

# Antonio Esposito

Curriculum Vitae [updated to 03/03/25]

# 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 Postdoctoral Research Associate, *Mathematical Institute*, University of Aug 2024 Oxford.
  - Prof. Dr. José Antonio Carrillo
- AA 2022/23 Stipendiary Lecturer in Mathematics, The Queen's College, University of 2023/24 Oxford.
- Oct 2019– Apr Postdoctoral Researcher, Department Mathematik, Friedrich-Alexander-2022 Universität Erlangen-Nürnberg, Chair of Applied Mathematics. Prof. Dr. Martin Burger
- Nov 2018-Sep 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 PhD in Mathematics and Models, Università degli Studi dell'Aquila, The2015–October sis 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**

- EPSRC Vacation Internships Funding, Oxford, June August, 2024. PI: Antonio Esposito, participant: D. K. (£6,696.94).
- Clay Mathematics Institute "Enhancement and Partnership Program": grant used to support a confernce at CIRM (Marseille) I co-organised (Eur 8600).
- 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 active Brownian particles.
- PDEs on graphs/networks.
- Mean-field limit for (systems of ) nonlocal PDEs.
- Fourth-order aggregation-diffusion PDEs.

#### Publications

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

- [2] 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).
- [3] A. Esposito, L. Mikolás, On evolution PDEs on co-evolving graphs, Discrete & Continuous Dynamical Systems A, 2024, 44(9): 2660-2683.
- [4] 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).
- [5] 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).
- [6] M. Burger, A. Esposito, Porous medium equation and cross-diffusion systems as limit of nonlocal interaction, Nonlinear Analysis, 235, 113347 (2023).
- [7] A. Esposito, F. S. Patacchini, A. Schlichting, On a Class of Nonlocal Continuity Equations on Graphs, European Journal of Applied Mathematics, 1-18 (2023).
- [8] 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.
- [9] 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.
- [10] A. Esposito, F.S. Patacchini, A. Schlichting, D. Slepčev, Nonlocalinteraction equation on graphs: gradient flow structure and continuum limit, Archive for Rational Mechanics and Analysis, vol. 240, no. 2, pp. 699–760 (2021).
- [11] 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).
- [12] 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).
- [13] A. Esposito, F. Leonetti, P.V. Petricca, Absence of Lavrentiev gap for nonautonomous functionals with (p,q)-growth, Advances in Nonlinear Analysis, vol. 8, pp. 73-78 (2019).
- [14] M. Di Francesco, A. Esposito, S. Fagioli, Nonlinear degenerate crossdiffusion systems with nonlocal interaction, Nonlinear Analysis, vol. 169, pp. 94-117 (2018).
- [15] 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

[16] 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

[17] 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
  - 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

- **20-24/01/25** Research visit at the University of Ulm, *Ulm*. 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- Research visit at WWU Münster, Germany.
  - 5/12/21 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- Junior Trimester Program "Kinetic Theory", Hausdorff Reaserch Institute

**03/08/19** for Mathematics, Bonn, Germany.

13/01/18- Visiting PhD Student, *Department of Mathematics*, Imperial College London, 10/03/18 London (UK).

Local supervisor: Prof. José Antonio Carrillo.

## Seminars and Talks

Upcoming

• Workshop: Diffusion in Warsaw, Poland.

Past events

- 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 crossdiffusion 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*)<sup>2</sup>", 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<sup>th</sup> 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
- 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 Nonlinear Science
- Journal of the London Mathematical Society
- Kinetic and Related Models
- Networks and Heterogeneous Media
- Nonlinear Analysis
- 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.

## Participation to Conferences and Schools

- August 2022 PDE WORKSHOP: Stability Analysis for Nonlinear PDEs, University of Oxford, Oxford (UK).
  - July 2022 International PDE Conference, University of Oxford, Oxford (UK).
  - September Interactive workshop on hyperbolic equations, University of Ferrara, Ferrara 2018 (Italy).
- August 2018 "Systems of PDEs with nonlocal Newtonian interactions in 1D", poster, Lluís Santaló Summer School on "Interactions between PDE and probability", Palacio de la Magdalena, Santander (Spain).
  - **June 2018** Nonlocal differential equations in collective behavior, American Institute of Mathematics San José (California).
  - June 2018 "Systems of PDEs with nonlocal Newtonian interactions in 1D", poster, 9th SUMMER SCHOOL ON "METHODS AND MODELS OF KINETIC THE-ORY" M&MKT 2018, Hotel Don Pedro - Porto Ercole (Grosseto), Italy.
  - June 2017 "Nonlinear cross-diffusion and nonlocal interaction systems", poster, Workshop on PDEs: Modelling, Analysis and Numerical Simulation PDE-MANS 2017, University of Granada (IEMath-GR) - Granada (Spain).

