Curriculum Vitae

Camille Horbez
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Academic positions

Depuis 02/2016   Junior researcher (CNRS)
Working at the Laboratoire de Mathématiques d'Orsay (Université Paris-Saclay, Orsay)

08/2015–01/2016   Post-doctorate (University of Utah)
Mentor : Mladen Bestvina

09/2012–07/2015   PhD studies (Université de Rennes 1)
Advisor : Vincent Guirardel (Professor)
Thesis : *Random walks in* $\mathrm{Out}(F_N)$ *and subgroups of automorphisms of free products*, defended on Dec. 9th, 2014.

09/2012–08/2013   Student at the Ecole Normale Supérieure, Paris
Master internship at Cornell University, advisor : Karen Vogtmann.

Awards and grants

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1. <u>Awards</u>

   2020 Kamil Duszenko award (international award in geometric group theory)

   2018 Cours Peccot (Collège de France)

2. <u>Grants</u>

   — PI of an ERC Starting Grant since 2022 : "Artin groups, mapping class groups and $\mathrm{Out}(F_N)$: from geometry to operator algebras via measure equivalence" (Artin-Out-ME-OA)
   — Member in three projects funded by the French National Research Agency (ANR) :
      1. Since 2022 : "Groups acting on Fractals" (PI : François Dahmani)
      2. Spring 2022 : PI of the ANR Tremplin "Artin groups, mapping class groups and $\mathrm{Out}(F_N)$: from geometry to operator algebras via measure equivalence"

3. From 2016 to 2022 : "Dynamics of Automorphisms of Groups : Growth, Entropy, Random Walks" (PI : Rémi Coulon)

Publications and preprints

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32. C. Horbez and J. Huang. Integrable measure equivalence rigidity of right-angled Artin groups via quasi-isometry. *arXiv :2309.12147*, 2023.

31. D. Gaboriau, Y. Guerch, and C. Horbez. On the homology growth and the ℓ^2-Betti numbers of $\mathrm{Out}(W_n)$. *arXiv :2209.02760*, 2022.

30. C. Horbez and J. Huang. Measure equivalence rigidity among the Higman groups. *arXiv :2206.00884*, 2022.

29. S. Hensel and C. Horbez. Measure equivalence rigidity of the handlebody groups. *arXiv :2111.10064*, 2021.

28. C. Horbez, J. Huang, and A. Ioana. Orbit equivalence rigidity of irreducible actions of right-angled Artin groups. **Compos. Math.**, 159(4) :860–887, 2023.

27. V. Guirardel and C. Horbez. Measure equivalence rigidity of $\mathrm{Out}(F_N)$. *arXiv :2103.03696*, 2021.

26. C. Horbez and J. Huang. Measure equivalence classification of transvection-free right-angled Artin groups. **J. Éc. polytech. Math.**, 9 :1021–1067, 2022.

25. C. Horbez, J. Huang, and J. Lécureux. Proper proximality in non-positive curvature. **Amer J. Math.**, 145(5) :1327-1364, 2023.

24. V. Guirardel, C. Horbez, and J. Lécureux. Cocycle superrigidity from higher rank lattices to $\mathrm{Out}(F_N)$. **J. Mod. Dyn.**, 18 :291–344, 2022.

23. C. Horbez et Y. Qing and K. Rafi. Big mapping class groups with hyperbolic actions : classification and applications. **J. Inst. Math. Jussieu**, 21(6) :2173–2204, 2022.

22. C. Horbez and J. Huang. Boundary amenability and measure equivalence rigidity among two-dimensional Artin groups of hyperbolic type. *arXiv :2004.09325*, 2020.

21. A. Genevois and C. Horbez. Acylindrical hyperbolicity of automorphism groups of infinitely ended groups. **J. Topol.**, 14(3) :963–991, 2021.

20. S. Hensel, C. Horbez, and R.D. Wade. Rigidity of the Torelli subgroup in $\mathrm{Out}(F_N)$. *arXiv :1910.10189*, 2019.

19. C. Horbez and R.D. Wade. Commensurations of subgroups of $\mathrm{Out}(F_N)$. **Trans. Amer. Math. Soc.**, 373(4) :2699–2742, 2020.

