SwissMAP
The Mathematics of Physics
National Centre of Competence in Research

The University of Geneva and the EPF Lausanne invite you to:

Journée Georges de Rham

Wednesday 23rd Sept 2020

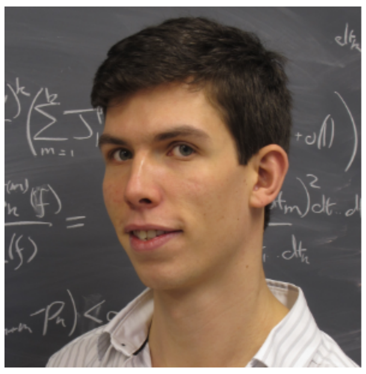
Uni Bastions (Auditorium O. Reverdin - B106)
University of Geneva, Switzerland

For further information and registration (mandatory): nccr-swissmap.ch/

Due to the COVID-19 pandemic travel restrictions James Maynard's talk will be a live online presentation.

18:15-19:15 **James MAYNARD (University of Oxford)**

Approximating real numbers by fractions



How well can you approximate real numbers by fractions with denominators coming from a given set? Although this old question has applications in many areas, in general this question seems impossibly hard - we don't even know whether e+pi is rational or not!If you allow for a tiny number of bad exceptions, then a beautiful dichotomy occurs - either almost everything can be approximated or almost nothing! I'll talk about this problem and recent joint work with Dimitris Koukoulopoulos which classifies when these options occur, answering an old question of Duffin and Schaeffer. This relies on a fun blend of different ideas, including ergodic theory, analytic number theory and graph theory.

19:15-20:15 **Corinna ULCIGRAI (University of Zurich)**

Slow chaos: dynamics of parabolic systems

How can we understand chaotic behaviour mathematically? A well popularized feature of chaotic systems is the butterfly effect: a small variation of initial conditions may lead to drastically different future evolutions, a mechanism at the base of the so-called 'deterministic chaos'. In this talk we will focus on 'parabolic' or 'slowly chaotic' dynamical systems, for which the butterfly effect happens "slowly" e.g. at (sub) polynomial speed. These include many fundamental examples, both coming from physics (such as the Ehrenfest and Novikov models of metals) and mathematics (such as horocycle flows or smooth flows on surfaces), but are much less understood than 'fast chaotic' (hyperbolic) dynamical systems. We will survey some of the recent advances in our understanding of typical chaotic features, in particular of area-preserving flows on surfaces, and present some key mechanisms which explains them, which exploit a mixture of dynamical, analytic and geometric techniques.

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