Lecture Series Announcement:

**INTRODUCTION TO RIEMANN SURFACES AND TEICHMÜLLER THEORY**

**Guy Buss, Brian Clarke (MPI)**
Tuesdays, 1:15–2:45 PM
28 October 2008 – 5 February 2009
Room A2
Max-Planck-Institut für Mathematik in den Naturwissenschaften (Inselstr. 22)

**Prerequisites:** Differential Geometry II (or equivalent knowledge in Riemannian geometry), basic complex analysis, ordinary differential equations

**Intended audience:** Advanced master’s students, graduate students, and other interested parties

**Summary**

Teichmüller space is, in some sense, the space of all Riemann surfaces—complex manifolds of dimension one. Individual Riemann surfaces can be viewed from various perspectives (e.g., hyperbolic geometry, complex analysis, group theory, algebraic geometry), and these viewpoints lead to a rich understanding of Teichmüller space. In addition to being of intrinsic interest, Teichmüller theory has found wide-ranging applications—from complex analysis to differential and algebraic geometry, physics, topology, and even number theory.

The main topics to be covered in this one-semester series include:

- Hyperbolic and complex geometry of Riemann surfaces and their uniformization, including Möbius transformations
- The real-analytic theory of Teichmüller spaces (Fenchel-Nielsen coordinates, Fricke-Klein coordinates)
- Quasi-conformal mappings
- The complex-analytic theory of Teichmüller spaces (the Beltrami equation, the Bers embedding)
- Universal properties of Teichmüller spaces
- The geometry of Teichmüller spaces (the Teichmüller and Weil-Petersson metrics)
- Applications of Teichmüller theory

Further topics will be decided based on the interests of the participants, but may include moduli spaces, mapping class groups, degenerations of Riemann surfaces, and completions of Teichmüller spaces.