



UNIVERSITÀ DEGLI STUDI DELL'AQUILA

Prof. Emanuela Radici

Curriculum scientifico

(Aggiornato il 2023/01/10)

Current Position

? Tenure track Assistant professor (RTDb) at Università degli Studi dell'Aquila

Personal Information

? born in Milan on 18/12/1989

? parental leave 21/02/2022 - 21/06/2022

Education

? 16/09/2013 - 30/09/2016: PhD student in Mathematik at Friedrich-Alexander Universität Erlangen-Nürnberg. PhD defended on 09/12/2016 with evaluation ?magna cum laude?. Advisor prof. A. Pratelli.

? 09/2008 - 07/2013: student at Istituto Universitario di Studi Superiori (IUSS) in Pavia. Diploma licence defended on 7/05/2014. Advisor prof. P. Colli, co-advisor prof. F. Brezzi.

? 09/2011 - 07/2013: Master degree in Mathematics at Università degli Studi di Pavia. Master degree defended on 15/07/2013 with evaluation ?110/110 cum laude?. Advisor prof. A. Pratelli.

? 01/03/2013-30/06/2013 Erasmus Placement Student at FAU Erlangen Nürnberg; tutor prof. A. Pratelli

? 09/2008 - 07/2011: Bachelor degree in Mathematics at Università degli Studi di Pavia. Bachelor degree defended on 20/09/2011 with evaluation ?110/110 cum laude?. Advisor prof. E. Vitali.

? 2008-2013: fellow of Collegio Universitario d'eccellenza Santa Caterina da Siena in Pavia

? 2003-2008: student at Scientific High School Niccolò Copernico in Pavia, Piano Nazionale Informatico, final grade 100/100.

Employment history

? from 01/09/2022: Tenure track Assistant professor (RTDb) at Università degli Studi dell'Aquila

? 01/09/2019 - 31/08/2022: Bernoulli Instructor at École Polytechnique Fédérale de Lausanne

? 01/10/2016 - 30/04/2017: postDoc at Università degli Studi dell'Aquila, project ?Approssimazioni particellari per flussi gradienti in spazi di Wasserstein con mobilità nonlineare? mentore prof. M. Di Francesco

? 01/05/2017 - 31/08/2019: postDoc at Università degli Studi dell'Aquila, project ?Un approccio finito-dimensionale ai flussi gradienti in spazi di Wasserstein con mobilità nonlineare? mentore prof. M. Di Francesco

Publications

1. E. Radici: A planar $W_{1,p}$ Sobolev extension theorem for piecewise linear homeomorphisms, 2016, Pacific Journal of Mathematics 283-2, 405-418.

2. A. Pratelli, E. Radici: On the piecewise approximation of bi-Lipschitz curves, 2017, Rend. Sem. Mat. Univ. Padova 138, 1-37.

3. A. Pratelli, E. Radici: On the planar minimal BV extension problem, 2018, Rendiconti Lincei: Matematica e Applicazioni 29-3, 511-555.

4. D. Campbell, S. Hencl, A. Kauranen, E. Radici: Strict limits of BV planar homeomorphisms, 2018, *Nonlinear Analysis* 177, 209-237.
5. S. Fagioli, E. Radici: Solutions to aggregation-diffusion equations with nonlinear mobility constructed via a deterministic particle approximation, 2018, *Math. Mod. and Meth. in App. Sci.* 28, 1801-1829.
6. A. Pratelli, E. Radici: Approximation of BV planar homeomorphisms by diffeomorphisms, 2019, *Journal of Functional Analysis* 276, 659-686.
7. M. Di Francesco, S. Fagioli, E. Radici: Deterministic particle approximation for nonlocal transport equations with nonlinear mobility, 2019, *J. Differential Equations* 266, 2830-2868.
8. C. Dappiaggi, F. Finster, S. Murro, E. Radici: The Fermionic signature operator in De Sitter spacetime, 2020, *J. Math. Anal. and Appl.* 485-2, 123808
9. S. Fagioli, E. Radici: Opinion formation systems via deterministic particle approximation, 2020, *Kinet. Relat. Models* 14-1, 25-44
10. D. Campbell, A. Pratelli, E. Radici: Comparison between the non-crossing and the non-crossing on lines properties, 2020, *J. Math. Anal. and Appl.* 498-1, 124956
11. S. Daneri, E. Radici, E. Runa: Deterministic particle approximation of aggregation diffusion equations on unbounded domains, 2022, *J. Differential Equations* 312, 474-517.
12. E. Radici, F. Stra: Entropy solutions of non-local scalar conservation laws with congestion via deterministic particle method, 2022, to appear on *SIAM J. Math. Anal.*

