

## Curriculum Vitae

### • Personal Information

Full Name: Alfonso Sorrentino.

Citizenship: Italian.

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### • Research Interests

Hamiltonian and Lagrangian systems: Aubry-Mather-Mañé theory, KAM theory, weak KAM theory, Integrable systems, geodesic flows, Stability and Instability.

Twist maps and symplectic maps: low-dimensional (topological) dynamics, Aubry-Mather theory.

Billiards: dynamics, integrability, spectral geometry, rigidity phenomena.

Dissipative systems: conformally symplectic Aubry-Mather theory.

Hamilton-Jacobi equation: Homogenization, Symplectic Homogenization, Hamilton-Jacobi on networks and ramified spaces.

Symplectic and contact geometry/topology: general theory, Hofer geometry, applications to dynamics.

### • Education

– *Laurea* in Mathematics (Summa cum laude), Università degli Studi “Roma Tre”, February 2003. Thesis Title: *On smooth quasi-periodic solutions of Hamiltonian Systems*. Supervisor: Prof. Luigi Chierchia. Evaluation: 110/110 cum laude.

– M.A. in Mathematics, Princeton University (USA), May 2004.  
Degree Committee: Prof. John Mather (President), Alice Chang and János Kollár.

– Ph.D. in Mathematics, Princeton University (USA), Academic year: 2007/2008 (Thesis defense: May 2008).

Thesis Title: *On the structure of action-minimizing sets for Lagrangian systems*.

Advisor: Prof. John N. Mather.

Degree Committee: Prof. John N. Mather (President), Elon Lindenstrauss, Yakov Sinai and Bo'az Klartag.

### • Academic Positions

CURRENT:

Associate Professor in Mathematical Analysis (01/A3, MAT/05) (tenured position) at Dipartimento di Matematica, Università degli Studi di Roma “Tor Vergata”, Rome (Italy) (from November 2014 to present).

PAST:

- Research member at Mathematical Science Research Institute (MRSI), Berkeley (Aug-Dec., 2018).
- Researcher in Mathematical Analysis MAT/05 (tenured position) at Dipartimento di Matematica e Fisica, Università degli Studi “Roma Tre”, Rome (Italy) (from July 2012 to October 2014).
- Junior Research Fellow at *Fondation des Sciences Mathématiques de Paris* (September 2008 - August 2009). Host Department: CEREMADE, Université Paris-Dauphine.
- *Herchel-Smith Research Fellow* in Pure Mathematics at University of Cambridge (UK), Department of Pure Mathematics and Mathematical Statistics (September 2009 to August 2012).
- *Newton Trust fellow* at Pembroke College, University of Cambridge, UK (September 2009 to August 2012).

### • Academic/Professional Qualifications

- Italian National Scientific Qualification (ASN) to function as Full Professor (Sector 01/A2, Algebra and Geometry), September 2018.
- Italian National Scientific Qualification (ASN) to function as Full Professor (Sector 01/A3, Mathematical Analysis), July 2018.
- Italian National Scientific Qualification (ASN) to function as Associate Professor (Sector 01/A2, Algebra and Geometry), December 2013.
- French Qualification of *Conseil national des universités* (CNU) to function as maître de conférences in Mathematics (Sector 25), February 2009.
- Teaching training certificate, McGraw Center for Education, Princeton University (USA), 2004.

### • Awards

- *Guido Fubini Prize* 2018, (biennial prize awarded to an Italian mathematician, younger than 40 years old).
- *Marie Curie INdAM cofund fellowship 2012-2014*: “Stable and Unstable Motions in Hamiltonian Dynamics” (SaUMiHD). PI and Coordinator. Ranked 1st (ex-aequo) with full score. (Declined: incompatibility with the appointment as tenured Researcher at University of Roma Tre).
- *Newton Trust Fellowship* of Pembroke College, University of Cambridge, UK (September 2009 to August 2012).
- *Herchel-Smith Research Fellowship*, Department of Pure Mathematics and Mathematical Statistics, University of Cambridge (UK) (September 2009 to August 2012). Coordinator of a three-year Research Grant (Total: 30.000 GBP).
- *Fondation des Sciences Mathématiques de Paris*, junior research fellowship (September 2008 - August 2009).
- *Frelinghuysen scholarship*, Princeton University (academic year 2003-2004).
- Full tuition and scholarship, Princeton University (2003-2008).

### • Grants

- French *ANR Project*: “Hamilton-Jacobi et théorie KAM faible” (ANR-07-BLAN-3-0361). Participant from 2009 to 2012.

- *Herchel-Smith Research Grant* (30.000 GBP/ 3 years), University of Cambridge (UK) (September 2009 to August 2012). PI and Coordinator.
- *Marie Curie INdAM cofund fellowship 2012-2014*: “Stable and Unstable Motions in Hamiltonian Dynamics” (SaUMiHD). PI and Coordinator. Ranked 1st (ex-aequo) with full score. (Declined: incompatibility with the appointment as tenured Researcher at University of Roma Tre).
- Italian *GNAMPA (National Group of Mathematical Analysis, Probability and Applications) research project*: “Symplectic, variational and viscosity techniques for the study of Homogenization of Hamilton-Jacobi” [Total: 4.000 Euro for 1 year]. PI and Coordinator (from May 2013 to May 2014). Other team members: Antonio Siconolfi and Andrea Davini from University of Rome “La Sapienza”.
- Italian PRIN 2009 (Italian Project of National Relevance): “Critical point theory and perturbative methods for nonlinear differential equations” [3 years]. Participant from 2012 to 2013.
- Italian PRIN 2012 (Italian Project of National Relevance): “Variational and perturbative aspects in nonlinear differential problems” [3 years]. Participant from 2014 to 2017.
- Proponent and Scientific coordinator of *Incontro INdAM 2015*: “The Hamilton-Jacobi equation: at the crossroads of PDE, Dynamical Systems and Geometry” held in Cortona in June 2015. Other organizers: A. Davini and A. Siconolfi. [15.000 Euro].
- Italian *GNAMPA (National Group of Mathematical Analysis, Probability and Applications) research project*: “Fenomeni asintotici e normalizzazione” [Total: 2.400 Euro for 1 year]. Participant (from March 2016 to March 2017). Other team members: Annalisa Cesaroni, Andrea Davini (PI), Antonio Siconolfi.
- University of Rome “Tor Vergata”: *Consolidate the Foundations 2015*. Project title: “Irreversibility in Dynamic Optimization (PI: Piermarco Cannarsa). Participant (2016-2017, 18 months).
- University of Rome “Tor Vergata”: *Mission Sustainability 2017*. Project title: “Dynamic Optimization in Multi-Agents phenomena (PI: Alessio Porretta). Participant (2018-2019, 18 months).
- Italian *GNAMPA (National Group of Mathematical Analysis, Probability and Applications) research project* [Total: 5.500 Euro for 1 year]. Participant (from March 2018 to March 2019). P.I.: Fabiana Leoni.
- Proponent and Scientific coordinator of *Incontro INdAM 2018*: “Interactions of Symplectic topology and Dynamics”, Cortona June 2019. Other organizers: V. Ginzburg, B. Gürel and M. Mazzucchelli. [15.000 Euro]
- University of Rome “Tor Vergata”: *Mission Sustainability 2017*. Project title: “Order and chaos in modern dynamical systems” [1500 Euro]. P.I. (2018-2019, 18 months).
- MSCA ITN -ETN 2018, EU project 813644. Title: *Stardust-R*. Participant (4 years).

