


PERSONAL INFORMATION

Roberto Ognibene

 Largo Bruno Pontecorvo, 5 - 56127 - Pisa (PI) - Italy

 +39 329 1792088

 roberto.ognibene@dm.unipi.it

 <https://sites.google.com/view/ognibene>

 **ORCID** [0000-0002-6157-7597](https://orcid.org/0000-0002-6157-7597)

Date of birth 17 January 1992 | **Nationality** Italian

APPLYING FOR RTT - Università di Milano

EDUCATION

2006–2011 **High School - Scientific Studies** (Maturità scientifica)

Liceo Classico-Scientifico "Ariosto-Spallanzani" - Reggio Emilia, Italy

Evaluation: 100/100

2011–2014 **Bachelor's Degree in Mathematics** (Laurea triennale)

Università degli studi di Modena e Reggio Emilia - Modena, Italy

Evaluation: 110/110 cum Laude

Thesis Title: "Complessità e Approssimazione"

Supervisor: prof. Mauro Leoncini.

2014–2017 **Master's Degree in Mathematics** (Laurea magistrale)

Università degli studi di Modena e Reggio Emilia - Modena, Italy

Evaluation: 110/110 cum Laude

Thesis Title: "Perturbation of the Green-Dirichlet Operator and Weyl's Law"

Supervisor: prof. Massimo Villarini.

2017–2021 **Ph.D. in Mathematics** (Dottorato di ricerca)

Università degli studi di Milano-Bicocca - Milano, Italy

Thesis title: "Monotonicity formulas and blow-up methods for the study of spectral stability and fractional obstacle problems"

Supervisor: prof.ssa Veronica Felli

Defence: 16 April 2021

Referees: A. Ferrero and E. Valdinoci.

ACADEMIC POSITIONS

Feb 2022 – now **Post-doc fellow** (Assegnista di Ricerca)

Università di Pisa - Pisa, Italy

Within the ERC program VAREG "Variational approach to the regularity of the free boundaries".

Supervisor: prof. Bozhidar Velichkov.

Sep 2022 – Dec 2022 Junior fellow

Mittag-Leffler Institute, Royal Swedish Academy of Sciences - Stockholm, Sweden

Within the research program "Geometric Aspects of Nonlinear Partial Differential Equations"

Website of the program.

Feb 2021 – Jan 2022 Post-doc fellow (Assegnista di Ricerca)

Università degli studi di Genova - Genova, Italy

Title of the project: "Equazioni alle derivate parziali e metodi variazionali applicati alla scienza dei materiali".

Supervisor: prof. Edoardo Mainini

PUBLICATIONS

Referred publications

1. Felli, V., Mukherjee, D., Ognibene, R., *On fractional multi-singular Schrödinger operators: Positivity and localization of binding*, (2020), J. Funct. Anal., 278 (4), DOI: <https://doi.org/10.1016/j.jfa.2019.108389>.
2. Felli, V., Ognibene, R., *Sharp convergence rate of eigenvalues in a domain with a shrinking tube*, (2020), J. Differential Equations, 269 (1), pp. 713-763, DOI: <https://doi.org/10.1016/j.jde.2019.12.022>.
3. Felli, V., Noris, B., Ognibene, R., *Eigenvalues of the Laplacian with moving mixed boundary conditions: the case of disappearing Dirichlet region*, (2020), Calc. Var. and Partial Differential Equations, 60 (1), art. no. 12, DOI: <https://doi.org/10.1007/s00526-020-01878-3>.
4. Cinti, E., Ognibene, R., Ruffini, B., *A quantitative stability inequality for fractional capacities*, (2021), Math. Eng., 4 (5), pp. 1-28, DOI: <https://doi.org/10.3934/mine.2022044>.
5. Felli, V., Noris, B., Ognibene, R., *Eigenvalues of the Laplacian with moving mixed boundary conditions: the case of disappearing Neumann region*, (2022), J. Differential Equations, 320, pp. 247-315, DOI: <https://doi.org/10.1016/j.jde.2022.02.052>.
6. Mainini, E., Ognibene, R., Percivale, D. *Asymptotic Behavior of Constrained Local Minimizers in Finite Elasticity*, (2022), J. Elast, DOI <https://doi.org/10.1007/s10659-022-09946-9>
7. Danielli, D., Ognibene, R., *On a weighted two-phase boundary obstacle problem*, (2023), Indiana Univ. Math. J. 72, No. 4, 1627–1666 , DOI: <https://doi.org/10.1512/iumj.2023.72.9481>
8. Abatangelo, L., Ognibene, R., *Sharp behavior of Dirichlet-Laplacian eigenvalues for a class of singularly perturbed problems*, (2024), SIAM Journal on Math. Anal., 56 (1), pp. 474-500. DOI: <https://doi.org/10.1137/23M1564444>
9. Bianchi F., Brasco, L., Ognibene, R., *On the spectrum of sets made of cores and tubes*. To appear in Journal of Convex Analysis. (2024). <https://arxiv.org/abs/2306.16895>

