

Antonio Esposito

Curriculum Vitae *[updated to 09/26]*

Personal Information

Work address Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica (DISIM), Università degli Studi dell'Aquila, Via Vetoio 1, Coppito, 67100 L'Aquila, Italy.

✉ antonio.esposito3@univaq.it

Web `https://sites.google.com/view/antonioespositomath`

Nationality Italian

Current Position

Sep 2024-now **Tenure Track Assistant Professor (RTDb)**, *Department of Information Engineering, Computer Science and Mathematics*, Università degli Studi dell'Aquila.

Previous Positions

May 2022 – Aug 2024 **Postdoctoral Research Associate**, *Mathematical Institute*, University of Oxford.
Prof. Dr. José Antonio Carrillo

AA 2022/23 – 2023/24 **Stipendiary Lecturer in Mathematics**, *The Queen's College*, University of Oxford.

Oct 2019– Apr 2022 **Postdoctoral Researcher**, *Department Mathematik*, Friedrich-Alexander-Universität Erlangen-Nürnberg, Chair of Applied Mathematics.
Prof. Dr. Martin Burger

Nov 2018-Sep 2019 **Research Fellowship**, *Department of Information Engineering, Computer Science and Mathematics*, Università degli Studi dell'Aquila.
Prof. Dr. Marco Di Francesco

Qualifications

Feb 2025 **National Scientific qualification as associate professor**, *disciplinary field: 01/A3 - Mathematical analysis, probability and statistics (valid until Feb 2037).*

Education

November 2015–October 2018 **PhD in Mathematics and Models**, *Università degli Studi dell'Aquila*, Thesis defended on the 4th of March 2019 - Title:"Systems of PDEs modelling aggregation-diffusion phenomena with many species", Cum laude.
Advisor: Prof. Dr. Marco Di Francesco

2013–2015 **Master's degree in Mathematics**, *University of Naples "Federico II"*, Thesis:"Bi-Sobolev maps and structure of weights on the real line", Mark: 110/110 cum laude.
Advisor: Prof. Carlo Sbordone

2010–2013 **Bachelor's degree in Mathematics**, *University of Naples "Federico II"*, Thesis:"Radó-Kneser-Choquet theorem and applications", Mark: 110/110 cum laude.
Advisor: Prof. Carlo Sbordone

2005–2010 **Italian Secondary school diploma: Scientific certificate**, *Liceo Scientifico Statale "E. Pascal"*, Viale Unità d'Italia n°42, 80045 - Pompei (Naples).

Research Grants

- Research grant by UNIVAQ within "Progetto di ricerca di Ateneo" 2025. PI: Antonio Esposito.
- EPSRC Vacation Internships Funding, Oxford, June - August, 2024. PI: Antonio Esposito, participant: D. K.
- Clay Mathematics Institute "Enhancement and Partnership Program": grant used to support a confernce at CIRM (Marseille) I co-organised.
- Grant for a Research in Paris program at the Institute Henri Poincaré, Paris, March, 2020.
- Fellowship to participate to the Junior Trimester Program "Kinetic Theory" at the Hausdorff Reaserch Institute for Mathematics, Bonn, Germany.
- Grant awarded by the French Embassy in Italy for the organisation of study days to foster collaborations with researchers from French institutions.

Research

Research interests

- Optimal transport theory applied to evolutionary PDEs: gradient flows and their generalisation, including applications to kinetic theory and data science.
- Systems of PDEs with nonlinear cross-diffusion and nonlocal interactions.
- Analysis of systems of interacting particles. Mean-field limits. Nonlocal-to-local limits.
- PDEs on graphs/networks.
- Fourth-order aggregation-diffusion PDEs.

Publications

[1] **J. A. Carrillo, A. Esposito, L. Mikolás**, *Evolution equations on co-evolving graphs: long-time behaviour and the graph continuity equation, J Nonlinear Sci 36, 31 (2026).*

[2] **A. Esposito, G. Heinze, A. Schlichting**, *Graph-to-local limit for the nonlocal interaction equation*, Journal des Mathématiques Pures et Appliquées, 194, 103663 (2025).

[3] **J. A. Carrillo, A. Esposito, C. Falcó, A. Fernández-Jiménez**, *Competing effects in fourth-order aggregation-diffusion equations*, Proceedings of the London Mathematical Society, 129(2), e12623 (2024).