## • Publications

- Alfonso Sorrentino. On John Mather’s seminal contributions in Hamiltonian dynamics. To appear in *Methods and Applications of Analysis*, 2019.
- Alfonso Sorrentino and Alexander P. Veselov. Markov numbers, Mather’s beta function and stable norm, to appear in *Nonlinearity*, 2019.
- Vadim Kaloshin and Alfonso Sorrentino. On the integrability of Birkhoff billiards. *Philosophical Transactions of the Royal Society A*, Volume 376, Issue 2131, 2018.
- Vadim Kaloshin and Alfonso Sorrentino. On the local Birkhoff conjecture for convex billiards, *Annals of Mathematics*, 188 (1): 315–380, 2018.

- Guan Huang, Vadim Kaloshin and Alfonso Sorrentino. Nearly circular domains which are integrable close to the boundary are ellipses. *Geom. and Funct. Analysis (GAFA)*, 28 (2): 334–392, 2018.
- Guan Huang, Vadim Kaloshin and Alfonso Sorrentino. On Marked Length Spectrum of Generic Strictly Convex Billiard Tables, *Duke Math. Journal*, 167 (1): 175 – 209, 2018.
- Antonio Siconolfi and Alfonso Sorrentino. Global results for Eikonal Hamilton-Jacobi equations on networks, *Analysis & PDE* 11 (1): 171–211, 2018.
- Stefano Marò and Alfonso Sorrentino. Aubry-Mather theory for conformally symplectic systems, *Comm. Math. Phys.*, 354 (2): 775–808, 2017.
- Marco Mazzuccheli and Alfonso Sorrentino. Remarks on the symplectic invariance of Aubry-Mather sets. *C. R. Acad. Sci. Paris, Ser. I* 354: 419-423, 2016.
- Alfonso Sorrentino. Lecture notes on Mather’s theory for Lagrangian systems, *Publicaciones Matemática del Uruguay*, 16: 169–192, 2016.
- Alfonso Sorrentino. *Action-minimizing methods in Hamiltonian dynamics: an introduction to Aubry-Mather theory*. *Mathematical Notes* Vol. 50, Princeton University Press (Editors: Phillip A. Griffiths, John N. Mather, and Elias M. Stein), 2015.
- Alfonso Sorrentino. Computing Mather’s  $\beta$ -function for Birkhoff billiards. *Discrete and Contin. Dyn. Syst. - A*, 35 (10): 5055 – 5082, 2015.
- Gabriel P. Paternain and Alfonso Sorrentino. Symplectic and contact properties of Mañé’s critical value on the universal cover. *NoDEA, Nonlinear Differential Equations Appl.* 21(5): 679–708, 2014.
- Alfonso Sorrentino. A variational approach to the study of the existence of invariant Lagrangian graphs. *Boll. Unione Mat. Italiana Serie IX*, Vol VI (2): 405 – 440, 2013.
- Leo T. Butler and Alfonso Sorrentino. Weak Liouville-Arnol’d theorems and their implications. *Comm. Math. Phys.* 315 (1): 109 – 133, 2012.
- Daniel Massart and Alfonso Sorrentino. Differentiability of Mather’s average action and integrability on closed surfaces. *Nonlinearity* 24 (6): 1777 - 1793, 2011.
- Alfonso Sorrentino. On the integrability of Tonelli Hamiltonians. *Trans. Amer. Math. Soc.* 363 (10): 5071 - 5089, 2011.
- Alfonso Sorrentino and Claude Viterbo. Action minimizing properties and distances on the group of Hamiltonian diffeomorphisms. *Geom. & Topol.* 14 (4): 2383 - 2403, 2010.
- Albert Fathi, Alessandro Giuliani and Alfonso Sorrentino. Uniqueness of invariant Lagrangian graphs in a homology or a cohomology class. *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)*, Vol. VIII (4): 659 - 680, 2009.
- Alfonso Sorrentino. On the structure of action-minimizing sets for Lagrangian systems. Ph.D. thesis Series, Princeton University, 157 pp. ISBN: 978-0549-52575-2, ProQuest LLC, 2008.
- Alfonso Sorrentino. On the total disconnectedness of the quotient Aubry set. *Ergodic Theory Dynam. Systems* 28 (1): 267 - 290, 2008.

#### PRE-PUBLICATIONS:

- Monography: Vadim Kaloshin and Alfonso Sorrentino, “Stochastic Arnold diffusion of deterministic systems” (under contract with EMS for the series “Zurich Lectures in Advanced Mathematics”), 2018.
- Alfonso Sorrentino. Homogenization of the Hamilton-Jacobi equation, Preprint 2016.

