Program & Abstract

12 - 14 Juin 2018 Nice, Grand Château, Valrose

Mardi 12 Juin	
9:00	Accueil
9:45	Ergodic properties of STIT Tessellations *S. Martinez (CMM - DIM, Univ. du Chili)*
10:35	Geometry in neurosciences: the example of the visual cortex *P. Chossat (LJAD, Nice)*
11:25	Heterogeneously Coupled Maps. Coherent behaviour and reconstructing network from data *S. Van Strien (Imperial College London)*
12:10	Déjeuner
14:00	Heteroclinic chains in a model of associative memory *M. Krupa (LJAD, Nice)*
14:30	Gluing bifurcations for monotone families of vector fields on a torus *R. MacKay (Univ. of Warwick)*
15:20	A complex evolving system approach to the study of economic fluctuations *M. Napoletano (Sciences Po, Paris & SKEMA, Sophia)*
15:45	Pause café
16:30	Lagrangian turbulence and time irreversibility *J. Bec (Lagrance, OCA)*
17:00	Discovering laws of Nature with a compass and a ruler *P. Coullet (InPhyNi)*
17:30	Existence of quasipatterns in the superposition of two hexagonal patterns for the Swift Hohenberg PDE *G. Iooss (LJAD, Nice)*

Mercredi 13 juin	
9:00	Linking with Jean-Marc *E. Ghys (ENS Lyon)*
9:50	Dynamics of strongly dissipative diffeomorphisms of the disc with zero entropy *S. Crovisier (Paris XI)*
10:15	Pause café
10:50	Maximal isotopies, transverse foliations and orbit forcing theory for surface homeomorphisms *P. Le Calvez (Paris VI)*
11:40	Emergence of lung?s geometry, complex or not ? *B. Mauroy (LJAD, Nice)*
12:05	Déjeuner
14:00	Scaling laws for a compliant biomimetic swimmer *M. Argentina (InPhyNi, Sophia)*
14:30	Groups of diffeomorphisms of a Cantor set *E. Militon (LJAD, Nice)*
15:00	Spectral statistics of sparse random graphs: the Thomae function and modular forms *S. Nechaev (Interdisciplinary Scientific Center Poncelet, Moscow)*
15:30	Periodic Approximations to Aperiodic Hamiltonian *J. Bellissard (Westfälische Wilhelms-Universität, Münster & Georgia Institute of Technology, USA)*
16:20	Quelques mots
17:00	Douceurs et champagne
20:00	Banquet

Jeudi 14 Juin	
9:00	Gap labelling in quasicrystals: from microwaves to ultracold atoms *P. Vignolo (InPhyNi, Sophia)*
9:30	Strong orbit equivalence and eigenvalues *M.I. Cortez (Univ. de Santiago du Chili)*
10:00	Freezing Gibbs measures *J-R. Chazottes (CPhT, Ecole Polytechnique)*
10:25	Pause café
11:00	Tilings, Towers, Linear repetitivity *Aliste & Coronel (Univ. Andres Bellos)*
11:50	On a toy network of neurons interacting through nonlinear dendritic compartments *R. Veltz (INRIA, Sophia)*
12:15	Déjeuner
14:00	Cellular automata, tilings and undecidability *E. Formenti (I3S, Nice)*
14:30	Mass transport in tilings *L. Sadun (University of Texas at Austin)*
15:20	Frenkel-Kontorova Models in almost-periodic environments *S. Petite (Univ. de Picardie Jules Verne)*
15:50	Solenoid minimal sets for smooth dynamics *S. Hurder (Univ. Illinois)*
16:35	Gâteau d'anniversaire et d'au revoir (Salle à manger) - Gâteaux et champagne

Ergodic properties of STIT tessellations

Servet Martinez*[1] and Werner Nagel[2]

[1]UMM - DIM – Chili
[2]Universität Jena – Allemagne

Résumé

We give the construction of STIT tessellation process and supply its main ergodic properties in time and space: the renormalized STIT process is Bernoulli process and its discrete past process is standard in the Vershik sense. In space the STIT tessellation process has a trivial tail σ–field and we give a bound for its β–coefficient. These works are in collaboration with Werner Nagel (Jena, Germany).

