THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

GEOMETRY SEMINAR

Conley conjecture and beyond: infinitely many periodic points of Hamiltonian dynamical systems

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Abstract

One distinguishing feature of Hamiltonian dynamical systems is that such systems, with very few exceptions, tend to have numerous fixed and periodic points. In 1984 Conley conjectured that a Hamiltonian diffeomorphism (i.e., the time-one map of a Hamiltonian flow) of a torus has infinitely many periodic points or, more precisely, such a diffeomorphism with finitely many fixed points has simple periodic points of arbitrarily large period. This fact was proved by Hingston some twenty years later, in 2004. Similar results for Hamiltonian diffeomorphisms of surfaces of positive genus were also established by Franks and Handel. Of course, one can expect the Conley conjecture to to hold for a much broader class of closed manifolds and this is indeed the case. For instance, by now, the conjecture has been proved for the so-called closed, symplectically aspherical manifolds (including tori and surfaces of positive genus) and the Calabi-Yau manifolds using symplectic topological techniques.

In this talk, mainly based on the results of Hein, Gurel and the speaker, we will examine underlying reasons for the existence of periodic orbits for Hamiltonian flows and maps and outline a proof of the Conley conjecture.

Date:	**April 15, 2011 (Friday)**
Time:	**3:00 – 4:00pm**
Place:	**Room 210, Run Run Shaw Bldg., HKU**

All are welcome