Prof. Dr. W. Müller
Dr. J. Pfaff

Wintersemester 2012/13
Seminar on Global Analysis S4B3:
The equivariant index theorem

The euqivariant index theorem is a far reaching generalization of the calssical Lefschetz fixed point formula. It incorporates the action of a Lie group into the usual Atiyah-Singer index theorem. The equivariant index theorem has many interesting applications in geometry and topology. The aim of the seminar is to discuss some of these applications in various fields of mathematics.

Prerequisites: Global Analysis I + II, Geometrie I.

Date: Thursday, 14:15, room 0.008

Distribution of talks: Tuesday, October 2, 14:15, room 0.008, or by e-mail

Literature:

1. M.F. Atiyah, R. Bott: A Lefschetz fixed point formula for elliptic complexes: I. Ann. of Math. (2) 86 (1967), 374–407.

2. M.F. Atiyah, R. Bott: A Lefschetz fixed point formula for elliptic complexes: II. Applications. Ann. of Math. (2) 88 (1968), 451–491.

3. M.F. Atiyah, I. M. Singer: The index of elliptic operators. III. Ann. of Math. (2) 87 1968 546–604.

4. M.B. Lawson, M.-L. Michelson: Spin Geometry, Princeton Univ. Press, 1989.

5. N. Berline, E. Getzler, M. Vergne: Heat kernels and Dirac operators. Springer-Verlag, BErlin, 1996.

Kontakt: pfaff@math.uni-bonn.de, mueller@math.uni-bonn.de

Talks

I. Foundations

1. The classical Lefschetz fixed point theorem.

2. The Leschetz fixed point formula for elliptic complexes I.

3. The Leschetz fixed point formula for elliptic complexes II.

4. The equivariant index theorem

II. Applications

5. The Weyl character formula I

6. The Weyl character formula II

7. Applications of the index theorem in number theory

8. The equivariant index of Dirac operators I (Atiyah-Hirzebruch)

9. The equivariant index of Dirac operators II (Bott-Taubes)

10. Elliptic genera I

11. Elliptic genera II