*Intervenant

Geometry in neuroscience: the example of the visual cortex

Pascal Chossat*[1,2]

[1]MATHNEURO – INRIA – France
[2]Laboratoire Jean Alexandre Dieudonné – Université Nice Sophia Antipolis (UNS), CNRS : UMR7351 – France

Résumé

How does the brain process sensory information so as to restitute a coherent, global representation of the world (this is the "Gestalt" problem)?
Vision has been a much studied sensory system to investigate this problem: anatomical and functional experiments have provided a fairly detailed description of the visual system in the brain, at least from the retina to the primary visual cortex also named V1, which is the area in the visual cortex receiving the signal generated in the retina and processing first the "low-level" informations such as orientation of lines, contrast, spatial frequency etc. This information is however essentially of local nature. How does V1 proceed to restitute from that a global geometrical information? This is a typical complex system with multiple spatial scales.
I shall first present a quick survey of the current state of knowledge about the anatomical and functional architecture of V1 and its mathematical idealization. Then I shall show how coupling this geometrical setup with physical modeling of neural metworks can explain how visual patterns are generated in the brain even in the absence of sensorial stimuli (visual hallucinations). If time permits I shall present some recent results about the mathematical treatment of this problem.

*Intervenant

Heterogeneously Coupled Maps. Coherent behaviour and reconstructing network from data

Tiago Pereira[1], Matteo Tanzi[1], and Sebastian Van Strien*[1]

[1]Imperial College London – Royaume-Uni

Résumé

In this joint work with Matteo Tanzi and Tiago Pereira, we study networks of heterogeneously coupled maps. Using transfer operators on invariant cones of densities and a concentration inequality, we show that different types of dynamics emerge across distinct connectivity layers. Moreover, it turns out that data arising from such systems can be used to reconstruct detailed information on the dynamics and the network. Reference: https://arxiv.org/abs/1704.06163. To appear in JEMS.

*Intervenant

Heteroclinic chains in a model of associative memory

Martin Krupa*[1,2]

[1]Project Team MathNeuro – INRIA – France
[2]LJAD (UMR CNRS 7351) – Université Côte d'Azur – France

Résumé

We consider a Hopfield network designed to model so called prime-target relations in associative memory. In this model stable equilibrium states correspond to learned patterns, representing concepts stored in the memory. Passage through a sequence of concepts from one to the next has been called *latching dynamics* (see Lerner I. and Shriki O., Internally and externally driven network transitions as a basis for automatic and strategic processes in semantic priming: theory and experimental validation. *Front.Psychol* **5:314**, 2014). It has been conjectured that synaptic depression, that is weakening of synaptic connections due to the depletion of neuro-transmitter, is the biological mechanism of the transitions between the concepts. In our recent work we show that in the Hopfield network, extended to include a model of synaptic depression, latching dynamics can be approximated by heteroclinic chains (see Aguilar C., Chossat P., Krupa M., Lavigne F., Latching dynamics in neural networks with synaptic depression. *PLoS ONE* **12** (8), 2017). In this talk we discuss the conditions for the existence of heteroclinic chains using singular perturbation theory: we define a singular limit and determine necessary and sufficient conditions for the existence of heteroclinic chains. Subsequently we discuss the passage times in the presence of noise.

*Intervenant

Gluing bifurcations for monotone families of vector fields on a torus

Claude Baesens[1] and Robert Mackay*[1]

[1]University of Warwick – Royaume-Uni

Résumé

The concept of *gluing bifurcations* was introduced in *Gambaudo J-M, Glendinning P, Tresser C,* Stable cycles with complicated structures*, J. Phys. Lett. (Paris)* ***46*** *(1985) L653-7.* We prove that the simplest generic monotone families of vector fields on a torus have at least 2 gluing bifurcations of necklace type and most of them have infinitely many gluing bifurcations of pendant type. These results and many others are contained in *Baesens C, MacKay RS,* Simplest bifurcation diagrams for monotone families of vector fields on a torus, *Nonlinearity* ***31*** *(2018) 2928-2981.*

*Intervenant

A complex evolving system approach to the study of economic fluctuations

Mauro Napoletano*[1,2]

[1]OFCE – Sciences Po – France
[2]KTO Research Center – SKEMA Business School-UCA – France

Résumé

I discuss the main building blocks of a complex evolving approach to economic analysis. This approach studies economic fluctuations as the emergent properties of local and disequilibrium interactions among heterogeneous agents. I also discuss how most elements of this approach are embedded in new class of models, such as Financial Network models and Agent-Based Models. Finally, I show how these models are able to capture salient features of observed economic dynamics, like deep economic recessions or the emergence of systemic risk in financial markets, which are typically not captured by more standard economic models.