#### • Invited Talks

##### UPCOMING TALKS:

- Colloquium at University of Nice, February 2019.
- Conference: “New trends in Hamilton-Jacobi: PDE, Control, Dynamical Systems and Geometry”, Fudan University, Shanghai (China), July 2019.
- Conference: “ $C^0$  aspects of symplectic geometry and Hamiltonian dynamics”, Haifa (Israel), May 2019.
- Oberwolfach workshop: “Dynamische Systeme”, Oberwolfach (Germany), July 2019.
- Conference: “Dynamics, Equations and Applications (DEA 2019)” (Session: Smooth dynamical systems), Krakow (Poland), September 2019. Invited speaker.
- School: “V Brazilian School on Dynamical Systems”, Belo Horizonte (Brazil), October 2019.

## PAST TALKS:

- Colloquium classe di scienze, Scuola Normale Superiore. Pisa, December 2018.
- Seminario di Analisi, Università degli Studi di Torino, October 2018.
- Memorial Conference conference for John N. Mather, Princeton University, October 2018. Organizer and Invited speaker.
- Introductory Workshop: “Hamiltonian systems, from topology to applications through analysis”, MSRI Berkeley (USA), August 2018.
- Workshop: “An analyst, a geometer and a probabilist walk into a bar”, Cardiff (UK), June 2018.
- Conference: “Perspectives in Hamiltonian Systems”, Venice (Italy), June 2018.
- “Geometrie Analyse et Dynamique Seminar”, Université de Nice - Sophia Antipolis (France), April 2018.
- Analysis seminar, University of Zürich (Switzerland), March 2018.
- Geometry, Groups, and Dynamics Seminar, ENS Lyon (France), January 2018.
- Seminaire de Geometrie Hamiltonienne, Paris Jussieu (France), January 2018.
- International conference on Singularity Theory (in honor of John Mather’s 75th Birthday), Tsinghua Sanya International Mathematics Forum (TSIMF), Sanya (China), December, 2017. Invited speaker.
- Geometry Seminar, ICMAT (Madrid, Spain), November 2017.
- Seminario di sistemi dinamici ed olomorfi, Scuola Normale di Pisa and Centro De Giorgi, Pisa (Italy), November 2017. Speaker.
- Conference on Hamiltonian Dynamics in memory of John Mather, Congressi Stefano Francini, Ascona, Switzerland, November 2017. Invited Speaker.
- Department Colloquium, University of Hokkaido (Japan), October 2107.
- International Workshop on Nonlinear Analysis and Applications, Lahore, Pakistan, September 2017. Invited Keynote speaker.
- SIAM meeting on control and its applications, Pittsburgh (USA), July 2017. Speaker.
- Geometry & Dynamics Seminar, University of Tel Aviv (Israel), April 2017.
- ITS-ETH Dynamical system seminar, ETH Zürich (Switzerland), April 2017.
- Workshop on Mathematical Physics & Dynamical Systems, UT Dortmund (Germany), March 2017. Invited speaker.
- ETH Winter School on *Conservative Dynamics*, Engerlberg (Switzerland), February 2017. Course Lecturer.
- Workshop: *Chaotic Phenomena in Mathematical Models*, SNS Pisa and Centro de Giorgi (Italy), September 2016. Invited Speaker.

- Workshop on Hamilton-Jacobi equation, Fudan University, Shanghai (China), July 2016. Invited Speaker.
- Analysis Seminar, Università La Sapienza, Rome (Italy), May 2016.
- Dynamical System Seminar, Universitat Politècnica de Catalunya, May 2016
- SIAM Conference on Analysis of PDE 2015 (Special Session: “Analysis of Hamilton-Jacobi Equation: Optimization, Dynamics and Control”), Scottsdale (Arizona, USA), December 2015.
- BKM Seminar (Bochum-Köln-Münster seminar on symplectic and contact geometry), University of Bochum (Germany), November 2015.
- Mathematical Physics seminar, Università di Pisa, November 2015.
- XX Congresso UMI (Session on Nonlinear Analysis and Dynamical Systems), Siena (Italy), September 2015.
- Oberwolfach Workshop: “Dynamische Systeme”, Mathematisches Forschungsinstitut Oberwolfach (Germany), 19-25 July 2015. Invited participant.
- Conference: *Global dynamics in Hamiltonian systems* (in honor of Amadeu Delshams’ 60th birthday), Santuari de Núria, Girona (Spain), 28 June - 3 July 2015. Invited Speaker.
- Conference: *Dynamics, Topology and Computations*, Bedlewo (Poland), 15–20 June 2015. Plenary Speaker (Cancelled).
- Math Colloquium, CIMAT (Mexico), April 2015.
- Analysis Seminar, Università degli Studi di Roma “Tor Vergata” (Italy), March 2015.
- *CIMPA Research School in Hamiltonian and Lagrangian Dynamics*, Salto (Uruguay), 9-20 March 2015. Invited Lecturer.
- *Workshop on Hamiltonian Dynamical Systems*, Fudan University, Shanghai (China), January 2015. Invited Speaker.
- Colloquium at Nanjing University (China), December 2014.
- Meeting: “*Journées dynamiques*”, Université d’Avignon (France), 25 June 2014. Invited Speaker.
- Conference: “*Beyond Hamilton-Jacobi in Avignon*”, Université d’Avignon (France), 23-30 April 2014.
- Workshop: “*Symplectic and Contact Dynamics*”, 23-27 March 2014, University of Tel Aviv (Israel).
- Dynamical System Seminar, Scuola Normale Superiore di Pisa (Italy), February 2014.
- Analysis Seminar, Università La Sapienza, Rome (Italy), October 2013.
- Holomorphic Dynamics Seminar, Centro de Giorgi & SNS Pisa, Pisa (Italy), October 2013.
- Workshop of young italian dynamicisists, Corinaldo (Italy), June 2013.
- Analysis and Dynamics Seminar, Université de Nantes, France, April 2013.
- Workshop on the N-body problem, BIRS Banff (Canada), January 2013.
- Dynamical Systems Seminar, Università Roma Tor Vergata (Italy), November 2012.
- Conference on Periodic Orbits in Contact and Riemannian Geometry, Touquet-Paris-Plage (France), September 2012.
- Montevideo dynamical systems conference 2012, Montevideo (Uruguay), August 2012.
- Recent Progress in Lagrangian & Hamiltonian Dynamics, A conference in honor of John Mather’s 70th Birthday, ENS Lyon, Lyon (France), June 2012.
- Differential geometry Seminar, University of Cambridge (UK), May 2012.
- Dynamical Systems and Ergodic Theory Seminar, University of Bristol (UK), May 2012.

