University of Notre Dame Department of Mathematics

FELIX KLEIN SEMINAR

Tim Nguyen

MIT

Will give a lecture entitled:

The Seiberg-Witten Equations on Manifolds with Boundary

On

Thursday, March 24, 2011

At

2:00 PM

In

125 Hayes-Healy Hall

Abstract

The analysis of the Seiberg-Witten equations have led to many important results in low-dimensional topology. These include the invariants defined by Witten for 4-manifolds and the Seiberg-Witten Floer invariants for 3-manifolds defined by Kronheimer-Mrowka and others. In both these situations, the equations and their moduli space of solutions are studied on closed manifolds. In this talk, we study the analysis of the Seiberg-Witten equations on manifolds with boundary. First, we discuss the moduli space of solutions to the equations on 3-manifolds with boundary Y . These moduli spaces are infinite dimensional (even modulo gauge) since no boundary conditions are imposed on the equations. Second, we discuss how these moduli spaces give natural boundary conditions for the Seiberg-Witten equations on a cylindrical 4-manifold $R \times Y$. We explain how the resulting nonlinear boundary value problem has well-posedness and compactness properties, and how these results therefore serve as foundational analysis for an eventual construction of a Seiberg-Witten Floer theory on manifolds with boundary.