CURRICULUM VITAE OF RENATO LUCÀ

Personal Data	Born:	May 23, 1985 in Naples. Italian citizen.
	Current address:	Iturribide 46, 48006, Bilbao, Spain.
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Webpage

- https://www.ikerbasque.net/es/renato-luca,
- http://www.bcamath.org/en/people/rluca,
- https://sites.google.com/view/renatoluca.

Current position

Ikerbasque research fellow at BCAM (Basque Center for Applied Mathematics). Type: tenure track.

These five year Fellowships are directed to promising young researchers; they are intended to offer a track towards a Principal Investigator (PI) role and independent research. Ikerbasque is committed to offer a long-term career to the research community: Fellows in their 5th year can be assessed for a permanent position.

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 Departement Mathematik und Informatik, Universität Basel, 4051 Basel, Switzerland
- September 1, 2019 – now: Ikerbasque research fellow at BCAM (Basque Center for Applied Mathematics). Type: tenure track.

Research interests

Harmonic Analysis and PDEs.

Publications

(1) E. Compaan, R. Lucà, G. Staffilani. Pointwise Convergence of the Schrödinger Flow. *Int. Math. Res. Not.*, 2021(1), 596–647, 2021, DOI:10.1093/imrn/rnaa036, online here.

(2) G. Genovese, R. Lucà. Local Central Limit Theorem for a Random Walk Perturbed in One Point. *Mathematical Physics, Analysis and Geometry*, 22(3), 1–15, 2019, DOI:10.1007/s11040-019-9316-6, online here .

(3) 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 .

(4) 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 .

(5) 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 .

(6) 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 .

(7) F. Cacciafesta, P. D'Ancona, R. Lucà. A limiting absorption principle for the Helmholtz equation with variable coefficients. *J. Spectr. Theory*, 8(4), 1349–1392, 2018, DOI:10.4171/JST/229, online here .

(8) 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 .

(9) 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 .

(10) 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 .

(11) 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 .

(12) 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 .

(13) 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 .

(14) 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 .

(15) 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 .

(16) P. D'Ancona, R. Lucà. Stein–Weiss and Caffarelli–Kohn–Nirenberg inequalities with angular integrability. *J. Math. Anal. Appl.*, 388(2): 1061-1079, 2012, DOI:10.1016/j.jmaa.2011.10.051, online here .

To Appear

(1) R. Lucà, F. Ponce-Vanegas, Convergence over fractals for the Schrödinger equation. *Indiana University Mathematics Journal.* arXiv:2101.02495 .

(2) D. Eceizabarrena, R. Lucà. Convergence over fractals for the periodic Schrödinger equation. *Analysis and PDEs.* arXiv:2005.07581 .

(3) R. Lucà. A note on vortex reconnection for the 3d Navier–Stokes equation. *Lecture Notes of the Unione Matematica Italiana* .

Preprints

(1) G. Genovese, R. Lucà, N. Tzvetkov. Quasi-invariance of low regularity Gaussian measures under the gauge map of the periodic derivative NLS arXiv:2008.10001 .

(2) G. Genovese, R. Lucà, N. Tzvetkov. Transport of Gaussian measures with exponential cutoff for Hamiltonian PDEs, arXiv:2103.04408 .

(3) G. Genovese, R. Lucà, N. Tzvetkov. Quasi-invariance of Gaussian measures for the periodic Benjamin-Ono-BBM equation arXiv:2107.03445 .

Proceedings

(1) R Lucà. Invariant measures for the DNLS equation. Mathematics of Wave Phenomena, 235-242, 2020, DOI:0.1007/978-3-030-47174-3_14, online here .

(2) R. Lucà, Oberwolfach Report: Mini-Workshop: Gibbs Measures for Nonlinear Dispersive Equations, 1096–1098, DOI: 10.4171/OWR/2018/18

(3) 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 .

(4) 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 .