*Intervenant

Lagrangian turbulence and time irreversibility

Jérémie Bec*[1]

[1]Lagrange – Observatoire de la Cote d'Azur, CNRS : UMR7293, Université Côte d'Azur – France

Résumé

Accurate and efficient models of turbulence are key in a multitude of applications, ranging from cardiology and engine optimization, to atmospheric circulation and planet formation. Flows develop in an unsteady and chaotic turbulent state when the amount of injected kinetic energy overwhelms viscous damping. This excess, measured by the Reynolds number, results in a cascading process where a wide range of excited scales are strongly tied up. Energy dissipation is then sustained by violent fine-scale structures, leading to the persistence of a finite viscous dissipation in the limit of infinite Reynolds numbers. This phenomenon, dubbed "dissipative anomaly", rests on the singular nature and deep irreversibility of turbulent flows, and is the primary source of difficulties when developing turbulence models. I will present recent quantitative progress in the understanding of this highly singular behaviour, by focusing on the irreversible nature of turbulence. A special emphasis will be given on the signature of irreversible processes on the motion of tracers transported by the flow.

*Intervenant

Discovering laws of Nature with a compass and a ruler

Pierre Coullet*[1]

[1]InPhyNi – CNRS, Université Côte d'Azur – France

Résumé

I will describe some of the experimentations I performed in schools with pupils in the context of geometry and physics. From Euclids to Newton, physical phenomena (equilibria, light and motion) have been described in term of geometry only. The first part of the talk will be devoted to light, and particularly to the law of reflexion and the construction of Anaclastic mirrors and lenses. In the second part I will show how to solve the Kepler problem of planetary motion with the help of a compass and a ruler only. These are two examples among others which can be done in schools.

*Intervenant

Existence of quasipatterns in the superposition of two hexagonal patterns for the Swift Hohenberg PDE

Gerard Iooss*[1]

[1]Labo J. A. Dieudonné – Ministère de l'Education nationale, de l'Enseignement supérieur et de la Recherche – France

Résumé

Let us consider a quasilattice spanned by the superposition of two hexagonal lattices in the plane, differing by a rotation of angle ß. We study bifurcating quasi patterns solutions of the Swift-Hohenberg PDE, built on such a quasilattice, invariant under rotations of angle $\pi/3$. For nearly all ß, we prove that in addition to the classical hexagonal patterns, there exist four bifurcating quasi patterns, with equal amplitudes on each basic lattice.

*Intervenant

Linking with Jean-Marc

Etienne Ghys*[1]

[1]Ghys (CNRS ENS Lyon) – Centre national de la recherche scientifique - CNRS (France) – UMPA, 46 Allée d'Italie, 69364 Lyon, France

Résumé

In the last 25 years, my trajectory has been entangled with Jean-Marc in many ways. Many times, we tried - unsuccessfully - to prove the topological invariance of Arnold's asymptotic linking number but we harvested quite a few knots, braids and links. In this talk, I would like to review partial results around this conjecture and to present related recent related work by Marie Lhuissier on the three body problem.

*Intervenant

Dynamics of strongly dissipative diffeomorphisms of the disc with zero entropy

Sylvain Crovisier*[1], Enrique Pujals[2], and Charles Tresser

[1]Laboratoire de Mathématiques d'Orsay – CNRS - Univ. Paris-Sud – France
[2]IMPA – Brésil

Résumé

We consider the diffeomorphisms of the disc satisfying a dissipation assumption (it includes the dynamics of Hénon diffeomorphisms with Jacobian $< 1/4$.) We describe the dynamics of these systems when the topological entropy vanishes, in particular the renormalizations and the set of periods. This is a joint work with Enrique Pujals and Charles Tresser.

*Intervenant

Maximal isotopies, transverse foliations and orbit forcing theory for surface homeomorphisms

Patrice Le Calvez*[1] and Fabio Tal[2]

[1]IMJ - PRG – Université Pierre et Marie Curie - Paris 6, CNRS : UMR7586 – France
[2]Universidade de São Paulo – Brésil

Résumé

If f is a homeomorphism of a surface that is isotopic to the identity, we can define the notion of maximal isotopies, transverse foliations and transverse trajectories. Recently we developped with Fabio Tal (Universidade de Sao Paulo) a *forcing theory* on the set of transverse trajectories of such a homeomorphism. In particular we obtain a simple criterium of existence of a topological horseshoe. Different applications can be deduced, in particular results related to rotation vectors and also structural results about homeomorphisms on the 2-sphere with no entropy.

