

Pierre-Antoine Guihéneuf

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Date of birth: 1 September 1989

Positions

- 2016– Associate professor “*maître de conférences*” at UPMC (Paris 6), IMJ-PRG and ICSD.
- 2015–2016 Post-doc at UFF Niterói, funded by a grant of CAPES (*Pós-Doutorado de Excelência* awarded by IMPA).
- 2012–2015 *Allocataire moniteur* in Orsay: PhD fellowship from ÉNS Cachan, including teaching.
- 2008–2012 *Élève normalien de l'ÉNS Cachan*: 4 years fellowship obtained by a competitive exam.

Education

- 2011–2015 **PhD thesis supervised by François Béguin**, *Subject: spatial discretization of dynamical systems*, Laboratory of mathematics of Orsay.
- 2010–2011 **Agrégation de mathématiques**, (*national teacher employment competitive exam, option algebra and symbolic calculus*).

Publications and preprints

- 2023 **Area preserving homeomorphisms of surfaces with rational rotational direction**, (*with Patrice Le Calvez and Alejandro Passeggi*), arXiv: 2305.05755v1.
- 2023 **Parabolic isometries of the fine curve graph of the torus**, (*with Emmanuel Militon*), arxiv: 2302.08184.
- 2022 **Discrepancy and discretizations of circle expanding maps I: theory**, (*in collaboration with Maurizio Monge*), to appear in Nonlinearity.
- 2022 **Discrepancy and discretizations of circle expanding maps II: simulations**, (*with Maurizio Monge*), to appear in Dynamical Systems: An International Journal.
- 2022 **Homotopic rotation sets for higher genus surfaces**, (*with Emmanuel Militon*), arxiv:2201.08593, to appear in the Memoirs of the AMS.
- 2020 **Historic behaviour vs. physical measures for irrational flows with multiple stopping points**, (*with Martin Andersson*), Advances in Mathematics Volume 409, Part A, 19 November 2022, 108626.
- 2020 **Théorie de forçage des homéomorphismes de surface [d'après Le Calvez et Tal]**, Séminaire Bourbaki, 72e année, 2019-2020, nr. 1171, Janvier 2020.
- 2019 **Dynamical behavior of a nondiffusive scheme for the advection equation**, (*with Nina Aguillon*), Confluentes Matematici, 12 (2020) no. 1, 3–29.

- 2019 **Dirac physical measures on saddle-type fixed points**, (with Pablo Guarino and Bruno Santiago), arXiv:1909.02172, Journal of Dynamics and Differential Equations, 34 (2022) 983–1048.
- 2016 **Stability of the rotation set of area-preserving toral homeomorphisms**, (with Andr s Koropecki), Nonlinearity, 30 (2017), no. 3, 1089–1096.
- 2016 **On the genericity of the shadowing property for conservative homeomorphisms**, (with Thibault Lefeuvre), Proc. Amer. Math. Soc. 146 (2018), no. 10, 4225–4237.
- 2016 **A Minkowski theorem for Meyer sets**, (with  milien Joly), Discrete & Computational Geometry 58 (2017), iss. 3, 596–613.
- 2015 **Model sets, almost periodic patterns, uniform density and linear maps**, Revista Matem tica Iberoamericana 34 (2018), no. 1, 455–474.
- 2015 **Degree of recurrence of generic diffeomorphisms**, Discrete Analysis 2019:1, 43 p., <https://discreteanalysisjournal.com/article/7545>.
- 2015 **Physical measures of discretizations of generic diffeomorphisms**, Ergodic Theory and Dynamical Systems 38 (2018), no. 4, 1422–1458.
- 2015 **Discretizations of isometries**, proceedings of the conference DGCI 2016, Lecture Notes in Computer Science.
- 2014 **Almost periodic patterns**, (with Yves Meyer), permanent preprint.
- 2014 **How roundoff errors help to compute the rotation set of torus homeomorphisms**, Topology and its Applications 193 (2015), 116–139.
- 2012 **Dynamical properties of spatial discretizations of a generic homeomorphism**, Ergodic Theory and Dynamical Systems 35 (2015), no. 5, 1474–1523.
- 2012 **Propri t s dynamiques g n riques des hom omorphismes conservatifs**, survey published in Ensaios Matem ticos 22, 2012.

