

CURRICULUM VITAE

MARCO MAZZUCHELLI

Contact Details

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Personal Data

Date of birth: May 24, 1981

Place of birth: Legnano (Italy)

Citizenship: Italian

Spoken languages: Italian (native speaker), English, French and Spanish (fluent)

Employment

From Oct. 2016: **École Normale Supérieure de Lyon** (France)
CNRS researcher (CR1)

Oct. 2012 – Sep. 2016: **École Normale Supérieure de Lyon** (France)
CNRS researcher (CR2)

Sep. 2011 – June 2012: **Pennsylvania State University** (University Park, Pennsylvania)
S. Chowla Research Assistant Professor

Sep. 2010 – Aug. 2011: **École Normale Supérieure de Lyon** (France)
Postdoc

Sep. 2009 – Aug. 2010: **Max Planck Institute for Mathematics in the Sciences** (Leipzig, Germany)
Postdoc

Education

2006 – 2009: **Università di Pisa** (Italy)
Ph.D. in Mathematics
Advisor: Prof. Alberto Abbondandolo
Thesis: Periodic orbits of Tonelli Lagrangian systems
Defense date: July 29, 2009

2003 – 2005: **Politecnico di Milano** (Italy)
Master degree in Computer Engineering (score 110/110 cum laude)

Date: September 23, 2018.

Advisor: Prof. Alessandra Cherubini

Thesis: Application of automata theory to the word problem in inverse semi-groups (*in italian*)

2000 – 2003: **Politecnico di Milano** (Italy)

Bachelor degree in Computer Engineering (score 110/110 cum laude)

Publications and Preprints

Preprints:

- (with Stefan Suhr) **A min-max characterization of Zoll Riemannian metrics**
- (with Luca Asselle) **Waist theorems for Tonelli systems in higher dimension**
- (with Colin Guillarmou and Leo Tzou) **Boundary and lens rigidity for non-convex manifolds**
- (with Luca Asselle and Gabriele Benedetti) **Minimal boundaries in Tonelli Lagrangian systems**

Papers:

- (with Stefan Suhr) **A characterization of Zoll Riemannian metrics on the 2-sphere**
To appear in Bulletin of the London Mathematical Society
- (with Luca Asselle) **Closed geodesics with local homology in maximal degree on non-compact manifolds**
Differential Geometry and its Applications **58** (2018), 17–51
- (with Luca Asselle) **On Tonelli periodic orbits with low energy on surfaces**
To appear in Transactions of the American Mathematical Society
- (with Leonardo Macarini) **Isometry-invariant geodesics and the fundamental group, II**
Advances in Mathematics **308** (2017), 671–698
- (with A. Abbondandolo, L. Asselle, G. Benedetti, and I. A. Taimanov) **The multiplicity problem for periodic orbits of magnetic flows on the 2-sphere**
Advanced Nonlinear Studies **17** (2017), no. 1, 17–30
- (with Colin Guillarmou) **Marked boundary rigidity for surfaces**
Ergodic Theory and Dynamical Systems **38** (2018), no. 4, 1459–1478
- (with Luca Asselle) **On the existence of infinitely many closed geodesics on non-compact manifolds**
Proceedings of the American Mathematical Society **145** (2017), no. 6, 2689–2697
- (with A. Abbondandolo, L. Macarini, and G. P. Paternain) **Infinitely many periodic orbits of exact magnetic flows on surfaces for almost every subcritical energy level**
Journal of the European Mathematical Society **19** (2017), 551–579
- **The Morse index of Chaperon’s generating families**
Publicaciones Matemáticas del Uruguay **16** (2016), 81–125
- (with A. Sorrentino) **Remarks on the symplectic invariance of Aubry-Mather sets**
Comptes Rendus Académie des Sciences Paris - Séries I **354** (2016), no. 4, 419–423
- **Isometry-invariant geodesics and the fundamental group**
Mathematische Annalen **362** (2015), no. 1–2, 265–280
- **On the multiplicity of isometry-invariant geodesics on product manifolds**
Algebraic & Geometric Topology **14** (2014), 135–156
- **Symplectically degenerate maxima via generating functions**
Mathematische Zeitschrift **275** (2013), no. 3–4, 715–739