[4] **A. Esposito, L. Mikolás**, *On evolution PDEs on co-evolving graphs*, Discrete & Continuous Dynamical Systems - A, 2024, 44(9): 2660-2683.

[5] **J. A. Carrillo, A. Esposito, J. S.-H. Wu**, *Nonlocal approximation of nonlinear diffusion equations*, Calculus of Variations and Partial Differential Equations, 63, 100 (2024).

[6] **A. Esposito, R. S. Gvalani, A. Schlichting, M. Schmidtchen**, *On a novel gradient flow structure for the aggregation equation*, Calculus of Variations and Partial Differential Equations, 63, 126 (2024).

[7] **M. Burger, A. Esposito**, *Porous medium equation and cross-diffusion systems as limit of nonlocal interaction*, Nonlinear Analysis, 235, 113347 (2023).

[8] **A. Esposito, F. S. Patacchini, A. Schlichting**, *On a Class of Nonlocal Continuity Equations on Graphs*, European Journal of Applied Mathematics, 1-18 (2023).

[9] **M. Bruna, M. Burger, A. Esposito, S. M. Schulz**, *Well-posedness of an integro-differential model for active Brownian particles*, SIAM Journal on Mathematical Analysis, 54, (2022), no. 5, 5662 - 5697.

[10] **M. Bruna, M. Burger, A. Esposito, S. M. Schulz**, *Phase Separation in Systems of Interacting Active Brownian Particles*, SIAM Journal on Applied Mathematics, 82 (2022), no. 4, 1635–1660.

[11] **A. Esposito, F.S. Patacchini, A. Schlichting, D. Slepčev**, *Nonlocal-interaction equation on graphs: gradient flow structure and continuum limit*, Archive for Rational Mechanics and Analysis, vol. 240, no. 2, pp. 699–760 (2021).

[12] **M. Di Francesco, A. Esposito, M. Schmidtchen**, *Many-particle limit for a system of interaction equations driven by Newtonian potentials*, Calculus of Variations and Partial Differential Equations, vol. 60, no. 2, 68. (2021).

[13] **J. A. Carrillo, M. Di Francesco, A. Esposito, S. Fagioli, M. Schmidtchen**, *Measure solutions to a system of continuity equations driven by Newtonian nonlocal interactions*, Discrete & Continuous Dynamical Systems - A, vol. 40, no. 2, pp. 1191–1231 (2020).

[14] **A. Esposito, F. Leonetti, P.V. Petricca**, *Absence of Lavrentiev gap for non-autonomous functionals with (p,q)-growth*, Advances in Nonlinear Analysis, vol. 8, pp. 73-78 (2019).

[15] **M. Di Francesco, A. Esposito, S. Fagioli**, *Nonlinear degenerate cross-diffusion systems with nonlocal interaction*, Nonlinear Analysis, vol. 169, pp. 94–117 (2018).

[16] **A. Esposito, T. Radice, R. Schiattarella**, *Duality for borderline A_p-weights and G_q-weights on $\mathbb{R}$*, Rendiconto dell'Accademia delle Scienze Fisiche e Matematiche, vol. 82; pp. 107-114 (2015).

Proceedings

[17] **A. Esposito, G. Heinze, J.-F. Pietschmann, A. Schlichting**, *Graph-to-local limit for a multi-species nonlocal cross-interaction system*, Proceedings in Applied Mathematics & Mechanics (2023).

Submitted for publication

[18] **J. A. Carrillo, A. Esposito, J. Skrzeczkowski, J. S.-H. Wu**, *Nonlocal particle approximation for linear and fast diffusion equations, preprint arXiv:2408.02345 (2024).*

Supervision of doctoral students

2023 – 2025 **László Mikolás**, co-supervision with José Antonio Carrillo, University of Oxford.

Projects

2025-2029 **COST Action**, *mSPACE (multiscale Stochastics, Patterns, and Analysis of Combinatorial Environments)*, Chair: Prof. D. Mugnolo, FernUniversität in Hagen, Germania.

2026 **GNAMPA**, *Aggregation-Diffusion meets Nonlinear mobility*, Participant (Coordinator: M. Perugini, Università degli Studi dell'Aquila, Italy).