18. V. Guirardel and C. Horbez. Boundaries of relative factor graphs and subgroup classification for automorphisms of free products. **Geom. Topol.**, 26(1) :71–126, 2022.

17. V. Guirardel and C. Horbez. Algebraic laminations for free products and arational trees. **Algebr. Geom. Topol.**, 19(5) :2283–2400, 2019.

16. M. Bestvina, V. Guirardel, and C. Horbez. Boundary amenability of $\mathrm{Out}(F_N)$. **Ann. Sci. Éc. Norm. Supér. (4)**, 55(5) :1379–1431, 2022.

15. M. Bestvina, C. Horbez, and R.D. Wade. On the topological dimension of the Gromov boundaries of some hyperbolic $\mathrm{Out}(F_N)$-graphs. **Pacific J. Math.**, 308(1) :1–40, 2020.

14. V. Guirardel and C. Horbez. Morphisms from higher rank lattices to $\text{Out}(F_N)$. Appendix to the article *Hyperbolic rigidity of higher rank lattices*, by Thomas Hattael. **Ann. Sci. Éc. Norm. Supér. (4)**, 53(2) :439–468, 2020.

13. M. Bestvina and C. Horbez. A compactification of outer space which is an absolute retract. **Ann. Inst. Fourier (Grenoble)**, 69(6) :2395–2437, 2019.

12. C. Horbez Central limit theorems for mapping class groups and $\text{Out}(F_N)$. **Geom. Topol.**, 22(1) :105–156, 2018.

11. F. Dahmani and C. Horbez Spectral theorems for random walks on mapping class groups and $\text{Out}(F_N)$. **Int. Math. Res. Not. IMRN**, 9 :1693–2744, 2018.

10. C. Horbez. The Tits alternative for the automorphism group of a free product. *arXiv :1408.0546*, 2014.

9. C. Horbez. Hyperbolic graphs for free products, and the Gromov boundary of the graph of cyclic splittings. **J. Topol.**, 9(2) :401–450, 2016.

8. C. Horbez. The boundary of the outer space of a free product. **Israel J. Math.**, 1 :179–234, 2017.

7. C. Horbez. The horoboundary of outer space, and growth under random automorphisms. **Ann. Sci. Éc. Norm. Supér. (4)**, 49(5) :1075–1123, 2016.

6. C. Horbez et R.D. Wade. Automorphisms of graphs of cyclic splittings of free groups. **Geom. Dedicata**, 178 :171-187, 2015.

5. C. Horbez. The Poisson boundary of $\text{Out}(F_N)$. **Duke Math. J.**, 165(2) :341–369, 2016.

4. C. Horbez. Spectral rigidity for primitive elements of F_N. **J. Group Theory**, 19(1) :55-123, 2016.

3. C. Horbez. A short proof of Handel and Mosher's alternative for subgroups of $\text{Out}(F_N)$. **Groups Geom. Dyn.**, 10(2) :709–721, 2016.

2. A. Hilion et C. Horbez. The hyperbolicity of the sphere complex via surgery paths. **J. Reine Angew. Math.**, 730 :135–161, 2017.

1. C. Horbez. Sphere paths in outer space. **Algebr. Geom. Topol.**, 12(4) :2493–2517, 2012.

Talks

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1. <u>Mini-courses.</u>

> **05/23** Nahsholim (Israel), Big mapping class groups (with K. Mann), *1,2,3 : Curves, Surfaces and 3-Manifolds.*
> **02/23** Bengaluru (India), Measure equivalence, negative curvature, rigidity *Probabilistic Methods in Group Theory*
> **12/22** Columbus (USA), Introduction to $\text{Out}(F_N)$
> **10/14** Carcassonne, Géométrie asymptotique de $\text{Out}(F_N)$, *Rencontre finale de l'ANR LAM*
> **11/12** Barcelona (Spain), Hyperbolicité du complexe des sphères, *Automorphisms of free groups. Cool-down workshop.*

2. <u>Talks given at international conferences.</u>

06/23 Orsay, *Groups and operator algebras.* (Integrable measure equivalence rigidity of right-angled Artin groups via quasi-isometry.)

05/23 CIRM, Luminy, *Théorie mesurée des groupes, processus stochastiques sur les groupes et combinatoire Borélienne.* (Integrable measure equivalence rigidity of right-angled Artin groups via quasi-isometry.)

