kac-Weisfeiler type estimates for dimensions of irreducible modules of an almost commutative algebra in terms of dimensions of symplectic leaves of the corresponding Poisson variety. Applications to symplectic reflection algebras will be discussed.

Tuesday, November 2nd, 2010

Surge 284

1:00-2:00pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

COLLOQUIUM

Mario Micheli
(UCLA)

**"The differential geometry of the Riemann manifold of Landmark points:
metrics, geodesics, curvature, with applications to image processing"**

Abstract: In the past few years there has been a growing interest, in diverse scientific communities, in endowing Shape Spaces with Riemannian metrics, so to be able to measure similarities between shapes and perform statistical analysis on data sets (e.g. for object recognition, target detection and tracking, classification, and automated medical diagnostics).

The knowledge of curvature on a Riemannian manifold is essential in that it allows one to infer about the existence of conjugate points, the behavior of geodesic curves, the well-posedness of the problem of computing the implicit mean (and higher statistical moments) of samples on the manifold, and more. In shape analysis such issues are of fundamental importance since they allow one to build templates, i.e. shape classes that represent typical situations in different applications (e.g. in the field of computational anatomy).

The actual differential geometry of Shape Spaces has started to emerge only very recently: in this talk we will explore the sectional curvature for the Shape Space of landmark points, endowed with the Riemannian metric induced by the action of a diffeomorphism group. Applications to Image Processing will be discussed and numerical results will be shown.

Wednesday, November 3rd, 2010

Surge 284

4:10-5:00pm

Tea Time at 3:40pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week of November 8th – 12th, 2010

TUESDAY, 9th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

10:10-11:00AM, SURGE 284

OPERATOR ALGEBRAS AND RELATED TOPICS (Mang Wu, UCR)

“A Brownian motion on the group of diffeomorphisms of the circle”

11:10-12:00PM, SURGE 268

TOPOLOGY (Michael Williams, UCR)

“Handle number one links and Generalized Property R”

12:40-2:00PM, SURGE 284

LIE THEORY (Eliana Zoque, UCR)

“Kostka polynomials in Lie Theory”

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (Lucas Randall, UCR)

“Hardy-Orlicz Spaces”

WEDNESDAY, 10th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (John Dusel, UCR)

“An exposition of ‘On character sums and primitive roots’ by d.h. burgess, part 2

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)

“Gorenstein Rings”

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (James Kelliher)

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Philip Hackney, UCR)

“Cochain algebras for real this time (maybe)”

THURSDAY, 11th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY

CANCELED FOR HOLIDAY

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP

CANCELED FOR HOLIDAY

12:40-2:00PM, SURGE 284

LIE THEORY

CANCELED FOR HOLIDAY

2:00-3:30PM, SURGE 284

INTERSECTION THEORY

CANCELED FOR HOLIDAY

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS

CANCELED FOR HOLIDAY

FRIDAY, 12th

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Daniele Grandini, UCR)

“Topological degroupoidification and weak pull-backs”

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (David Rush, UCR)

“Exact pairs of zero divisors and applications to free resolutions”



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Lie Theory

Eliana Zoque
(UCR)

“Kostka polynomials in Lie theory”

Abstract:

In this talk I will present present combinatorial definitions of Kostka numbers and Kostka polynomials, their connection to the algebra of invariant polynomials and some applications to Lie Theory.

Tuesday, November 9th, 2010

Surge 284

1:00-2:00pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Operator Algebras & Related Topics

Mang Wu
(UCR)

“A Brownian motion of the group diffeomorphisms of the circle”

Abstract: The group $\text{Diff}(S^1)$ of diffeomorphisms of the circle arises in many places in mathematical physics. It is an infinite dimensional Frechet Lie group. Since it is not locally compact, we cannot expect a Haar measure on it. But by constructing a Brownian motion on it, we can induce a family of measure on it. In part I of the talk, I will review basics of the group $\text{Diff}(S^1)$ and Brownian motions. In part II of the talk, I will construct a Brownian motion on $\text{Diff}(S^1)$ by solving a stochastic differential equation (SDE).