- Dynamical Systems and Ergodic Theory Seminar, Warwick University (UK), November 2011.
- Second meeting of the Young Italian Hyperbolicians, Università di Pisa, Pisa (Italy), September 2011.
- XIX Congresso dell’Unione Matematica Italiana, Bologna (Italy), September 2011. Plenary Speaker in the session: Nonlinear analysis and Dynamical Systems.
- Conference on Hamiltonian Dynamics 2011, Nanjing University, Nanjing (China), August 2011.
- Workshop on conservative dynamics and symplectic geometry, IMPA, Rio de Janeiro (Brazil), August 2011.
- Workshop on instabilities in Hamiltonian systems, Field Institute, Toronto (Canada), June 2011.
- Séminaire de Géométrie hamiltonienne, Institut de Mathématiques de Jussieu, Paris (France), May 2011.
- Pure Mathematics Colloquium, University of Durham, Durham (UK), May 2011.
- Dynamics and geometry seminar, Penn State University, State College (Pennsylvania, USA), October 2010.
- Workshop on dynamical systems and related topics, Penn State University, State College (Pennsylvania, USA), October 2010.
- Rencontre KAM faible, Calvi (France), October 2010.
- Differential geometry seminar, University of Cambridge, Cambridge (UK), March 2010.
- Colloque: Paulette Libermann, héritage et descendance, Institut Henri Poincaré, Paris (France), December 2009.
- Séminaire de géométrie et dynamiques , UMPA, École normale supérieure de Lyon, Lyon (France), November 2009.
- Séminaire de systèmes dynamiques et géométrie, Université d’Avignon, Avignon (France), May 2009.
- Analysis Seminar, Università degli Studi di Napoli “Federico II”, Naples (Italy), April 2009.
- Mathematical Physics Seminar, University of Helsinki, Helsinki (Finland), March 2009.
- Conference: Nice weak KAM methods in Nice, Université de Nice-Sophia Antipolis, Nice (France), February 2009.
- Séminaire du CEREMADE Analyse-Probabilités, Université Paris-Dauphine, Paris (France), January 2009.
- Séminaire de topologie symplectique (SYMPLECT’X), École Polytechnique, Palaiseau (France), November 2008.
- Rencontre de KAM faible, Université de Bordeaux, Bordeaux (France), October 2008.
- Seminari de sistemes dinamics, Centre de Recerca Matemàtica, Barcelona (Spain), October 2008.
- Analysis Seminar, Università degli Studi “Roma Tre”, Rome (Italy), June 2008.
- Dynamics Seminar, University of Toronto, Toronto (Canada), January 2008.
- Ergodic Theory and Statistical Mechanics Seminar, Princeton University, Princeton (New Jersey, USA), September 2007.
- Workshop on Symplectic topology and area-preserving dynamical systems, Snowbird (Utah, USA), June 2007.
- Analysis, Geometry, and Dynamical Systems Seminar, Instituto Superior Técnico, Lisbon (Portugal), June 2007.

- Workshop and School on Conservative dynamics, San José (Uruguay), December 2006.
- AIMS's Sixth international Conference on dynamical systems, Université de Poitiers, Poitiers (France), June 2006.
- PASI 2005 Conference on Differential equations and nonlinear analysis, Universidad de Chile, Santiago (Chile), January 2005.

### • Conferences, Workshops and Schools

#### UPCOMING EVENTS:

- CIME School: *Modern aspects of dynamical systems*, Cetraro (Italy), July 2020. Organizer.
- School: “V Brazilian School on Dynamical Systems”, Belo Horizonte (Brazil), October 2019. Invited lecturer.
- Conference: “Dynamics, Equations and Applications (DEA 2019)” (Session: Smooth dynamical systems), Krakow (Poland), September 2019. Invited speaker.
- XXI Congresso UMI (Italian Mathematical Union), Session: “Ordinary Differential equations and Dynamical Systems”, Pavia, September 2019. Organizer.
- Oberwolfach Workshop: “Dynamische Systeme”, Mathematisches Forschungsinstitut Oberwolfach (Germany), July 2018. Invited participant.
- Conference: “New trends in Hamilton-Jacobi: PDE, Control, Dynamical Systems and Geometry”, Fudan University, Shanghai (China), July 2019. Invited participant.
- Incontro INdAM 2019: “Interactions of Symplectic topology and Dynamics”, Cortona June 2019. Proponent and Scientific coordinator.
- Conference: “ $C^0$  aspects of symplectic geometry and Hamiltonian dynamics”, Haifa (Israel), May 2019. Invited participant.
- Workshop: “Mathematical Models and Methods in Earth and Space Sciences”, University of Rome Tor Vergata, Rome, March 2019. Organizer.
- Workshop: “Dynamical Systems: from geometry to mechanics”, University of Rome Tor Vergata, Rome, February 2019. Organizer.

#### PAST EVENTS:

- Mini-Workshop: “Seconda giornata DinAmica (II DAI DAY)”, Accademia dei Lincei, Roma, December 2018. Organizer.
- Workshop: “Hamiltonian systems, from topology to applications through analysis II”, MSRI Berkeley (USA), November 2018. Participant.
- Workshop: “Hamiltonian systems, from topology to applications through analysis I”, MSRI Berkeley (USA), October 2018. Participant.
- Memorial Conference conference for John N. Mather, Princeton University, October 2019. Organizer and Invited speaker.
- MSRI program: “Hamiltonian systems, from topology to applications through analysis”, MSRI Berkeley (USA), August -December 2018. Research member.
- Introductory Workshop: “Hamiltonian systems, from topology to applications through analysis”, MSRI Berkeley (USA), August 2018. Invited lecturer.
- Workshop: *Weak KAM in Rio* (ICM2018's satellite conference), Rio de Janeiro (Brazil), August 2018. Invited speaker and scientific committee.
- Workshop: “An analyst, a geometer and a probabilist walk into a bar”, Cardiff (UK), June 2018. Invited speaker.
- Conference: “Perspectives in Hamiltonian Systems”, Venice (Italy), June 2018. Invited speaker.