03/23 Toronto, Fields Institute, *Workshop on Borel and Measurable Combinatorics in Algebra and Dynamics.* (Measure equivalence rigidity among the Higman groups.)

10/22 Madrid, *Groups in Madrid.* (A strong Tits alternative for Out(F_N).)

02/22 Oberwolfach, *Geometric structures in group theory.* (Measure equivalence rigidity of Out(F_N).)

10/21 *Topics in von Neumann Algebras and Geometric Group Theory* (en ligne). (Right-angled Artin groups, orbit equivalence, and von Neumann algebras.)

06/21 Paris, *Rencontre ANR Algèbres d'Opérateurs et Dynamique des Groupes.* (Rigidité de Out(F_N) en équivalence mesurée.)

10/20 Luminy, CIRM, *Measured and geometric group theory, rigidity, operator algebras.* (Right-angled Artin groups and measure equivalence.)

06/20 Oberwolfach, *Geometric structures in group theory.* (Boundary amenability and measure equivalence rigidity among 2-dimensional Artin groups of hyperbolic type.)

09/19 Bielefeld, *Outer space in Bielefeld.* (Rigidity of the Torelli subgroup in Out(F_N).)

06/19 Luminy, CIRM, *Aspects of Non-Positive and Negative Curvature in Group Theory*

05/19 Banach Center, Warsaw, *Non-positive curvature*

08/18 Midway (Utah, US), *Summer 2018 Wasatch Topology Conference*

07/18 Warwick, *Graphs, surfaces, and cube complexes*

04/18 Warwick, *Geometry of outer spaces and outer automorphism groups*

02/18 Luminy, CIRM, *Geometry of Groups and 3-Manifolds*

09/17 Regensburg, *Non-Positively Curved Groups and Spaces*

09/17 Ventotene, *Moduli spaces*

06/17 Oberwolfach, *Geometric structures in group theory*

01/17 Cambridge, Newton Institute, *Non-positive curvature in action*

10/16 Berkeley, MSRI, *Geometry of mapping class groups and* Out(F_n)

08/16 Berkeley, MSRI, *Geometric Group Theory, Introductory Workshop*

02/16 Karlsruhe, *Young Geometric Group Theory V*

04/15 Park City (Utah), *Summer 2015 Wasatch Topology Conference*

07/15 Luminy, CIRM, *Impacts of geometric group theory*

06/15 Dubrovnik, *Geometric Topology, Geometric Group Theory and Dynamical Systems*

06/15 Notre Dame, *International Conference on Boundaries and Ergodic Geometry*

05/15 Austin, *Workshop on Mapping Class Groups and* Out(F_n)

06/14 Rennes, *Geometric, dynamical and combinatorial aspects of infinite groups*

07/13 Marseille, *The geometry of outer space : investigated through its analogy with Teichmüller space*

06/13 Oberwolfach, *Geometric structures in group theory*

2. <u>Seminar talks</u>

2023 Orsay, Avignon, Münster
2022 Genève, Séminaire virtuel francophone de Groupes et Géométrie (en
ligne), Université Paris-Cité, Villetaneuse, San Diego, Ohio State University (Columbus – mini-cours)
2021 Geometric Group Theory in East Asia Seminar (en ligne), UCLA (en
ligne), Warwick (en ligne), ENS Lyon
2020 ENS Lyon (en ligne), Université de Paris (deux fois, en ligne), Group
Actions Seminar (en ligne)
2019 Munich, Nantes, Rennes, Oklahoma City, Salt Lake City, Ohio State
University, Toronto
2018 Bordeaux, Avignon, Mexico, Kingston, Toronto, Buffalo, McGill University (Montréal)
2017 IHES, Lyon, Toronto, Ecole Polytechnique
2015 Orsay, Paris VI, Marseille, Vienne, Berlin, Montréal, University of Illinois (Urbana-Champaign), Nantes, Toulouse, Lille, Salt Lake City, Oklahoma City, Vancouver, Yale University (New Haven), Rice University
(Houston)
2014 Rennes, Orsay, Caen, Strasbourg, Genève, Grenoble
2013 Marseille, Münster, Rennes
2012 Marseille, Bonn
2011 Cornell University (Ithaca)