2022-2024 **ERC Advanced Grant**, *Nonlocal-CPD: "Nonlocal PDEs for Complex Particle Dynamics: Phase Transitions, Patterns and Synchronization"*, Participant (Coordinator: Prof. J.A. Carrilo, University of Oxford, UK).

2020-2022 **German Science Foundation (DFG)**, *Transport metrics for Analysis and Optimization of Network Problems*, Participant (Coordinator: Prof. Dr. Martin Burger, FAU Erlangen-Nürnberg, Germany). This is a subproject of Transregio SFB TRR 154 "Mathematical Modelling, Simulation and Optimization Using the Example of Gas Networks".

2017 **GNAMPA**, *Analisi Di Modelli Matematici Della Fisica, Della Biologia E Delle Scienze Sociali*, Participant (Coordinator: S. Spirito, Università degli Studi dell'Aquila, Italy).

2016 **GNAMPA**, *Analisi Variazionale per Modelli Competitivi con Incertezza e Applicazioni*, Participant (Coordinator: L. Mallozzi, University of Naples "Federico II", Italy).

Visiting periods

16-22/03/25 **Research visit at the University of Warsaw**, *Poland*.
Collaboration with Dr. Tomasz Dębiec.

03-07/03/25 **Research visit at WIAS (Berlin)**, *Germany*.
Collaboration with Dr. Georg Heinze.

20-24/01/25 **Research visit at the University of Ulm**, *Germany*.
Collaboration with Prof. Dr. André Schlitchting.

02-09/11/24 **Research visit at KAUST**, *Saudi Arabia*.
Collaboration with Prof. Dr. Peter Markowich.

12-14/09/24 **Research visit at TU Munich**, *Germany*.
Collaboration with Prof. Dr. Daniel Matthes.

27-29/12/22 **Research visit at Sapienza University**, *Italy*.
Collaboration with Prof. Dr. Nadia Ansini.

23-30/01/22 **Research visit at TU Dresden**, *Germany*.
Collaboration with JProf. Dr. Markus Schmidtchen.

28/11/21-5/12/21 **Research visit at WWU Münster**, *Germany*.
Collaboration with Prof. Dr. André Schlichting.

05-11/09/21 **Research visit at Sapienza University**, *Italy*.
Collaboration with Prof. Dr. Nadia Ansini.

07-22/03/20 **Research in Paris**, *Institute Henri Poincaré*, Paris, France.

4-8/11/19 **Research visit at Institut de Mathématiques de Toulouse (Univ. Paul Sabatier)**, *France*.
Collaboration with Ariane Trescases.

13/05/19-03/08/19 **Junior Trimester Program "Kinetic Theory"**, *Hausdorff Reaserch Institute for Mathematics*, Bonn, Germany.

13/01/18-10/03/18 **Visiting PhD Student**, *Department of Mathematics*, Imperial College London, London (UK).
Local supervisor: Prof. José Antonio Carrillo.

Seminars and Talks

Upcoming

- Workshop "Variational Methods for Evolution", MFO Oberwolfach, December, 2026.

Past events

Sep 2026 **"On a novel gradient flow structure for the aggregation equation"**, *Invited speaker*, *Gradient Flows Face-to-Face 6 meets Transformers*, Universität Ulm, Ulm (Germany).

Aug 2026 **"Competing effects in fractional thin film equations"**, *Invited speaker*, *Workshop on Nonlocal Aggregation Models in the Life Sciences, BIRS, Banff (Canada).*

Jul 2026 **"Competing effects in fractional thin film equations"**, *Speaker at the special session "Singularity and regularity in nonlinear PDEs", 15th AIMS Conference at Athens (Greece).*

Jul 2026 **"Graph approximation for nonlocal interaction equations"**, *Speaker at the special session "Multiscale Analysis: Geometry and Evolution Problems (mSPACE)", 15th AIMS Conference at Athens (Greece).*

Jun 2026 **"Competing effects in fractional thin film equations"**, *Invited speaker*, *Workshop on PDEs and Mathematical Biology, Laboratoire Jacques-Louis Lions, Sorbonne Université, Paris (France).*

May 2026 **"Gradient flow solutions for fractional thin film equations with aggregation"**, *Speaker at the minisymposium "FRACTIONAL"International Conference on Elliptic and Parabolic Problems: GAETA-2026, Gaeta (Italy).*