*Intervenant

Emergence of lung's geometry, complex or not ?

Benjamin Mauroy*[1]

[1]Laboratoire J.A. Dieudonné – CNRS : UMR7351, Université Côte d'Azur – France

Résumé

Mammals' lung is an organ that transports ambient air to and from the fifty to one hundred square meters of air/blood interface, where exchanges of oxygen and carbon dioxide occur. This large interface is folded into the thoracic cage, and to reach it, the lung's geometry is shaped as dichotomous tree. Each branch of that tree is a tube where air is flowing, and each leaf of the tree feeds a portion of the air/blood interface. Lung's characteristics have been selected by evolution so that it is efficient to perform its function under the constraints of the universal laws of physics. During this talk, we will focus on lung's geometry and see how modelling and mathematical approaches can bring important insights on why and how lung's geometry could have been selected. While unveiling the probable mechanisms behind lung's geometry selection, we will discuss the status of the lung as a complex system or not.

*Intervenant

Scaling laws for a compliant biomimetic swimmer

Florence Gibouin[1], Christophe Raufaste[1], Yann Bouret[1], and Médéric Argentina*[1]

[1]InPhyNi – CNRS, Université Côte d'Azur – France

Résumé

Motivated by the seminal work of Lord Lighthill in the sixties, we study the motion of inertial aquatic swimmers that propels with undulatory gaits. We have uncovered the law linking the swimming velocity to the kinematics of the swimmer and the fluid properties (Nat. Phys. 2014). At high Reynolds numbers, the velocity appears to be equal to $0.4\mathrm{Af}/(2\pi)$, where A and f are respectively the amplitude and the frequency of the oscillating fin. We have constructed a compliant biomimetic swimmer, whose muscles have been modeled through a torque distribution thanks to a servomotor. A soft polymeric material mimics the flesh and provides the flexibility. By immersing our robot into a water tunnel, we find and characterize the operating point for which the propulsive force balances the drag. We bring the first experimental proof of the former law and probe large amplitude undulations which exhibits nonlinear effects. All data collapse perfectly onto a single master curve. We investigate the role of the fin flexibility by varying its length and its thickness and we figured out the existence of an efficient swimming regime.

*Intervenant

Groups of diffeomorphisms of a Cantor set

Dominique Malicet[1] and Emmanuel Militon*[2]

[1]LAMA – Université Paris-Est Marne-la-Vallée (UPEMLV), CNRS : UMR8050 – France
[2]LJAD – Université Côte d'Azur (UCA), CNRS : UMR7351 – France

Résumé

Let K be a Cantor set contained in a line. We call *group of diffeomorphisms of K* the group of homeomorphisms of K which are locally restrictions of diffeomorphisms of the line. In this talk, we will discuss some properties of these groups and see consequences of our results for Higman-Thompson groups Vn. This is joint work with Dominique Malicet.

*Intervenant

Spectral statistics of sparse random graphs: the Thomae function and modular forms

Sergei Nechaev*[1]

[1]Interdisciplinary Scientific Center Poncelet (CNRS UMI 2615), Moscow – Russie

Résumé

We discuss the spectral properties of highly sparse adjacency matrices near the percolation threshold. The eigenvalue density of an ensemble of such matrices can be expressed through a discontinuous function at all rational points, known as the "Thomae" (or "popcorn") function, obtained via the construction known as the "Euclid's orchard." We discuss the connection between the Thomae function and the theory of modular forms and propose a continuous approximation of the Thomae function on the basis of the Dedekind's eta-function near the real axis. We propose simple arguments that demonstrate the presence of the "Lifshitz tail" near the spectral boundary typical for the one-dimensional Anderson localization.

*Intervenant

Periodic Approximations to Aperiodic Hamiltonian

Siegfried Beckus[1], Jean Bellissard*[2,3], and Giuseppe De Nittis[4]

[1]Israel Institute of Technology – Israël
[2]Georgia Institute of Technology – États-Unis
[3]Münster Universität – Allemagne
[4]Pontificia Universidad Catolica de Chile – Chili

Résumé

This talk will provide a glimpse of the content of a series of articles already written or under writing, concerning the calculation of the spectrum of a self-adjoint operator by approximating the operator with a sequence or a family of self-adjoints operators. A special emphasis will be put on the case of Hamiltonians describing the quantum motion of a particle in an aperiodic medium, by approximating the medium by periodic ones as the periods goes to infinity. This is joint work with S. Beckus and G. De Nittis.

