SFB-Seminartag

TIME:
25 Apr 2006, 15:00 - 18:00

LOCATION:
Humboldt-Universität zu Berlin
Unter den Linden 6
Hauptgebäude, Hörsaal 3075
10099 Berlin

PROGRAM:

15:00 - 16:00 **Prof. Dr. Grigori Rozenblioum (Chalmers University Sweden)**

The spectrum of the perturbed Landau Hamiltonian
The Landau Hamiltonian describes the quantum behavior of an electron confined to a plane, under the influence of the constant magnetic field. The spectrum of this operator consists of infinitely degenerate eigenvalues, Landau levels. It is natural to expect that under a perturbation of the operator the Landau levels split. This fact was established recently for the case of perturbation by a compactly supported electtric field, and it was found that the perturbed eigenvalues converge to the Landau levels very fact, superexponentially. In the talk we present the newest results concerning a perturbation by a compactly supported MAGNETIC field. We find a rather exact
approximation to the new position of spectral subspaces, the latter change rather strongly. The eigenvalues still split superexponentially. We prove an estimate from above for this splitting, and under some additional conditions, the asymptotics of the perturbed eigenvalues.

16:30 - 17:30 **Dr. Hidehiko Shimada**

Membrane topology and matrix regularization
The most successful proposal for formulation of M theory, the matrix

Contact:
Humboldt-Universität zu Berlin . Institut für Mathematik
SFB 647 . Unter den Linden 6 . 10099 Berlin
Tel. +49 30 2093 1804 . Fax. +49 30 2093 2727
sfb647@math.hu-berlin.de

model of M theory, can be considered as a regularised version of membrane theory. The regularisation procedure, known as the matrix regularisation, turns functions defined on membranes into N x N matrices.
In this talk I will discuss some aspects of membrane topology in the matrix regularisation. It will be shown that the information of Morse theoretic information anifests itself in the eigenvalue distribution of a single matrix. Understanding how topology is reflected in the eigenvalues then enables us to write down a new geometric rule to translate functions into matrices.
Finally I will briefly touch on some results of the recent work with Arnlind, Bordemann, Hofer, Hoppe from these viewpoints.

Contact:
Humboldt-Universität zu Berlin . Institut für Mathematik
SFB 647 . Unter den Linden 6 . 10099 Berlin
Tel. +49 30 2093 1804 . Fax. +49 30 2093 2727
sfb647@math.hu-berlin.de