

## CURRICULUM VITAE

MARCO MAZZUCHELLI

### Contact Details

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### Personal Data

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*Date of birth:* May 24, 1981

*Place of birth:* Legnano (Italy)

*Citizenship:* Italian

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

### Employment

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*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)  
Postdoctoral fellow

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

### Education

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*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)

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*Date:* June 10, 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

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### Preprints:

- (with Stefan Suhr) **A characterization of Zoll Riemannian metrics on the 2-sphere**
- (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 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**

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**Ph.D. students:**

- **Simon Allais** (ENS de Lyon, starting on 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**

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**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:**

- 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**

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*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**

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- 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**

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- May 8, 2018:* **Analysis Seminar**  
Scuola Internazionale Superiore di Studi Avanzati (Trieste, Italy)
- 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)