

CURRICULUM VITAE

Eleonora Cinti

Born: 08/08/1982

Citizenship: Italy

CURRENT POSITION and CONTACT:

Assistant Professor (Ricercatore RTD B) at the University of Bologna.

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EDUCATION

09/2001-12/2004 *Laurea Triennale* (Bachelor) in Mathematics
Università di Bologna, Italy.

12/2004-10/2006 *Laurea Specialistica* (Master) in Mathematics
Università di Bologna, Italy.

01/2007- 07/2010 Ph.D. in Mathematics
Universitat Politècnica de Catalunya (Barcelona)
and *Università degli Studi di Bologna.*
Advisers: Xavier Cabré and Bruno Franchi.

PAST POSITIONS

- **09/2010-01/2012:** Postdoc at the **Max Planck Institute for Mathematics in the Sciences**, Leipzig, Germany (Felix Otto's research group).
- **02/2012-11/2012:** Postdoc at the **University of Pavia** in the ERC Starting Grant *Analysis of optimal sets and optimal constants: old questions and new results* (Principal Investigator: Aldo Pratelli).
- **12/2012-11/2014:** Postdoc at the **University of Bologna**.
- **12/2014:** Fellowship at the **Max Planck Institute for Mathematics in the Sciences**.
- **01/2015-08/2016:** Postdoc at the **Weierstrass Institute for Applied Analysis and Stochastics** (Berlin), in the ERC Starting Grant *Epsilon* (Principal Investigator: Enrico Valdinoci).
- **09/2016-04/2017:** Postdoc at the **University of Turin**, in the ERC Advanced Grant *COMPAT* (Principal Investigator: Susanna Terracini).
- **05/2017-09/2018:** RTD A, **University of Bologna**.

QUALIFICATIONS:

- Spanish national qualification for the position “Profesor Ayudante Doctor”, October 2015;
- French national qualification for the position of Maître de conférences, Section 25 - Mathématiques and 26 - Mathématiques appliqués et applications des mathématiques, February 2017 (qualification n. 17225305629D - 17226305629D, respectively).
- Italian national qualification for the position of Associate Professor, July 2018.

VISITING RESEARCH PERIODS

- December 2011 (1 week): Universitat Politècnica de Catalunya (Barcelona, Spain), invited by Prof. X. Cabré.
- October-November 2012 (2 months): University of Erlangen-Nuremberg (Germany), invited by Prof. A. Pratelli.
- November 2012 (1 week): Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany), invited by Prof. F. Otto.
- January 2013 (2 weeks): Universitat Politècnica de Catalunya (Barcelona, Spain), invited by Prof. X. Cabré and M.d.M Gonzalez.
- March 2013 (1 week): Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany), invited by Prof. F. Otto.
- May 2013 (1 week): Universitat Politècnica de Catalunya (Barcelona, Spain), invited by Prof. X. Cabré and M.d.M Gonzalez.
- October 2013 (3 weeks): Universidad Tecnica Federico Santa Maria (Valparaiso, Chile), invited by Prof. Jिंगgang Tan.
- November 2013 (1 week): Universidad de Chile (Santiago de Chile), invited by Prof. Manuel del Pino.
- February 2014 (1 week): Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany), invited by Prof. F. Otto.
- May 2014 (1 week): Universidad Autonoma de Madrid (Spain), invited by Prof. J. L. Vazquez and M. Bonforte.
- May 2014 (1 week): Universitaet Erlangen-Nurnberg (Germany), invited by Prof. A. Pratelli.
- September-December 2014 (3 months): Weierstrass Institute for Applied Analysis and Stochastics (Berlin), invited by Prof. E. Valdinoci.
- November 2014 (1 week): Universitaet Bonn (Germany), invited by C. Seis.
- November 2014 (1 week): Universitat Politècnica de Catalunya (Barcelona, Spain), invited by Prof. X. Cabré and M.d.M Gonzalez.
- December 2014 (3 weeks): Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany), invited by Prof. F. Otto.
- February 2015 (1 week): Universitaet Bonn (Germany), invited by C. Seis.

