Topology Seminar

UNIVERSITY OF NOTRE DAME
Department of Mathematics

Speaker: **Karsten Grove**
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Thursday, January 27, 2011
12:45 pm
258 Hurley Hall

Title: A Knot Characterization and Non-negatively Curved 4-manifolds with Circle Symmetry

Abstract:

By work of W.Y Hsiang and B. Kleiner, utilizing Freedman's classification of simply connected 4-manifolds, it has been known for over 20 years that a closed positively curved simply connected 4-manifold with infinite isometry group, i.e. having circle symmetry, is homeomorphic to either S^4 or CP^2. In the case of nonnegative curvature independent work of Kleiner and of Searle–Yang show that in addition $S^2 \times S^2$, $CP^2 \# CP^2$ and $CP^2 \# -CP^2$ occur.

A new construction in, and use of Alexandrov geometry combined with the Poincaré conjecture allows to provide a complete classification of simply connected closed 4-manifolds with nonnegative curvature and circle symmetry up to equivariant diffeomorphism. A new(?) knot characterization plays a crucial role.

This is joint work with Burkhard Wilking.