Submitted works

1. D. Campbell, A. Kauranen, E. Radici: Classification of strict limits of planar BV homeomorphisms, 2021, submitted
2. S. Fagioli, A. Kaufmann, E. Radici: Optimal control problems of nonlocal interaction equations, 2022, submitted
3. S. Di Marino, L. Portinale, E. Radici: Optimal transport with nonlinear mobilities: a deterministic particle approximation result 2022, submitted
4. S. Daneri, E. Radici, E. Runa: Deterministic particle approximation of aggregation diffusion equations with nonlinear mobility 2022, submitted
5. E. Marconi, E. Radici, F. Stra: Stability of quasi-entropy solutions of non-local scalar conservation laws 2022, submitted
6. D. Campbell, A. Kauranen, E. Radici: Classification of area-strict limits of planar BV homeomorphisms, 2022, submitted
7. D. Campbell, A. Kauranen, E. Radici: Minimal extension for the ℓ^1 -Manhattan norm, 2022, submitted

Thesis

1. Minimizing Movements, Bachelor degree, supervisor prof. E. Vitali.
2. Analysis of a 2D model for epitaxially strained growth of islands and properties of minimal configurations, Master degree, supervisor prof. A. Pratelli.
3. Study of a Cahn-Hilliard type phase-field model related to tumor growth, IUSS diploma, advisor prof. P. Colli, coadvisor prof. F. Brezzi.
4. Diffeomorphic approximation of planar elastic deformations, PhD Thesis, supervisor prof. A. Pratelli.

Principal Investigator of research projects

? 01/09/2019-31/8/2023: EPFL funds for Bernoulli Instructorship

Participation to research projects

? 16/09/2013-31/8/2015: PhD position funded by ERC Starting Grant 258685 - P.I. Aldo Pratelli,

? participant to GNAMPA2017 project ?Analisi Di Modelli Matematici Della Fisica, Della Biologia E Delle Scienze Sociali?, P.I. Stefano Spirito.

Prizes and Awards

- ? IUSS study prize in the years 2008/09, 2009/10, 2010/11, 2011/12, 2012/13
- ? refund from Universit' a degli Studi di Pavia for on time degree, 2013.

Organization of Workshops

- ? co-organizer of ?Mini-Workshop on Optimal Transport and PDEs in Applied Sciences?, GSSI L'Aquila, April 6-7 2017.
- ? co-organizer of ?136th European Study Groups with Industry (ESGI)?, GSSI L'Aquila, May 14-18 2018.
- ? co-organizer of ?Cross-diffusion systems, gradient flows, and their perturbations ?, GSSI L'Aquila, April 10-13 2019.

Visiting for cooperation

- ? Faculty of Mathematics and Physics at Charles University, May 2016 in Prague.
- ? Department Mathematik, Universit' Nat Regensburg, during 2015/2016 in Regensburg.
- ? Department Mathematik, Universit' Nat Erlangen-Nurnberg, December 2016 in Erlangen.
- ? Faculty of Mathematics and Physics at Charles University, May 2017 in Prague.
- ? Department Mathematik, Universit' Nat Erlangen-Nurnberg, April 2018 in Erlangen.
- ? Department of Mathematics, Pontificia Universidad Catolica de Chile, August 2018 in Santiago de Chile.
- ? Department of Mathematics, ESI Institute, May 2019 in Vienna.
- ? Department of Mathematics, University of Pisa, December 2019.
- ? Department of Mathematics, University of Hradec Kralove, September 2021.

Refereeing activities for

Archive for Rational Mechanics and Analysis; ESAIM: Control, Optimisation and Calculus of Variations; Rendiconti Lincei Matematica e Applicazioni; Mathematical Methods in the Applied Sciences; Numerische Mathematik.