- *Padua's Winter school on Hamiltonian dynamics and symplectic geometry*, Padova (Italy), February 2018. Scientific committee.
- *International conference on Singularity Theory* (in honor of John Mather's 75th Birthday), Tsinghua Sanya International Mathematics Forum (TSIMF), Sanya (China), December, 2017. Invited speaker.
- *Workshop on Hamiltonian Systems*, ETH-Congressi Stefano Francini, Ascona (Switzerland), November 2017. Organizer and Speaker.
- *Workshop in honour of Luigi Chierchia's 60th Birthday*, Patù (Italy), October 2017. Scientific committee.
- *International Workshop on Nonlinear Analysis and Applications*, Lahore (Pakistan), September 2017. Invited Keynote speaker.
- *SIAM meeting on control and its applications*, Pittsburgh (USA), July 2017. Speaker.
- INdAM Workshop “*Modern trend in the modern theory of ergodic theory*”, Rome (Italy) June 2017. Organizer.
- Workshop on Mathematical Physics & Dynamical Systems, UT Dortmund (Germany), March 2017. Invited speaker.
- ETH Winter School on *Conservative Dynamics*, Engerlberg (Switzerland), February 2017. Lecturer and Organizer.
- Meeting: *Prima Giornata DinAmica (Dynamics DAY)*, Gran Sasso Science Institute (L'Aquila, Italy), November 2016. Organizer.
- Workshop: *Chaotic Phenomena in Mathematical Models*, SNS Pisa and Centro de Giorgi (Italy), September 2016. Invited Speaker.
- *Workshop on Hamilton-Jacobi equation*, Fudan University, Shanghai (China), July 2016. Invited Speaker.
- SIAM Conference on Analysis of PDE 2015 (Special Session: “Analysis of Hamilton-Jacobi Equation: Optimization, Dynamics and Control”), Scottsdale (Arizona, USA), December 2015. Invited speaker and organizer.
- XX Congresso UMI (Session on Nonlinear Analysis and Dynamical Systems), Siena (Italy), September 2015. Invited speaker.
- Oberwolfach Workshop: “Dynamische Systeme”, Mathematisches Forschungsinstitut Oberwolfach (Germany), 19-25 July 2015. Invited participant.
- Conference: *Global dynamics in Hamiltonian systems* (in honor of Amadeu Delshams' 60th birthday), Santuari de Núria, Girona (Spain), 28 June - 3 July 2015. Invited Speaker.
- Conference: *Dynamics, Topology and Computations*, Bedlewo (Poland), 15–20 June 2015. Plenary Speaker.
- INdAM Workshop: *Hamilton-Jacobi equation: at the crossroads of PDE, Dynamical Systems and Geometry*, 22-27 June 2015. Scientific coordinator and organizer.
- *CIMPA Research School in Hamiltonian and Lagrangian Dynamics*, Salto (Uruguay), 9-20 March 2015. Invited Lecturer.
- *Workshop on Hamiltonian Dynamical Systems*, Fudan University, Shanghai (China), January 2015. Invited Speaker.
- Meeting: “*Journées dynamiques*”, Université d'Avignon (France), 25 June 2014. Invited Speaker.
- Conference: “*Hamiltonian Perturbation Theory: Separatrix Splitting, Theory and Applications*”, Centro de Giorgi, Pisa (Italy), 5-9 May 2014. Invited Speaker (Declined).
- Conference: “*Beyond Hamilton-Jacobi in Avignon*”, Université d'Avignon (France), 23-30 April 2014. Invited Speaker.

- Workshop: “*Symplectic and Contact Dynamics*”, 23-27 March 2014, University of Tel Aviv (Israel). Invited Speaker.
- *Workshop of young italian dynamicists*, Corinaldo (Italy), June 2013. Invited Speaker.
- *Mini-Symposium on Aubry-Mather theory*, Université de Nantes (France), April 2013. Invited Lecturer.
- *Workshop on N-body problem*, BIRS, Banff (Canada), January 2013. Invited Speaker.
- *Dynamics and EDP*, CIRM, Luminy Marseille (France), November 2012. Invited Participant.
- *Conference on Periodic Orbits in Contact and Riemannian Geometry*, Touquet-Paris-Plage (France), September 2012. Invited Lecturer.
- *Montevideo dynamical systems conference 2012*, Montevideo, Uruguay, August 2012. Invited Speaker.
- *Workshop on Interactions Between Algebra and Dynamics in Symplectic Topology*, Technion, Haifa (Israel), June 2012. Invited participant.
- *Recent Progress in Lagrangian & Hamiltonian Dynamics. A conference in honor of John Mather’s 70th Birthday*, Ecole Normale superieure de Lyon, France, June 2012. Invited speaker and co-organizer.
- *Conference on Dynamical Optimization in PDE and Geometry*, University of Bordeaux, France, December 2011. Invited speaker.
- *Workshop on Symplectic dynamics*, Institute for advanced studies, Princeton (NJ, USA), October 2011. Invited participant.
- *Second meeting of the Young Italian Hyperbolicians*, Università di Pisa, Pisa (Italy), September 2011. Invited speaker.
- *XIX Congresso dell’Unione Matematica Italiana*, Bologna (Italy), September 2011. Invited speaker at the Session: Nonlinear analysis and dynamical systems.
- *Workshop on weak KAM theory*, Cortona (Italy), September 2011. Invited speaker.
- *Conference on Hamiltonian Dynamics 2011*, Nanjing University, Nanjing (China), August 2011. Invited speaker.
- *Workshop on conservative dynamics and symplectic geometry*, IMPA, Rio de Janeiro (Brazil), August 2011. Invited speaker.
- Summer school on *Closed orbits and variational methods*, Université de Neuchâtel (Switzerland), June 2011. Invited lecturer.
- *Workshop on Instabilities in Hamiltonian Systems*, Fields Institute, Toronto (Canada), June 2011. Invited speaker.
- *Workshop in dynamical systems and related topics*, Penn State University, State College (Pennsylvania, USA), October 2010. Invited speaker.
- *Rencontre KAM faible*, Calvi (France), October 2010. Invited Speaker.
- *International congress of mathematicians (ICM2010)*, Hyderabad (India), August 2010. Participant.
- *Jornades d’introducció als sistemes dinàmics i a les EDP’s (JISD2010)*, Universitat Politècnica de Catalunya (UPC), Barcelona (Spain), June 2010. Invited lecturer.
- *Workshop on Symplectic and contact topology and dynamics: puzzles and horizons*, MSRI, Berkeley (USA), March 2010. Invited participant.
- *Colloque: Paulette Libermann, héritage et descendance*, Institut Henri Poincaré, Paris (France), December 2009. Invited speaker.
- *Ecole d’automne sur la théorie KAM faible*, CIRM, Marseille (France), October 2009. Invited participant.

