

Fifth NRW Topology Meeting – Bielefeld (Germany)

Friday, April 28, 2006

12.00 – 12.45, Hörsaal 11

Steffen Sagave (Bonn): **”Toda brackets of ring spectra and realizability”**

Given a module over the homotopy groups $\pi_*(R)$ of a ring spectrum R , one can ask whether it can be realized by the homotopy groups of an R -module spectrum. This has to do with Toda brackets of R , as I will explain in the case of the real K -theory spectrum.

The general study of this realizability question leads to the *universal Toda bracket* of a ring spectrum. This invariant of R is an element in a Mac Lane cohomology group of $\pi_*(R)$, and it determines the first obstruction of the realizability problem for every $\pi_*(R)$ -module M . A second kind of information detected by the universal Toda bracket of R is the first k -invariant of the space $BGL_n R$. I will indicate how to compute the universal 4-fold Toda bracket of the complex K -theory spectrum.