- **On the multiplicity of non-iterated periodic billiard trajectories**
Pacific Journal of Mathematics **252** (2011), no. 1, 181–205
- (with Peter Albers) **Periodic bounce orbits of prescribed energy**
International Mathematics Research Notices **2011**, no. 14, 3289–3314
- **The Lagrangian Conley Conjecture**
Commentarii Mathematici Helvetici **86** (2011), no. 1, 189–246
- (with Alessandra Cherubini) **On the Decidability of the Word Problem for Amalgamated Free Products of Inverse Semigroups**
Semigroup Forum **76** (2008), no. 2, 309–329

Books:

- **Critical Point Theory for Lagrangian Systems**
Progress in Mathematics, vol. **293** (2011), Birkhäuser

Students

Ph.D. students:

- **Simon Allais** (ENS de Lyon, from September 2018)

Master students:

- **Simon Allais** (Master 2, ENS de Lyon, April–July 2018)
Thesis: forthcoming
- **Benoît Joly** (Master 2, ENS de Lyon, April–July 2016)
Thesis: “On fixed and periodic points of Hamiltonian diffeomorphisms”

Scientific Activity

Member of the projects:

- ANR WKBHJ (Weak KAM beyond Hamilton-Jacobi)
<http://perso.ens-lyon.fr/marco.mazzucchelli/KAM-Faible/>
- ANR COSPIN (Contact spectral invariants)
<http://www.math.u-psud.fr/~leclercq/ANR/>

Member of the Research Committee of the Labex Milyon (from September 2016)
<http://milyon.universite-lyon.fr/>

Organizer of the conferences:

- **Interactions of Symplectic Topology and Dynamics**
Il Palazzone (Scuola Normale Superiore di Pisa), Cortona, Italy
<https://sites.google.com/view/cortona2019/>
- **Meeting ENS de Lyon – SISSA**
École Normale Supérieure de Lyon, France
December 5-6, 2017
<http://perso.ens-lyon.fr/marco.mazzucchelli/ENSL-SISSA/>
- **Symplectic Geometry in Lyon – A conference in honor of Jean-Claude Sikorav**
École Normale Supérieure de Lyon and Université Claude Bernard – Lyon 1, France
November 2-4, 2017
<http://sikorav60.math.cnrs.fr>

Organizer of the Geometry, Groups, and Dynamical Systems Seminar at the ENS de Lyon (*from September 2013*)

Member of the Ph.D. thesis committees of:

- **Jingzhi Yan** (Université Pierre et Marie Curie)
Advisor: Patrice Le Calvez
Thesis: “Utilisation de feuilletages transverse à l’étude d’homéomorphismes préservant l’aire de surfaces”
Defense date: December 2, 2014

Referee for:

- Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg (Springer)
- Advances in Mathematics (Elsevier)
- American Journal of Mathematics (Johns Hopkins University Press)
- Annali della Scuola Normale Superiore di Pisa – Classe di Scienze
- Commentarii Mathematici Helvetici (EMS)
- Communications on Pure and Applied Mathematics (Wiley)
- Discrete and Continuous Dynamical System – Series A (AIMS)
- Geometriae Dedicata (Springer)
- Geometric and Functional Analysis (Springer)
- International Journal of Mathematics (World Scientific)
- International Mathematics Research Notices (Oxford Journals)
- Journal de l’École polytechnique – Mathématiques (CEDRAM)
- Journal of Fixed Point Theory and Applications (Birkhäuser)
- Journal of Functional Analysis (Elsevier)
- Journal of Geometric Analysis (Springer)
- Journal of Symplectic Geometry (International Press)
- Journal of the European Mathematical Society (EMS)
- Journal of the London Mathematical Society (LMS)
- Journal of Topology and Analysis (World Scientific)
- Mathematische Zeitschrift (Springer)
- Proceedings of the Edinburgh Mathematical Society (Cambridge University Press)

Reviewer for MathSciNet (American Mathematical Society)

