Damien Gaboriau

Curriculum Vitae

Directeur de recherche, CNRS
École normale supérieure de Lyon, 69007 Lyon, France

WEB page: `http://perso.ens-lyon.fr/gaboriau/home-en.html`
email: damien.gaboriau@ens-lyon.fr

Employment

2017-today — **Director of Research at the C.N.R.S.**, *École Normale Supérieure*, Lyon, France.

2016-2017 — **Director of Research at the C.N.R.S.**, *Center for Mathematical Modeling*, Santiago, Chile.

2003-2016 — **Director of Research at the C.N.R.S.**, *École Normale Supérieure*, Lyon, France.

2005-2016 — **Associate Professor**, *École Polytechnique*, Palaiseau.

2005-2009 — **Chairman**, *of the Research Mathematics Department*, École normale supérieure, Lyon.

1994-2003 — **Research Associate (Chargé de Recherche) at the C.N.R.S**.
  – 1997-2003 *École Normale Supérieure*, Lyon
  – 1994-1997 *Université Paul Sabatier*, Toulouse

1996-1997 — **Research Associate**.
  – FAPERJ, Universidade Fed. Fluminense (Niteroi, Brasil)
  – Universidad Nacionale Autónoma de México Morelos (Cuernavaca, Mexico)

1993-1994 — **Assistant Professor (Agrégé Préparateur)**, *École Normale Supérieure*, Lyon.

Education

2002 — **Habilitation à diriger des recherches (HDR)**, *ENS-Lyon*, Title: *Arbres, groupes, quotients* (Trees, Groups, Quotients).

1993 — **PhD**, *Univ. Paul Sabatier*, Toulouse, Title: *Dynamique des systèmes d'isométries et actions de groupes sur les arbres réels*, Advisor: G. Levitt.

1990 — **Master**, *Univ. Paul Sabatier*, Toulouse.

1989 — **Agrégation de Mathématiques**.

1986 — **ENS Cachan**.

Awards and Distinctions

2012 — Fellow of the American Mathematical Society.

2011 — Bourbaki seminar presented by C. Houdayer: *Invariant percolation and measured theory of nonamenable groups (after Gaboriau-Lyons, Ioana, Epstein)*.

2010 — Invited speaker at the International Congress of Mathematicians, Hyderabad, India, section "Functional analysis and applications".

2004 — Bourbaki seminar presented by A. Connes: *Nombres de Betti L^2 et facteurs de type II_1 (after D. Gaboriau et S. Popa)*.

2003 — G. Sand and G. Triossi prize of the French Academy of Sciences.

Supervision of PhD students

PhD 2005 — **Mikaël Pichot**, *"Quasi-périodicité et théorie de la mesure"*, Currently: Professor at Mc Gill University in Montreal, Quebec, Canada..

PhD 2008 — **Aurélien Alvarez**, *"Une théorie de Bass-Serre pour les relations d'équivalence et les groupoïdes boréliens"*, Currently: Professor at the ENS Lyon.

PhD 2011   **Bruno Duchesne**, *"Des espaces de Hadamard symétriques de dimension infinie et de rang fini"*, Currently: Professor at the Orsay, University of Paris-Saclay.

PhD 2011   **Pierre-Adelin Mercier**, *"Graphages à type d'isomorphisme prescrit"*, Currently: Teacher.

PhD 2014   **François Le Maître**, *"Sur les groupes pleins préservant une mesure de probabilité"*, (Co-adviser Julien Melleray, Lyon), Currently: Assistant Professor (Maître de conférences) at IMJ, University of Jussieu, Paris.

PhD 2015   **Alessandro Carderi**, *"Groups, Actions and von Neumann algebras"*, Currently: Post-doc in Karlsruhe, Germany.

PhD 2016   **Mohamed Bouljihad**, *"Propriété (T) de Kazhdan relative à l'espace"*, (Co-adviser Bachir Bekka (Rennes)), Currently: Professeur en CPGE.

PhD 2017   **Lison Jacoboni**, *"Propriétés métriques et probabilistes des groupes métabéliens*, Co-adviser Romain Tessera (Orsay), Currently: Professeur en CPGE.