Postdoc Supervision

- July 2021-July 2022, Supervisor of Dariusz Kosz, postdoctoral fellow, founded by the "Severo Ochoa SEV-2017-0718 joint postdoc program", details here (co-supervised with Luz Roncal BCAM).
- July 2021-June 2022, Supervisor of Odysseas Bakas, postdoctoral fellow, partially founded by the Grant (IHAIP) PGC2018-094528-B-I00, details here (co-supervised with Luz Roncal BCAM).
- July 2021-July 2022, Supervisor of Gennaro Ciampa, postdoctoral fellow, founded by the "Severo Ochoa SEV-2017-0718 joint postdoc program", details here (co-supervised with Pedro Caro BCAM).

Member of the projects

- Interplays Between Harmonic Analysis And Inverse Problems (IHAIP) PGC2018-094528-B-I00 (AEI/FEDER, UE).
- BCAM 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 Economia 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 Economia y Competitividad, SEV-2015-0554.
- Oscilación, control y aplicaciones a las EDPS, MTM2013-41780-P.

Research grants

- Ikerbasque research fellow 2018, personal webpage.

Visiting

- April 15 –July 15, 2021, September 21–October 16, 2021, Institute de Mathématique d'Orsay, Orsay, France. As visiting professor supported by a "poste rouge" of the CNRS.
- September 21–October 16, 2020, Institute de Mathématique d'Orsay, Orsay, France.
- October 16–31, 2019, January 17–February 6, 2020, Departement Mathematik und Informatik, University of Basel, Switzerland.
- 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, Univaersität 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 Modéles Aléatoires, University Paris Diderot, France.
- July 8–19, 2013, Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy.

Teaching

Academic year 2009/10	Teaching assistant of Prof. L. Lamberti for *Analysis 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 *Relle Analysis*, Department Mathematik und Informatik, Universität Basel.
Spring 2017	Teaching *Introduction to Fourier Analysis* (course + exercises) Department Mathematik und Informatik, Universität Basel.
Spring 2018	Teaching assistant of Dr. G. Crippa for *Analysis II*, Department Mathematik und Informatik, Universität Basel.
Winter 2018	Teaching assistant of Dr. G. Crippa for *Analysis I*, Department Mathematik und Informatik, Universität Basel.
Spring 2019	Teaching assistant of Dr. G. Crippa for *Analysis I*, Department Mathematik und Informatik, Universität Basel.
June 17–21, 2019	Phd course *Pointwise convergence of solutions of the Schrödinger equation to the initial datum*, program here, 10 hours, BCAM.
May 31–June 4, 2021	Phd course *Invariant measures for Hamiltonian PDEs*, program here, 10 hours, BCAM.

Responsabilities

- Speaker at the 2020 BCAM Scientific Advisory committee meeting to present the "Linear and Nonlinear Wave" research group, December 1th, 2020 (online).

- Organizer of the conference *3d Bilbao meeting on analysis and PDEs*, Bilbao, June 2–4, 2020 (postponed), https://sites.google.com/view/bilbaoapde2020. 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, https://www.icmat.es/rogers/ERCworkshop/. Funded principally by the ERC Starting Grant 277778.

