MONDAY, 2nd
4:10-5:30PM, SURGE 268  NETWORK THEORY | Dr. John Baez
4:10-5:00PM, SURGE 284  MATH CLUB | Mikahl Banwarth-Kuhn, UC Riverside
                      “Randomization and the Probabilistic Method”
TUESDAY, 3rd
9:40-11:00AM, SURGE 284  ALGEBRAIC GEOMETRY | Dr. Ziv Ran
11:10AM-12:00PM, SURGE 268  TOPOLOGY | Dr. Greg Chadwick, UC Riverside
                      “Cobordism, Thom spectra, and stable homotopy theory”
1:00-2:00PM, SURGE 284  LIE THEORY | Dr. Vyjayanthi Chari
*3:40-5:00PM, SURGE 284  COLLOQUIUM | Dr. Kenneth Ho, Stanford
                      "Fast direct methods for structured matrices"
WEDNESDAY, 4th
11:10AM-12:00PM, SURGE 268  COMBINATORIAL NUMBER THEORY | Dr. Mei-Chu Chang
11:10AM-12:00PM, SURGE 284  PDE & APPLIED MATHEMATICS | Dr. Moradifam / Dr. Blass
12:10-1:00PM, SURGE 277  FLUIDS | Dr. Jim Kelliher
3:40-5:00PM, SURGE 284  COLLOQUIUM | Dr. Jitka Stehnova, Mount Mercy University
                      "Theta Correspondence for p-adic Groups"
THURSDAY, 5th
11:10-12:30PM, SURGE 268  FRACTAL RESEARCH GROUP | Scott Roby, UC Riverside
1:00-2:00PM, SURGE 284  LIE THEORY | Dr. Vyjayanthi Chari
3:40-5:00PM, SURGE 268  MATHEMATICAL PHYSICS & DYNAMICAL SYSTEMS | Dr. Zhiqiang Li, UCLA
                      “Ergodic Theory for Expanding Thurston Maps”
FRIDAY, 6th
11:10AM-12:00PM, SURGE 268  DIFFERENTIAL GEOMETRY | Dr. Richard Bamler, UC Berkeley
                      “On the scalar curvature blow up conjecture in Ricci flow”
1:10-2:00PM, SURGE 284  GRAD STUDENT SEMINAR | Grad Students
                      TBA
3:10-4:00PM, SURGE 268  COMMUTATIVE ALGEBRA | Dr. David Rush
There are some problems for where it is very difficult computationally to find the exact answer. What can you do in this situation? Randomize! Using some tools from probability theory, you can show that a random solution "on average" provides a very fast, very easy solution that's at least a decent approximation to the (much harder) exact solution. We'll be focusing on a specific example known as the Max-Cut problem.

Snacks and drinks served!
Many linear systems arising in practice are governed by rank-structured matrices. Examples include PDEs, integral equations, Gaussian process regression, etc. In this talk, we describe our recent work on fast direct algorithms that exploit such structure. These methods are of particular interest due to their exceptional robustness and high capacity for information reuse. Our main technical achievement is a linear-complexity matrix factorization as a generalized LU decomposition. This factorization permits fast multiplication/inversion and furthermore supports rapid updating. We anticipate that such techniques will be game-changing in environments requiring the analysis of many right-hand sides or the solution of many closely related systems, such as in protein design or other inverse problems. Similar applications abound in computational statistics and data analysis.
In this talk, we will explore the representation theory of lower dimensional p-adic groups. Specifically, we will discuss the pairing of supercuspidal representations in the theta correspondence associated to a reductive dual pair of (U(1,1), U(2)) over p-adic field with p-odd. We will use the theory of types and lattice models. Additionally, last part of the talk will also address the undergraduate research projects as well as STEM outreach programs.
Dr. Zhiqiang Li, UCLA
UC Los Angeles

“On the Assouad dimension of self-similar sets with overlaps”

Abstract:

Thurston maps are a class of branched covering maps on the 2-sphere that arose in W. Thurston’s characterization of postcritically finite rational maps. By imposing a natural expansion condition, M. Bonk and D. Meyer investigated a subclass of Thurston maps known as expanding Thurston maps, which turned out to enjoy nice topological, metric, and dynamical properties. This talk will summarize known results and new developments on the ergodic theory for expanding Thurston maps, with an emphasis on thermodynamical formalism. We will first introduce expanding Thurston maps with some motivation from their connection to other topics of mathematics. We will then use thermodynamical formalism to sketch a proof for the existence, uniqueness, and exactness of equilibrium states for expanding Thurston maps and H’older continuous potentials. Equidistribution results of periodic points and preimages will also be discussed.

Thursday, February 5th, 2015
Surge 268
3:40 – 5:00 p.m.
“On the scalar curvature blow up conjecture in Ricci flow”

Abstract:

It is a basic fact that the Riemannian curvature becomes unbounded at every finite-time singularity of the Ricci flow. Sesum show that, more precisely, even the Ricci curvature becomes unbounded at every such singularity. Whether the same can be said about the scalar curvature has since remained conjecture, which has resisted several attempts of resolution.

In this talk, I will present a new result that partially confirms the conjecture in dimension 4 and motivates some interesting questions in 4 dimensional Ricci flow. Its proof relies on a combination of multi-scale arguments and Perelman’s Harnack inequality on the conjugate heat equation. As a byproduct, we obtain an unconventional backward pseudolocality theorem, which hold in any dimension.

This project is joint work with Qi Zhang.

Friday, February 6th, 2015
Surge 268
11:10 a.m. – 12:00 noon