Mar 2026 **"Nonlocal equations on co-evolving graphs"**, *Invited speaker*, *mSPACE conference, Bocconi University, Milan, Italy.*

Sep 2025 **"Particle approximation for linear and fast diffusion equations"**,*invited speaker*, *Worskhop: Diffusion in Warsaw, University of Warsaw (Poland).*

Jul 2025 **On a class of evolutionary equations on co-evolving graphs"**, *invited speaker*, *Workshop "Mathematical Biology: Analysis and Applications", University of Warsaw (Poland).*

Jul 2025 **"Some recent developments on evolutionary equations on graphs"**, *Invited speaker*, *2025 Blended Intensive Programme (B.I.P.) in Mathematical Modelling, University of L'Aquila (Italy).*

Mar 2025 **"Recent developments on evolution equations on graphs"**, *Seminar by invitation*, *Department of Mathematics Guido Castelnuovo, Sapienza University (Italy).*

Mar 2025 **"Nonlocal particle approximation for diffusion PDEs"**, *Seminar by invitation in the Langenbach-Seminar*, *Weierstraß-Institut, Berlin (Germany).*

Jan 2025 **"Deterministic particle solutions for diffusion PDEs via nonlocal approximations"**, *Seminar by invitation*, *Institute of Applied Analysis of the University of Ulm (Germany).*

Dec 2024 **"On the interplay between numerical methods for PDEs and evolution equations on graphs"**, *Invited speaker*, *Numerical Aspects for Hyperbolic Balance Laws and Related Problems, 2nd Young Researchers Conference, University of Ferrara (Italy).*

Jul 2024 **"Competing effects in fourth-order aggregation-diffusion PDEs: a variational approach"**, *Invited speaker*, *Special session "Nonlinear Patterns and Waves in Biological Systems", 2nd UMI AMS International Joint Meeting, University of Palermo (Italy).*

Apr 2024 **"Variational approach to fourth-order aggregation-diffusion PDEs"**, *Invited speaker*, *Conference "The Cahn-Hilliard equation - recent advances and new challenges", Chęciny (Poland).*

Jan 2024 **"Interplay between numerical methods and evolution PDEs on graphs"**, *Plenary speaker*, *Conference "Numerical methods for optimal transport problems, mean field games, and multi-agent dynamics", Universidad Técnica Federico Santa María, Valparaíso (Chile).*

Dec 2023 **"Graph limits for nonlocal interaction PDEs"**, *Speaker*, *Workshop "Variational Methods for Evolution", MFO Oberwolfach (Germany).*

Nov 2023 **"Recent developments on evolution PDEs on graphs"**, *Seminar by invitation*, *PDEs Seminar*, University of Oxford (UK).

Nov 2023 **"Variational approach to fourth-order aggregation-diffusion PDEs"**, *Seminar by invitation*, *Analysis and PDE Seminar*, University of Durham (UK).

Sep 2023 **"Graph approximation of nonlocal interaction equations"**, *Invited talk*, *Workshop "Gradient Flows face-to-face 3", Université Claude Bernard Lyon I, Lyon, (France).*

Aug 2023 **"Nonlocal approximation of nonlinear diffusion equations and cross-diffusion systems"**, *Invited talk*, *Minisymposium "Interfaces between kinetic equations and many-agent social systems", ICIAM 2023, Waseda University, Tokyo (Japan).*

Jun 2023 **"A gradient flow approach to Cahn-Hilliard models"**, *Invited talk*, *Workshop "Mathematical Biology: Applications and Analysis", Dresden (Germany).*

May 2023 **"Graph-to-local limit for the nonlocal interaction equation"**, *Invited talk*, *BIRS-IMAG Workshop in Granada: Nonlinear diffusion and nonlocal interaction models: entropies, complexity, and multi-scale structures, Granada (Spain).*

Dec 2022 **"Nonlocal PDEs on graphs: well-posedness, gradient flow structure, and continuum limit"**, *Seminar by invitation*, *PDEs and their Applications Seminar*, University of Warwick (UK).

Nov 2022 **"On a kinetic interpretation of the aggregation equation,"**, *Invited talk*, *Research School on Kinetic Theory*, CIRM, Marseille (France).