Tuesday, November 9th, 2010

Surge 284

10:10-11:00am



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Commutative Algebra

Ines Henriques
(UCR)

“Exact pairs of zero divisors and applications to free resolutions”

Abstract: Commutative algebra had its origins in the study of systems of polynomial equations in several variables. Free resolutions are objects that arise from the study of systems of linear equations over rings. They define numerical invariants of the system of linear equations, which reflect properties of the ring over which it being solved. We will discuss the behavior of resolutions under change of ring modulo a special type of zero divisor, we define to be an exact zero divisor. In addition, we will discuss the ascent and descent of structural properties of the ring modulo exact zero divisors.

Friday, November 12th, 2010

Surge 284

4:10-5:00pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week of November 16th – 19th, 2010

TUESDAY, 16th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

10:10-11:00AM, SURGE 284

OPERATOR ALGEBRAS AND RELATED TOPICS (Mang Wu, UCR)
TBA

11:10-12:00PM, SURGE 268

TOPOLOGY (Philip Hackney, UCR)
"Operators and operations"

12:40-2:00PM, SURGE 284

LIE THEORY (Christopher Walker, UCR)
"Hopf algebra structures for Hall Algebras"

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (Lucas Randall, UCR)
"Hardy Spaces"

WEDNESDAY, 17th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough)

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (James Kelliher)

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Julie Bergner, UCR)
"Construction of $A(K)$ "

THURSDAY, 18th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP (Nishu Lal)
"The Shubin invariant for the Sturm-Liouville operator on $[0,1]$ "

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

2:00-3:30PM, SURGE 284

INTERSECTION THEORY (Ziv Ran)

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS & DYNAMICAL PHYSICS (Michael Maroun, UCR)
"The Feynman Integral"

FRIDAY, 19th

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Sung Rak Choi, UCR)
"Base locus and the LMMP"

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA (Inês B. Henriques, UCR)
"Exact pairs of zero divisors and applications to free resolutions II"



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Lie Theory

Christopher Walker
(UCR)

“Hopf algebra structures for Hall algebras”

Abstract: One problematic feature of Hall algebras is the fact that the standard multiplication and comultiplication maps do not satisfy the bialgebra compatibility condition in the underlying symmetric monoidal category Vect . In the past this problem has been resolved by working with a weaker structure called a ‘twisted’ bialgebra. In this talk we will present a different solution by first switching to a new underlying category Vect^K of vector spaces graded by a group K called the Grothendieck group. We equip this category with a nontrivial braiding which depends on the K -grading. With this braiding, we find that the Hall algebra does satisfy the bialgebra condition exactly for the standard multiplication and comultiplication in this category, and can also be equipped with an antipode, making it a Hopf algebra object in Vect^K .

Tuesday, November 16th, 2010

Surge 284

1:00-2:00pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week of November 22nd – 26th, 2010

TUESDAY, 23rd

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

10:10-11:00AM, SURGE 284

OPERATOR ALGEBRAS AND RELATED TOPICS (Dominick Scaletta, UCR)
"Operator Methods in Quantum Theory and Uncertainty Relations"

11:10-12:00PM, SURGE 268

TOPOLOGY (Philip Hackney, UCR)

TBA

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

3:40-5:00PM, SURGE 268

FUNCTIONAL ANALYSIS (Mang Wu, UCR)

"Exponential map of the group of diffeomorphisms of the circle"

WEDNESDAY, 24th

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA

CANCELED FOR THIS WEEK

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (Qi Zhang, UCR)

"A Liouville theorem for axially symmetric Navier-Stokes equations"

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Julie Bergner, UCR)

TBA

THURSDAY, 25th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY

CANCELED – HOLIDAY

11:10-12:30PM, SURGE 268

FRACTAL RESEARCH GROUP

CANCELED – HOLIDAY

12:40-2:00PM, SURGE 284

LIE THEORY

CANCELED – HOLIDAY

2:00-3:30PM, SURGE 284

INTERSECTION THEORY

CANCELED – HOLIDAY

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS & DYNAMICAL PHYSICS

CANCELED – HOLIDAY

FRIDAY, 26th

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY

CANCELED – HOLIDAY

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA

CANCELED – HOLIDAY



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Operator Algebras & Related Topics

Dominick Scaletta
(UCR)

“Operator Methods in Quantum Theory and Uncertainty
Relations”

Abstract: I will develop the mathematical formalism of quantum mechanics by precisely defining states and observables. With these tools I will discuss expectation values, which are what give us physical predictions. I will then define the commutation relation of operators and their physical implications. I will finish by proving Heisenberg’s uncertainty principle, and if time allows, the time-energy uncertainty relation. I will not assume prior knowledge of quantum mechanics.