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

#### • Academic and Scientific Visits

- Aug-Dec 2018: MSRI, Berkeley (USA). Research member for the thematic program: Hamiltonian systems, from topology to applications through analysis (Fully Funded by MSRI).
- January 2018: ENS Lyon (France), Invited by Prof. Marco Mazzucchelli. One week.
- September 2017: Hokkaido University (Japan), Invited by Hideo Kubo. One week.
- April 2017: ETH Zürich and Forschungsinstitut für Mathematik (FIM), Invited by Prof. Vadim Kaloshin. Two weeks.
- April 2017: University of Tel Aviv (Israel), Invited by Prof. Yaron Ostrover. One week.
- May 2016: Universitat Politècnica de Catalunya, Barcelona (Spain), Invited by Prof. Pau Martin and Rafael Ramirez-Ros. One week.
- June 2015: University of Maryland, College Park (Maryland, USA). Invited by Prof. Vadim Yu. Kaloshin. Two weeks.
- April 2015: CIMAT, Guanajuato (Mexico). Invited by Prof. Gonzalo Contreras. One week.
- December 2014: University of Nanjing, Nanjing (China). Invited by Prof. Chong-Qing Cheng and Wei Cheng. Two weeks.

- January 2014: University of Maryland, College Park (Maryland, USA). Invited by Prof. Vadim Yu. Kaloshin. Two weeks.
- April 2013: Université de Nantes (France). Invited by Prof. Georgi Popov. One week.
- October 2010: Penn State University, State College (Pennsylvania, USA). Invited by Prof. Vadim Yu. Kaloshin. Two weeks.
- April 2009: Università degli Studi di Napoli Federico II, Naples (Italy). Thematic program: *New connections between dynamical systems and Hamiltonian PDEs*. Two weeks.
- February 2009: University of Helsinki, Helsinki (Finland). Invited by Dr. Emiliano De Simone. One week.
- September/October 2008: Centre de Recerca Matemàtica, Barcelona (Spain). Research Program: “*Stability and Instability in Mechanical Systems*” (SIMS08). One month.
- June 2007: Instituto Superior Técnico, Lisbon (Portugal). Invited by Prof. Diogo Gomes. One week.
- May 2005: Institut Henri Poincaré, Paris (France). Thematic Trimester: “*Time at work*”. One month.

### • Teaching Activity

#### UNDERGRADUATE TEACHING:

- Spring 2019: Università Roma Tor Vergata, *Fourier Analysis*, Lecturer.
- Spring 2019: Università Roma Tor Vergata, *Mathematical methods for engineers*, Engineering School, Lecturer.
- Spring 2018: Università Roma Tor Vergata, *Fourier Analysis*, Lecturer.
- Spring 2018: Università Roma Tor Vergata, *Mathematical methods for engineers*, Engineering School, Lecturer.
- Fall 2016: Università Roma Tor Vergata, *Analysis II*, Department of Physics, Lecturer.
- Fall 2016: Università Roma Tor Vergata, *Analysis II*, Engineering School, Lecturer.
- Fall 2015: Università Roma Tor Vergata, *Analysis I*, Engineering School, Lecturer.
- Spring 2015: Università Roma Tor Vergata, *Fourier Analysis*, Exercise Class.
- Fall 2014: Università Roma Tor Vergata, *Analysis I*, Engineering School, Lecturer.
- Fall 2014: Università Roma Tre, *Introduction to Elliptic PDEs*, Lecturer.
- Spring 2014: Università Roma Tre, *Istituzioni di Analisi Superiore* (abstract measure theory and functional analysis), Lecturer.
- Fall 2013: Università Roma Tre, *Analysis I*, Teaching Assistant.
- Fall 2012: Università Roma Tre, *Complex Analysis*, Teaching Assistant.
- Fall 2012: Università Roma Tre, *Analysis I*, Teaching Assistant.
- Spring 2012: University of Cambridge (UK), Part III course on *Hamiltonian dynamical systems*, Lecturer.
- Spring 2012: Pembroke College (University of Cambridge, UK): *Analysis I* and *Groups, Rings and Modules*, Supervisor.
- Fall 2011: Pembroke College (University of Cambridge, UK): *Analysis II* and *Groups*, Supervisor.
- Spring 2011: Pembroke College (University of Cambridge, UK): *Analysis I* and *Groups, Rings and Modules*, Supervisor.

