Guest Lectures

Wouter van Limbeek (Chicago)
Gaps in symmetry groups of Riemannian manifolds

In 1893 Hurwitz showed that a hyperbolic surface of genus g has isometry group of order at most $84(g-1)$. Do such bounds on the order of isometry groups exist more generally? It was conjectured by Farb-Weinberger that this is the case for certain aspherical manifolds. In this spirit we prove that the size of the isometry group of an arbitrary closed manifold is bounded in terms of certain geometric quantities (such as curvature and volume), unless the manifold admits an action by a compact connected Lie group. As an application, we characterize so-called locally symmetric spaces among all Riemannian manifolds.

Tuesday

Sander Kupers (Stanford)
The homology of diffeomorphism groups

In this talk I'll give an overview of a successful approach to the homology of diffeomorphism groups: the complimentary techniques of homological stability and scanning. We will give an overview of known results and outline the techniques in the case of 0-dimensional manifolds. Later in the workshop we will see two particular instances in more detail.

Nathan Perlmutter (University of Oregon)
Homological stability for diffeomorphism groups of odd dimensional manifolds

I will present a new homological stability result for the diffeomorphism groups of manifolds of dimension $2n + 1 \geq 9$, with respect to forming the connected sum with copies of an arbitrary $(n - 1)$-connected, $(2n + 1)$-dimensional manifold that is stably parallelizable. This result is an odd dimensional analogue of a recent theorem of Galatius and Randal-Williams regarding the homological stability of the diffeomorphism groups of manifolds of dimension $2n \geq 6$, with respect to forming connected sums with $S^n \times S^n$.

Thursday

Ying Hu (Louisiana State)
Left-orderability and cyclic branched covers

A group is called left-orderable if it can be equipped with a total order that is invariant under left-multiplication. In this talk, I will start with a brief introduction on the left-orderability of 3-manifold groups. I will then give a detailed account to the case when 3-manifolds in consideration are cyclic branched covers of the three sphere.

Sam Nariman (Stanford)
Stable moduli space of flat surface bundles

Flat manifold bundles (i.e. manifold bundles with foliations transverse to the fibers) are classified by homotopy classes of maps to the classifying space of diffeomorphisms made discrete. In this talk, I will talk about homological stability of discrete surface diffeomorphisms and discrete symplectic diffeomorphisms which was conjectured by Morita. I will describe an infinite loop space related to the Haefliger space whose homology is the same as group homology of discrete surface diffeomorphisms in the stable range. Finally, I will discuss some interesting applications to the characteristic classes of flat surface bundles and foliated bordism groups of codimension 2 foliations.