Preprints

1. Felli, V., Noris, B., Ognibene, R., Siclari, G., *Quantitative spectral stability for Aharonov-Bohm operators with many coalescing poles*. (2023). <https://doi.org/10.48550/arXiv.2306.05008>
2. Felli, V., Liverani, L., Ognibene, R., *Quantitative spectral stability for the Neumann Laplacian in domains with small holes* (2023). <https://arxiv.org/abs/2311.05999>.

Other publications

1. Ognibene, R., *Monotonicity formulas and blow-up methods for the study of spectral stability and fractional obstacle problems*, (2021), Ph.D. Thesis, [Link](#).

Articles in preparation

1. Mukherjee, D., Ognibene, R., *On fractional Schrödinger equations with multipolar Hardy-type potentials and critical nonlinearity.*
2. Ognibene, R., Velichkov, B., *Up to the boundary regularity of the free interface in spectral optimal partition problems.*
3. Mainini, E., Ognibene, R., Volzone, B., *Uniqueness of radial solutions for fractional equations with critical potentials.*
4. Jeon, S., Ognibene, R., Tortone, G., *On the fractional Alt-Phillips problem.*
5. De Luca, A., Ognibene, R., Vita, S., *Quantitative unique continuation at the boundary for fractional elliptic equations.*

COMMUNICATIONS IN
CONFERENCES AND
WORKSHOPS, SEMINARS

Invited talks in conferences and workshops

- 28 April 2022 *A two-phase obstacle problem for the fractional Laplacian*
Proprietà Qualitative per Soluzioni di Equazioni Ellittiche Non-Lineari - Cosenza, Italy
- 6 June 2022 *A two-phase obstacle problem for the fractional Laplacian*
Nonlinear meeting in Bologna - Bologna, Italy
- 13 January 2023 *Sharp spectral stability in domains with thin branches*
PDEs in Cogne: a friendly meeting in the snow - Cogne (AO), Italy

Short communications

- 22 May 2018 *Sharp convergence rate of eigenvalues in a domain with a shrinking tube*
Summer School: Nonlocal interactions in Partial Differential Equations and Geometry - Stockholm, Sweden
- 21 May 2019 *Eigenvalues of the Laplacian with moving mixed boundary conditions: sharp asymptotics in terms of Sobolev capacity*
International Conference on Elliptic and Parabolic Problems - Gaeta, Italy
- 9 September 2019 *Eigenvalues of the Laplacian with moving mixed boundary conditions: sharp asymptotics in terms of Sobolev capacity*
Workshop on Spectral Geometry and Analysis of Differential Operators - Padova, Italy
- 22 June 2021 *Sharp asymptotics of eigenvalues of the Laplacian in a domain with a shrinking tube*
Online Mini-courses in Mathematical Analysis 2021 - Padova, Italy
- 24 September 2021 *A quantitative fractional isocapacitary inequality*
XII Forum of Partial Differential Equations - Bedlewo, Poland
- 27 May 2022 *Spectral stability of the Laplacian under perturbation of the boundary conditions: the case of disappearing Neumann region*
First UMI meeting of Ph.D. students - Padova, Italy
- 13 June 2022 *Sharp spectral stability upon perturbation of the boundary conditions*
Shape Optimization, related topics and applications - Roscoff, France
- 18 September 2023 *Spectral stability for the Neumann-Laplacian in domains with small holes,*
Shape Optimization and Isoperimetric and Functional Inequalities - Levico Terme (TN), Italy.