Nov 2022 **"Nonlocal approximation of nonlinear diffusion PDEs and cross-diffusion systems"**, *Invited talk*, *Workshop "Kinetic and hydrodynamic descriptions in collective behavior"*, University of Granada (Spain).

Sep 2022 **"Nonlocal-to-local limit for the porous medium equation"**, *Invited talk*, *Workshop "(Gradient Flows face-to-face)^2"*, University of L'Aquila (Italy).

Jul 2022 **"Porous medium equation as limit of nonlocal interaction"**, *Invited talk*, *Workshop on "Frontiers in Nonlocal Nonlinear PDEs"*, Anacapri (Italy).

Jun 2022 **"Nonlocal dynamics on graphs"**, *Contributed talk*, *XVIII International Conference on Hyperbolic Problems: Theory, Numerics and Applications*, HYP22, University of Málaga, Spain.

Mar 2022 **"Porous medium equation as limit of nonlocal interaction"**, *Online seminar by invitation*, *Seminar on "Gradient Flows for PDEs"*, organised by Dr. Havva Yoldaş (University of Vienna).

Mar 2022 **"Well-Posedness of an Integro-Differential Model for Active Brownian Particles"**, *Invited talk*, *Minisymposium "Systems of Interacting Particles - Analysis and Pattern Formation" - SIAM Conference on Analysis of Partial Differential Equations (PD22)*, online.

Mar 2022 **"Nonlocal PDEs on Graphs"**, *Talk*, *Minisymposium "The Geometry of PDEs on Graphs: Analysis and Applications" - SIAM Conference on Analysis of Partial Differential Equations (PD22)*, online.

Jan 2022 **"On the analysis of active Brownian particle systems"**, *Seminar by invitation* at the Institute of Scientific Computing, TU Dresden, Germany.

Dec 2021 **"On the mathematical modelling and analysis of active Brownian particle systems"**, *Seminar by invitation* at the Kolloquium des Instituts für Analysis und Numerik, University of Münster, Germany.

Nov 2021 **"Well-posedness of an integro-differential model for active Brownian particles"**, *Contributed talk*, *Asymptotic Behaviors of systems of PDEs arising in physics and biology*, Polytech Lille - Nord Europe, France.

Oct 2021 **"Nonlocal interaction equation on graphs: gradient flow structure and continuum limit"**, *Invited talk*, *Workshop on Dynamics and Discretization: PDEs, Sampling, and Optimization*, Simons Institute for the Theory of Computing in Berkeley, California.

Jul 2021 **"Nonlocal interaction equation on graphs: gradient flow structure and continuum limit"**, *Invited talk*, *Recent advances in Gradient Flows, Kinetic Theory, and Reaction-Diffusion Equations*, IST Austria, Vienna (Austria).

Sep 2020 **"Nonlinear degenerate cross-diffusion systems with nonlocal interaction"**, *Online seminar by invitation*, *Webinars on "Gradient Flows for PDEs"*, Université Claude Bernard Lyon 1, Lyon (France).

Sep 2020 **"Many-particle limit for a system of interaction equations driven by Newtonian potentials"**, *Invited talk*, *Variational Methods for Evolution*, MFO Oberwolfach, Germany.

Feb 2020 **"Nonlinear degenerate cross-diffusion systems with nonlocal interaction"**, *Invited talk*, *Recent Advances in Degenerate Parabolic Systems with Applications to Mathematical Biology*, Laboratoire Jacques-Louis Lions, Paris (France).

Jan 2020 **"Nonlocal interaction equation on graphs: gradient flow structure and continuum limit"**, *Invited talk*, *Workshop on PDEs: Modelling, Analysis and Numerical Simulation* PDE-MANS 2020, University of Granada (IEMath-GR) - Granada (Spain).

Dec 2019 **"Many Particle Limit for a System of PDEs with Newtonian Nonlocal Interactions"**, *Invited talk*, *Minisymposium "Mean-Field Models for Large Interacting Agent Systems" - SIAM Conference on Analysis of Partial Differential Equations (PD19)*, La Quinta, California (U.S.).

Nov 2019 **"On systems of PDEs with nonlinear cross-diffusion and nonlocal interactions"**, *Seminar by invitation*, Institut de Mathématiques de Toulouse (Univ. Paul Sabatier), Toulouse (France).