Invited Talks in international conferences

- June 15–17, 2020, University of Padova, Italy (postponed), 3-days workshop "PDEs in quantum mechanics": Pointwise convergence properties of the nonlinear Schrödinger equation.
- June 10–14, 2019, Institut Mittag Leffer, Stockholm, Nonlinear dispersive waves, solitons and related topics: Pointwise convergence properties of the nonlinear Schrödinger equation.
- December 17–21, 2018, Bressanone, Bolzano, Italy, Winter school on Fluid Dynamics, Dispersive equations and Quantum fluids: Vortex reconnection for the 3D Navier–Stokes equation.
- July 23–27, 2018, KIT, Karlsruhe, Germany, Conference on Mathematics of Wave Phenomena: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- April 15–21, 2018, MFO, Oberwolfach, Germany, Gibbs Measures for Nonlinear Dispersive Equations: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- February 5–8, 2018, La Thuile, Aosta, Italy, Dynamics of Hamiltonian PDEs: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- December 13, 2016, University of Birmingham, United Kingdom, Harmonic Analysis/PDEs workshop: Average decay of the Fourier transform of fractal measures.
- July 18-22, 2016, GSSI L'Aquila, Italy, Summer School on fluid dynamic and related topics: Stability and regularity properties of the Navier–Stokes equation.
- June 12-17, 2016, El Escorial, Madrid, Spain, 10th International Conference on Harmonic Analysis and Partial Differential Equations: Pointwise convergence of the Schrödinger equation.
- September 7-11, 2015, Universidad de Murcia, Spain, Congreso de jóvenes investigadores: Maximal estimates for the Schrödinger operator.
- June, 1-5, 2015, Roscoff Station Biologique CNRS, France, Journées ÉDP: On the size of the regular set of suitable weak solutions of the Navier–Stokes equation.
- September, 1-11, 2014, Sapienza University, Rome, Summer school on KAM Theory and Dispersive PDEs: On the Schrödinger maximal function in higher dimension.
- July, 07-11, 2014, Campus de Cantoblanco, Madrid, 10-th AIMS Conference on Dynamical System, Differential Equation and Applications, Special Session 43: Local regularity with angular integrability for the Navier–Stokes equation.
- May, 19-23, 2014, Sapienza University, Rome, Conference on Analysis of Relativistic and Non-Relativistic models in Quantum Mechanics: On the size of divergence sets of the Schrödinger equation.
- June 27, 2013, ICMAT, Madrid, Summer School on Analysis of Incompressible Fluids: Regularity criteria with angular integrability for the Navier–Stokes equation.

Invited Talks in Seminars

- 15 Mars, 2021, University Paris 13, (online), working group of the LAGA, Mesures quasi-invariantes pour EDPs Hamiltoniennes.
- January 21, 2021 (online), BCAM, Bilbao, Joint Meeting APDEs - Machine Learning, Machine learning and the Korteweg–de Vries equation.

- July 16, 2020, BCAM-UPV, Bilbao, Spain. Joint Analysis-PDEs Seminar (online). Convergence over fractals for the periodic Schrödinger equation.
- June 25, 2020, University of Nice, Nice, France. Séminaire équations aux dérivées partielles (Online). Reconnection tourbillonnaire pour l'équation de Navier-Stokes.
- February 4, 2020, IECL, University of Nancy, France, Séminaire équations aux dérivées partielles et applications: Sur la convergence ponctuelle de l'équation de Schrodinger non-linéaire.
- February 12, 2019, MIT, Boston, USA, PDE/Analysis seminar: On the pointwise convergence of solutions of the Schrödinger equation to the initial datum.
- November 19, 2018, University of Glasgow, Scotland: Invariant measures for the derivative nonlinear Schrödinger equation.
- June 21, 2018, BCAM, Bilbao, Spain, BCAM scientific seminar: On the pointwise convergence of solutions of the Schrödinger equation to the initial datum
- January 9, 2018, SISSA, Trieste, Italy, Analysis Seminars: Invariant measures for the periodic derivative nonlinear Schrödinger equation.
- November 20, 2017, Sapienza University, Rome, Italy, PDEs Seminars: On the pointwise convergence of solutions of the Schrödinger equation to the initial datum.
- May 4, 2016, Department Mathematik und Informatik, Universität Basel: Stability and regularity properties of the Navier–Stokes equation.
- December 17, 2015, Institut für Mathematik Universität, Zürich: Stability and regularity properties of the Navier–Stokes equation.
- November 20, 2015, Universidad Autónoma de Madrid, Madrid: Pointwise convergence of the Schrödinger equation and related problems.
- December 6, 2013, HCM, Bonn, Graduate Seminar on Advanced Topics in PDE: Local regularity with angular integrability for the Navier–Stokes equation.
- December 5, 2013, University Paris Diderot, Probabilities and Random Models Laboratory: Random walk on a lattice with an antisymmetric perturbation in a point.
- November 13, 2013, ICMAT, Madrid, Seminario de EDP's y Mecanica de Fluidos: Local regularity with angular integrability for the Navier–Stokes equation.
- December 12, 2012, Sapienza University, Rome: Inequalities with angular integrability and applications.
- June 24, 2011, Federico II University, Naples: The Hardy–Littlewood–Sobolev inequality with angular integrability.

July 25, 2021.