

## **abstract**

JOINT IAS/PU NUMBER THEORY SEMINAR

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

---

An interesting new class of modular forms has emerged in the last several years that generalize Ramanujan's mock theta functions. The generalization is based on an observation of of Zwegers who showed that mock theta functions occur as holomorphic parts of harmonic Maass forms of weight  $1/2$  having singularities in cusps. Their non-holomorphic parts are directly related to actual theta functions. This realization has enhanced the study of the coefficients of the mock-theta functions, which are related to various kinds of partitions.

In this talk I will describe a new class of mock-modular forms of weight  $1/2$ . Here the Fourier coefficients can be expressed in terms of cycle integrals of the classical modular  $j$ -function. The hope that these cycle integrals could be related to abelian extensions of real quadratic fields has not been realized. However, we are able to relate them to certain regularized Petersson inner products of weight  $3/2$  weakly holomorphic forms whose coefficients are traces of the values of the  $j$ -function at  $cm$  points. As an application we show that modular integrals having rational period functions are real quadratic versions of (logarithmic derivatives of) Borcherds products.

This is joint work with O. Imamoglu and A. Toth.