

Nguyen-Thi Dang

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Nationality : French

Keywords : group actions, semisimple Lie groups, topological dynamics, Weyl chamber flows, spectrum of a product of random square matrix, Benoist cone, product of loxodromic elements.

Positions

- 1/10/2019– **Post-Doc at the University of Heidelberg**, *Research team "Asymptotic invariants and limits of groups and spaces"*, Universität Heidelberg.
Germany
- 23/09/2019 **PhD defense**, *Ergodic Theory Team, IRMAR*, University of Rennes.
France
- 2016–2019 **PhD under the supervision of François Maucourant and Barbara Schapira**, *Ergodic Theory Team, IRMAR*, University of Rennes.
France

Training

- 02/2016– **Master thesis under the supervision of Fanny Kassel**, *Proper affine actions in dimension 3*, Laboratoire Paul Painlevé, Lille.
07/2016
France
- 2013–2016 **Master's degree in Mathematics**, *Université Paris-Diderot*, Paris, France, *with distinction*.
- 02/2012– **Licence thesis with F. Patou under the supervision of Laure Quivy**, *Traitement du vide dans l'écoulement des fluides*, Cmla, Cachan.
07/2012
France
- 2012–2013 **Licence degree in Mathematics**, *Université Paris-Diderot and ENS Cachan*, Paris and Cachan, joint diploma, *with distinction*.

Research papers

- 2020 **Topological mixing of positive diagonal flows**, *Submitted*, on arXiv 2011.12900 or on HAL hal-03010830, version 2.

Abstract: Let G be a semi-simple real Lie group without compact factors and $\Gamma < G$ a Zariski dense, discrete subgroup. We study the topological dynamics of positive diagonal flows on $\Gamma \backslash G$. We extend Hopf coordinates to Bruhat-Hopf coordinates of G , which gives the framework to estimate the elliptic part of products of large generic loxodromic elements. By rewriting results of Guivarc'h-Raugi into Bruhat-Hopf coordinates, we partition the preimage in $\Gamma \backslash G$ of the non-wandering set of mixing regular Weyl chamber flows, into finitely many dynamically conjugated subsets. We prove a necessary condition for topological mixing, and when the connected component of the identity of the centralizer of the Cartan subgroup is abelian, we prove it is sufficient.

- 2020 **Topological mixing of the Weyl chamber flow**, *Ergodic Theory and dynamical systems*, (preprint 2018), joint work with O. Glorieux.

Abstract: In this paper, we study topological properties of the right action by translation of the

Weyl Chamber flow on the space of Weyl chambers. We obtain a necessary and sufficient condition for topological mixing.

PhD thesis

2019 **Dynamics of group action on homogeneous spaces of higher rank and infinite volume**, HAL Id:tel-02301728, version 1, under the supervision of Barbara Schapira and François Maucourant.

Abstract : Let G be a semisimple Lie group (of higher rank) and Γ a Zariski dense subgroup of G (of infinite covolume). In this thesis, we discuss two questions related to the *Benoist limit cone* of Γ : one concerns random walks, the other topological mixing of the directional Weyl chamber flow. In the introduction, we state the main results of this thesis in their context. In the second chapter, we recall some general facts about Lie groups and loxodromic elements. In the third chapter, we prove that every point of the interior of the limit cone is a Lyapunov vector. In the fourth chapter, we construct local coordinates of G and give key tools for the remaining parts. In the fifth chapter, we introduce the invariant subsets of G . In the last chapter of this thesis, we prove the topological mixing criterion of regular directional Weyl chamber flow obtained with O. Glorieux and we generalize this criterion to $\Gamma \backslash G$ for a class of Lie groups including $SL(n, \mathbb{R})$, $SL(n, \mathbb{C})$, $SO_0(p, p + 2)$.

Talks

- 15/04/2021 **Séminaire francophone de groupes et géométrie**, *online*, BBB, in french.
Mélange topologique des flots diagonaux positifs
- 29/10/2020 **Ergodic theory and dynamical systems Seminar**, *Bristol University*, Bristol, Great Britain.
Topological mixing of the Weyl chamber flow
- 15/06/2020 **HORUS seminar in Strasbourg**, *IRMA*, Strasbourg, France.
Mélange topologique des flots hyperboliques homogènes
- 14/02/2020–**Sophus Lie 2020**, *Universität Paderborn*, Paderborn, Germany.
15/02/2020 Short talk : Topological dynamics of the Weyl chamber flow
- 25/11/2019–**Topological Mixing of the Weyl Chamber Flows**, *Paroles aux jeunes chercheuses et chercheurs en Géométrie et Dynamique*, University of Nancy, Nancy, France
27/11/2019
- 11/11/2019 **Topological Mixing of the Weyl Chamber Flows**, *Ergodic Theory and Dynamical Systems Seminar*, University of Zuerich, Zuerich.
Switzerland
- 6/11/2019 **Topological Mixing of the Weyl Chamber Flows**, *Ergodic Theory and Dynamical Systems Seminar*, LAGA, University Paris 13, Villetaneuse.
France
- 14/10/2019–**The Top Lyapunov Exponent**, *Arbeitsgemeinschaft*, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach.
19/10/2019
Germany
- 8/10/2019 **Topological Mixing of the Weyl Chamber Flows**, *Spectral Theory Seminar*, University of Paderborn, Paderborn.
Germany
- 23/09/2019 **Dynamics of group action on homogeneous spaces of higher rank and infinite volume**, *PhD defense*, *IRMAR*, University of Rennes, Rennes.
France

