**Brandeis – Harvard – MIT – Northeastern**

**Mathematics Colloquium**

**“Counting vector bundles”**

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Abstract: It is a classical fact that the ideal class group of the ring of integers in a number field is a finite group. I will discuss ``higher rank" variants of this finiteness statement for suitable ``higher dimensional" arithmetic rings, i.e., normal domains that are finitely generated as Z-algebras. Here the ``higher rank" generalization of ideal classes consists of higher rank projective modules, i.e., direct summands of free modules. I will try to explain the kinds of finiteness statements one expects and why one might expect them, with a view toward the proofs. In brief, I will explain how one may transport intuition from the question of classifying topological vector bundles over CW-complexes to the our setting by appeal to a homotopy classification of projective modules using the Morel-Voevodsky A^1-homotopy category. Using that translation, the ``geometric" finiteness questions are naturally reformulated as suitable cohomological finiteness statements.

**Thursday March 9th, 2016**

**4:30PM-5:30PM**

**MIT, Room 2-190**

**Reception in 2-290 at 4:00PM**