*Intervenant

Gap labelling in quasicrystals: from microwaves to ultracold atoms

Patrizia Vignolo*[1], Jean-Marc Gambaudo[1], Matthieu Bellec[1], Ulrich Kuhl[1], Fabrice Mortessagne[1], Julien Boehm , and Abdoulaye Camara

[1]Institut de Physique de Nice – CNRS : UMR7010, Université Nice Sophia Antipolis (UNS), Université Nice Sophia Antipolis [UNS] – France

Résumé

Quasicrystals can be modelled with a collection of polygons (tiles) that cover the whole plane, so that each pattern (a sub-collection of tiles) appears up to translation with a positive frequency, but the tiling is not periodic. The frequency of presence of each pattern determines the spectrum of the system, and this is the subject of the gap labelling theory [1].

Using a microwave realization of a tight-binding Penrose-tiled quasicrystal [2], we measured the gap labelling and the spatial energy distribution of each eigenstate [3]. The energy-scaling behaviour of the hopping terms in this particular system, allowed us to identify the main patterns that determine the first hierarchical structure of the spectrum . Our energy-scaling analysis enabled us not only a straightforward interpretation of the gap labelling but also a full understanding of the wavefunction behaviour observed in each band.

The next goal will be the realization of a light Penrose-tiled quasicrystal for ultracold atoms, the underlying idea being to have access to samples with a lager number of tiles and thus to have the opportunity to observe the hierarchical effect of larger and larger patterns in the gap labelling. We have shown that this may be possible by mapping the gap labelling on a Brillouin zone (BZ) labelling and measure the areas of the extended BZs or the Bragg peak intensity distribution via different time-of-flight techniques [4].

1. J. Bellissard in "From Number Theory to Physics", 538 (Springer, 1993).
2. M. Bellec, et al., Phys. Rev. Lett. 110, 033902 (2013).
3. P. Vignolo et al. , Phys. Rev. B 93, 075141 (2016).
4. J.M. Gambaudo, P. Vignolo, New J. Phys. 16, 043013 (2014).

*Intervenant

Strong orbit equivalence and eigenvalues

Maria Isabel Cortez*[1], Fabien Durand[2], and Samuel Petite[2]

[1]UNIVERSIDAD DE SANTIAGO DE CHILE – Chili

[2]Laboratoire Amiénois de Mathématique Fondamentale et Appliquée – CNRS : UMR7352, Université de Picardie Jules Verne – France

Résumé

The additive group E(X,T) of continuous eigenvalues of a minimal Cantor systems (X,T) is not invariant under strong orbit equivalence. Nevertheless, there are some restrictions determined by the dimension group associated to (X,T). In this work we show that, if I(X,T) is the intersection of all the images of the dimension group by its traces, then the quotient group I(X,T)/E(X,T) is torsion free whenever the associated dimension group has no non trivial infinitesimal. There are some open question about realization. This is a joint work with Fabien Durand and Samuel Petite. Another work in the same direction was made by Giordano, Handelman and Hosseini.

*Intervenant

Freezing Gibbs measures

Jean-René Chazottes*[1]

[1]CPhT – Ecole Polytechnique, CNRS : UMR7644 – France

Résumé

I will talk about the behavior of Gibbs measures on the d-dimensional cubic lattice at low temperature. I will review several results, e.g., the (non-)convergence of Gibbs measures as temperature goes to 0. Some have been obtained in collaboration with Jean-Marc. Then I will address some frozen questions about phase transitions at positive temperature, in dimension d greater than or equal to 2, between a disordered phase and a quasicrystalline phase modelled by a uniquely ergodic subshift of finite type in the context of lattice systems.

*Intervenant

Tilings, Towers, Linear repetitivity

José Aliste*[1] and Daniel Coronel*[1]

[1]Universidad Andres Bello – Chili

Résumé

We will give a brief account of the developments in the study of tilings through systems of Kakutani-Rohlin towers. We will review several results obtained along the years that were either done by Gambaudo or directly influenced by his work and done by Chilean mathematicians. Finally, we will present some new results regarding the study of eigenvalues of tilings systems.