Jun 2019 **"Measure solutions to a system of continuity equations driven by Newtonian nonlocal interactions"**, *Contributed talk*, *People in Optimal Transportation and Applications*, Cortona (Italy).

Jun 2019 **"Measure solutions to a system of continuity equations driven by Newtonian nonlocal interactions"**, *Contributed talk*, *Crowds: Models and Control*, CIRM, Marseille (France).

May 2019 **"Measure solutions to a system of continuity equations driven by Newtonian nonlocal interactions"**, *Invited talk*, *Partial Differential Equations in Analysis and Mathematical Physics*, Cagliari (Italy).

May 2019 **"Nonlinear degenerate cross-diffusion systems with nonlocal interaction"**, *Invited talk*, *Workshop "Probabilistic and Variational Methods in Kinetic Theory"*, Hausdorff Reaserch Institute for Mathematics, Bonn (Germany).

Nov 2018 **"On systems of PDEs with nonlinear cross-diffusion and nonlocal interactions"**, *Seminar by invitation*, Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen (Germany).

Jun 2018 **"Systems of PDEs with nonlocal Newtonian interactions in 1D"**, *Contributed talk & poster*, *XVII International Conference on Hyperbolic Problems Theory, Numerics, Applications* **HYP2018**, University Park - Pennsylvania (U.S.).

Sep 2017 **"Nonlinear cross-diffusion and nonlocal interaction systems"**, *Contributed talk*, *XVII Italian Meeting on Hyperbolic Equations* **IperPV2017**, University of Pavia - Pavia (Italy).

Jul 2017 **"Nonlinear cross-diffusion and nonlocal interaction systems"**, *Invited talk*, *Workshop on "Aggregation-Diffusion PDEs: Variational Principles, Nonlocality and Systems"* - Anacapri (Italy).

Nov 2016 **"Absence of Lavrentiev gap for non-autonomous functionals with (p,q)-growth"**, *Contributed talk*, Workshop on Calculus of Variations and Nonlinear PDEs, Università degli Studi del Sannio - Benevento (Italy).

Service

Organisation of Scientific Events

Sep 2025 Organiser of the workshop *Gradient flows face-to-face 5 in Graná*, University of Granada, Spain.

Jul 2025 Organiser of the Workshop on *New Perspectives in Nonlocal and Nonlinear PDEs*, Anacapri, Italy.

Sep 2024 Organiser of the workshop *Gradient flows face-to-face 4* Raitenhaslach, TU Munich, Germany.

Apr 2024 Organiser of the conference "Aggregation-Diffusion Equations and Collective Behavior: Analysis, Numerics, and Applications" CIRM, Marseille, France.

Aug 2023 Organiser of the minisymposium "Different perspectives in non-linear and non-local PDEs", during ICIAM 2023, Tokyo, Japan.

Mar 2022 Organiser of the minisymposium *The geometry of PDEs on Graphs: Analysis and Applications* during SIAMPD22, Berlin (virtual), Germany.

Sep 2021 Organiser of the workshop *Gradient flows face-to-face*, Rome, Italy.

Apr – Jun 2020 Organiser of the *One World Seminar "Mathematical Methods for Arbitrary Data Sources (MADS)"*, Erlangen, Germany.

Apr 2019 Organiser of the *Working group on "Cross-diffusion systems, gradient flows, and their perturbations"*, L'Aquila, Italy.

May 2018 Organiser of the 136^{th} *European Study Groups With Industry (**ESGI**)*, L'Aquila, Italy.

Apr 2017 Organiser of the *Mini-Workshop on Optimal Transport and PDE's in Applied Sciences*, L'Aquila, Italy (cofunded by the French Embassy in Italy).

