THE UNIVERSITY   **OF HONG KONG**

Institute of Mathematical Research
Department of Mathematics

Geometry Seminar

March 26, 2010 (Friday)

Rm 210, Run Run Shaw Bldg., HKU

Dr. Nan-Kuo Ho

National Tsing-Hua University, Hsin-chu, Taiwan

Antiperfect Morse stractification

3:00 – 3:50pm

Abstract

Atiyah and Bott studied the moduli space of flat connections over a Riemann surface from a Morse theory point of view via the use of Yang-Mills functional. They showed that the Morse stratification of the space of all connections over a Riemann surface is gauge-equivariantly perfect and concluded recursive formulas for the equivariant Poincaré series of the space of at connections over a Riemann surface. We extend their Morse theory approach to study the moduli space of flat connections over a nonorientable surface. Contrary to equivariant perfection of the stratication in Atiyah-Bott's study, the difference of the equivariant Morse series and the equivariant Poincaré series doesn't necessarily achieve the minimal possible value 0 here. We introduce the notion of antiperfection and explain how equivariant antiperfection of the Morse stratification derives the gauge-equivariant Poincaré series of the space of flat connections over a nonorientable surface in certain cases. This is a joint work with Chiu-Chu Melissa Liu.

3:50 − 4:00   *Tea Break*

Dr. William Kirwin

Center for Mathematical Analysis, Geometry, and
Dynamical Systems, Lisbon, Portugal

Adapted Complex Structures and Geodesic Flow

4:00 – 4:50pm

Abstract

I will present a new construction of adapted complex structures. Adapted complex structures provide one way to understand the "complexification" of a compact, real-analytic Riemannian manifold M. I will explain how a tubular neighborhood of M in its tangent bundle inherits a "canonical" complex structure, the so-called adapted complex structure, and furthermore that this complex structure can be constructed using the "imaginary time" geodesic flow. This is a joint work with Brian Hall.

All are welcome