Invited Talks

- ? April 2014, Seminar Talk at C.I.A., University of Cambridge.
- ? May 2016, Seminar Talk, ?Oberseminar Analysis?, Universit' Regensburg.
- ? May 2016, Seminar Talk at Charles University in Prague.
- ? May 2017, Seminar Talk at Charles University in Prague.
- ? July 2017, Seminar Talk, Aggregation-Diffusion PDEs: Variational Principles, Nonlocality and Systems, Anacapri.
- ? August 2018, Seminar Talk at Pontificia Universidad Cat'lica de Chile, Santiago.
- ? September 2018, Seminar Talk, Interactive workshop on hyperbolic equations, Ferrara.
- ? October 2018, Seminar Talk, Workshop on New Developments in PDEs and Related Topics, Napoli.
- ? June 2019, Seminar Talk, Singular nonlinear problems in Calculus of Variations and PDE's, Napoli.
- ? December 2019, Seminar Talk at University of Pisa.
- ? June 2020, Seminar Talk, Special Session ?Nonlocal balance laws: Theory and Applications? at AIMS Conference on Dynamical Systems and Differential Equations, Atlanta. (postponed to 2021).
- ? December 2020, Seminar Talk, GeoCa on Geometric Analysis and Calculus of Variations, Lyseciny.
- ? February 2021, Seminar Talk, Recent Advances in Gradient Flows, Kinetic Theory, and Reaction-Diffusion Equations, Vienna.

- ? May 2021, Seminar Talk, Minisymposium at SIAM Conference on Mathematical Aspects of Materials Science, BCAM Bilbao.
- ? June 2021, Seminar Talk at University La Sapienza of Rome.
- ? June 2021, Seminar Talk, ?Durham Analysis & PDE Seminars?, Durham University.
- ? July 2021, Seminar Talk, Workshop GradKinReadi21, IST Wien
- ? July 2021, Seminar Talk at University of L'Aquila.
- ? October 2021, Seminar Talk, Workshop Dynamics and Discretization: PDEs, Sampling, and Optimization, Simons Institute at UC Berkeley.
- ? December 2021, Seminar Talk at Politecnico di Milano.
- ? December 2021, Seminar Talk at Gran Sasso Science Institute.
- ? December 2021, Seminar Talk at University of L'Aquila.
- ? January 2022, Seminar Talk at Università Bocconi.
- ? November 2022, Seminar Talk, Weekend di lavoro su Calcolo delle Variazioni, Montecatini Terme.
- ? February 2023, Seminar Talk, Between Regularity and Defects: Variational and Geometrical Methods in Materials Science, ESI Institute Wien.
- ? May 2023, Seminar Talk, BIRS-IMAG workshop: Nonlinear Diffusion and nonlocal Interaction Models - Entropies, Complexity, and Multi-Scale Structures (23w6003), Granada.
- ? July 2023, Seminar Talk, LMS Invited Lecture Series event, Durham.

Contributed talks

- ? Sept. 2013, Short Talk, ?New trends in shape optimization?, Universität Erlangen-Nürnberg.
- ? Jan. 2014, Short Talk, ?XXIV Convegno Nazionale di Calcolo delle Variazioni?, Levico Terme.
- ? January 2016, Short Talk, ?XXVI Convegno Nazionale di Calcolo delle Variazioni?, Levico Terme.
- ? February 2016, Short Talk, ?PDEs and applications?, Università di Napoli.
- ? September 2017, Seminar Talk, ?IperPv 2017?, Università di Pavia.
- ? June 2018, Short Talk, ?Hyp2018?, Penn State University.
- ? September 2018, Short Talk, ?Analysis of Differential Operators on Manifolds?, Freiburg Universität.
- ? February 2019, Short Talk, ?XXIX Convegno Nazionale di Calcolo delle Variazioni?, Levico Terme.
- ? May 2019, Short Talk, ?Introductory School on Optimal Transport?, ESI Institute Wien.
- ? June 2019, Seminar Talk, ?Crowds: Model and Control?, CIRM Marseille.
- ? June 2019, Short Talk, ?People in Optimal Transport and Applications?, Cortona.

