

CURRICULUM VITAE OF RENATO LUCÀ

Personal Data

Born: May 23, 1985 in Naples. Italian citizen.
Current address: Iturribide 46, 48006, Bilbao, Spain.
Phone: (+39) 339 6229258.
E-mail: rluca@bcamath.org.
E-mail: Renato.Luca.23.05.1985@gmail.com.

Current position

Ikerbasque research fellow at BCAM (Basque Center for Applied Mathematics)

Education

January 2013 Ph.D. in Mathematics.
Sapienza University, Rome.
Dissertation: *Inequalities with angular integrability and applications*.
Advisor: prof. Piero D’Ancona.

October 2009 Master degree in mathematics, grade 110/110 cum laude.
Federico II University, Naples.
Dissertation: *The Cauchy problem for the nonlinear Schrödinger and wave equations on \mathbb{R}^n* .
Advisor: prof. Massimiliano Berti.

June 2007 Bachelor degree in mathematics, grade 110/110.
Federico II University, Naples.
Dissertation: *Hamiltonian dynamical systems and two body problem*.
Advisor: prof. Vittorio Coti Zelati.

Working experiences

- February 01, 2013 – August 31, 2016: Postdoctoral fellow at the Instituto de Ciencias Matemáticas (ICMAT), 28049 Madrid, Spain
- September 01, 2016 – August 31, 2019: Postdoctoral fellow at Department Mathematik und Informatik, Universität Basel, 4051 Basel, Switzerland
- September 1, 2019 – now: Ikerbasque research fellow at BCAM (Basque Center for Applied Mathematics)

Research interests

Harmonic Analysis and PDEs.

Publications

- G. Crippa, C. Schulze, R. Lucà. Polynomial mixing under a certain stationary Euler flow. *Physica D: Nonlinear Phenomena*, 394, 44–55, 2019, DOI: 10.1016/j.physd.2019.01.009, online [here](#).
- G. Genovese, R. Lucà, D. Valeri. Invariant measures for the periodic derivative nonlinear Schrödinger equation. *Math. Annalen*, 374(3-4), 1075–1138, 2019, DOI: 10.1007/s00208-018-1754-0, online [here](#).
- R. Lucà, K. M. Rogers. Average decay of the Fourier transform of measures with applications. *J. Eur. Math. Soc. (JEMS)*, 21(2), 465–506, 2019, DOI: 10.4171/JEMS/842, online [here](#).
- R. Lucà, K. M. Rogers. A note on pointwise convergence for the Schrödinger equation. *Math. Proc. Cambridge Philos. Soc.*, 166(2), 209–218, 2019, DOI: 10.1017/S0305004117000743, online [here](#).
- P. D’Ancona, R. Lucà. Stability properties of the regular set for the Navier–Stokes equation. *J. Math. Fluid. Mech.*, 20(2), 819–852, 2018, DOI: 10.1007/s00021-017-0349-y, online [here](#).

- A. Enciso, R. Lucà, D. Peralta-Salas. Vortex reconnection in the three dimensional Navier–Stokes equations. *Adv. Math.*, 309, 452–486, 2017, DOI: 10.1016/j.aim.2017.01.025, online [here](#).
- R. Lucà, K. M. Rogers. Coherence on fractals versus pointwise convergence for the Schrödinger equation. *Comm. Math. Phys.*, 351(1), 341–359, DOI: 10.1007/s00220-016-2722-8, 2017, online here [here](#).
- P. D’Ancona, R. Lucà. On the regularity set and angular integrability for the Navier–Stokes equation. *Arch. Ration. Mech. Anal. (ARMA)*, 221(3): 1255–1284, 2016, DOI: 10.1007/s00205-016-0982-2, online [here](#).
- G. Genovese, R. Lucà, D. Valeri. Gibbs measures associated to the integrals of motion of the periodic derivative nonlinear Schrödinger equation. *Selecta Math. New Series*, 22(3), 1663–1702, 2016, DOI: 10.1007/s00029-016-0225-2, online [here](#).
- F. Cacciafesta, P. D’Ancona, R. Lucà. Helmholtz and dispersive equations with variable coefficients on exterior domains. *SIAM J. Math. Anal.*, 48(3): 1798–1832, 2016, DOI: 10.1137/15M103769X, online [here](#).
- F. Cacciafesta, R. Lucà. Singular integrals with angular integrability, *Proc. Am. Mat. Soc.*, 144(8): 3413–3418, 2016, DOI: 10.1090/proc/13123, online [here](#).
- R. Lucà. Regularity criteria with angular integrability for the Navier–Stokes equation. *Nonlinear Anal.*, 105: 24–40, 2014, DOI: 10.1016/j.na.2014.04.004, online [here](#).
- P. D’Ancona, R. Lucà. Stein–Weiss and Caffarelli–Kohn–Nirenberg inequalities with higher angular integrability. *J. Math. Anal. Appl.*, 388(2): 1061–1079, 2012, DOI: 10.1016/j.jmaa.2011.10.051, online [here](#).

