Department of Mathematics
University of Notre Dame

GEOMETRIC ANALYSIS SEMINAR

Speaker: Thomas Walpuski
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Date: Thursday, November 8, 2018
Time: 11:00 AM
Location: 258 Hurley Hall

Lecture Title:
Existence of harmonic Z/2Z spinors via wall-crossing

Abstract
Recently, Taubes introduced the notion of harmonic Z/2Z spinors and initiated the study of their singular sets. These are special cases of harmonic multi-valued spinors; arguably the simplest instance being harmonic multi-valued 1-forms. I will explain this notion from scratch and discuss what is known about them in some detail. No prior knowledge of spinors will be assumed. The importance of harmonic Z/2Z spinors is that they appear in various compactifications of gauge-theoretic PDE which are of great interest in geometry, topology and physics. Arguably, the most important instance of such a PDE is the Kapustin-Witten equation. One of the simplest cases of such a PDE is the Seiberg-Witten equation with two spinors. Although, various compactness theorems “predict” the existence of harmonic Z/2Z spinors they do not actually guarantee it. The purpose of this talk is to explain a concrete existence result. Our proof is of a topological nature; at its heart lies a wall-crossing formulae for the Seiberg-Witten equation with two spinors. This is joint work with Aleksander Doan.

Thomas Walpuski - Michigan State University