THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Mathematical Analysis and Applications Seminar

Room 1, Ziskind Building
on Tuesday, Feb 13, 2018
at 11:15

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On Herman's positive metric entropy conjecture

Abstract:

We show that any area-preserving C^r-diffeomorphism of a two-dimensional surface displaying an elliptic fixed point can be C^r-perturbed to one exhibiting a chaotic island whose metric entropy is positive, for every $1 \leq r \leq 1$. This proves a conjecture of Herman stating that the identity map of the disk can be C^∞-perturbed to a conservative diffeomorphism with positive metric entropy. This implies also that the Chirikov standard map for large and small parameter values can be C^-approximated by a conservative diffeomorphisms displaying a positive metric entropy (a weak version of Sinai's positive metric entropy conjecture). Finally, this sheds light onto a Herman's question on the density of C^r-conservative diffeomorphisms displaying a positive metric entropy: we show the existence of a dense set formed by conservative diffeomorphisms which either are weakly stable (so, conjecturally, uniformly hyperbolic) or display a chaotic island of positive metric entropy.

This is a joint work with Pierre Berger.