Talks

- 2020 Porto Dynamical Systems Seminar (remote), Semin rio de Sistemas Din micos da UFF (remote), Working group "mod lisation stochastique" du LPSM (Paris)
- 2019 S minaire de dynamique (IMJ-PRG, Paris), S minaire Dynamique, Arithm tique, Combinatoire (Ernest, Marseille), ANR CODYS 2019 meeting (LaBRI, Bordeaux), DYADISC3 (Amiens), Seminario de Sistemas Din micos (Montevideo, 2 talks)
- 2018 ANR CODYS Meeting (IRIF, Paris), Hadamard minicourse (Orsay), S minaire G om tries (Lyon), S minaire G om trie, analyse et dynamique (Nice), S minaire g om trie et syst mes dynamiques (Dijon), HCERES talk (IMJ-PRG), DSDFE 2018 (Krynica-Zdr j, Pologne), Journ es SDA2 (St Etienne)
- 2017 S minaire de Dynamique, Th orie Ergodique et Probabilit s (Amiens), Ergodic Theory, Algorithms and Rigorous Computations (Warwick), Semin rio de Sistemas Din micos da UFF (Niter i).

- 2016 Séminaire PEQUAN (Paris), Surfaces in Luminy (Marseille), journée de rentrée de l'équipe AA (Paris), journée de rentrée de l'IMJ (Paris), Seminario de Sistemas Dinámicos (Montevideo), International Conference on Dynamical Systems (Búzios), Workshop for young researchers: groups acting on manifolds (Teresópolis), 62^o EDAI (UFRJ), Seminário de Sistemas Dinâmicos (IME-USP, São Paulo), DGCI 2016 (Nantes), Séminaire de théorie ergodique de Jussieu, Séminaire COOL (IHP), Séminaire géométrie et systèmes dynamiques de Dijon, Seminario de Sistemas Dinámicos de Santiago (Chili), TopDin 2016 (IME-UFF, Brésil), Séminaire Dynamique et Géométrie (Nice), Séminaire Ernest (Marseille).
- 2015 Seminário de Sistemas Dinâmicos da UFF (Niterói), Oitavo Encontro de Jovens Dinamicistas (UFRJ, Rio), School and Conference on Dynamical Systems (ICTP, Italy), poster, Seminar of dynamical systems, analysis and geometry (Avignon), Seminar of ergodic theory and dynamical systems (Paris XIII), Seminar of geometry and dynamics (Lille), Seminar of geometry, topology and dynamics (Orsay).
- 2014 Conference for young researchers in geometry and dynamics (Bordeaux), PhD students seminar of Orsay, Seminar of ergodic theory (Rennes), "Rencontres du troisième cycle" (Bordeaux).
- 2013 Conference for young researchers in geometry and dynamics (CIRM), Workshop on combinatorics, number theory & dynamical systems (IMPA), poster, Seminar of geometry, topology and dynamics (Orsay), PhD students seminar (Bordeaux).
- 2012 Working group "Ergodic theory and dynamics" (Orsay), Third year students seminar of ÉNS Cachan, Students seminar of ÉNS Cachan, PhD students seminar of Orsay.

Conferences

- 05/2023 Beyond Uniform Hyperbolicity (Bedlewo).
- 11/2022 Invited 3 weeks in Montevideo (Uruguay).
- 10/2022 Big Mapping Class Groups and Diffeomorphism Groups (CIRM).
- 10/2022 School on Dynamical Group Theory (Dijon).
- 09/2021 2nd Workshop on Wild Dynamical Systems (Azores).
- 09/2021 ANR CODYS meeting (Bordeaux).
- 06/2021 Uniformly and non-uniformly hyperbolic dynamics (CIRM, in honour of Christian Bonatti's 60th birthday).
- 09/2020 1st Workshop on Wild Dynamical Systems (Banyuls, organized).
- 09-12/2019 Invited three months in Montevideo (Uruguay).
- 08/2019 Invited one week in UFF Niteroi (Brazil).
- 07/2019 DYADISC 3 (Amiens).
- 06/2019 ANR CODYS 2019 meeting (LaBRI, Bordeaux).
- 05/2019 Beyond Uniform Hyperbolicity 2019 (CIRM).
- 12/2018 Invited two weeks in Montevideo (Uruguay) / conference for Patrice Le Calvez.
- 07/2018 Journées SDA2 (St Etienne).
- 06/2018 DSDFE 2018 (Krynica-Zdrój, Pologne).