Proceedings

- R. Lucà. On the size of the regular set of suitable weak solutions of the Navier–Stokes equation. *Actes de Journées ÉDP*, 2015, DOI: 10.5802/jedp.634, online [here](#).
- G. Genovese, R. Lucà, D. Valeri. Gibbs measures associated to the integrals of motion of the periodic derivative nonlinear Schrödinger equation. *Oberwolfach Preprints (OWP)* 2015, DOI: 10.14760/OWP-2015-04, online [here](#).

To Appear

- F. Cacciafesta, P. D’Ancona, R. Lucà. A limiting absorption principle for the Helmholtz equation with variable coefficients. *J. Spectr. Theory*, DOI: 10.4171/JST/229, online [here](#).
- G. Genovese, R. Lucà. Local Central Limit Theorem for a Random Walk Perturbed in One Point. *Mathematical Physics, Analysis and Geometry*, 22(3), 2019, DOI: 10.1007/s11040-019-9316-6, online [here](#).
- E. Compaan, R. Lucà, G. Staffilani. Pointwise Convergence of the Schrödinger Flow. To appear in *International Mathematics Research Notices*, DOI: 10.1093/imrn/rnaa036, [arXiv:1907.11192](#).
- R. Lucà. A note on vortex reconnection for the 3d Navier–Stokes equation. To appear in *Lecture Notes of the Unione Matematica Italiana*.
- R. Lucà. Invariant measures for the DNLS equation. To appear in proceedings volume of “Conference on Mathematics of Wave Phenomena 2018” (KIT Karlsruhe).

Member of the projects

- Interplays Between Harmonic Analysis And Inverse Problems (IHAIP) PGC2018-094528-B-I00 (AEI/FEDER, UE)
- BERC 2018-2021 program, funded by the Basque government.
- BCAM Severo Ochoa excellence accreditation SEV-2017-0718, funded by the Spanish State Research Agency.
- Fluid Flows and Irregular Transport (FLIRT) European Research Council – 676675.

- Restriction of the Fourier Transform with Applications to the Schrödinger and Wave Equations, European Research Council – 277778, September 2011 – August 2016.
- Severo Ochoa Programa de Excelencia Ministerio de Economía y Competitividad, SEV-2011-0087, September 2011 – August 2015.
- Dispersive dynamics: Fourier Analysis and Variational Methods, FIRB 2012 – RBFR12MXPO, March 2013 – March 2016.
- Severo Ochoa Programa de Excelencia Ministerio de Economía y Competitividad, SEV-2015-0554.
- Oscilación, control y aplicaciones a las EDPS, MTM2013-41780-P.

Research grants

- Ikerbasque research fellow 2018, [personal webpage](#).
- National Spanish grant “Juan de la Cierva Incorporación 2015”. Score 94.5/100. Position 3. Reference: IJCI-2015-26778, (declined).

Visiting

- February 11–16, 2019, MIT, Boston, USA.
- November 17–21, 2018, University of Glasgow, Scotland.
- December 12–16, 2016, University of Birmingham, United Kingdom.
- October 14–31, 2016, Yau Mathematical Sciences Center, Beijing, China.
- February 9–14 and July 27-31 and December 15-18, 2015, Institut für Mathematik, Universität Zürich, Switzerland.
- November 16–22, 2014, Centro Internazionale per la Ricerca Matematica (CIRM), Trento. Supported by the Research in Pairs Programme.
- April 27–May 24, 2014, Mathematisches Forschungsinstitut Oberwolfach (MFO), Oberwolfach. Supported by the Research in Pairs Programme
- December 5–10, 2013, Hausdorff center for Mathematic, Bonn, Germany.
- December 1–5, 2013, Laboratoire de Probabilités et Modèles Aléatoires, Paris, France.
- July 8–19, 2013, Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy.

Services

- Organizer of the conference *3d Bilbao meeting on analysis and PDEs*, Bilbao, June 2–4, 2020. Funded by BERC 2018-2021 and (IHAIP) PGC2018-094528-B-I00.
- Organizer of the conference *Harmonic Analysis to celebrate Michael Cowling’s 65th*, Segovia, July 1–5, 2014. Funded principally by the ERC Starting Grant 277778.

Teaching

Academic year 2009/10	Teaching assistant of Prof. L. Lamberti for <i>Analysis I</i> , Department of Mathematics, Sapienza, University of Rome.
Academic year 2010/11	Corsi di recupero e sostegno CAD in Matematica, Sapienza, University of Rome.
Winter 2016	Teaching assistant of Dr. C. Nobili for <i>Relle Analysis</i> , 26 hours, Department Mathematik und Informatik, Universität Basel.
Spring 2017	Teaching <i>Introduction to Fourier Analysis</i> , 26 hours course + 26 hour exercises, Department Mathematik und Informatik, Universität Basel.
Spring 2018	Teaching assistant of Dr. G. Crippa for <i>Analysis II</i> , 26 hours, Department Mathematik und Informatik, Universität Basel.
Winter 2018 and Spring 2019	Teaching assistant of Dr. G. Crippa for <i>Analysis I</i> , 26 + 26 hours, Department Mathematik und Informatik, Universität Basel.
June 17–21, 2019	Phd course <i>Pointwise convergence of solutions of the Schrödinger equation to the initial datum</i> , program here , 10 hours, BCAM.

