

Eleventh NRW Topology Meeting – Bielefeld (Germany)

Friday, May 08, 2009

11.00, Hörsaal 3

Brent Doran: (Oxford) **“Applications of A^1 -topology to problems in classical algebraic geometry”**

This talk will cover a number of questions in classical algebraic geometry which seem to have close ties with ideas of “ A^1 -topology”, by which we mean A^1 -homotopy as a geometric topologist might use it. En route we encounter non-reductive group actions and Hilbert’s 14th problem (finite generation of rings), surprising facts about moduli of vector bundles, algebraic spaces that aren’t schemes, a host of interesting stably rational varieties, a curious re-encoding of affine hypersurfaces, and quadrics behaving an awfully lot like spheres. Time permitting, the talk will give a gentle introduction to a few basic ideas, some quite recent, of A^1 -homotopy which seem relevant for notions of higher connectivity in algebraic geometry. The material is mostly drawn from joint work with Aravind Asok and with Frances Kirwan. It will hopefully serve as a geometric guide to some topics that may appear in subsequent talks in the conference, and can be appreciated by a broad mathematical audience without any background in A^1 -homotopy theory.