

INTRODUCTION

In this course I plan to describe aspects of smooth K-theory.

I will start with a discussion of the algebra of smoothing operators in its various forms and properties including finite-dimensional approximation, the Fredholm determinant, group of invertible perturbations of the identity and hence to definitions of odd and even K-theory.

Subsequently I will discuss:-

1. The loop group and delooping sequence and the Chern character.
2. Semiclassical quantization and Bott periodicity. Thom isomorphism and Atiyah-Singer theorem.
3. The quantization (looping) sequence and Quillen's line bundle.
4. Segal's representation of the loop group and the K-theory gerbe.

As time (and the enthusiasm of the audience) permits I will discuss twisting of K-theory and bordism.