

Elliptic Genera and Applications

In summer semester 2006 we want to learn the theory of elliptic genera and give some applications concerning the celebrated divisibility and rigidity theorems with their geometric interpretations. After an introducing survey talk we want to see the details and will do some explicit calculations with modular and Jacobi forms.

- April 6th, 2006:
Talk 1 by Hanno von Bodecker: Survey talk on elliptic genera
- April 20th, 2006:
Talk 2 by Holger Reeker: The classical elliptic genus a la Ochanine, [HiBeJu] chapter 1, [Oc], [Liu2]
Talk 3 by Marc Siegmund: Modular and Jacobi functions I, [HiBeJu] Appendix I, [EiZa]
- May 4th, 2006:
Talk 4 by Ferit Deniz: Modular and Jacobi functions II, [HiBeJu] Appendix I, [EiZa], concentrate on $\Gamma^0(2)$ and show $M(\Gamma^0(2)) \cong \mathbb{Z}[8\delta_2, \varepsilon_2]$
Talk 5 by Martin Langer: Divisibility results by Rochlin-Ochanine for the signature and miraculous cancellation, [Liu1] and [Liu2], make sure that you use the same notations as Ferit
- May 18th, 2006:
Talk 6 by Maria Castillo: Lefschetz fixed point formula I, [HiBeJu]: read 5.1, 5.2, 5.5, but concentrate on 5.6.-6.2, [Wi], it might be useful to have a look in [AB]
Talk 7 by Juan Wang: Lefschetz fixed point formula II, [HiBeJu] 5.6-6.2, [Wi]
- June 22nd, 2006:
Talk 8 by Julia Singer: Rigidity and vanishing results for elliptic genera I, [Bo-Ta], [Liu1], [Liu2], [Oc]
Talk 9 by Hanno von Bodecker to be confirmed/ scheduled: Rigidity and vanishing results for elliptic genera II, [BoTa], [Liu1], [Liu2], [Oc]
- July 6th, 2006:
Talk 10 by Constanze Roitzheim: towards elliptic cohomology/ spectra I
Talk 11 by Arne Weiner: towards elliptic cohomology/ spectra II

Literature

- [AB] Atiyah, Bott: Lefschetz fixed point formula for elliptic complexes
- [BoTa] Bott, Taubes: On the rigidity theorems of Witten, Journal of AMS 2 (1989)
- [EiZa] Eichler, Zagier: The Theory of Jacobiforms, Birkhäuser
- [HiBeJu] Hirzebruch, Berger, Jung: Manifolds and modular forms, Vieweg
- [Liu1] Liu: On modular invariance and rigidity theorems, Journal of Differential Geometry 41 (1995)
- [Liu2] Liu: Modular forms and topology, this is a good survey article which can be found on the web: www.math.ucla.edu/~liu/Research/vam.pdf
- [Oc] Ochanine: Genres elliptiques equivariants, in LNM 1326, Springer
- [Wi] Witten: The index of the Dirac Operator in Loop Space, in LNM 1326, Springer.