- June 2017 Ninth Summer School in Analysis and Applied Mathematics, University of Rome "La Sapienza", Rome (Italy).
- April 2017 Mini-Workshop on Optimal Transport and PDE's in Applied Sciences, Gran Sasso Science Institute, L'Aquila (Italy)
- **July 2016** GSSI Summer School on Fluid Dynamics and Related Topics, Gran Sasso Science Institute, L'Aquila (Italy)
- **July 2016** Cime Summer School on "Nonlocal and nonlinear diffusions and interactions: new methods and directions", Cetraro (Italy)
- **June 2016** First Summer School of the Thematic period on "Calculus of Variations, Optimal Transportation, and Geometric Measure Theory: from Theory to Applications", Lyon–Villeurbanne (France)
- May 2016 "Duality for borderline  $A_p$ -weights and  $G_q$ -weights on  $\mathbb{R}$ ", poster, New Trends in Calculus of Variations, ACCADEMIA NAZIONALE DEI LINCEI, Roma
- February 2016 School and Workshop "PDEs and Applications", University of Naples "Federico II", Naples (Italy)
- January 2016 XXVI Convegno Nazionale di Calcolo delle Variazioni, Levico Terme (Italy)

# Teaching and Tutoring

#### Academic year 2024/25

- **First term PhD Course**, Introduction to Optimal Transport and Applications, Ph.D. in Mathematics and Modelling, DISIM, Università degli Studi dell'Aquila. (joint with Prof. Dr. Emanuela Radici)
- First term Course, *Biomathematics*, MSc in Mathematics and Mathematical Modelling, DISIM, Università degli Studi dell'Aquila.
- **First term Course**, *Deterministic modelling in population dynamics and epidemiology*, MSc in Mathematical Modelling and Mathematical Engineering, DISIM, Università degli Studi dell'Aquila.
- **First term Course**, *Introductory Real Analysis*, MSc in Mathematical Engineering, DISIM, Università degli Studi dell'Aquila.

**Previous academic years** 

United Kingdom

#### Courses

- MichaelmasPhD course,Foundation Space and Distributions,CDT Foundation courses,Term 2023Mathematical Institute,University of Oxford.
- Hilary Term PhD course, Gradient flows in metric spaces: overview and recent advances, 2023 Mathematical Institute, University of Oxford.

#### Exercises classes

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

| Hilary Term<br>2023 & 2024        | <b>Exercises classes</b> - <b>Tutor</b> , <i>Optimal Transport</i> & <i>PDEs</i> , MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.  |
|-----------------------------------|---|
| Hilary Term<br>2023 & 2024        | <b>Exercises classes</b> - <b>Tutor</b> , <i>Differential Equations 2</i> , MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.  |
| Hilary Term<br>2023 & 2024        | <b>Exercises classes - Tutor</b> , <i>Numerical Analysis</i> , MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.   |
| Michaelmas<br>Term 2022           | <b>Exercises classes</b> - <b>Tutor</b> , <i>Functional Analytic Methods for PDEs</i> , MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.   |
| Michaelmas<br>Term 2022           | <b>Exercises classes</b> - <b>Tutor</b> , <i>Applied PDEs</i> , MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.   |
| Michaelmas<br>Term 2022 &<br>2023 | <b>Exercises classes</b> - <b>Tutor</b> , <i>Quantum Theory</i> , MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.  |
| Michaelmas<br>Term 2022 &<br>2023 | <b>Exercises classes</b> - <b>Tutor</b> , <i>Introductory calculus</i> , MMath (Bachelor+Master of Mathematics), The Queen's College, University of Oxford.   |
|                                   | Germany   |
| Summer 2020                       | <b>Course</b> , <i>Modeling and Analysis in Continuum Mechanics 2 (english)</i> , Master Degree in Computational and Applied Mathematics, Friedrich-Alexander-Universität Erlangen-Nürnberg.<br>(joint with Prof. Dr. Martin Burger)          |
| Summer 2020                       | <b>Exercises classes – Tutor</b> , <i>Partial Differential Equations for Life Sciences (en-<br/>glish)</i> , Master Degree in Integrated Life Sciences, Friedrich-Alexander-Universität<br>Erlangen-Nürnberg.                                 |
| Winter 2019                       | <b>Course</b> , <i>Modeling and Analysis in Continuum Mechanics 1 (english)</i> , Master De-<br>gree in Computational and Applied Mathematics, Friedrich-Alexander-Universität<br>Erlangen-Nürnberg.<br>(joint with Prof. Dr. Martin Burger)  |
|                                   | Italy   |
| Fall 2018                         | <b>Exercise classes</b> - <b>Tutor</b> , <i>Mathematical Analysis I</i> , Bachelor Degree in Inge-<br>gneria dell'Informazione, University of L'Aquila.   |
| Spring 2018                       | <b>Exercise classes</b> - <b>Tutor</b> , <i>Mathematical Analysis II</i> , Bachelor Degree in Inge-<br>gneria dell'Informazione, University of L'Aquila.  |
| Fall 2016                         | <b>Exercise classes</b> - <b>Tutor</b> , <i>Functional Analysis in Applied Mathematics And Engineering (english)</i> , Master Degree in Mathematical Engineering-MathMods program and Bachelor Degree in Mathematics, University of L'Aquila. |
| March 2014–<br>December<br>2014   | <b>MIUR (Ministry of Education, University and Research) Project "Logi-</b><br><b>camente</b> ", <i>Città della Scienza</i> , Via Coroglio 104, 80142 Naples - Website:<br>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– Apprenticeship, ISTITUTO COMPRENSIVO CAMPO DEL MORICINO, March 2013 PIAZZA G. PEPE N°7, 80142, NAPLES.

Supervision of MSc theses

- 2020/21 L. Weigand, 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. Tyrpak, Particle Approximation for Quadratic Porous Medium, MMath (Bachelor+Master of Mathematics), Mathematical Institute, University of Oxford.

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

**2023/24 A. Massucco**, *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)

Supervision of BSc thesis

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

## Computer skills

- $\bullet$  Advanced knowledge of the following operating systems: Mac OS, Windows and Linux
- Advanced knowledge of LaTeX
- Good knowledge of MATLAB and the programming languages Fortran and C
- Basic knowledge of parallel programming
- ECDL Certificate

#### 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