

CONTACT INFORMATION	Department of Pure Mathematics and Mathematical Statistics University of Cambridge Centre for Mathematical Sciences Wilberforce Road Cambridge CB3 0WB UNITED KINGDOM	Phone (Office): +44 1223 764262 Phone (Home): +44 1223 338105 Phone (Mobile): +39 347 8803640 E-mail: A.Sorrentino@dpmms.cam.ac.uk as998@cam.ac.uk Website: http://www.dpmms.cam.ac.uk/~as998/
EMPLOYMENT	September 2008 to August 2009 Sept. 2009 - present Sept. 2009 - present	Postdoctoral Research Fellowship granted by <i>Fondation des Sciences Mathématiques de Paris</i> (Host Laboratoire: CEREMADE - Université Paris-Dauphine). <i>Herchel Smith Research Fellow</i> - Department of Pure Mathematics and Mathematical Statistics, University of Cambridge (Cambridge, UK). Fellow of Pembroke College (Cambridge, UK).
EDUCATION	1998 - 2003 May 2004 2003 - 2008	Undergraduate studies, Università degli Studi “Roma Tre” (Rome, Italy) Laurea degree in Pure Mathematics, <i>Summa cum laude</i> (February 2003). Thesis: “ <i>On smooth quasi-periodic solutions of Hamiltonian systems</i> ”. Advisor: Prof. Luigi Chierchia. M.A. Princeton University, Department of Mathematics. Ph.d. Princeton University, Department of Mathematics. Thesis: <i>On the structure of action-minimizing sets for Lagrangian systems</i> . Advisor: Prof. John N. Mather.
RESEARCH INTERESTS	Hamiltonian and Lagrangian systems: Aubry-Mather theory, KAM theory, stability and instability problems (Arnold diffusion). Hamilton-Jacobi equation and Weak KAM theory. Symplectic geometry. Integrable systems. Geodesic flows.	

PUBLICATIONS

- “On the total disconnectedness of the quotient Aubry set”, *Ergodic Theory Dynam. Systems* 28 (01): 267-290, 2008.
- “On the structure of action-minimizing sets for Lagrangian systems”, *Ph.d. Thesis, Princeton University*, June 2008.
Publication number (ProQuest): AAT 3305777, ISBN: 9780549525752.
- “Uniqueness of invariant Lagrangian graphs in a homology or cohomology class”, with Albert Fathi and Alessandro Giuliani.
Ann. Sc. Norm. Super. Pisa Cl. Sci. Vol. VIII (4): 659–680, 2009.
- “On the integrability of Tonelli Hamiltonians”, submitted to *Transaction American Mathematical Society*.
- “Differentiability of Mather’s average action and integrability on closed surfaces”, with Daniel Massart.
Submitted to *Annales de L’Institut Henri Poincaré (C) Analyse non Lineaire*.
- “Action minimizing properties and distances on the group of Hamiltonian diffeomorphisms”, with Claude Viterbo (submitted).
To appear in *Geometry & Topology*.
- “Lecture notes on Mather’s theory for Lagrangian systems”, Preprint (2010).

INVITED TALKS

- “On the isoenergetic persistence of invariant tori for Hamiltonian systems”, PASI 2005 Conference on Differential equations and nonlinear analysis, Universidad de Chile, Santiago (Chile), January 2005. [Poster presentation]
- “On the total disconnectedness of the quotient Aubry set”, *AIMS’s Sixth international Conference on dynamical systems*, Université de Poitiers, Poitiers (France), June 2006.
- “On the total disconnectedness of the quotient Aubry set”, Workshop and School on Conservative dynamics, San José (Uruguay), December 2006.
- “Sobre a total desconexão do quociente do conjunto de Aubry”, Instituto Superior Técnico, Lisbon (Portugal), June 2007.
- “On the total disconnectedness of the quotient Aubry set”, Workshop on Symplectic topology and area-preserving dynamical systems, Snowbird (Utah, USA), June 2007.
- “Sard’s lemma and the quotient Aubry set”, Ergodic Theory and Statistical Mechanics Seminar, Princeton University, Princeton (New Jersey, USA), September 2007.
- “Sard’s lemma and the quotient Aubry set”, Dynamical System Seminar, University of Toronto, Toronto (Canada), January 2008.
- “Varietà Lagrangiane invarianti per flussi Hamiltoniani: proprietà di minimizzazione dell’azione ed unicità”, Università degli Studi “Roma Tre”, Rome (Italy), June 2008.
- “Tutorial on Mather’s theory for Lagrangian systems”, Seminari de sistemes dinàmics, Centre de Recerca Matemàtica, Barcelona (Spain), October 2008.
- “Some attempts to understand the Homology of the Aubry set”, Rencontre de KAM faible, Université de Bordeaux, Bordeaux (France), October 2008.
- “Aubry-Mather sets and commuting Hamiltonians”, Séminaire de topologie symplectique (SYMPLECT’X), École Polytechnique, Palaiseau (France), November 2008.
- “Aubry-Mather sets and integrals of motion”, Séminaire du CEREMADE Analyse-Probabilités, Université Paris-Dauphine, Paris (France), January 2009.
- “On the integrability of Tonelli Hamiltonians”, Conference: Nice weak KAM methods in Nice, Université de Nice-Sophia Antipolis, Nice (France), February 2009.
- “On the integrability of Tonelli Hamiltonians”, University of Helsinki, Helsinki (Finland), March 2009.
- “An introduction to Mather’s theory”, Università degli Studi di Napoli “Federico II”, Naples (Italy), April 2009.
- “Integrability of Tonelli Hamiltonians”, Séminaire de systèmes dynamiques et géométrie, Université d’Avignon, Avignon (France), May 2009.

