# *Bay Area Differential Geometry Seminar*
# *Saturday March 9, 2013*
# *MSRI, Berkeley*

- 10:00–11:00 **Reception, Morning Coffee**
- 11:00-12:00 **Ian Algol, UCB**: *The virtual Haken conjecture*

We'll describe the proof of Waldhausen's conjecture that aspherical closed 3-manifolds have a finite sheeted cover with positive Betti number and related results. The proof reduces to the proof of a conjecture of Dani Wise about cubulated hyperbolic groups being "virtually special" and results of Kahn-Markovic on surface groups in closed hyperbolic 3-manifolds. All of the terminology will be explained

- 12:00–2:00 **Lunch**

*Lunch will be available for purchase at MSRI. Orders will be taken before the first talk. There will be a brief organizational meeting at 1:45.*

- 2:00–3:00 **Li-Sheng Tseng, UCI**: *Cohomologies on Symplectic Manifolds*

Cohomologies of differential forms provide some of the most basic invariants on manifolds. In this talk, I will discuss some new cohomologies of forms on symplectic manifolds. These cohomologies can be defined simply in terms of linear differential operators that are intrinsically symplectic. Of interest, they have standard Hodge theoretical properties and provide useful invariants especially for non-Kahler symplectic manifolds. Moreover, they also encode the data of Lefschetz maps between de Rham cohomologies. This is joint work with C.-J. Tsai and S.-T. Yau.

- 3:00–4:00 **Afternoon Tea**
- 4:00–5:00 **Rick Schoen, Stanford**: *Metrics on surfaces which extremize eigenvalues*

For closed surfaces and for surfaces with boundary there are natural eigenvalue extremal problems whose solutions, when they exist, determine minimal surfaces in the sphere or the ball with a natural boundary condition. We will discuss the existence problem and describe some geometric properties of extremal metrics.

- 6:00 **Dinner**

*Seminar participants and their significant others are invited to dinner at the home of David Hoffman, 37 Hill Road, Berkeley, CA 94708 (tel: 510 649-1641). Directions will be provided at the meeting. Please use the* **signup list** *to indicate your participation and dietary restrictions if any.*