

Seminar & Events Bulletin: Geometry
01-01-2012 to 06-30-2012

Friday, January 13, 2012

3:00pm-4:00pm **Geometry** -- Alexandra Popa (SUNY Stony Brook) *Two-Point Gromov-Witten Formulas for Symplectic Toric Manifolds* -- 3096 East Hall

Friday, January 27, 2012

3:00pm-4:00pm **Geometry** -- Aaron Naber (MIT) *Quantitative Stratification and regularity for Einstein manifolds, harmonic maps and minimal surfaces* -- 3096 East Hall

Friday, February 10, 2012

3:00pm-4:00pm **Geometry** -- Zuoqin Wang (U Michigan) *On lower bounds for nodal sets of Laplacian eigenfunctions* -- 3096 East Hall

Friday, February 17, 2012

3:00pm-4:00pm **Geometry** -- Francois Ledrappier (U Notre Dame) *Entropy rigidity for non-positively curved compact manifolds* -- 3096 East Hall

Friday, February 24, 2012

3:00pm-4:00pm **Geometry** -- () *no meeting* -- 3096 East Hall

Friday, March 02, 2012

3:00pm-4:00pm **Geometry** -- () *no meeting* -- 3096 East Hall

Friday, March 16, 2012

3:00pm-4:00pm **Geometry** -- Mehdi Lejmi (U Minnesota) *Deformations of extremal almost-Kahler metrics* -- 3096 East Hall

Friday, April 06, 2012

3:00pm-4:00pm **Geometry** -- Lizhen Ji (U Michigan) *Geometric topology of moduli spaces of Riemann surfaces* -- 3096 East Hall

Friday, April 13, 2012

3:00pm-4:00pm **Geometry** -- Jon Wolfson (MSU) *Three manifolds of constant vector curvature* -- 3096 East Hall

Friday, April 20, 2012

3:00pm-4:00pm **Geometry** -- Pedro Ontaneda (SUNY Binghamton) *Smooth Hyperbolization* -- 3096 East Hall

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Abstracts

Geometry

Friday, January 13, 2012, 3:00pm-4:00pm

3096 East Hall

Alexandra Popa (SUNY Stony Brook)

Two-Point Gromov-Witten Formulas for Symplectic Toric Manifolds

The genus 0 Gromov-Witten invariants of a complete intersection in a smooth projective variety are twisted invariants of the ambient space arising from a convex vector bundle. I will explain formulas involving genus 0 two-point twisted Gromov-Witten invariants induced by a concave vector bundle over a symplectic toric manifold, consequences, and ideas behind the proofs.

When the ambient space is a projective space, these formulas have been used to compute the genus 1 Gromov-Witten invariants of Calabi-Yau complete intersections and to confirm recent mirror symmetry predictions concerning open and unoriented genus 1 invariants. The two-point formulas described in this talk should lead to such results in arbitrary symplectic toric manifolds.

Geometry

Friday, January 27, 2012, 3:00pm-4:00pm

3096 East Hall

Aaron Naber (MIT)

Quantitative Stratification and regularity for Einstein manifolds, harmonic maps and minimal surfaces

In this talk we discuss new techniques for taking ineffective local, e.g. tangent cone, understanding and deriving from this effective estimates on regularity. Our primary applications are to Einstein manifolds, harmonic maps between Riemannian manifolds, and minimal surfaces. For Einstein manifolds the results include, for all $p < 2$, 'a priori' L^p estimates on the curvature $|Rm|$ and the much stronger curvature scale $r_{|Rm|}(x) = \max\{r > 0: \sup_{B_r(x)} |Rm| \leq r^{-2}\}$. If we assume additionally that the curvature lies in some L^q we are able to prove that $r^{-1}_{|Rm|}$ lies in weak L^{2q} . For minimizing harmonic maps f we prove $W^{1,p} \cap W^{2,p/2}$ estimates for $p < 3$ for f and the stronger likewise defined regularity scale, and for minimizing hypersurfaces we prove L^p estimates for $p < 7$ for the second fundamental form and its regularity scale. The proofs include a new quantitative dimension reduction, that in the process strengthens Hausdorff estimates on singular sets to Minkowski estimates. This is joint work with Jeff Cheeger.

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Friday, February 10, 2012, 3:00pm-4:00pm

3096 East Hall

Zuoqin Wang (U Michigan)

On lower bounds for nodal sets of Laplacian eigenfunctions

In this talk I will report some recent progress on the lower bound for the volume of the nodal set of Laplacian eigenfunctions on compact Riemannian manifolds.

Geometry

Friday, February 17, 2012, 3:00pm-4:00pm

3096 East Hall

Francois Ledrappier (U Notre Dame)

Entropy rigidity for non-positively curved compact manifolds

We consider different asymptotic rates related to the geometry of the universal cover of a compact manifold. We discuss relations between these rates, a characterization of symmetric spaces of non-positive curvature and related problems.

Geometry

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Geometry

Friday, March 16, 2012, 3:00pm-4:00pm

3096 East Hall

Mehdi Lejmi (U Minnesota)

Deformations of extremal almost-Kahler metrics

In this talk, we introduce the notion of extremal almost-Kahler metrics which appear as a generalization of Calabi extremal Kahler metrics to the symplectic case. First, we look to the obstructions to their existence. Then, we study if it is possible to deform extremal almost-Kahler metrics to obtain a family of them.

Geometry

Friday, April 06, 2012, 3:00pm-4:00pm

3096 East Hall

Lizhen Ji (U Michigan)

Geometric topology of moduli spaces of Riemann surfaces

In this talk, I will describe some results on the simplicial volume and spines of moduli spaces of Riemann surfaces. These results depend on the action of the mapping class group on the Teichmuller spaces. Besides their own interests, they also provide further evidence for similarities between the action of arithmetic groups on symmetric spaces and the action of the mapping class group on the Teichmuller spaces.

Geometry

Friday, April 13, 2012, 3:00pm-4:00pm

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Jon Wolfson (MSU)

Three manifolds of constant vector curvature

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3096 East Hall

Pedro Ontaneda (SUNY Binghamton)

Smooth Hyperbolization

The strict hyperbolization process of R. Charney and M. Davis produces a large and rich class of negatively curved spaces (in the geodesic sense). This process is based on an earlier version introduced by M. Gromov and later studied by M. Davis and T. Januszkiewicz. If M is a manifold its Charney-Davis strict hyperbolization $h(M)$ is also a manifold, but the negatively curved metric obtained is far from being Riemannian because it has a large and complicated set of singularities.

We will discuss whether the strict hyperbolization process can be done smoothly.