- “*Differentiability of Mather’s average action and integrability on closed surfaces*”, Séminaire de géométrie et dynamiques , UMPA, École normale supérieure de Lyon, Lyon (France), November 2009.
- “*Aubry-Mather theory and integrability of Hamiltonian systems*”, Colloque: Paulette Libermann, héritage et descendance, Institut Henri Poincaré, Paris (France), December 2009.
- “*Differentiability and symplectic properties of the minimal Lagrangian action*”, Differential geometry seminar, University of Cambridge, Cambridge (UK), March 2010.

ACADEMIC
VISITS

- May 2005 Institut Henri Poincaré, Paris (France). Thematic Trimester: “*Time at work*”. [One month]
- June 2007 Instituto Superior Técnico, Lisbon (Portugal). Invited by Prof. Diogo Gomes. [One week]
- Sept./Oct. 2008 Centre de Recerca Matemàtica, Barcelona (Spain). Research Program: “*Stability and Instability in Mechanical Systems*” (SIMS08). [One month]
- Feb. 2009 University of Helsinki, Helsinki (Finland). Invited by Dr. Emiliano de Simone. [One week]
- April 2009 Università degli Studi di Napoli Federico II, Naples (Italy). Thematic program: *New connections between dynamical systems and Hamiltonian PDEs*. [Two weeks]

CONFERENCES
AND SCHOOLS

- *International Workshop on Hamiltonian dynamical systems*, CRM, Montréal (Canada), May 2004. Fields Institute Grants.
- *Summer School and Conference on Dynamical Systems*, ICTP, Trieste (Italy), July/August 2004.
- PASI 2005 *Conference on Differential equations and nonlinear analysis*, Universidad de Chile, Santiago (Chile), January 2005. NSF Grants.
- *Recent developments in Hamiltonian dynamics*, Institut Henri Poincaré, Paris (France), May 2005. Conference Grants.
- *Workshop on dynamical systems and related topics (Prof. Sinai’s 70th Birthday)*, University of Maryland (USA), March 2006. Conference grants.
- *AIMS’s Sixth international Conference on dynamical systems*, Université de Poitiers, Poitiers (France), June 2006. Invited speaker. NSF Grants.
- *Young Researcher symposium*, IMPA, Rio de Janeiro (Brazil), August 2006. NSF Grants.
- *International Conference on Mathematical Physics (ICMP06)*, Rio de Janeiro (Brazil), August 2006. NSF Grants.
- *Workshop and School on Conservative dynamics*, San José (Uruguay), December 2006. Invited speaker. Conference Grants.
- *Workshop on Symplectic topology and area-preserving dynamical systems*, Snowbird (Utah, USA), June 2007. Invited speaker. AMS-NSF Grants.
- *Workshop on dynamical systems and related topics (Prof. Brin’s 60th Birthday)*, University of Maryland (USA), March 2008. Conference grants.
- *Summer school on Hamiltonian PDEs and Variational Methods*, Capri (Italy), September 2008. Conference Grants.
- *Advanced courses on Stability and Instability in Mechanical Systems*, CRM (Barcelona, Spain), September 2008. CRM Grants.
- *Conference on Stability and Instability in Mechanical Systems: Recent progress and mathematical theory*, CRM (Barcelona, Spain), September 2008. CRM Grants.
- *Conference: Nice weak KAM methods in Nice*, Université de Nice-Sophia Antipolis, Nice (France), February 2009. Invited speaker. Conference Grants.

- *Ecole d'automne sur la théorie KAM faible*, CIRM, Marseille (France), October 2009. Conference Grants.
- *Colloque: Paulette Libermann, héritage et descendance*, Institut Henri Poincaré, Paris (France), December 2009. Invited Speaker.
- *Workshop on Symplectic and contact topology and dynamics: puzzles and horizons*, MSRI, Berkeley (USA), March 2010.
- *Jornades d'introducció als sistemes dinàmics i a les EDP's* (JISD2010), Universitat Politècnica de Catalunya (UPC), Barcelona (Spain), June 2010.
- *International congress of mathematicians* (ICM2010), Hyderabad (India), August 2010.

