$u^b$

# Mathematical Colloquia

_____

**Monday, 06 November 2017**

17:15 h, Lecture Room B 78

**Prof. Dr. Arunima Ray, MPI Bonn**

# Knot theory in dimension 3.5

**Abstract:**

Manifolds are natural generalizations of the familiar Euclidean spaces. The study of knots in 3-dimensional Euclidean space gives a concrete way to understand 3-dimensional manifolds. Similarly, one hopes that the study of knots under a 4-dimensional equivalence relation would shed light on 4-dimensional manifolds. I will describe such 4-dimensional equivalence relations, called concordance, and why they are interesting. Under concordance, and the operation of connected sum, knots form an abelian group. Satellite operations are a natural generalization of the connected sum operation, and are of interest both within and beyond knot theory. I will discuss a number of recent results about satellite operations on topological and smooth knot concordance classes, particularly winding number one satellite operations, and how they contribute to the conjecture that the concordance groups are fractal spaces. Some of the results I will discuss are joint work with Tim Cochran and/or Christopher Davis.