- 05/2018 Invited one week in Dijon.
- 05/2018 Invited one week in Nice.
- 04/2018 Surfaces in Bedlewo (Pologne)
- 11/2017 Invited one week in Vienna (Autriche)
- 09/2017 Workshop on Topological Dynamics and Rotation Theory on Surfaces (Jena).
- 08/2017 3 weeks in Rio for collaborations with Maurizio Monge (UFRJ, Rio de Janeiro) and Pablo Guarino and Bruno Santiago (UFF, Niteroi).
- 06/2017 Dynamics beyond uniform hyperbolicity (Provo, Utah).
- 06/2017 A conference in memory of Jean-Christophe Yoccoz (Paris)
- 04/2017 Ergodic Theory, Algorithms and Rigorous Computations (Warwick).
- 10/2016 Surfaces in Luminy (Marseille).
- 07/2016 Invited one week in Montevideo.
- 07/2016 *Workshop for young researchers: groups acting on manifolds* (Teresópolis, Brasil).
- 06/2016 *International Conference on Dynamical Systems* (Búzios, Rio de Janeiro).
- 06/2016 Invited one week at USP (São Paulo).
- 04/2016 DGCI 2016 (Discrete Geometry for Computer Imagery), Nantes (France).
- 07/2015 *School and Conference on Dynamical Systems*, ICTP (Trieste, Italy).
- 06/2015 *Geometries in action*, conference in honor of Étienne Ghys (Lyon, France).
- 06/2015 *Third Palis-Balzan international symposium on dynamical systems*, I'HP (Paris).
- 11/2014 *Paroles aux jeunes chercheurs en géométrie et dynamique*, Bordeaux (France).
- 04/2014 *Surfaces in Sao Paulo*.
- 04/2014 *Rencontres du troisième cycle*, Bordeaux (France).
- 11/2013 *Paroles aux jeunes chercheurs en géométrie et dynamique* at CIRM (Marseille, France).
- 09/2013 *Journées de géométrie et dynamique*, Bordeaux (France).
- 08/2013 Invited two weeks in IMPA (Rio de Janeiro), *Workshop on combinatorics, number theory & dynamical systems*.
- 07/2013 *Summer school on dynamical systems*, Gdynia (Poland).
- 06/2013 *Second Palis-Balzan international symposium on dynamical systems*, IHP (Paris).

Teaching

- 2019–2020 Courses and tutorial for Lebesgue integration in \mathbf{R}^n . Tutorials of Dynamical Systems II (M2).
- 2018–2019 Tutorials of integration and differential forms (L2) and topology and differential calculus (L3). Courses and tutorial for Euclidean vector spaces (L2). TD de Tutorials of Dynamical Systems II (M2).
- 2016–2017 Tutorials of integration and differential forms (L2) and topology and differential calculus (L3).
- 2014–2015 Modelling practical in second year (20h, design of the course), remedial teaching (40h).

- 2013–2014 Modelling practical in second year (20h, design of the course), remedial teaching (40h). Courses to prepare the entry exam of ENSEA (5h). Courses during the week “ski & studies” (10h).
- 2012–2013 Courses and tutorial in second year (50h, entire series, Fourier series, Fourier transform, z transform, several variable functions). Support lessons to a disabled student (10h). Supervision of the master 1 memoir of Gleen Foos (rotation number of circle homeomorphisms).
- 2011–2012 Oral exams in “classes préparatoires” (2h by week).

Animation

- 2022– Member of the board of the SMF (French mathematical society).
Responsible of the large audience conferences “Un texte un mathématicien”, “Mathématiques étonnantes”, “une questions un chercheur”, “Aromaths” and “Mathematic Park”
- 2020 Un puente matemático entre los billares, los gases y el algoritmo de Google, an article for the Spanish journal El País.
- 2016–2017 Talks at the “lycée français” of Rio de Janeiro. Writing of two articles for the website *Images Des Maths*.
- 2016–2017 Co-responsible of the heading “l’objet du mois” du of the website *Images Des Mathématiques*, talks in Aromaths and MathematicPark. Writing of three articles for the website *Images Des Maths*.
- 2015–2016 Writing of three articles for the website *Images Des Maths*.
- 2014–2015 Courses in the maths club Parimaths (4h), coaching of a team for the TFJM (French tournament of young mathematicians, winning team) and the ITYM (International tournament of young mathematicians, winning team).
- 2013–2014 Courses in the maths club Parimaths (8h), coaching of a team for the TFJM (French tournament of young mathematicians, winning team) and the ITYM (International tournament of young mathematicians, the team wins a second price), courses in the week of preparation of mathematical olympiads in Montpellier.
- 2012–2013 Courses in the maths club of Orsay (8h). Animation in the forum of mathematical games, in the seminar “Maths en Jeans” and in the science festival.
- 2011–2012 Participation in the conference “popularisation of mathematics” in Orléans, in the math fair in Jussieu, creation of problems and jury for ITYM.

Organization

- 2016–2022 Co-organizer of the Ergodic theory seminar of LPSM.
- 2020 Co-organizer of the First Workshop on Wild Dynamical Systems (Banyuls).
- 2015–2016 Organisation of a working group at UFF Niterói on the paper *Forcing theory for transverse trajectories of surface homeomorphisms* of Patrice Le Calvez and Fabio Tal. Referee for the journal *Chaos, Solitons and Fractals*.
- 2012–2014 Co-organizer of the PhD students seminar of Orsay.
- 2011–2012 Co-rganizer (and co-creator) of the students seminar of the ÉNS Cachan.