3. <u>Colloquia</u>

10/18 Queen's University (Kingston, Canada)
10/15 University of Oklahoma

4. <u>Visiting positions for participation in thematic programmes</u>

04/22–07/22 Institut Henri Poincaré, Paris : Participation (as an organizer) to the
trimester *Groups acting on fractals, hyperbolicity and self-similarity*
08/18–12/18 Fields Institute, Toronto : Participation to the semester *Teichmüller
Theory and its Connections to Geometry, Topology and Dynamics*
08/16–12/16 Mathematical Sciences Research Institute (MSRI), Berkeley : Participation to the semester *Geometric Group Theory*

Responsibilities

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1. <u>Organization of scientific events</u>

07/24	Organizer of a workshop on Orbit equivalence in Besse (with Matthieu Joseph, François Le Maître and Romain Tessera)
03/24	Organizer of the conference "Rigidity in group theory : geometric and ergodic aspects" in Orsay (in the context of the ANR GoFR project)
04/22–07/22	Organization, with François Dahmani, Anna Erschler and Dani Wise, of a trimester at the Institut Henri Poincaré : "Groups acting on fractals, Hyperbolicity and Self-similarity". Member of the organization committee of two conferences during the trimester : • Introductive school at the CIRM, Luminy (with François Dahmani, Tullia Dymarz and Peter Haïssinsky) • Conference "Mapping class groups and $\text{Out}(F_n)$" (with Hyungryul Baik, Mladen Bestvina, Kasra Rafi and Karen Vogtmann).
05/18	Organization (with Rémi Coulon and Arnaud Hilion) of a conference "Right-angled Artin groups and their automorphisms" in Orsay (as part of the ANR DAGGER project).

2. <u>Seminars organized</u>

Since 2023	Organizer, with Matthieu Joseph, of the seminar *Groups and actions* (Orsay).
2021–2023	Organizer, with Cyril Houdayer, of the seminar *Groups and operator algebras* (Orsay).
2019	Organizer, with Anne Vaugon, of a working seminar *Geometric group theory, symplectic geometry and contact geometry* (Orsay).
2017–2020	Organizer, with Daniel Monclair, Damien Thomine and Anne Vaugon, of the team seminar *Geometry, Topology and Dynamics* (Orsay).

3. <u>Thesis committee</u>

07/22	Oussama Bensaid, *On coarse embeddings among groups and metric spaces* (Université Paris-Cité, advisor : Romain Tessera).

4. <u>Committees</u>

2020	Member of a selection committee for a Maître de Conférences position, Dijon.
Since 2019	Member of the CCUPS (Orsay), consultative committee for questions related to careers in the department.
2018–2023	Member of the selection committee for the Hadamard Post-Doc Fellowships (Université Paris-Saclay).

5. Referee for many journals, reviewer for *MathSciNet*.

Advising experience

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1. <u>PhD student</u>

2019–2022 Co-advisor, with Frédéric Paulin, of Yassine Guerch's thesis, entitled "Geometry, dynamics and rigidity of automorphism groups of free products". Yassine Guerch is now a post-doc at ENS Lyon.

2. <u>Post-docs</u>

09/2023– Post-doc mentor for Amandine Escalier (on my ERC project Artin-Out-ME-OA).

10/2022– Post-doc mentor for Matthieu Joseph (Hadamard post-doc).

3. <u>Master theses and pre-doctoral advising</u>

Spring 2024 Mentor of the master thesis of Alexandra Gurieva.

Fall 2023 Mentor of a pre-doctoral fellowship of Antoine Derimay (ENS Lyon).

Spring 2020 Mentor of a pre-doctoral fellowship of Corentin Le Bars (ENS Lyon).

Spring 2019 Mentor of the master thesis of Yassine Guerch.

Spring 2018 Mentor of the master thesis of Chloé Papin.

Spring 2017 Mentor of the Erasmus master project of Robin Sroka.

Teaching experience

2018—2019 Master course *Introduction to geometric group theory* (20h).

2017 Co-organizer, with Élise Goujard, of a lecture group for master students (topic : surface groups and mapping class groups)

2012–2014 Exercise sessions at Université de Rennes 1 (linear algebra, low-dimensional geometry, analysis for students in biology).