- Fall 2010: Pembroke College (University of Cambridge, UK): *Analysis II* and *Groups*, Supervisor.
- Spring 2010: Pembroke College (University of Cambridge, UK): *Analysis I* and *Groups, Rings and Modules*, Supervisor.
- Fall 2009: Pembroke College (University of Cambridge, UK): *Analysis II* and *Groups*, Supervisor.
- Spring 2008: Princeton University (USA): *Calculus II*, Lecturer and coordinator of the various sections.
- Fall 2007: Princeton University (USA): *Analysis in a single variable*, Review section instructor.
- Spring 2007: Princeton University (USA): *Analysis in a single variable*, Review section instructor.
- Fall 2006: Princeton University (USA): *Advanced linear algebra*, Lecturer.
- Spring 2006: Princeton University (USA): *Linear algebra and Calculus for economists*, Teaching assistant and Review session instructor.
- Fall 2005: Princeton University (USA): *Advanced multivariable calculus*, Teaching assistant.
- Fall 2005: Princeton University (USA): *Classical mechanics and chaos*, Teaching assistant.
- Spring 2005: Princeton University (USA): *Complex analysis with applications*, Teaching assistant.
- Fall 2004: Princeton University (USA): *Advanced multivariable calculus*, Teaching assistant.
- Spring 2003: Università Roma Tre: *Analysis in several variables* and *Complex Analysis*, Tutor.
- Fall 2002: Università Roma Tre: *Analysis in several variables*, Tutor.
- Spring 2002: Università Roma Tre: *Analysis in several variables* and *Complex Analysis*, Tutor.
- Fall 2001: Università Roma Tre: *Analysis in several variables*, Tutor.

## POSTGRADUATE AND ADVANCED TEACHING:

## UPCOMING COURSES:

- September 2019: Graduate course on Hamiltonian dynamics at “V Brazilian School on Dynamical Systems”, Belo Horizonte (Brazil).
- January 2019: Ph.D. Course on Aubry-Mather theory at University of Turin (Italy) [8 hours].

## PAST COURSES:

- March 2017: Ph.D. course on Aubry-Mather theory at University of Padova (Italy) [about 10 hours].
- February 2017: *Winter school on Conservative Dynamics*, Engelberg (Switzerland). Course on “Birkhoff Billiards” [8 hours].
- Spring 2016: Ph.D. course on weak KAM theory and Aubry-Mather theory (University of Rome Tor Vergata) [Course: 24 hours].
- March 2015: *CIMPA Research School in Hamiltonian and Lagrangian Dynamics*, Salto (Uruguay) [Course: 10 hours].
- February 2014: Scuola Normale Superiore Pisa (Italy), *From KAM theory to Aubry-Mather theory* [Mini-course: 4 hours].

- April 2013: Université de Nantes (France), *The least action principle in Hamiltonian dynamics and Geometry* [Mini-course: 4 hours].
- September 2012: Touquet-Paris-plage (France), *The least action principle in Hamiltonian dynamics and Geometry* [Mini-course: 3 hours].
- February-April 2012: University of Cambridge (UK), Part III/Ph-D course on *Hamiltonian dynamical systems* [Graduate course: 24 hours].
- June 2011: Université de Neuchâtel (Switzerland), *The principle of least action in Hamiltonian dynamics* [Summer School course: 10 hours].
- June 2010: Universitat Politècnica de Catalunya (UPC), Barcelona (Spain), *Action-minimizing methods in Lagrangian dynamics* [Summer School course: 10 hours].
- December 2009: University of Cambridge, *Introduction to Aubry-Mather theory* [Mini-course: 6 hours].
- April 2009: Università degli Studi di Napoli Federico II, *An introduction to Mather's theory* [Graduate Course: 10 hours].
- October 2008: CRM Barcelona (Spain), *Tutorial on Mather's theory for Lagrangian systems* [Mini-course: 3 hours].

#### TEACHING MATERIAL:

- Lecture notes for my postgraduate course: “*Action-minimizing methods in Hamiltonian dynamics: an introduction to Aubry-Mather theory*”, to be published by Princeton University Press, Series: *Mathematical Notes* (Editors: Phillip A. Griffiths, John N. Mather, and Elias M. Stein), 2014. Preprint: <http://arxiv.org/abs/1011.0590>.
- Lecture notes for the undergraduate course “*Advanced Linear Algebra with applications*”. Preprint: [http://ricerca.mat.uniroma3.it/users/sorrentino/Alfonso\\_Sorrentinos\\_Home\\_Page/MAT204Fall06.html](http://ricerca.mat.uniroma3.it/users/sorrentino/Alfonso_Sorrentinos_Home_Page/MAT204Fall06.html).
- Collection of solved exercises (Real and Complex Analysis) (in italian). Preprint: [http://ricerca.mat.uniroma3.it/users/sorrentino/Alfonso\\_Sorrentinos\\_Home\\_Page/Teaching\\_files/raccoltanew.pdf](http://ricerca.mat.uniroma3.it/users/sorrentino/Alfonso_Sorrentinos_Home_Page/Teaching_files/raccoltanew.pdf).

#### • Academic Services

**Journal refereeing:** Referee for many international journals, including: Annals of Math. Studies, Inventiones Mathematicae, Duke Math. Journal, Advances in mathematics, Communications on Pure and Applied mathematics, Annales Henri Poincaré, Communications in Mathematical Physics, Ergodic theory and Dynamical Systems, Journal in Modern Dynamics, Bulletin of the London Mathematical Society, International Mathematics Research Notices, Discrete and Continuous Dynamical Systems A & B, Canadian Journal of Mathematics, Journal de l'École Polytechnique - Mathématiques, Rivista iberoamericana, Acta Mathematica Sinica English series, Journal of Topology and Analysis, Proceeding London Mathematical Society, Mathematical Proceedings of the Cambridge Philosophical Society, Nonlinearity, Journal of Mathematical Physics, Journal of Differential Equations, Journal of Nonlinear Sciences, Journal of Geometric Mechanics, Chaos, Solitons & Fractals, Inverse Problems and Imaging, Mathematical Physics Electronic Journal, Rendiconti del Circolo Matematico di Palermo.

- Reviewer for Math Reviews (MathSciNet) (since 2011).

#### Evaluator and Grant Assessment:

- Evaluator of grant proposals for the Natural Sciences and Engineering Research Council of Canada (NSERC), 2012 and 2018.

- Evaluator of grant proposals for the German Israeli Foundation for Scientific Research and Development, 2018.
- Evaluator of grant proposals for some Italian Universities.
- Referee for MIUR (Italian Ministry of Education, University and Research).

**Master students:**

- Donato Scarcella, University Roma Tre (January 2018). Thesis: *On the dynamics of mathematical billiards*. Summa cum laude.
- Sara D’Ettorre, University Roma Tre (July 2016). Thesis: *The study of Aubry-Mather sets: two different approaches*. Summa cum laude.