Tuesday, November 23rd, 2010

Surge 284

10:10-11:00am



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Functional Analysis

Mang Wu
(UCR)

“Exponential Map of the Group of diffeomorphisms of the circle”

Abstract: For finite dimensional Lie group, exponential map is always a local diffeomorphism. This is not true for infinite dimensional Lie groups. The group $\text{Diff}(S^1)$ of infinitely differentiable diffeomorphisms of the circle is an infinite dimensional Frechet Lie group. Milnor showed that the exponential map of $\text{Diff}(S^1)$ is not a local diffeomorphism. In this talk, I will examine some related groups that might have the exponential map being a local diffeomorphism.

Tuesday, November 23rd, 2010

Surge 268

4:00-5:00pm



UNIVERSITY OF CALIFORNIA, RIVERSIDE

Department of Mathematics

Calendar of Events For the Week of November 29th – December 3rd, 2010

TUESDAY, 30th

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

10:10-11:00AM, SURGE 284

OPERATOR ALGEBRAS AND RELATED TOPICS (Dominick Scaletta, UCR)
"Principal Fiber Bundles and the Hopf Fibration in Quantum Theory 1:
Mathematical Foundations"

11:10-12:00PM, SURGE 268

TOPOLOGY (Dennis Gumaer, UCR)
TBA

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

3:40-4:30PM, SURGE 268

FUNCTIONAL ANALYSIS (James Stafney, UCR)
"The Wiener Algebra is not Operator Algebra"

WEDNESDAY, 1st

11:10-12:00PM, SURGE 268

COMBINATORIAL NUMBER THEORY (Mei-Chu Chang)

11:10-12:00PM, SURGE 277

TOPICS IN COMMUTATIVE ALGEBRA (Jason McCullough, UCR)
"Local Duality"

1:10-2:00PM, SURGE 284

PARTIAL DIFFERENTIAL EQUATIONS (Mark Rosin, UCLA)
"Plasmas, Asymptotic Closures and Boltzmann Equation"

1:10-2:00PM, SURGE 268

RATIONAL HOMOTOPY THEORY (Julie Bergner)
Discussion

THURSDAY, 2nd

8:10-9:30AM, SURGE 268

ALGEBRAIC GEOMETRY (Ziv Ran)

11:10-12:30PM, SURGE 268

FRactal RESEARCH GROUP (Dr. Dana Clahane, Fullerton College)
"Zeta Functions and Riemann Hypotheses on multicomplex spaces,
toward complex Clifford algebras"

12:40-2:00PM, SURGE 284

LIE THEORY (Vyjayanthi Chari)

2:00-3:30PM, SURGE 284

INTERSECTION THEORY (Ziv Ran)

3:40-5:00PM, SURGE 268

MATHEMATICAL PHYSICS & DYNAMICAL PHYSICS (Dominick Scaletta, UCR)
"Applications and the Hopf Fibration in Quantum Physics"

FRIDAY, 3rd

*10:30-12:00PM, SURGE 284

***SPECIAL FRACTAL RESEARCH GROUP SEMINAR** (Scott Childress, UCR)
"Statistical Mechanics and Fractal Strings: Bringing ISRZ to Real Life
Using a Fictional Methodology"

11:10-12:00PM, SURGE 268

DIFFERENTIAL GEOMETRY (Barbara Herzog, UCR)
"Toward a notion of index for critical points of distance functions"

4:10-5:00PM, SURGE 284

COMMUTATIVE ALGEBRA *Canceled*****



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Operator Algebras & Related Topics

Dominick Scaletta
(UCR)

“Principal Fiber Bundles and the Hopf Fibration in Quantum
Theory 1: Mathematical Foundations”

Abstract: I will introduce the definition of a fiber bundle, and give some traditional examples, such as a Möbius band, a covering space and the tangent bundle. I will then define principal fiber bundles and their associated vector bundles, and discuss the Hopf fibration in some detail. I will define Ehresmann connections on principle bundles and discuss their many uses, such as defining curvature and holonomy. These mathematical topics have far reaching application in theoretical physics, and I will mention some motivations to this. After the mathematical theory is developed I will give many examples of its application in future talks.

