BAY AREA DIFFERENTIAL GEOMETRY SEMINAR

SATURDAY, APRIL 23, 2011

STANFORD UNIVERSITY

Department of Mathematics

Room 380-C

David Bao (San Francisco State University), Robert Bryant (Mathematical Sciences Research Institute), Joel Hass (University of California, Davis), David Hoffman (Stanford University), Rafe Mazzeo (Stanford University), Richard Montgomery (University of California, Santa Cruz)*

The Bay Area Differential Geometry Seminar meets three times each year and is a one-day seminar on recent developments in differential geometry and global analysis, broadly interpreted. The April meeting at Stanford will conclude with a banquet dinner that will be subsidized for students and postdocs. Please use the signup form to register for the seminar and to indicate whether or not you will attend the banquet. Spouses and significant others are invited to the dinner. Problems? Email *hoffman@math.stanford.edu*.

The Maps and Direction Page will help you get to Stanford. The department is located on the northwest corner of the Main Quad on the Stanford University Campus in Building Number 380 The campus map and the mathematics department map will help you find the meeting. Parking is unrestricted on the weekends.

10:00 AM ***Reception. Coffee and rolls***

11:00 AM **Guofang Wei, University of California, Santa Barbara**

COMPARISON GEOMETRY AND RICCI SOLITONS

12:00 PM: ***Lunch***
(There are many places to eat on the Campus and in Palo Alto)

1:30 PM: ***Business meeting***

2:00 PM: **David Hoffman, Stanford University**

LIMITS OF EMBEDDED MINIMAL DISKS

3:00 PM ***Afternoon Coffee and Cake***

3:45 PM **Misha Kapovich, University of California, Davis**

RAAGS IN HAM

6:00 PM **Banquet**

This meeting of the BADGSeminar is supported by the
MATHEMATICS RESEARCH CENTER of STANFORD UNIVERSITY

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Misha Kapovich, University of California, Davis

RAAGs in Ham

Abstract. "RAAGs" are Right Angled Artin Groups and "Ham" is the group of hamiltonian symplectomorphisms of a symplectic manifold. I will explain how to embed any RAAG in any Ham. In particular, any Ham contains fundamental groups of hyperbolic manifolds for arbitrary dimension. The proof is a combination of topology, geometry and analysis: We will start with embeddings of RAAGs in the mapping class groups of hyperbolic surfaces (topology), then will promote these embeddings to faithful hamiltonian actions on the 2-sphere, supported on a disk (hyperbolic geometry and analysis).

David Hofffman, Stanford University

Limits of Embedded Minimal Disks

Abstract. Given a sequence of properly embedded minimal disks in a subset $\mathbf{R}^3$, a subsequence will converge—away from the points where the curvature blows up—to a limit lamination by embedded minimal surfaces. What is the nature of the blowup set? What kinds of limit laminations can occur? I will discuss joint work with Brian White, in which we prove that any closed subset of a line can occur as the blowup set and, surprisingly, catenoids can occur as limit leaves. This contrasts strongly with a famous result of Colding-Minicozzi, Meeks, which states in essence that the only thing that can happen globally is what happens when the disks are rescaled helicoids: the singular set is a line corresponding to the axis Z, and the limit lamination is the foliation of $\mathbf{R}^3 \setminus Z$ by punctured planes orthogonal to Z. Our methods work in more general three-manifolds. In particular, they apply to hyperbolic space, where the global results are very different from the Euclidean case.

Guofang Wei, University of California, Santa Barbara

Comparison Geometry and Ricci Solitons

Abstract. Ricci solitons are natural extension of Einstein metrics. They also play an important role in the theory of Ricci flow. We will talk about comparison theorems for smooth metric measure space developed with Will Wylie. We will then apply the volume comparison to study the growth of potential function of gradient steady Ricci soliton. This part of work is joint with Peng Wu.