Posters

- 11 September 2018 *Sharp convergence rate of eigenvalues in a domain with a shrinking tube*
Nonlinear Analysis and PDEs in Caserta - Caserta, Italy

Research seminars upon invitation

- 26 November 2018 *Eigenvalues of the Laplacian and their dependence on the domain: regular and singular perturbations*
Université de Picardie Jules Verne - Amiens, France
- 2 April 2019 *"Can one hear the shape of a drum?" and other related questions*
Università degli studi di Milano-Bicocca - Milano, Italy
- 17 April 2019 *Eigenvalues of the Laplacian and their dependence on the domain: regular and singular perturbations*
Università degli studi di Modena e Reggio Emilia - Modena, Italy
- 17 June 2019 *An introduction to capacity. Basic notions and applications to PDEs*
Université de Picardie Jules Verne - Amiens, France
- 13 February 2020 *Eigenvalues of the Laplacian under perturbation of the boundary conditions: a capacitary approach*
Purdue University - West Lafayette, IN, USA
- 14 May 2021 *Spectral stability of the Laplacian under perturbation of the boundary conditions*
Young Researchers Colloquium - Mathematical Institute of the Polish Academy of Sciences - Warsaw, Poland
- 30 June 2021 *Spectral stability of the Laplacian under perturbation of the boundary conditions*
DEG1 Webinars - Online seminar organized by DEG1 group
- 13 October 2022 *Capacity and torsional rigidity: two measures of spectral stability*
Mittag-Leffler Institute - Stockholm, Sweden
- 23 March 2023 *Capacity and torsional rigidity: two measures of spectral stability*
Università degli studi di Ferrara, Ferrara, Italy
- 5 April 2023 *Capacity and torsional rigidity: two measures of spectral stability*
Università di Pisa, Pisa, Italy
- 30 May 2023 *Spectral stability in domains with small holes*
Università degli studi di Torino, Torino, Italy

ATTENDANCE TO SCHOOLS, WORKSHOPS AND CONFERENCES

- ◇ Young PDE's @ Roma, 19-22 February 2018, Rome, Italy.
- ◇ Summer School: Nonlocal interactions in Partial Differential Equations and Geometry, 21-25 May 2018, Stockholm, Sweden.
- ◇ Nonlinear Analysis and PDEs in Caserta, 10-14 September 2018, Caserta, Italy.
- ◇ RISM School: Generalized Solutions in Differential Equations: Theory and Applications, 11-15 February 2019, Varese, Italy.
- ◇ AIMS Spring School: Local and Nonlocal Elliptic and Geometric problems, 18-22 February 2019, Mbour, Senegal.
- ◇ International Conference on Elliptic and Parabolic Problems, 20-24 May 2019, Gaeta, Italy.
- ◇ Analytic and Geometric Aspects of PDEs, 27-30 May 2019, Milano, Italy.
- ◇ EMS Summer School: Partial differential equations from theory to applications, 1-5 July 2019, Milano, Italy.
- ◇ UMI Conference, 2-7 September 2019, Pavia, Italy.
- ◇ Workshop on Spectral Geometry and Analysis of Differential Operators, 9-11 September 2019, Padova, Italy.
- ◇ Focused Research Groups (FRG) New Challenges in Geometric Measure Theory, 24-27 August 2020, online lectures, organized by University of Washington, Princeton University, University of Texas at Austin.
- ◇ Online Mini-courses in Mathematical Analysis 2020, 14-17 September 2020, organized by Università degli Studi di Padova.