Tuesday, November 30th, 2010

Surge 284

10:10-11:00am



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Partial Differential Equations

Mark Rosin
(UCLA)

“Plasmas, Asymptotic Closures and Boltzmann Equation”

Abstract: Whilst neutral fluids rely on collisions to close the moment hierarchy of the underlying Boltzmann equation, plasmas (ionized gases) can invoke another asymptotically large closure parameter, the particle "gyro-frequency". The resultant (plasma) fluid equations support new instabilities with important physical ramifications. One of these instabilities is known as the firehose instability. Simple theories describing this instability tend to be ill-posed and so, starting from the Boltzmann equation, a well-posed non-linear theory is developed and analyzed with surprising results.

Wednesday, December 1st, 2010

Surge 284

1:10-2:00pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Mathematical Physics & Dynamical Physics

Dominick Scaletta
(UCR)

“Applications and the Hopf Fibration in Quantum Physics”

Abstract: I will introduce the definition of a fiber bundle, and give some traditional examples, such as a Möbius band, a covering space and the tangent bundle. I will then define principal fiber bundles and their associated vector bundles, and discuss the Hopf fibration in some detail. I will define Ehresmann connections on principle bundles and discuss their many uses, such as defining curvature and holonomy. These mathematical topics have far reaching application in theoretical physics, and I will mention some motivations to this. After the mathematical theory is developed I will give many examples of its application in future talks.

Thursday, December 2nd, 2010

Surge 268

3:40-5:00pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Fractal Research Group

Dana Clahane
(Fullerton College)

“Zeta Functions and Riemann Hypotheses on multicomplex spaces, toward complex Clifford algebras”

Abstract: Let j be a non-real and non-complex object, and define the "product" of j with itself to be 1. j here is called a "hyperbolic imaginary unit." The bicomplex, or 2-complex numbers, are all expressions of the form $z+jw$, where z and w are complex numbers, which we call 1-complex numbers. In a similar fashion, for each positive integer n that is at least 2, we can define, more generally, the n -complex numbers, by recursively taking the n -complex numbers to be all expressions of the form $z+j_nw$, where j_n is the n th hyperbolic imaginary unit not equal to any previous such units for $1,2,\dots,n-1$, and z and w are $(n-1)$ -complex numbers. The n -complex numbers form a commutative algebra with multiplication $(z+j_nw)(c+j_nd)$ defined by ordinary polynomial multiplication. Although $(1+j_n)/2$ and its conjugate are zero-divisors in this setting, this existence of zero-divisors turns out to be an advantage in many ways. I will give an introduction to properties of these numbers and describe a result of D. Rochon showing that the Riemann Hypothesis and a Bicomplex Riemann Hypothesis are equivalent and discuss multicomplex spectral and geometric zeta functions. If time permits, I will discuss the open problem of whether or not there is a tricomplex Riemann Hypothesis.

Thursday, December 2nd, 2010

Surge 268

11:10-12:30pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

Special Fractal Research Group Seminar

Scot Childress (UCLA)

“Statistical Mechanics and Fractal Strings: Bringing ISRZ to Real Life Using a Fictional Methodology”

Abstract: In my thesis, “Quantum Measures, Arithmetic Coils, and Generalized Fractal Strings” I began a study of physical models of fractal strings via a vie ISRZ. Since then I have found a large portion of what I did to be more or less right, some of it to be morally right, and still more of it to be wholly, immorally wrong. I have continued to investigate the connections between Statistical Mechanics (spec. phase space dynamics) in modern physical theories and the behaviors and constructions of fractal membranes/coils. In this talk I will give an introduction to a number of the points of contact between these fields, give an update on the progress of my current work, and discuss some of the current difficulties and future directions for the path that I have been pursuing.

Suggested Background Reading: ISRZ, FGCD, FGNT, Classical Mechanics (Goldstein), Mathematical Foundations of Statistical Mechanics (Kinchin), Introduction to Quantum Mechanics (Hannabus), Quantum Theory (A. Bohm)

Friday, December 3rd, 2010

Surge 284

10:30-12:00pm



UNIVERSITY OF CALIFORNIA RIVERSIDE

DEPARTMENT OF MATHEMATICS

COLLOQUIUM

Professor Herbert Heyer
(Univ. Tübingen)

"Bessel Random Walks of Higher Rank"

Abstract:

[There is no abstract, but the subject will be detailed in the talk and new developments will be discussed.]

Friday, December 3rd, 2010

Surge 284

4:10-5:00pm

Tea Time at 3:40pm