- March-April 2015(1 month): Università di Bologna (Italy), invited by B. Franchi.
- April-May 2015 (1 month): Universitat Politècnica de Catalunya (Barcelona, Spain), invited by Prof. X. Cabré and M.d.M Gonzalez.
- July 2015 (1 week): Università di Bologna (Italy), invited by B. Franchi.
- October 2015 (3 weeks): University of Edinburgh (UK), invited by A. Karakhanyan.
- October 2015 (3 days): University of Oxford (UK), invited by A. Ruland.
- November 2015 (2 weeks): Università di Bologna (Italy), invited by B. Franchi.
- November 2015 (1 week): Universitat Politècnica de Catalunya (Barcelona, Spain), invited by Prof. X. Cabré and M.d.M Gonzalez.
- April 2016 (3 days): Universitat Politècnica de Catalunya (Barcelona, Spain), invited by Prof. X. Cabré and M.d.M Gonzalez.
- April 2016 (1 week): Universitaet Bonn (Germany), invited by C. Seis.
- April 2016 (3 days): Università di Roma Tor Vergata, invited by C. Sines-trari.
- May 2016 (2 days): Università di Roma Tor Vergata, invited by C. Sines-trari.
- February 2017 (3 days): Université de Lyon 1 (France), invited by Louis Dupaigne.
- November 2017 (3 days): Universidad Autonoma de Madrid (Spain), invited by Prof. M.d.M Gonzalez.
- April 2018 (2 days): La Sapienza Università di Roma, invited by I. Birindelli.
- March 2019 (1 week): Università di Torino, invited by F. Colasuonno.

TALKS AT CONGRESSES

- March 2010: *Deterministic and stochastic front propagation*, Banff International Research Station (Canada),
Title of the talk: *Energy estimates and 1D symmetry for nonlinear equations with fractional diffusion.*
- June 2010: *Nonlinear evolution equations*, Mondello (Italy),
Title of the talk: *Energy estimates and 1D symmetry for nonlinear equations with fractional diffusion.*
- May 2012: *10th Workshop in interactions between dynamical systems and partial differential equations*, Universitat Politècnica de Catalunya, Barcelona (Spain),
Title of the talk: *Interpolation inequalities in pattern formation.*
- July 2012: *Geometric inequalities in calculus of variations*, Centro de Giorgi, Pisa (Italy),
Title of the talk: *Boundedness and regularity of isoperimetric sets with density.*

- October 2012: *Two days on nonlocal operators and applications*, Università di Parma (Italy),
Title of the talk: *1-D symmetry for fractional diffusion equations*.
- August 2013: *Connections for Women: Optimal Transport and Dynamics*, MSRI Berkeley (USA),
Title of the talk: *Pattern formation, optimal transport and interpolation inequalities*.
- March 2014: *Women in Partial Differential Equations and Calculus of Variations Workshop*, Mathematical Institute, University of Oxford (UK),
Title of the talk: *The isoperimetric problem with density*.
- June 2014: *Isoperimetric problems between Analysis and Geometry*, Scuola Normale, Pisa (Italy),
Title of the talk: *A quantitative weighted isoperimetric inequality via the ABP method*.
- July 2014: *The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, Madrid (Spain),
Title of the talk: *A Liouville-type result for a nonlinear and nonlocal equation in the Heisenberg group*.
- July 2014: *The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, Madrid (Spain),
Title of the talk: *Phase transitions in Stein manifolds and boundary energies*.
- March 2015: *Phase transition problems and nonlinear PDEs*, Bologna (Italy),
Title of the talk: *Flatness of nonlocal phase transitions in low dimensions*.
- September 2015: *Congreso de jóvenes investigadores de la RSME*, Murcia (Spain),
Title of the talk: *Flatness of nonlocal phase transitions in low dimensions*.
- December 2015: *PDE 2015: Theory and Applications of Partial Differential Equations*, WIAS, Berlin (Germany),
Title of the talk: *Quantitative flatness results for nonlocal minimal surfaces in low dimensions*.
- May 2016: *Bruxelles-Torino Talks in PDE's Conference*, Torino (Italy),
Title of the talk: *Quantitative flatness results and BV-estimates for nonlocal minimal surfaces*.
- May 2016: *9th European Conference on Elliptic and Parabolic Problems (Minisymposium: Nonlinear models and beyond)*, Gaeta (Italy),
Title of the talk: *Quantitative flatness results and BV-estimates for nonlocal minimal surfaces*.
- July 2016: *Calculus of Variations*, Oberwolfach (Germany)
Title of the talk: *Quantitative flatness results and BV-estimates for nonlocal minimal surfaces*.