- ◇ Shape Optimization, Spectral Geometry and Calculus of Variations, 29 March-2 April 2021, virtual event, held by CIRM Marseille, France.
- ◇ Online Mini-courses in Mathematical Analysis 2021, 21-25 June 2021, organized by Università degli Studi di Padova.
- ◇ XXII Forum of Partial Differential Equations, 20-24 September 2021, Bedlewo, Poland.
- ◇ Proprietà Qualitative per soluzioni di Equazioni Ellittiche Non-lineari, 27-28 April 2022, Cosenza, Italy.
- ◇ UMI Meeting, 23-27 May 2022, Padova, Italy.
- ◇ Nonlinear meeting in Bologna, 6-7 June 2022, Bologna, Italy.
- ◇ Shape Optimization, related topics and applications, 13-17 June 2022, Roscoff, France.
- ◇ Geometric and analytic aspects of functional variational principles, 27 June - 1 July, Cetraro (Cosenza), Italy.
- ◇ Regularity Theory for Free Boundary and Geometric Variational Problems II, 10-15 July 2022, Pisa, Italy.
- ◇ PDEs in Cogne: a friendly meeting in the snow, 9-13 January 2023, Cogne (AO), Italy.
- ◇ Highlights in Nonlinear Analysis, 12-16 June 2023, Cetraro (CS), Italy.
- ◇ Regularity Theory for Free Boundary and Geometric Variational Problems III, 19-23 June 2023, Levico Terme (TN), Italy.
- ◇ School on Interactions between Dynamical Systems and Partial Differential Equations, 3-7 July 2023, Barcelona, Spain.
- ◇ Shape Optimization and Isoperimetric and Functional Inequalities, 18-22 September 2023, Levico Terme (TN), Italy.

AWARDS, SCHOLARSHIPS, FELLOWSHIPS, GRANTS

- 2014 Awarded by *Università degli studi di Modena e Reggio Emilia* for my Bachelor's Degree (520 EUR).
- 2017 Scholarship for the Ph.D. course (3 years), funded by *Università degli studi di Milano-Bicocca*.
- 2020 International mobility scholarship for Ph.D. students, funded by *Università degli studi di Pavia*, 9th edition.
- 2021 Post-doc fellowship (1 year), funded by *Università degli studi di Genova*.
- 2021 2nd place - "Enrico Jannelli" award for Ph.D. thesis
- 2021 Fellowship for the research program "Geometric aspects of nonlinear partial differential equations" (see Link) at Mittag-Leffler Institute, Sep-Dec 2022, funded by *Royal Swedish academy of sciences*.
- 2021 Kovalevskaya grant for participation to ICM2022, (supposed to be held in) St. Petersburg.
- 2021 Post-doc fellowship, funded by the ERC program VAREG "Variational approach to the regularity of the free boundaries", P.I. prof. Bozhidar Velichkov.

RESEARCH PROJECTS

As principal investigator

- 2022 Project: *Questioni di esistenza e unicità per problemi non locali con potenziale di tipo Hardy* (4500 €), Institution: INdAM-GNAMPA.

As participant

- 2018 Project: *Formula di monotonia e applicazioni: problemi frazionari e stabilità spettrale rispetto a perturbazioni del dominio*, Institution: INdAM-GNAMPA, Principal investigator: Alberto Ferrero.
- 2019 Project: *Valeurs propres d'un opérateur Aharonov-Bohm avec pôle variable*, Institution: PICS, Principal investigator: Benedetta Noris.
- 2023 Project: *Regolarità e singolarità in problemi con frontiere libere*, Institution: INdAM-GNAMPA, Principal investigator: Giorgio Tortone.

2024 Project: *Nuove frontiere nella capillarità non locale*, Insitution: INdAM-GNAMPA, Principal investigator: Alessandra de Luca.

