

Northern California Symplectic Geometry Seminar

BERKELEY – DAVIS – SANTA CRUZ – STANFORD

Monday, March 13, 2006

BERKELEY, Room 47 Evans Hall

2:30–3:30

Joa Weber (MSRI and Humboldt University Berlin)

Floer homology of cotangent bundles

Floer homology of the cotangent bundle of a closed Riemannian manifold M is naturally isomorphic to the singular homology of the free loop space. We review the three approaches by Viterbo (1996), Salamon-Weber (2003) and Abbondandolo-Schwarz (2004) to prove the theorem and present an application to existence of noncontractible periodic orbits.

3:30-4:00

Tea break in 1015 Evans Hall

4:15–5:15

Alfonso Gracia-Saz (UC Berkeley)

The symbol of a function of an operator

In the quantum description of a physical system, the observables are represented by operators on a Hilbert space. In the classical description, they are represented by functions on a Poisson manifold. Weyl quantization provides a bijection between quantum and classical observables. To every (quantum) operator \hat{A} , we associate a (classical) function A , called its symbol.

We consider the following problem. Let \hat{A} be an operator with symbol A and let f be a smooth function. Then $\hat{B} := f(\hat{A})$ is another operator, with symbol B . What is B in terms of A ? We will provide an answer to this question in the form of a formula “à la Feynman”, i.e. a power series whose terms are labeled by diagrams. As an application, we will discuss an asymptotic method to obtain the eigenvalues of a hamiltonian which is the sum of kinetic and potential energy.

The talk will come with a moral: *There are no difficult calculations, only unfortunate notations.*

Please contact alanw@math.berkeley.edu to arrange parking.

There will be a dinner at 6pm

—Y. Eliashberg
D. Fuchs
V. Ginzburg
R. Montgomery
X. Tang
A. Weinstein