

ALGEBRA AND NUMBER THEORY
SEMINAR

Gauge Theory in Four Dimensions and Mock Modular Forms

Andreas Malmendier
Colby College

Abstract: In physics, the moduli space of vacua for the topological $N = 2$ supersymmetric pure gauge theories with gauge group $SO(3)$ is the universal elliptic curve for the modular group of level 2. Moreover, the supersymmetric gauge theory associates to each four-manifold a not necessarily holomorphic modular form of level two. I will explain why for the complex projective plane this modular form is a Mock theta function - in fact, it is one of the examples listed in Ramanujan's letter to Hardy to undermine a notoriously obscure definition. In joint work with Ken Ono, we then proved that its cusp contributions are the Donaldson invariants of CP^2 , a conjecture made by Moore and Witten. Time permitting, I will also sketch how string theory suggests a connection of this construction to a generalized elliptic genus.

Tuesday, January 25, 2011, 3:00 pm
Mathematics and Science Center: W306

MATHEMATICS AND COMPUTER SCIENCE
EMORY UNIVERSITY