Current   **Matthieu Joseph**, *Théorie métrique et mesurée des groupes, L^p-ME, IRS, URS.*

Editorial Boards

2004-2016   *Astérisque*, SMF.

2008-now   *Confluentes Mathematici (Managing Editors since 2016).*

2006-now   *Groups, Geometry and Dynamics*, EMS.

2008-now   *Journal of Topology and Analysis*, World Scientific.

2018-now   *Journal de l'École Polytechnique*, Univ. Paris-Saclay, É. Pol.

Responsibilities within Academic Institutions

2017-now   **Head of the Research Team**, *"Geometry, Groups and Dynamics" of the Mathematics Department*, École normale supérieure, Lyon.

2015-now   **Member of the Executive board of the Labex (Laboratoire d'excellence) MILyon**, Lyon.
https://milyon.universite-lyon.fr/governance-and-organization-136526.kjsp

2005-2009   **Head of the Research Mathematics Department**, École normale supérieure, Lyon.

2009-2016   **Member of the Committee of the Math. Department**, École Polytechnique, Palaiseau.

2017-2018   **Panel Committee for ICM 2018**, *Invited Lectures Section 8, Analysis and Operator Algebras.*

2014-2019   **co-PI of the Research Grant ANR Project GAMME**, *"Groups, Actions, Metrics, Measures and Ergodic theory"*, (ANR-14-CE25-0004 GAMME).
http://math.unice.fr/%7Eindira/GAMME.html

2009-2012   **PI of the Research Grant ANR Project AGORA**, *"Groups, Actions and Operator Algebras"*, (ANR-09-BLAN-0059, NT09461407).

2008-2014   **Scientific Council of the FRUMAM**, *Fédération de Recherche des Unités de Mathématiques*, Marseille, FR 2291 CNRS.

2011-2016   **Steering Committee of the FMJH**, *Fondation Mathématiques Jacques Hadamard*, Paris-Sud, (Orsay, IHÉS, Polytechnique, ENS Cachan,...).

2000-2002   **National Committee of the Scientific Research, France**, *(CoNRS)*, section 01.

2007   **Evaluation Committee (President)**, of the "laboratoire de mathématiques d'Amiens" (LAMFA).

2010   **AERES Evaluation Committee (President)**, of the "laboratoire de mathématiques de Rennes" (IRMAR).

2018	**HCERES Evaluation Committee (President)**, of the "Laboratoire Analyse, Géométrie et Applications" (LAGA) at Villateaneuse (Paris 13).
Since 1999	**Many Hiring Committees**, *Professors, assistant professors,...*, Pure and Applied Math. (sections 25, 26).
Since 2001	**Selected Scientific Assessments**, *ERC, ACI, ANR, NSF (USA), FNRS (Switzerland), ISF (Israel Science Foundation), UK Research Council, Regions, Comité National de la Recherche Scientifique (FR), ...*

Events Organization (Selection)