- 13/06/2019 **Topological Mixing of the Weyl Chamber Flows**, *Joint meeting of the ergodic theory teams of Brest and Vannes*, University of Brest and Vannes, Quimper.
France
- 02/2019 - **Two talks on the Benoist limit cone**, *weekly meetings on Anosov Representations*,
06/2019 IRMAR, University of Rennes, Rennes.
France
- 3/05/2019 **Topological Mixing of the Weyl Chamber Flows**, *Geometry Seminar in Nantes*,
University of Nantes, Nantes.
France
- 7/02/2019 **Topological Mixing of the Weyl Chamber Flows**, *Geometry Seminar in Heidelberg*,
University of Heidelberg, Heidelberg.
Germany
- 6/02/2019 **Some problems of dynamics in higher rank**, *Junior Geometry Seminar in Heidelberg*,
University of Heidelberg, Heidelberg.
Germany
- 12/12/2018 **Topological Mixing of the Weyl Chamber Flows**, *Meeting of the ERC project IPPFLOWS*,
Université Paris 11, Orsay.
France
- 9/04/2018 **Special PhD student session: Quelques problèmes en dynamique en rang supérieur**,
Séminaire de l'équipe de théorie ergodique, IRMAR, Rennes.
France
- 1/02/2018 **Perturbations singulières: l'analyse géométrique de Fenichel**, *Journées Louis
Antoines*, IRMAR, Rennes.
France
- 31/05/2018 **Séminaire des doctorants**, *IRMA*, Strasbourg, France.
Exposé : Quelques problèmes en dynamique en rang supérieur
- 15/03/2018 **Surprise session: Comment jouer au ping-pong**, *Séminaire Pampers*, IRMAR,
Rennes.
France
- 07/11/2017 **Marches aléatoires dans $SL(n, \mathbb{R})$ pour $n > 2$.**, *Séminaire des doctorants*, Labora-
toire Jean Leray, Nantes.
France
- 26/10/2017 **Marches aléatoires dans $SL(n, \mathbb{R})$ pour $n > 2$.**, *Séminaire Pampers*, IRMAR,
Rennes.
France

Participation to meetings and Workshops

Upcoming

- 5/12/2021- **Workshop Anosov³ 2149a**, *MFO*, Oberwolfach, Germany.
11/12/2021
- 21/06/2021- **Summer school in dynamical systems**, *GDR Platon*, Brest, France.
25/06/2021

Former

- postponed **Dynamics, equidistribution and counting**, *Technion*, Haifa, Israël.
 since May Amos Nevo fest.
 2020
- 4/2/2021 **a hyperbolic day online**, *online*.
 Online conference
- 11/01/2021– **Topics at the interface of low dimensional group actions and geometric structures**, *online*, Singapour University, Singapour.
 15/01/2021
 Online conference
- 7/12/2020– **Paroles aux jeunes chercheurs et chercheuses**, *online conference organised by*
 9/12/2020 *IRMAR*, Rennes, France.
 GDR Platon
- 3/08/2020– **Dynamics on your screen**, *online conference*.
 6/08/2020
- 8/07/2019– **Aspects of Geometric Group Theory**, *IHES*, Bures-sur-Yvette, France.
 19/07/2019 Summer School
- 27/06/2019– **Dynamics of Parabolic Flows**, *University of Zuerich*, Zuerich, Switzerland.
 5/07/2019
- 27/05/2019– **Dynamics of Group Actions**, Cetraro, Italie.
 31/05/2019
- 12/10/2018– **Meeting of the ERC IPPFLOW**, *Université Paris 11*, Orsay, France.
 12/12/2018 Meeting of the ERC IPPFLOW
- 12/5/2018– **Borel seminar**, Les Diablerets, Suisse.
 12/07/2018 Topology and Dynamics in the Swiss Alps
- 06/11/2018– **Workshop**, *University of Luxembourg*, Esch-sur-Alzette, Luxembourg.
 06/14/2018 Workshop on pseudo-Riemannian geometry and Anosov representations
- june 2017 **Lebesgue Semester in Geometry and Dynamics**, *IRMAR, UBL, Leray*, Rennes,
 Brest, Nantes, France.
 all the semester

Experiences

- 18/06/2018– **Participation to MathC2+**, *Ens Rennes*, Rennes, France.
 20/06/2018
- 5/10/2018– **Participation to Science Festival**, Rennes, France.
 7/10/2018
- 2017–2018 **Organiser with C. Francini of the Junior Algebra and Geometry seminar (Pampers)**, *IRMAR*, Rennes, France.

Teaching

- 2018–2019 **64h of teaching in exercise sessions and computer sessions**, *University of Rennes*, Rennes, France.
- 2017–2018 **64h of teaching in exercise sessions and computer sessions**, *University of Rennes*, Rennes, France.
- 2016–2017 **64h of teaching in exercise sessions and computer sessions**, *University of Rennes*, Rennes, France.

Languages

French native language
Vietnamese native language
English proficient
German practical notions

C1, C2