Teaching Activity

- 2017/2018:* **Teaching at École Normale Supérieure de Lyon:**
Differential geometry
Rigidity phenomena in Riemannian geometry
- 2016/2017:* **Teaching at École Normale Supérieure de Lyon:**
Smooth manifolds
Differential calculus 2
- 2015/2016:* **Teaching at École Normale Supérieure de Lyon:**
Smooth manifolds
Generating functions in symplectic and contact topology
- 2014/2015:* **Teaching at École Normale Supérieure de Lyon:**
Smooth manifolds
- 2013/2014:* **Teaching at École Normale Supérieure de Lyon:**
Variational methods for the study of periodic orbits

- 2011/2012: **Teaching at Pennsylvania State University:**
Math 220: Matrices
- 2008/2009: **Teaching assistant at Università di Pisa:**
Calculus and Statistics (Prof. Marco Abate)
- 2007/2008: **Course coordinator at Stanford University:**
Math 51: Linear Algebra and Multivariable Calculus
Grading for graduate classes at Stanford University:
Math 210A: Algebra (Prof. James Milgram)
Math 217A: Differential Geometry (Prof. Richard Schoen)
Math 227: Partial Differential Equations and Diffusion Processes (Prof. James Nolen)

Visiting Periods

- Feb. – Apr. 2019* **University of Sydney** (Australia)
Research in pair with Colin Guillarmou and Leo Tzou.
- Aug. – Dec. 2018* **Mathematical Sciences Research Institute** (Berkeley, California)
Research member in the scientific program “Hamiltonian systems, from topology to applications through analysis”.
- Apr. 2016:* **National Research University Higher School of Economics** (Moscow, Russia)
Visiting Alexey Glutsyuk.
- Feb. 2015:* **Instituto Nacional de Matemática Pura e Aplicada** (Rio de Janeiro, Brazil)
Visiting Leonardo Macarini.
- Dec. 2010:* **Purdue University** (West Lafayette, Indiana)
Visiting Peter Albers.
- Apr. 2010:* **Institute for Advanced Study** (Princeton, New Jersey)
Visiting Peter Albers.
- Feb. 2010:* **Centro de Investigación en Matemáticas** (Guanajuato, Mexico)
Visiting Gonzalo Contreras.
- May 2009 – June 2009:* **Max Planck Institute for Mathematics in the Sciences** (Leipzig, Germany)
Visiting researcher, supported by Vigoni Grant.
- Dec. 2008:* **Universität Leipzig** (Germany)
Visiting researcher in the symplectic topology group directed by Matthias Schwarz.
- Sep. 2007 – June 2008:* **Stanford University** (California)
Visiting researcher in the symplectic topology group directed by Yakov Eliashberg.

Invited Talks

- Oct. 22, 2018:* **Symplectic Geometry Seminar**
Stanford University (California)
- Aug. 24, 2018:* **Introductory Workshop: Hamiltonian systems, from topology to applications through analysis**
Mathematical Sciences Research Institute (Berkeley, California)

