



ALGEBRA AND GEOMETRY SEMINAR

The Hong Kong University of Science and Technology
Department of Mathematics

Atiyah-Bott's fixed point theorem via categorification

by Kaif Hilman

from University of Bonn

A famous result of Atiyah and Bott in geometric topology says that a smooth action by a cyclic p -group on a smooth closed orientable manifold cannot have just a single fixed point when p is an odd prime. This result was proved using the Atiyah-Singer index theorem. In this talk, I will explain a different, purely homotopical, proof which in particular exhibits that the theorem is really a consequence of "global" homotopical reasons rather than "local" geometric ones. To this end, I will introduce a theory of Poincare duality for arbitrary topoi together with a suite of "basechange" principles. I will then sketch how this abstract theory reduces the theorem to an elementary Tate cohomology calculation by working with an equivariant topos. This is based on joint work with D. Kirstein and C. Kremer from arXiv:2405.17641.

Room 4472 (Lift 25/26) Wed, Sep 3, 2025 04:00 PM