- October 2016: *Research meeting on non-local operators*, Cagliari (Italy)
Title of the talk: *Quantitative flatness results and BV-estimates for non-local minimal surfaces.*
- October 2016: *Workshop on recent trends in the analysis of PDE's*, Pavia (Italy)
Title of the talk: *Energy estimates and flatness results for nonlocal phase transitions.*
- May 2017: *Intensive Period "Contemporary Research in elliptic PDEs and related topics"*, Bari (Italy)
Title of the talk: *Flatness results for nonlocal phase transitions in low dimensions.*
- December 2017: *Mini-conference in PDEs*, KTH, Stockholm (Sweden)
Title of the talk: *Flatness results for nonlocal phase transitions in low dimensions.*
- February 2018: *Young PDE's @ Roma, "La Sapienza"*, Roma (Italy).
Title of the talk: *Symmetry properties of stable solutions to nonlocal problems.*
- March 2018: *Viscosity and variational solutions of nonlinear PDE's*, Bologna (Italy) Title of the talk: *Some classifications results for stable solutions to some nonlocal problems.*
- March 2018: *Recent advances in Calculus of Variations and PDEs*, Parma (Italy)
Title of the talk: *Some recent results in the study of nonlocal minimal surfaces.*
- May 2018: *Nonlocal interactions in partial differential equations and geometry*, Institut Mittag-Leffler, Stockholm (Sweden).
Title of the talk: *Some recent results in the study of fractional mean curvature flows.*
- June 2018: *Variational and PDE problems in Geometric Analysis*, Bologna (Italy).
Title of the talk: *Some recent results in the study of fractional mean curvature flows.*
- August 2018: *Nonlinear PDE Days in Frankfurt*, Frankfurt (Germany).
Title of the talk: *Some recent results in the study of nonlocal minimal surfaces.*
- September 2018: *Nonlinear Analysis and PDEs in Caserta*, Caserta (Italy).
Title of the talk: *Some recent results in the study of nonlocal minimal surfaces.*

TALKS AT SEMINARS

- April 2009: Università di Bologna (Italy).
- May 2009: Università di Roma Tor Vergata (Italy).
- October 2009: Universitat Politècnica de Catalunya (Barcelona, Spain).
- January 2010: Hausdorff Centre for Mathematics (Bonn, Germany).

- March 2010: Université Pierre-et-Marie-Curie (Paris 6), Laboratoire Jacques-Louis-Lions (France).
- September 2010: Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany).
- April 2011: Università di Bologna (Italy).
- December 2011: Universitat Politècnica de Catalunya (Barcelona, Spain).
- January 2012: Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany).
- September 2012: Università di Pavia (Italy).
- November 2012: Workshop *Calculus of Variations and Partial Differential Equations*, Universität Erlangen-Nürnberg (Erlangen, Germany).
- January 2013: Universitat Politècnica de Catalunya (Barcelona, Spain).
- February 2013: Università di Bologna (Italy).
- November 2013: Universidad de Chile (Santiago de Chile).
- May 2014: Universidad Autonoma de Madrid (Spain).
- November 2014: Universitat Politècnica de Catalunya (Barcelona, Spain).
- February 2015: University of Bonn (Germany).
- March 2015: Università di Padova (Italy).
- May 2015: Universitat Politècnica de Catalunya (Barcelona, Spain).
- July 2015: Università di Bologna (Italy).
- October 2015: Universidad Autónoma de Madrid (Spain).
- October 2015: University of Oxford (UK).
- February 2015: Weierstrass Institute for Applied Analysis and Stochastics (Berlin, Germany).
- April 2016: Università di Roma Tor Vergata (Italy).
- November 2016: Università di Roma La Sapienza (Italy).
- December 2016: Università Cattolica del Sacro Cuore, Brescia (Italy).
- December 2016: Università di Torino (Italy),
- February 2017: Université de Lyon 1 (France).
- April 2017: Università di Bologna (Italy).
- June 2017: University of Augsburg (Germany).
- April 2018: La Sapienza Università di Roma (Italy).
- March 2019: Università di Pisa (Italy).
- March 2019: Università di Torino (Italy).

