

MATHEMATICAL PANORAMA LECTURES

(A National Mathematics Year Event)

Professor Etienne Ghys, Ecole Normale Supérieure, Lyon, France will give a course of 10 lectures (Panorama lectures) on

The dynamics of vector fields in dimension 3

at the **Tata Institute of Fundamental Research (TIFR), Mumbai**, during April 9-14, 2012 (see below for Abstract of the course).

There will also be a workshop, towards preparation for these lectures, held at **Indian Institute of Technology (IIT), Bombay**, during April 2-7, 2012.

All are welcome to attend the lectures

Support towards travel and local hospitality is available for a limited number of outstation mathematicians/Research Scholars desirous of attending the Panorama lectures, as well as the workshop. Interested persons may send their applications (please specify if applying only for the panorama lectures) to Prof. S.G. Dani at

`ghyslectures@gmail.com`

latest by **25 February 2012**. With the application please include a short CV, current affiliation, and topics of interest; Research Scholars should include in the application the details of the scholarship they receive, and may also arrange for a letter of recommendation from a teacher.

In exceptional cases applications by post will also be considered; these may be sent to Prof. Akhil Ranjan, Department of Mathematics, IIT Bombay, Powai, Mumbai 400076, to reach on or before 25 February 2012.

Abstract

The dynamics of vector fields on surfaces is fairly well understood. Starting from dimension 3, one can encounter more complicated and interesting phenomena, like chaotic behaviour for instance. In this series of talks, I would like to give a general introduction to the qualitative dynamics of flows on 3-manifolds. I will begin at a very elementary level and I will describe a great number of significant examples. Then, depending on time, I shall discuss the following three aspects :

- The many attempts to describe all Anosov flows and some conjectures...
- The search for periodic solutions, around the former Seifert and Weinstein's conjectures, Kuperberg example, Hofer and Taubes's theorem, and the conjecture in the volume preserving case.
- The construction of Birkhoff sections, the concept of left handed vector field, and conjectures concerning geodesic flows in negative curvature.