

课程介绍

课程名称: An Introduction to Gauge Theory

课程介绍: Mathematical gauge theory is the study of elliptic partial differential equations comes from physics, which are invariant under the action of a group of bundle automorphism. In this mini course, we will in particular talk about mathematical side of the Yang-Mills equations and its interaction with four manifold.

课程安排: 共十次课, 每次两小时。

The first part of the course will briefly introduce some background on differential manifold, including the theory of bundles and connections, Chern-Weil theory, elliptic operator and elliptic estimates.

The second part of the course will talk about the Yang-Mills equations. We discuss some basic tools in study the moduli space of gauge theory equations. We will sketch the proof of the Uhlenbeck compactness theorem, ADHM construction and Donaldson diagonalization theorem.

参考资料:

[1] Freed and Uhlenbeck, Instantons and Four Manifold

[2] Donaldson and Kronheimer, Geometry of Four Manifold

本课程面向高年级本科生, 研究生和青年数学工作者。

预备知识: 微分流形。

主讲人介绍: Siqi He is currently a postdoc at Simons Center of Geometry and Physics in Stony Brook University. He mainly focus on different kind of gauge theory equations, including the Kapustin-Witten equations, the Hitchin-Simpson equations.