Teaching Experience

- ? teaching assistant for Analysis 1 lectures, winter semester 2014/2015 at Department Mathematik der FAU Erlangen-Nürnberg. (Language: german)
- ? teaching assistant for Analysis 2 lectures, summer semester 2014/2015 at Department Mathematik der FAU Erlangen--Nürnberg. (Language: german)
- ? teaching assistant for Mehrdimensionale Integration lectures, winter semester 2015/2016 at Department Mathematik der FAU Erlangen--Nürnberg. (Language: german)
- ? teaching assistant for Ma.theorie lectures, summer semester 2015/2016 at Department Mathematik der FAU Erlangen--Nürnberg. (Language: german)
- ? teaching assistant for Analisi Matematica II lectures, summer semester 2016/2017 at Department of Information Engineering, Computer Science and Mathematics of Università dell'Aquila (Language: italian)
- ? teaching assistant for Analisi Matematica I lectures, winter semester 2017/2018 at Department of Information Engineering, Computer Science and Mathematics of Università dell'Aquila (Language: italian)
- ? teaching assistant for Mathematics I lectures, winter semester 2017/2018 at LUISS (Language: english)
- ? tutoring for Precourses for Mathematics I lectures, winter semester 2017/2018 at LUISS (Language: italian)

? tutoring for Mathematics lectures, winter and summer semester 2018/2019 at LUISS (Language: italian and english)

? teaching assistant for Analisi Matematica I lectures, winter semester 2018/2019 at Department of Civil, Construction-Architectural and Environmental Engineering of Università dell'Aquila (Language: italian)

? teaching assistant for Analisi Matematica II lectures, summer semester 2018/2019 at Department of Civil, Construction-Architectural and Environmental Engineering of Università dell'Aquila (Language: italian)

? PhD course Some Aspects of Calculus of Variations, winter semester 2019/2020 at the Department of Mathematics of École polytechnique fédérale de Lausanne (Language: english)

? Bachelor course Analyse II, summer semester 2019/2020 at the Departments of Chemistry and Chemical Engineering, and Life Science of École polytechnique fédérale de Lausanne (Language: french)

? Master course Distribution and Interpolation Spaces, winter semester 2020/2021 at the Department of Mathematics of École polytechnique fédérale de Lausanne (Language: english)

? PhD course Some Aspects of Calculus of Variations, winter semester 2020/2021 at the Department of Mathematics of École polytechnique fédérale de Lausanne (Language: english)

? Bachelor course Analyse II, summer semester 2020/2021 at the Departments of Chemistry and Chemical Engineering, and Life Science of École polytechnique fédérale de Lausanne (Language: french)

? Master course Distribution and Interpolation Spaces, winter semester 2021/2022 at the Department of Mathematics of École polytechnique fédérale de Lausanne (Language: english)

? Bachelor course Analisi I, winter semester 2022/2023 at the Department of Industrial and Information Engineering and Economy of Università dell'Aquila (Language: italian)

? Master course Biomathematics, winter semester 2022/2023 at the Departments of Mathematics and Mathematical Engineering of Università dell'Aquila (Language: english)

Mentoring activities

? Alic Kaufmann, Master thesis in Mathematics Optimal Control Problems in Transport Dynamics, spring semester 2020/21, EPFL

Outreach activities

1. from 09/2019 co-organizer of the Analysis Seminars of the Department of Mathematics at EPFL.

2. 10/2016 - 08/2019 co-organizer of the Analysis Seminars of the Department of Mathematics at Università dell'Aquila.

3. 05/2018 - 05/2022 As member of the board of directors of the Ex Alumni Association of Collegio Universitario Santa Caterina da Siena in Pavia, I am involved in the organization of internal courses of soft skills and of basics of statistics.

Spoken languages

1. Italian (mother tongue)
2. English (fluent)
3. German (professional)
4. French (professional)
5. Spanish (basic)

IT Skills

? Operating systems: Unix environment, Mac OS, Windows

? Programming languages: C, Matlab

? Graphics Editor: Inkscape, Xfig, Photoshop