1040-37-124 **Alejandro Kocsard*** (alejo@impa.br), IMPA, Estrada Dona Castorina, 110, Rio de Janeiro, RJ 22460-320, Brazil. *Cohomologically rigid vector fields: the Katok conjecture in dimension* 3.

A smooth vector field X on a manifold M is said to be *cohomologically rigid* when every smooth real function is cohomologous to a constant, i.e. given any $\psi \in C^\infty(M, \mathbb{R})$ we can find $u \in C^\infty(M, \mathbb{R})$ and $c \in \mathbb{R}$ such that

$$\mathcal{L}_X u = \psi - c,$$

where $\mathcal{L}_X$ denotes the Lie derivative in the X direction.

Constant vector fields on the d-torus $\mathbb{T}^d$ which satisfy a Diophantine condition are the only known examples of cohomologically rigid vector fields, and in 1984 Anatole Katok conjectured that, modulo C^∞-conjugacy, these are the only ones.

In this talk we will present the fundamental ideas used to prove Katok conjecture in dimension 3. (Received January 29, 2008)