PARTICIPATIONS IN RESEARCH PROJECTS AND GRANTS

- MICINN project **MTM2008-06349-C03-01**, *Ecuaciones en derivadas parciales: analisis y aplicaciones*, Spain. Principal Investigator: X. Cabré;
- **2009SGR 345**, *Equacions Diferencials en Derivades Parcials i Aplicacions*, Generalitat de Catalunya. Principal Investigators: J.A. Carrillo (coordinator); X. Cabré (UPC manager);

- MICINN project **MTM2011-27739-C04-01**, *Ecuaciones en derivadas parciales: problemas de reacción-difusión y problemas geométricos*, Spain. Principal Investigator: X. Cabré.
- MINECO grant **MTM2014-52402-C3-1-P**, *Ecuaciones en Derivadas Parciales en Física, Biología Matemática y Geometría*, Spain. Principal Investigator: X. Cabré.
- MINECO grant **MTM2017-84214-C2-1-P**, *Ecuaciones en Derivadas Parciales: problemas de reacción-difusión, integro-diferenciales y problemas geométricos*, Spain. Principal Investigator: X. Cabré.
- **GNAMPA** Project 2014: *Nonlocal equations, norms and operators*. Principal Investigator: A. Di Castro.
- **ERC Starting Grant n. 258685** *Analysis of optimal sets and optimal constants: old questions and new results*. Principal Investigator: A. Pratelli;
- **ERC Starting Grant n. 277749** *Epsilon*. Principal Investigator: E. Valdinoci.
- **ERC Advanced Grant n. 339958** *COMPAT* Principal Investigator: S. Terracini.

- **GNAMPA** Project 2017 (funded by INDAM, Italy): *Variational methods for nonlocal problems*.
Principal Investigator: E. Cinti.
Participants: Gabriele Cora (Univ. Torino), Matteo Cozzi (UPC-Barcelona), Giovanni Franzina (Univ. “La Sapienza”, Roma), Dario Mazzoleni (Univ. Pavia).

- **FFABR 2017** (Italian National funds for Research).

PUBLICATIONS and PREPRINTS

Publications

- 1) Xavier Cabré and Eleonora Cinti, *Energy estimates and 1D symmetry for nonlinear equations involving the half-Laplacian*, **Discrete and Continuous Dynamical Systems** **28**, (2010), 1179–1206.
- 2) Eleonora Cinti, *Saddle-shaped solutions of bistable elliptic equations involving the half-Laplacian*, **Ann. Sc. Norm. Super. Pisa Cl. Sci.** (5) **12**, (2013), no. 3, 623–664.
- 3) Xavier Cabré and Eleonora Cinti, *Sharp energy estimates for nonlinear fractional diffusion equations*, **Calculus of Variations and Partial Differential Equations** **49**, (2014), no. 1–2, 233–269.
- 4) Eleonora Cinti and Fausto Ferrari, *Geometric inequalities for fractional Laplace operators and Applications*, **NoDEA Nonlinear Differential Equations Appl.** **22** (2015), no. 6, 1699–1714.
- 5) Eleonora Cinti and Jinggang Tan, *A nonlinear Liouville Theorem for fractional equations in the Heisenberg group*, **J. Math. Anal. Appl.**, **433** (2016), no. 1, 434–454.
- 6) Eleonora Cinti, Juan Davila, and Manuel del Pino, *Solutions of the fractional Allen-Cahn equations invariant under screw motion*, **J. Lond. Math. Soc.** (2) **94** (2016), no. 1, 295–313.
- 7) Eleonora Cinti and Felix Otto, *Interpolation inequalities in pattern formation*, **J. Funct. Anal.** **271** (2016), no. 11, 3348–3392.
- 8) Eleonora Cinti and Aldo Pratelli, *The $\varepsilon - \varepsilon^\beta$ property and the boundedness of isoperimetric sets in \mathbb{R}^N with density*, **J. Reine Angew. Math. (Crelle's Journal)** **728** (2017), 65–103.
- 9) Eleonora Cinti and Aldo Pratelli, *Regularity of isoperimetric sets with density in dimension 2*, **Math. Ann.** **368** (2017), no. 1-2, 419–432.
- 10) Eleonora Cinti, Bruno Franchi, and Maria del Mar Gonzalez, *Γ -convergence of variational functionals with boundary terms in Stein manifolds*, **Calc. Var. Partial Differential Equations** **56** (2017), no. 6, 56:155.
- 11) Eleonora Cinti, *Saddle-shaped solutions for the fractional Allen-Cahn equation*, **Discrete and Continuous Dynamical Systems - Series S** **11** (2018), 441–463.
- 12) Eleonora Cinti, Carlo Sinestrari, and Enrico Valdinoci, *Neckpinch singularities in fractional mean curvature flows*, **Proc. Amer. Math. Soc.** **146** (2018), no. 6, 2637–2646.
- 13) Lorenzo Brasco and Eleonora Cinti, *On fractional Hardy inequalities in convex sets*, **Discrete Contin. Dyn. Syst.** **38** (2018), no. 8, 4019–4040.
- 14) Eleonora Cinti, Joaquim Serra, and Enrico Valdinoci, *Quantitative flatness results and BV-estimates for stable nonlocal minimal surfaces*, to appear in **J. Diff. Geom.** (Available at <http://cvgmt.sns.it/paper/2918/>).