- June 4, 2018:* **Deuxième congrès de la Société Mathématique de France**
Université de Lille (France)
- May 22, 2018:* **New Methods in Finsler Geometry**
Scuola Normale Superiore di Pisa (Italy)
- May 8, 2018:* **Analysis Seminar**
Scuola Internazionale Superiore di Studi Avanzati (Trieste, Italy)
- Mar. 13, 2018:* **Séminaire PADyque**
Université de Picardie Jules Verne (Amiens, France)
- Feb. 19, 2018:* **Tokyo-Lyon Conference in Mathematics**
The University of Tokyo (Japan)
- Nov. 28, 2017:* **Geometry Seminar**
Ruprecht-Karls-Universität Heidelberg (Germany)
- Nov. 21, 2017:* **Oberseminar dynamical systems**
Ruhr-Universität Bochum (Germany)
- Oct. 6, 2017:* **Journées de dynamique**
Université Paris Diderot (France)
- Aug. 7, 2017:* **Workshop on Conservative Dynamics and Symplectic Geometry**
IMPA (Rio de Janeiro, Brazil)
- July 18, 2017:* **Hamiltonian and Reeb Dynamics: New Methods and Applications**
Lorentz Center (Leiden, Netherlands)
- Mar. 28, 2017:* **Conference “100 Years of the Radon Transform”**
RICAM (Linz, Austria)
- Jan. 5, 2017:* **Séminaire de théorie spectrale et géométrie**
Institut Fourier (Grenoble, France)
- July 27, 2016:* **Workshop on Hamilton-Jacobi Equations**
Fudan University (Shanghai, China)
- June 16, 2016:* **Conference “Symplectic Techniques in Dynamical Systems”**
Instituto de Ciencias Matemáticas (Madrid, Spain)
- Apr. 25, 2016:* **Seminar**
Sobolev Institute of Mathematics (Novosibirsk, Russia)
- Apr. 23, 2016:* **Seminar on Spectral Geometry**
Independent University of Moscow and Laboratoire J.-V. Poncelet (Russia)
- Apr. 22, 2016:* **Laboratory of algebraic geometry: weekly seminar**
National Research University Higher School of Economics (Moscow, Russia)
- Apr. 11–22, 2016:* **Minicourse “Closed geodesics in Riemannian and Finsler manifolds”**
National Research University Higher School of Economics (Moscow, Russia)
- Apr. 11, 2016:* **Dynamical Systems Seminar**
Steklov Institute of Mathematics (Moscow, Russia)
- Feb. 18, 2016:* **Conference “Geometria in Bicocca 2016”**
Università di Milano Bicocca (Italy)
- Nov. 18, 2015:* **Dynamic Analysis Seminar**
VU University Amsterdam (Netherlands)
- Nov. 17, 2015:* **Seminar Geometry and Analysis**
Utrecht University (Netherlands)
- Nov. 3, 2015:* **Oberseminar dynamical systems**
Ruhr-Universität Bochum (Germany)

- Oct. 5, 2015: **Séminaire Géométrie et applications**
Institut de Recherche Mathématique Avancée (Strasbourg, France)
- Aug. 4, 2015: **Workshop on Conservative Dynamics and Symplectic Geometry**
IMPA (Rio de Janeiro, Brazil)
- June 25, 2015: **INDAM Meeting “The Hamilton-Jacobi Equation”**
Il Palazzone, Scuola Normale Superiore (Cortona, Italy)
- Mar. 11, 2015: **CIMPA Research School “Hamiltonian and Lagrangian Dynamics”**
Salto (Uruguay)
- Feb. 11, 2015: **Mathematical Physics Seminar**
IMPA (Rio de Janeiro, Brazil)
- Dec. 9, 2014: **Colloquium**
Université de Neuchâtel (Switzerland)
- Dec. 5, 2014: **Séminaire “Symplectix”**
Institut Henri Poincaré (Paris, France)
- Oct. 27, 2014: **Symplectic Geometry Seminar**
ETH Zürich (Switzerland)
- May 13, 2014: **Geometry and Dynamics Seminar**
École Polytechnique Fédérale de Lausanne (Switzerland)
- Jan. 20, 2014: **C^0 -symplectic topology and dynamical systems**
IBS Center for Geometry and Physics (Pohang, South Korea)
- Oct. 30, 2013: **Symplectic Geometry Seminar**
Universität Münster (Germany)
- Sep. 4, 2013: **Workshop on Conservative Dynamics and Symplectic Geometry**
IMPA (Rio de Janeiro, Brazil)
- Feb. 26, 2013: **Séminaire de Systèmes dynamiques et Géométrie**
Université d’Avignon et des Pays de Vaucluse (France)
- Feb. 15, 2013: **Séminaire Gaston Darboux**
Université Montpellier 2 (France)
- Feb. 4–6, 2013: **Workshop “Dynamique riemannienne et dynamique de contact : regards croisés sur les orbites périodiques”**
Laboratoire de Mathématiques Jean Leray, Nantes (France)
- Jan. 11, 2013: **Workshop on Symplectic Geometry, Contact Geometry and Interactions**
Les Diablerets (Switzerland)
- Sep. 10, 2012: **Séminaire d’Algèbre, Dynamique et Topologie**
Aix-Marseille Université (France)
- Sep. 3, 2012: **Conference “Periodic Orbits in Contact and Riemannian Geometry”**
Touquet Paris-Plage (France)
- May 29, 2012: **Séminaire de dynamique et géométrie**
Université de Neuchâtel (Switzerland)
- Apr. 30, 2012: **Séminaire Géométrie symplectique et applications**
Institut de Recherche Mathématique Avancée (Strasbourg, France)
- Apr. 24, 2012: **Séminaire Dynamique et Géométrie**
Laboratoire J.A. Dieudonné (Nice, France)
- Apr. 19, 2012: **Séminaire Géométries et Systèmes Dynamiques**
Institut de Mathématiques de Bourgogne, Dijon (France)