Reviewer for Scientific Journals

- Analysis & PDE
- Archive for Rational Mechanics and Analysis
- Calculus of Variations and Partial Differential Equations
- Communications in Mathematical Sciences
- Communications on Pure and Applied Analysis
- Discrete and Continuous Dynamical Systems
- European Journal of Applied Mathematics
- Journal de Mathématiques Pures et Appliquées
- Journal of Functional Analysis
- Journal of Nonlinear Science
- Journal of the London Mathematical Society
- Kinetic and Related Models
- Networks and Heterogeneous Media
- Nonlinear Analysis
- Nonlinear Differential Equations and Applications NoDEA
- Proceedings of the London Mathematical Society
- SIAM Journal on Mathematical Analysis (SIMA)

Editorial activity

- Guest editor for the special issue "Evolution Equations on Graphs: Analysis and Applications" - European Journal of Applied Mathematics

Others

- Member of the Selection Committee for Postdoctoral Research Associate positions in the group of J. A. Carrillo (Oxford).
- Admissions for undergraduate students in Mathematics at the Queen's College, Oxford.
- Organiser of the OxPDE lunchtime seminars at the Mathematical Institute, Oxford.
- Organiser of the Mas@DISIM seminars at the Department of Information Engineering, Computer Science and Mathematics, Università degli Studi dell'Aquila.
- Admissions for students of the MSc in Mathematical Modelling and Mathematical Engineering at the University of L'Aquila (2025, 2026).

Teaching and Tutoring

Academic year 2026/27

Winter 2027 **PhD Course**, *Introduction to Optimal Transport and Applications*, Ph.D. in Mathematics and Modelling, DISIM, Università degli Studi dell'Aquila.
(joint with Prof. S. Fagioli)

First term **Course**, *Mathematical models for collective behaviour*, MSc in Mathematics, Mathematical Modelling, and Mathematical Engineering, DISIM, Università degli Studi dell'Aquila (joint with Prof. Debora Amadori).

First term **Course**, *Applied Partial Differential Equations*, MSc in Mathematical Modelling, DISIM, Università degli Studi dell'Aquila (joint with Prof. Simone Fagioli).

First term **Course**, *Analisi Matematica I*, Ingegneria Industriale, DIIIE, Università degli Studi dell'Aquila (joint with Prof. Corrado Lattanzio).

First term **Course**, *Analisi Matematica I*, Ingegneria Civile, Edile e Architettura, DICEAA, Università degli Studi dell'Aquila (joint with Prof. Stefano Spirito).

Previous academic years

United Kingdom

Courses

Michaelmas Term 2023 **PhD course**, *Foundation Space and Distributions*, CDT Foundation courses, Mathematical Institute, University of Oxford.

Hilary Term 2023 **PhD course**, *Gradient flows in metric spaces: overview and recent advances*, Mathematical Institute, University of Oxford.

Exercises classes

Trinity Term 2023 & 2024 **Exercises classes - Tutor**, *Calculus of Variations*, MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.

Hilary Term 2023 & 2024 **Exercises classes - Tutor**, *Optimal Transport & PDEs*, MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.

Hilary Term 2023 & 2024 **Exercises classes - Tutor**, *Differential Equations 2*, MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.

Hilary Term 2023 & 2024 **Exercises classes - Tutor**, *Numerical Analysis*, MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.

Michaelmas Term 2022 **Exercises classes - Tutor**, *Functional Analytic Methods for PDEs*, MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.

Michaelmas Term 2022 **Exercises classes - Tutor**, *Applied PDEs*, MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.

Michaelmas Term 2022 & 2023 **Exercises classes - Tutor**, *Quantum Theory*, MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.

Michaelmas Term 2022 & 2023 **Exercises classes - Tutor**, *Introductory calculus*, MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.

Germany

Summer 2020 **Course**, *Modeling and Analysis in Continuum Mechanics 2 (english)*, Master Degree in Computational and Applied Mathematics, Friedrich-Alexander-Universität Erlangen-Nürnberg.
(joint with Prof. Dr. Martin Burger)

Summer 2020 **Exercises classes – Tutor**, *Partial Differential Equations for Life Sciences (english)*, Master Degree in Integrated Life Sciences, Friedrich-Alexander-Universität Erlangen-Nürnberg.

Winter 2019 **Course**, *Modeling and Analysis in Continuum Mechanics 1 (english)*, Master Degree in Computational and Applied Mathematics, Friedrich-Alexander-Universität Erlangen-Nürnberg.
(joint with Prof. Dr. Martin Burger)

Italy

First term 25/26 **Course**, *Mathematical models for collective behaviour*, MSc in Mathematics, Mathematical Modelling, and Mathematical Engineering, DISIM, Università degli Studi dell'Aquila (joint with Prof. Debora Amadori).