UNDERGRAD.
TEACHING

- | | |
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| Fall 2001 | Univ. of Rome, <i>Analysis in several variables</i> , Review session instructor. |
| Spring 2002 | Univ. of Rome, <i>Analysis in several variables</i> , Review session instructor;
Univ. of Rome, <i>Complex Analysis</i> , Review session instructor. |
| Fall 2002 | Univ. of Rome, <i>Analysis in several variables</i> , Review session instructor. |
| Spring 2003 | Univ. of Rome, <i>Analysis in several variables</i> , Review session instructor;
Univ. of Rome, <i>Complex Analysis</i> , Review session instructor. |
| Fall 2004 | Princeton Univ., <i>Advanced multivariable calculus</i> , Teaching assistant. |
| Spring 2005 | Princeton Univ., <i>Complex analysis with applications</i> , Teaching assistant. |
| Fall 2005 | Princeton Univ., <i>Advanced multivariable calculus</i> , Teaching assistant;
Princeton Univ., <i>Classical mechanics and chaos</i> , Teaching assistant. |
| Spring 2006 | Princeton Univ., <i>Linear algebra and calculus for economists</i> , Teaching assistant and Review session instructor. |
| Fall 2006 | Princeton Univ., <i>Advanced linear algebra</i> , Instructor. |
| Spring 2007 | Princeton Univ., <i>Analysis in a single variable</i> , Review section instructor. |
| Fall 2007 | Princeton Univ., <i>Analysis in a single variable</i> , Review section instructor. |
| Spring 2008 | Princeton Univ., <i>Calculus II</i> , Instructor and coordinator of the various sections. |
| Michaelmas 2009 | Tutor at Pembroke College (Cambridge) for <i>Analysis II</i> and <i>Groups</i> . |
| Lent 2010 | Tutor at Pembroke College (Cambridge) for <i>Analysis I</i> and <i>Groups, Rings and Modules</i> . |

ADVANCED
TEACHING

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| Oct. 2008 | CRM Barcelona (Spain), <i>Tutorial on Mather's theory for Lagrangian systems</i> . [Mini course: 2 hours] |
| April 2009 | Università degli Studi di Napoli Federico II, <i>An introduction to Mather's theory</i> . [Graduate Course: 10 hours] |
| Dec. 2009 | University of Cambridge, <i>Introduction to Aubry-Mather theory</i> . [Mini-course: 6 hours] |
| June 2010 | Universitat Politècnica de Catalunya (UPC), Barcelona (Spain), <i>Action-minimizing methods in Lagrangian dynamics</i> . [Summer school course: 10 hours] |

TEACHING
MATERIAL

- Lecture notes for the course "*Advanced Linear Algebra with applications*". (Preprint: <http://www.princeton.edu/~asorrent/MAT204Fall06.html>)
- Collection of solved exercises (Real and Complex Analysis) (in Italian). (Preprint: <http://www.princeton.edu/~asorrent/Teaching.html>)
- Lecture notes for the graduate course "*Lecture notes on Mather's theory for Lagrangian systems*" (Preprint 2010).

AWARDS

- ADISU Scholarship, Università degli Studi “Roma Tre” (academic years 1998-1999, 1999-2000, 2000-2001, 2001-2002).
- Full tuition and scholarship, Princeton University (2003-2008).
- *Frelinghuysen fellowship*, Princeton University (academic year 2003-2004).
- *Fondation des Sciences Mathématiques de Paris*, Postdoctoral research fellowship (Sept. 2008 - Aug. 2009).
- *Herchel-Smith Research Fellowship*, Department of Pure Mathematics and Mathematical Statistics, University of Cambridge (UK), from Sept. 2009 to Aug. 2012.
- Fellowship at Pembroke College (Cambridge, UK), from September 2009.

VARIOUS

- French *Qualification CNU aux fonctions de maître de conférences* (Mathematics) (February 2009).
- Member of ANR project (France): *Hamilton-Jacobi et théorie KAM faible* (ANR-07-BLAN-3-0361).
- American Mathematical Society (AMS) member (2004-2008).
- Mathematical Association of America (MAA) member (2009).
- *Teaching Certificate*, McGraw center at Princeton University (USA).
- Referee for several international journals, including *Bulletin of the London Mathematical Society*, *Communications on Pure and Applied mathematics*, *Journal of Analysis and Topology*, *Mathematical Physics Electronic Journal*, *Mathematical Proceedings of the Cambridge Philosophical Society*, *Nonlinearity* and *Rivista iberoamericana*.
- Collaboration with the on-line project “*Chiedi all’esperto*” (in Italian), devoted to scientific divulgation and tutoring.
- Languages: Italian (native), English (excellent), French (fluent), German (intermediate).