2017-2018	LABEX Thematic Semester at Lyon. "Graphs, Groups and Dynamics". Winter schools + conferences "Entropies and soficity".
Aug. 2016	Oberwolfach workshop. "Measured Group Theory". (Co-organizers Miklos Abert (Chicago) and Andreas Thom (Leipzig).
Feb. 2016	Trimester program at the ESI, Vienna. "Measured Group Theory". `http://www.uni-math.gwdg.de/schick/ESI16/esi16_1.html`
July 2015	Conférence "Geometries in action", at the ENS-Lyon, a conference in honor of Étienne Ghys. (280 participants). `http://geometrie.math.cnrs.fr/`
July 2015	Conférence "Impacts of geometric group theory", (Co-organizers Goulnara N. Arzhantseva, Nicolas Bédaride, Arnaud Hilion). Marseille, CIRM. `http://programme-scientifique.weebly.com/1224.html`
Oct 2013	Oberwolfach workshop. Group theory, Measure, and Asymptotic Invariants. (Co-organizers Miklos Abert (Budapest) and Andreas Thom (Leipzig).
Sept 2012	SAG Atlantic Geometry Seminar: Perspectives on Orbital Equivalences and Applications, Castro-Urdiales, Spain
Nov 2011	Meeting GAG, "Géométrie et Actions de Groupe", ENS Lyon
Apr-Jul 2011	Trimester: Thematic program "Von Neumann Algebras and Ergodic Theory of Group Actions". Institut Henri Poincaré. Paris. (Co-organizers Sorin Popa and Stefaan Vaes). `http://wis.kuleuven.be/ihp2011/index-fr.html`
Oct 2010	Oberwolfach workshop. Actions and invariants of residually finite groups. (Co-organizers Miklos Abert (Chicago) and Fritz Grunewald (Düsseldorf).
Oct 2008	Oberwolfach workshop. Von Neumann Algebras and Ergodic Theory of Group Actions. (Co-organizers Dietmar Bisch, Vaughan Jones and Sorin Popa).
Since 2008	Organizer of the working group "Dynamique mesurable" at the ENS Lyon. Measurable dynamics, Borel dynamics, von Neumann algebras, Geometry, Groupe theory, Representations, Descriptive set theory, Percolation,... `http://www.umpa.ens-lyon.fr/~gaboriau/GdT/GdT-prog.html`
Since 2007	GDRE Grefi-Genco. Scientific Committee, responsable for the scientific themes: non commutative integration– Free probabilities, Ergodic theory and operator algebras.
Since 2006	GDR 2947 "Géométrie non Commutative". Responsable de la direction "Théorie ergodique et systèmes dynamiques" dans la thématique "Intégration non commutative". `http://gdrgnc.math.cnrs.fr/`
Since 2002	Goutelas Mathematical Week-ends `http://www.umpa.ens-lyon.fr/~gaboriau/Goutelas/Goutelas.html`
2003-2015	Séminaire Tripode `http://math.univ-lyon1.fr/~tripode/`

Selected teaching

2019	Series of Lectures within the Workshop: "Groups of dynamical origin II", Institute of Mathematics, Mexico./ Topic: "Introduction to measured group theory".

2018-2019	Lectures in the Master 2, "Parcours Géométrie et actions de groupes", ENS Lyon, France. / Topic: Introduction to Ergodic Theory.
2018	Series of Lectures within the Thematic program: L^2-invariants and their analogues in positive characteristic, Madrid, Spain. / Topic: "Measured Group Theory".
2017	Master Lectures, CMM, Santiago, Chili. Topic: "Measurable Group Theory and percolation on graphs.
2005-2016	Professeur chargé de cours, École Polytechnique, Palaiseau. Topics: dynamical systems, measure theory, distributions, differential equations.
Dec. 2014	School on orbit equivalence and related fields, Santiago, Chili. "Measurable Group Theory".
Oct. 2014	Workshop: Boundaries of groups and L^p-cohomology. Université de Lille 1, France. Mini-course on ℓ^2-Betti numbers (Series of 3 lectures)
Oct. 2013	Series of 8 Lectures, Master class on Ergodic Theory and von Neumann algebras. University of Copenhagen. Topic: Around the Orbit Equivalence Theory of the Free Groups.
Jul. 2013	Series of 3 Lectures. 3rd Summer School on Operator Theory. Samos, Greece. Topic: A Measurable Solution to von Neumann's Problem, Measured Group Theory and Percolation.
2011-2012	Advanced Master Courses. Ens-Lyon. Topic: Percolation and measured group theory.
2011	Series of Advanced Lectures, in the frame of the thematic program *Von Neumann algebras and ergodic theory of group actions* at the Institut Henri Poincaré, Paris. Topics: Measured group theory and percolation on graphs
Dec. 2009	Colloque "Operator Algebras, Groups and Geometry". CIRM, Marseille, France. Topic: Expository lectures on Measured Equivalence Relations.
Aug. 2009	Summer School, "Ergodic theory of group actions", in Göttingen, Germany.
2008-2009	Advanced Master Course. Ens-Lyon. Topic: Équivalence orbitale, Théorie mesurable des groupes et algèbres de von Neumann.
Dec 2008	Intensive course, Jerusalem, Israel. Topic: Orbit Equivalence, von Neumann Algebras, Measure Equivalence
Feb 2008	Intensive course, Chennai, India. Workshop at IMSc Chennai. Topic: Orbit Equivalence, Geometric Group Theory and von Neumann Algebras

Selected publications

– **D. Gaboriau**, G. Levitt, F. Paulin. *Pseudogroups of isometries of* **R** *and Rips' theorem on free actions on* **R***-trees*, Israel J. Math. **87** (1994) 403–428.