First term 25/26 **Course**, *Deterministic modelling in population dynamics and epidemiology*, MSc in Mathematical Modelling and Mathematical Engineering, DISIM, Università degli Studi dell'Aquila (joint with Prof. Marco Di Francesco).

First term 25/26 **Course**, *Mathematical Analysis I*, BSc in Ingegneria dell'Informazione and Informatica, DISIM, Università degli Studi dell'Aquila (joint with Prof. Klaus Engel).

AY 24/25 **PhD Course**, *Introduction to Optimal Transport and Applications*, Ph.D. in Mathematics and Modelling, DISIM, Università degli Studi dell'Aquila.
(joint with Prof. Emanuela Radici)

First term 24/25 **Course**, *Biomathematics*, MSc in Mathematics and Mathematical Modelling, DISIM, Università degli Studi dell'Aquila.

First term 24/25 **Course**, *Deterministic modelling in population dynamics and epidemiology*, MSc in Mathematical Modelling and Mathematical Engineering, DISIM, Università degli Studi dell'Aquila.

First term 24/25 **Course**, *Introductory Real Analysis*, MSc in Mathematical Engineering, DISIM, Università degli Studi dell'Aquila.

Fall 2018 **Exercise classes - Tutor**, *Mathematical Analysis I*, Bachelor Degree in Ingegneria dell'Informazione, University of L'Aquila.

Spring 2018 **Exercise classes - Tutor**, *Mathematical Analysis II*, Bachelor Degree in Ingegneria dell'Informazione, University of L'Aquila.

Fall 2016 **Exercise classes - Tutor**, *Functional Analysis in Applied Mathematics And Engineering (english)*, Master Degree in Mathematical Engineering-MathMods program and Bachelor Degree in Mathematics, University of L'Aquila.

March 2014–December 2014 **MIUR (Ministry of Education, University and Research) Project "Logicamente"**, *Città della Scienza*, Via Coroglio 104, 80142 Naples - Website: www.cittadellascienza.it.
The project had the overall aims to raise the level of mathematical and scientific literacy of Italian students and to support school teachers in teaching some delicate topics. I was a tutor for the project.

January 2013–March 2013 **Apprenticeship**, *ISTITUTO COMPRENSIVO CAMPO DEL MORICINO*, PIAZZA G. PEPE N°7, 80142, NAPLES.

Supervision of MSc theses

2020/21 **L. W.**, *Transport distance for equations derived from Brownian active particles*, Master Degree in Computational and Applied Mathematics, Friedrich-Alexander-Universität Erlangen-Nürnberg.
(co-supervised with Prof. Dr. Martin Burger)

2022/23 **L. T.**, *Particle Approximation for Quadratic Porous Medium*, MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.

G. H., *Weak Solution to Non-local Interaction Equation*, MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford..

2023/24 **A. M.**, *Existence of Weak Solutions for a Family of Fractional Diffusion Models with Aggregation*, Master Degree in Mathematics, University of Pavia.
(co-supervised with Prof. Stefano Lisini and José Antonio Carrillo)

2024/25 **A. G. S.**, *Variational Inference via Wasserstein Gradient Descent*, Erasmus Mundus Joint Master Degree "InterMaths" Interdisciplinary Mathematics, University of L'Aquila.

P. I. O., *Optimal Transport on Gas Network*, Joint Master's Programme - MathMods Mathematical Modelling in Engineering: Theory, Numerics, Applications, University of L'Aquila.
(co-supervised with Prof. Martin Burger)

2025/26 **D. L.-M.**, *Nonlocal-to-Local Limit Towards the Quadratic Porous Medium Equation*, Erasmus Mundus Joint Master Degree "InterMaths" Interdisciplinary Mathematics, University of L'Aquila.

Supervision of BSc thesis

2023/24 **D. K.**, *BEE Extended Essay on "The Hille–Yosida Theorem for Evolutionary PDEs"*, MMath (Bachelor of Mathematics), Mathematical Institute, University of Oxford.

Languages

Italian **Mother tongue**
English **Fluent**
German **Beginner**

Others

Communication April 2015: Talk at the forum of the Innovation Day Tour "Competenze professionali e imprese innovative per l'Agenda Digitale Campana", at Renaissance Naples Hotel Mediterraneo in Via Ponte di Tappia, 25, Naples. Website: http://www.innovationday.info.

Driving license A1-B
Diving SSI Open Water Diver