- Apr. 13, 2012:* **Séminaire de Géométrie hamiltonienne**
Institut de Mathématiques de Jussieu (Paris, France)
- Apr. 12, 2012:* **Séminaire de l'équipe Topologie Dynamique**
Université Paris-Sud 11 (Orsay, France)
- Apr. 10, 2012:* **Séminaire de Géométrie**
Institut de Mathématiques de Toulouse (France)
- Feb. 29, 2012:* **Symplectic Dynamics Seminar**
Institute for Advanced Study (Princeton, New Jersey)
- Nov. 14, 2011:* **Center for Dynamics and Geometry Seminar**
Penn State University (University Park, Pennsylvania)
- Sep. 16, 2011:* **Topology/Geometry Seminar**
Penn State University (Altoona, Pennsylvania)
- June 24, 2011:* **Summer school on Closed orbits and variational methods**
Université de Neuchâtel (Switzerland)
- May 13, 2011:* **Séminaire Géométries**
Institut Camille Jordan (Lyon, France)
- Mar. 10, 2011:* **Séminaire de Topologie, Géométrie et Algèbre**
Laboratoire de Mathématiques Jean Leray (Nantes, France)
- Feb. 24, 2011:* **Séminaire KAM Faible**
École Normale Supérieure de Lyon (France)
- Jan. 21, 2011:* **Séminaire Gaston Darboux**
Université Montpellier 2 (France)
- Dec. 7, 2010:* **Department of Mathematics Colloquium**
Purdue University (West Lafayette, Indiana)
- Dec. 2, 2010:* **Symplectic Geometry Seminar**
Purdue University (West Lafayette, Indiana)
- Oct. 10, 2010:* **Rencontre KAM faible**
Calvi (France)
- Oct. 7, 2010:* **Séminaire KAM faible**
Université d'Avignon (France)
- June 9, 2010:* **Conference "Symplectic Geometry with Algebraic Techniques"**
Instituto Superior Técnico (Lisbon, Portugal)
- Apr. 20, 2010:* **Geometry - Dynamical Systems Seminar**
Institute for Advanced Study (Princeton, New Jersey)
- Feb. 11, 2010:* **Seminario de Sistemas Dinamicos**
CIMAT (Guanajuato, Mexico)
- Oct. 28, 2009:* **Dynamic Analysis Seminar**
VU University (Amsterdam, Netherlands)
- June 23, 2009:* **SFB Colloquium**
Berlin (Germany)
- June 22, 2009:* **Lecture Event**
Humboldt Universität (Berlin, Germany)
- May 25, 2009:* **Symplectic geometry seminar**
Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany)
- May 18, 2009:* **Bruxelles-Köln seminar on symplectic and contact geometry**
Université Libre de Bruxelles (Belgium)

- Nov. 13, 2008:* **Seminario del Departamento de Geometría**
Universidad Complutense (Madrid, Spain)
- Oct. 21, 2008:* **Progressi Recenti in Geometria Reale e Complessa**
Levico (Italy)
- Mar. 10, 2008:* **Symplectic Geometry Seminar**
Stanford University (California)
- Aug. 3, 2007:* **Scuola Matematica Interuniversitaria**
Il Palazzone, Scuola Normale Superiore (Cortona, Italy)