– **D. Gaboriau**, G. Levitt. *The rank of actions on* **R***-trees*, Ann. Scien. Ec. Norm. Sup. (4) **28** (1995) 549–570.

– **D. Gaboriau**. *Dynamique des systèmes d'isométries : sur les bouts des orbites*, Invent. Math. **126** (1996) 297–318.

– **D. Gaboriau**, A. Jägger, G. Levitt, M. Lustig. *An Index for counting fixed points of automorphisms of free groups*, Duke Math. J. (3) **93** (1998) 425–452.

– **D. Gaboriau**. *Coût des relations d'équivalence et des groupes*, Invent. Math., (1) **139** (2000) 41–98.

– **D. Gaboriau**, F. Paulin. *Sur les immeubles hyperboliques*, Geom. Dedi., **88** (2001) 153–197.

– **D. Gaboriau**. *Invariants L^2 des relations d'équivalence et de groupes*, Publ. Math. I.H.É.S., **95** (2002) 1, 93–150.

– N. Bergeron, **D. Gaboriau**. *Asymptotique des nombres de Betti, invariants ℓ^2 et laminations*, Comment. Math. Helv., **79** (2004), 362–395.

– **D. Gaboriau**, S. Popa. *An uncountable family of non orbit equivalent actions of* $\mathbf{F}_n$, J. of the A.M.S., **18** (2005), 547–559.

– **D. Gaboriau**. *Invariant Percolation and Harmonic Dirichlet Functions*, G.A.F.A., **15** (2005) 5,

1004–1051.

– **D. Gaboriau**. *Examples of Groups that are Measure Equivalent to the Free Group*, Erg. Th. & Dyn. Syst., (06) **25** (2005), 1809–1827.

– **D. Gaboriau**, R. Lyons. *A measurable-group-theoretic solution to von neumann's problem*, Invent. Math., **177** (2009), 533–540.

– **D. Gaboriau**. *Orbit Equivalence and Measured Group Theory*, Proceedings of the ICM (Hyderabad, India, 2010), Vol. III, Hindustan Book Agency (2010), 1501-1527.

– **D. Gaboriau**. *Relative Property (T) Actions and Trivial Outer Automorphism Groups*, J. of Functional Analysis, **260** (2011), no. 2, 414–427.

– A. Alvarez, **D. Gaboriau**. *Free products, Orbit Equivalence and Measure Equivalence Rigidity*, Groups, Geometry and Dynamics, **6** (2012), no. 1, 53–82.

– **D. Gaboriau**. *Entropie sofique, d'après L. Bowen, D. Kerr et H. Li*, Astérisque, (390):Exp. No. 1108, 101–138, 2017. Séminaire Bourbaki. Vol. 2015/2016. Exposés 1104–1119.

– **D. Gaboriau**, B. Seward. *Cost, ℓ^2-Betti numbers and the sofic entropy of some algebraic actions*, Journal d'Analyse Mathématique, 139 (2019), 1-65.

– **D. Gaboriau**, A. Ioana, R. Tucker-Drob. *Cocycle superrigidity for translation actions of product groups*, American Journal of Mathematics, 141 (2019), 1347-1374.

– A. Carderi, **D. Gaboriau**, and M. de la Salle. *Non-standard limits of graphs and some orbit equivalence invariants*, To appear in *Annales Henri Lebesgue.*

– **D. Gaboriau**, C. Noûs. *On the top-dimensional ℓ^2-Betti numbers*, To appear in *Annales de la Faculté des Sciences de Toulouse.*