**Ph.D. Thesis defense committees:**

- Anna Tamarit Sariol (Universitat Politècnica de Catalunya, Barcelona), June 2015.
- Nguyen Ngoc Quoc Thuong (La Sapienza, Università di Roma), July 2015.

**Scientific and Organizing Committees:**

## CONFERENCES AND MEETINGS:

- Organizer and member of the scientific committee of the CIME School: *Modern aspects of dynamical systems*, to be held in Cetraro (Italy) in July 2020. Other organizers: Claudio Bonanno and Corinna Ulcigrai.
- Organizer of the session “Ordinary Differential equations and Dynamical Systems” during the XXI Congresso UMI (Italian Mathematical Union), Pavia, September 2019. Other organizer: G. Bonanno.
- Proponent and Scientific coordinator of *Incontro INdAM 2018: “Interactions of Symplectic topology and Dynamics”*, Cortona June 2019. Other organizers: V. Ginzburg, B. Gürel and M. Mazzucchelli.
- Organizer and member of the scientific committee of the workshop: “Mathematical Models and Methods in Earth and Space Sciences”, University of Rome Tor Vergata, Rome, March 2019.
- Organizer and member of the scientific committee of the workshop “Dynamical Systems: from geometry to mechanics”, University of Rome Tor Vergata, Rome, February 2019.
- Organizer and member of the scientific committee of the mini-Workshop: “Seconda giornata DinAmica (II DAI DAY)”, Accademia dei Lincei, Roma, December 2018. Other organizers: Claudio Bonanno, Annamaria Cherubini, Marco Lenci.
- Organizer of the Memorial Conference for John N. Mather, Princeton University, October 2018. Other organizers: M. Goresky, H. Hofer, V. Kaloshin and Y. Sinai.
- Organizer of the summer school Hokkaido-Pisa-Rome 2018, August/September 2018, Pisa (Italy).
- Member of the Scientific Committee for Workshop Weak KAM in Rio 2018 (ICM2018’s satellite conference), August 2018.
- Member of the Scientific Committee for the Padua’s winter school on Hamiltonian dynamics and symplectic topology, Padova (Italy), February 2018.
- Member of the Scientific Committee for the Workshop in honour of Luigi Chierchia’s 60th Birthday, Patù (Italy), October 2017.

- Organizer of the *Workshop on Hamiltonian Systems*, ETH-Congressi Stefano Franscini, Ascona (Switzerland), November 2017. Other organizers: Marcel Guardia and Vadim Kaloshin.
- Organizer of the INdAM Workshop “*Modern trends in the ergodic theory of dynamical systems*”, Rome (Italy) June 2017. Other organizers: Claudio Bonanno and Marco Lenci.
- Organizer of the ETH-ITS *Winter school on Conservative Dynamics*, Engerlberg (Switzerland), February 2017. Other organizers: Marcel Guardia and Vadim Kaloshin.
- Organizer of the *Giornata DinAmica (Dynamics DAY)* at Gran Sasso Institute (Italy), November 2016. Other organizers: Claudio Bonanno and Marco Lenci.
- Proponent and Scientific coordinator of the Session: “Analysis of Hamilton-Jacobi Equation: Optimization, Dynamics and Control” as part of the *SIAM Conference on PDE 2015* (Scottsdale, Arizona, USA) in December 2015. Other organizer: P. Cannarsa.
- Proponent and Scientific coordinator of *Incontro INdAM 2015*: “The Hamilton-Jacobi equation: at the crossroads of PDE, Dynamical Systems and Geometry”, Cortona June 2015. Other organizers: A. Davini and A. Siconolfi.
- Member of the Scientific Committee for the annual Conference/Summer school “*Jornades d’introducció als sistemes dinàmics i a les EDP’s*” held at Universitat Politècnica de Catalunya (UPC), Barcelona (Spain). From 2010 to 2015.
- Member of the Organizing Committee for the Conference in honour of John Mather’s 70th Birthday, “*Recent progress in Hamiltonian & Lagrangian dynamics*” held at ENS Lyon (France), June 2012.

## SEMINARS AND COLLOQUIA:

- Organizer of the *Differential Equation Seminar* held weekly at Università degli Studi di Roma “Tor Vergata” (since October 2016).
- Organizer of the weekly Hamiltonian Seminar at MSRI (Berkeley), Fall 2018.
- Organizer of the *Analysis and Dynamical systems Seminar* held weekly at Università degli Studi Roma Tre (from 2012 to 2014).
- Member of the Organizing Committee of the *Mathematical Colloquia* held monthly at Università degli Studi Roma Tre (from 2013 to 2014).
- Member of the Organizing Committee of the *Tè di Matematica* (Divulgative Mathematical seminars) held monthly at Università degli Studi Roma Tre (from 2012 to 2014).

## COMMITTEES:

- (Elected) Member of the Department board (“Giunta”), University of Rome “Tor Vergata” (term 2015 - 2018)
- Member of the *Ph.D. Scientific Committee* for the Ph.D. program in Mathematics, at Università degli Studi Roma Tre (from 2012 to present).
- Founder and Member of the scientific board of the Italian network of Dynamicists (*DinAmicI*).
- Member of the *Mathematics Teaching Committee* for Department of Mathematics and Physics, Università degli Studi Roma Tre (from 2012 to 2014).
- Member of the “Premio Cuzzo” prize committee 2015.
- Member of the *Undergraduate Admission interview panel* (Pure Mathematics) for University of Cambridge/Pembroke College (December 2010 and December 2011).
- Member of the *International Program Committee* of Pembroke College, University of Cambridge (October 2010 - August 2012).



- **Various**

**Scientific Memberships:**

- Member of GNAMPA (National Group of Mathematical Analysis, Probability and Applications). From 2011 to present.
- Member of UMI (Unione Matematica Italiana), since 2015.
- Member of AMS (American Mathematical Society). From 2003 to 2008.
- Member of MAA (Mathematical Association of America). From 2003 to 2008.

**Computer skills:** Programming Languages (C, LaTeX, HTML), Mathematical Software (Mathematica, MATLAB).

**Languages:** Italian (native), English (excellent), French (fluent), German (basic).