*Intervenant

On a toy network of neurons interacting through nonlinear dendritic compartments

Romain Veltz*[1], Nicolas Fournier[2], and Etienne Tanré[1]

[1]INRIA – CRISAM - Inria Sophia Antipolis - Méditerranée – France

[2]Institut de Mathématiques de Jussieu - Paris Rive Gauche – Université Pierre et Marie Curie - Paris 6, Université Paris Diderot - Paris 7, Centre National de la Recherche Scientifique : UMR7586 – France

Résumé

The dendrites of many neurons are endowed with active mechanisms which confer them properties of excitability and enable the genesis of local dendritic spikes. In this work, we consider the propagation of dendritic spikes in a dendrite composed of a single branch. These local dendritic spikes are due to voltage dependent ion channels (i.e. sodium, calcium or NDMA spikes). Because the dendritic compartments are connected with passive conductors, dendritic spikes propagate in both sides, although with possibly different speeds. Two dendritic spikes propagating in opposite directions will cancel out when they collide as in the case of the axon because of the refractory period.

We focus on an abstract description of this nonlinear behaviour which is more amenable to analysis. This description reveals a rich mathematical structure that we study through the use of applied combinatorics. This also provide an algorithm for an efficient simulation. In passing, we link this description to the famous Ulam problem opening the door for a mean field model.

Whenever a dendritic spike reaches the soma, it triggers a depolarization. For simplicity, we put a spiking mechanism in the soma as a generalised integrate and fire model. We call such model, a Ball-and-Stick (BaS) neuron. We then study the large N limit of networks of N excitatory BaS neurons. Among other findings, we are able to extract the right scaling for the synaptic weights which allows to have a large N limit which we derive. Numerical simulations are presented for cases not covered by our mathematical results.

This is one of the first work on mean field limits of networks of spiking neurons with a dendritic branch.

*Intervenant

Cellular automata, tilings and undecidability

Enrico Formenti*[1]

[1]Laboratoire d'Informatique, Signaux, et Systèmes de Sophia-Antipolis (I3S) / Equipe MC3 (I3S) – CNRS : UMR7271, Université Nice Sophia Antipolis (UNS) – France

Résumé

Cellular automata and tilings are strictly related. Indeed, any evolution of a one-dimensional cellular automaton produces a tiling. In their turn tilings are connected to undecidability via the domino tiling problem. These connections opened the pathway to many proofs on the dynamical behavior of cellular automata and other symbolic dynamical systems. We will survey some of these historical proofs and show some recent developments about directional expansivity of cellular automata.

*Intervenant

Mass transport in tilings

Mike Kelly and Lorenzo Sadun*[1]

[1]University of Texas at Austin – États-Unis

Résumé

Suppose that we have a non-periodic tiling and two mass distributions, each determined locally from the tiling (e.g. you specify how much mass is in each A tile, each B tile, etc.). Under what circumstances is there a bounded transport from one distribution to the other ? When can the transport be done in a way that reflects the local structure of the tiling ? In this talk I'll show how these questions are equivalent to questions about tiling cohomology, and provide partial answers.

*Intervenant

Frenkel-Kontorova Models in almost-periodic environments

Samuel Petite*[1]

[1]LAMFA – Université de Picardie Jules Verne, CNRS : UMR7352 – France

Résumé

The Frenkel-Kontorova model describes how an infinite chain of atoms minimizes the total energy of the system when the energy takes into account the interaction of nearest neighbors as well as the interaction with an exterior environment. An almost-periodic environment leads to consider a family of interaction energies which is stationary with respect to a minimal topological dynamical system. In common works with J.-M. Gambaudo, E. Garibaldi, P. Guiraud and P. Thieullen, we give some properties of the minimizing configurations. The main mathematical tools for this study are developed in the frameworks of discrete weak KAM theory, Aubry-Mather theory and spaces of Delone sets.

*Intervenant

Solenoidal minimal sets for smooth dynamics

Steven Hurder*[1]

[1]University of Illinois at Chicago – États-Unis

Résumé

The Smale solenoid can be realized as the minimal set for a smooth flow on a compact manifold. In fact, all 1-dimensional solenoids can be so realized up to homeomorphism. In this talk, we consider the analogous question for higher dimensional solenoids, which are defined as the inverse limits of sequences of proper coverings of closed manifolds. In this case, we ask for conditions on the fundamental group of the base manifold and the monodromy action on its fiber, which suffice to imply that a given solenoid is homeomorphic to the minimal set for a foliation of a compact manifold with regularity class C^r, for r > 0.

*Intervenant

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- F. Gautero (LJAD, Univ. Nice Sophia Antipolis),
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