- 15) Eleonora Cinti, *Flatness results for nonlocal phase transitions*, to appear in Contemporary Research in Elliptic PDEs and Related Topics, **Springer-INDAM Series**. (Available at <http://cvgmt.sns.it/paper/3770/>).
- 16) Eleonora Cinti, Pietro Miraglio, and Enrico Valdinoci, *One-dimensional symmetry for the solutions of a three-dimensional water wave problem*, to appear in **J. Geom. Anal.** .
- 17) Xavier Cabré, Eleonora Cinti, and Joaquim Serra, *Stable s -minimal cones in \mathbb{R}^3 are flat for $s \sim 1$* , to appear in **J. Reine Angew. Math. (Crelle's Journal)**.

Preprints

- 18) Eleonora Cinti, Carlo Sinestrari, and Enrico Valdinoci, *Convex sets evolving by volume preserving Fractional Mean Curvature Flows*, submitted.
- 19) Lorenzo Brasco, Eleonora Cinti, and Stefano Vita, *A quantitative stability estimate for the fractional Faber-Khram inequality*, submitted.
- 20) Eleonora Cinti and Francesca Colasuonno, *A nonlocal supercritical Neumann problem*, submitted.

TEACHING

2007-2008	45 hours for the course of Mathematical Analysis I for first year students in Electronic Engineering, University of Bologna (Italy)
2008-2009	90 hours for the course of Mathematical Analysis II for first year students in Chemical and Civil Engineering, University of Bologna (Italy).
2012-2013	90 hours for the course of Mathematical Analysis II for first year students in Electronic and Civil Engineering, University of Bologna (Italy).
2013-2014	25 hours for the course of Mathematical Analysis I for first year students in Mathematics, University of Bologna (Italy).
2013-2014	30 hours for the course of Mathematical Analysis II for first year students in Chemical Engineering, University of Bologna (Italy).
2016-2017	15 hours for a course for Ph.D students on "BV functions and sets of finite perimeter" (jointly taught with Dario Mazzoleni), University of Turin.

- 2016-2017 Topic: $C^{1,\alpha}$ regularity for the reduced boundary
of Λ -minimizer for the perimeter via Excess decay.
12 hours for a course for Ph.D students on
“Alcuni problemi nonlocali dal punto di vista dell’analisi, della
geometria e della fisica matematica”
(jointly taught with Enrico Valdinoci),
University of Milan.
- 2017-2018 Topic: Modica-Mortola type results and a De Giorgi Conjecture
for the fractional Allen-Cahn equation.
Mathematical Analysis I for Engineering (60 hours),
University of Bologna (Italy).
- 2018-2019 Mathematical Analysis I for Engineering (60 hours),
University of Bologna (Italy).

Mentoring: One Bachelor student: Maurizio Cesaroni. Tesi di Laurea Triennale
entitled “Laplaciano Frazionario e Teorema di Caffarelli-Silvestre”, University of
Bologna, March 2018.

One postdoc: Stefano Vita, from 01-05-2018 to 30-04-2019, University of Bologna.