RESEARCH VISITS

18/11/2018 – 18/12/2018 Institution: Université de Picardie Jules Verne, Amiens, France.
 7/06/2019 – 23/06/2019 Institution: Université de Picardie Jules Verne, Amiens, France.
 14/11/2019 – 12/12/2019 Institution: Université de Picardie Jules Verne, Amiens, France.
 2/02/2020 – 4/03/2020 Institution: Purdue University, West Lafayette, IN, USA.
 5/02/2023 – 12/02/2023 Intitution: Università degli studi di Milano-Bicocca, Milan, Italy.
 20/03/2023 – 24/03/2023 Insitution: Università degli studi di Ferrara, Ferrara, Italy.
 29/05/2023 – 1/06/2023 Institution: Università degli studi di Torino, Torino, Italy.

TEACHING ACTIVITIES

2015/2016 Teaching assistant (*esercitazioni*) for the course *Analisi Matematica 1*, Undergraduate studies in Computer Science, Università degli studi di Modena e Reggio Emilia.
 2016/2017 Teaching assistant (*esercitazioni*) for the course *Analisi Matematica 1*, Undergraduate studies in Computer Science, Università degli studi di Modena e Reggio Emilia.
 2016/2017 Course *Analisi Matematica 1*, Fondazione Collegio San Carlo, Modena.
 2017/2018 Teaching assistant (*esercitazioni*) for the course *Matematica 2*, Undergraduate studies in Material Science, Università degli studi di Milano-Bicocca.
 2018/2019 Teaching assistant (*esercitazioni*) for the course *Matematica 2*, Undergraduate studies in Material Science, Università degli studi di Milano-Bicocca.
 2019/2020 Teaching assistant (*esercitazioni*) for the course *Matematica 2*, Undergraduate studies in Material Science, Università degli studi di Milano-Bicocca.
 2020/2021 Remedial course (*precorsso*) in Mathematics for science students, Università degli studi di Milano-Bicocca.
 2021/2022 Remedial course (*precorsso*) in Mathematics for architecture students, Università degli studi di Genova.
 2023 Teacher for the Ph.D. course *Monotonicity formulas in free boundary and geometric variational problems*, held at Università di Pisa during spring 2023.

REFeree ACTIVITIES

I served as a referee for the journals *Journal of Differential Equations*, *Mathematica Bohemica*, *Mathematics in Engineering*, *Communications in PDEs*, *Mathematical Methods in the Applied Sciences*.
 Since 2020 I am a reviewer for *Mathematical Reviews*.

ORGANIZATION OF SEMINARS, CONFERENCES, WORKSHOPS

2019/2020 Member of the organizing committee of the series of thematic mini-workshops *PDEs Sessions in Bicocca*. We held 2 events (the third one was cancelled due to Covid-19), see <https://sites.google.com/view/pdessionsinbicocca/home>
 2018–2020 Member of the organizing committee of the series of seminars *Insalate di Matematica* (based at Università degli studi di Milano-Bicocca), which are held by and addressed to PhD students or young researchers.
 2023 Member of the organizing committee of the workshop *Calculus of Variations and Free Boundary Problems V*, held in Pisa on 28/03/2023. [Website](#)
 2024 Member of the organizing committee of the workshop *Calculus of Variations and Free Boundary Problems VIII*, to be held in Pisa on 11-12/04/2024.
 2024 Member of the organizing committee of the conference *Young Researchers Meeting on PDEs*, to be held at Università di Milano-Bicocca (Milan, Italy) from 25/9/2024 to 27/9/2024.

MEMBERSHIPS

- 2019–present Member of UMI (Italian Mathematical Union).
2018–present Member of GNAMPA (INdAM group).

OTHER

- 2016/2017 Tutor at Fondazione Collegio San Carlo (Modena, Italy) for approximately 1 year.

LANGUAGES

- Italian Mother tongue
English Fluent