Invited Talks in international conferences

- University of Padova, Italy, June 15–17, 2020, 3-days workshop "PDEs in quantum mechanics": Pointwise convergence properties of the nonlinear Schrödinger equation.
- Institut Mittag Leffer, Stockholm, Nonlinear dispersive waves, solitons and related topics, June 10–14, 2019: Pointwise convergence properties of the nonlinear Schrödinger equation.
- Bressanone, Bolzano, Italy, Winter school on Fluid Dynamics, Dispersive equations and Quantum fluids, December 17–21, 2018: Vortex reconnection for the 3D Navier–Stokes equation.
- KIT, Karlsruhe, Germany, Conference on Mathematics of Wave Phenomena, July 23–27, 2018: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- MFO, Oberwolfach, Germany, Gibbs Measures for Nonlinear Dispersive Equations, April 15–21, 2018: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- La Thuile, Aosta, Italy, Dynamics of Hamiltonian PDEs, February 5–8, 2018: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- University of Birmingham, United Kingdom, Harmonic Analysis/PDEs workshop, December 13, 2016: Average decay of the Fourier transform of fractal measures.
- GSSI L'Aquila, Italy, Summer School on fluid dynamic and related topics, July 18–22, 2016: Stability and regularity properties of the Navier–Stokes equation.
- El Escorial, Madrid, Spain, 10th International Conference on Harmonic Analysis and Partial Differential Equations, June 12–17, 2016: Pointwise convergence of the Schrödinger equation.
- Universidad de Murcia, Spain, Congreso de jóvenes investigadores, September 7–11, 2015: Maximal estimates for the Schrödinger operator.
- Roscoff Station Biologique CNRS, France, Journées ÉDP, June, 1–5, 2015: On the size of the regular set of suitable weak solutions of the Navier–Stokes equation.
- Sapienza University, Rome, Summer school on KAM Theory and Dispersive PDEs, September, 1–11, 2014: On the Schrödinger maximal function in higher dimension.
- Campus de Cantoblanco, Madrid, 10-th AIMS Conference on Dynamical System, Differential Equation and Applications, Special Session 43, July, 07–11, 2014: Local regularity with angular integrability for the Navier–Stokes equation.
- Sapienza University, Rome, Conference on Analysis of Relativistic and Non-Relativistic models in Quantum Mechanics, May, 19–23, 2014: On the size of divergence sets of the Schrödinger equation.

- ICMAT, Madrid, Summer School on Analysis of Incompressible Fluids, June 27, 2013: Regularity criteria with angular integrability for the Navier–Stokes equation.

Invited Talks

- IECL, University of Nancy, France, Séminaire équations aux dérivées partielles et applications, February 4, 2020: Pointwise convergence properties of the nonlinear Schrödinger equation.
- MIT, Boston, USA, PDE/Analysis seminar, February 12, 2019: On the pointwise convergence of solutions of the Schrödinger equation to the initial datum.
- University of Glasgow, Scotland, November 19, 2018: Invariant measures for the derivative nonlinear Schrödinger equation.
- BCAM, Bilbao, Spain, BCAM scientific seminar, June 21, 2018: On the pointwise convergence of solutions of the Schrödinger equation to the initial datum
- SISSA, Trieste, Italy, Analysis Seminars, January 9, 2018: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- Sapienza University, Rome, Italy, PDEs Seminars, 20 November 2017: On the pointwise convergence of solutions of the Schrödinger equation to the initial datum.
- Department Mathematik und Informatik, Universität Basel, May 4, 2016: Stability and regularity properties of the Navier–Stokes equation.
- Institut für Mathematik Universität, Zürich, December 17, 2015: Stability and regularity properties of the Navier–Stokes equation.
- Universidad Autónoma de Madrid, Madrid, November 20, 2015: Pointwise convergence of the Schrödinger equation and related problems.
- HCM, Bonn, Graduate Seminar on Advanced Topics in PDE, December 6, 2013: Local regularity with angular integrability for the Navier–Stokes equation.
- University Paris Diderot, Probabilities and Random Models Laboratory, December 5, 2013: Random walk on a lattice with an antisymmetric perturbation in a point.
- ICMAT, Madrid, Seminario de EDP's y Mecanica de Fluidos, November 13, 2013: Local regularity with angular integrability for the Navier–Stokes equation.
- Sapienza University, Rome, December 12, 2012: Inequalities with angular integrability and applications.
- Federico II University, Naples, June 24, 2011: The Hardy–Littlewood–Sobolev inequality with angular integrability.

February 9, 2020.