Mariarosa Mazza

Curriculum Vitae
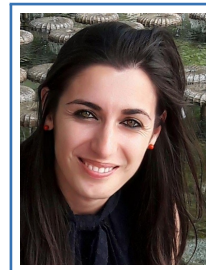
Personal information

Name	Mariarosa Mazza
Date of birth	September the 23th, 1987
Address	University of Rome Tor Vergata, Via della Ricerca Scientifica 1, 00133 Rome, Italy
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Employment history

Current **Assistant Professor tenure track (RTD-B)**, (May the 15th 2023 - present), University of Rome Tor Vergata, Department of Mathematics, Rome, Italy.

Past **Assistant Professor non-tenure track (RTD-A)**, (January the 1st 2020 - May the 14th 2023, 3 years and 4 months), University of Insubria, Department of Science and High Technology, Como, Italy.

Postdoctoral fellow, (December the 1st 2018 - November the 30th 2019, 1 year), University of Insubria, Department of Science and High Technology, Como, Italy.

Postdoctoral fellow, (May the 1st 2016 - November the 30th 2018, 2 years and 7 months), Max Planck Institute for Plasma Physics, Division of Numerical Methods in Plasma Physics, Garching bei München, Germany.

Education and qualifications

2023 **Italian Certification for Full Professorship**, SC: 01/A5.
Date of issue: December the 11th 2023
Valid till: December the 11th 2034

2020 **Italian Certification for tenured Associate Professorship**, SC: 01/A5.
Date of issue: November the 9th 2020
Valid till: November the 9th 2031

2013 − 2016 **PhD Degree in "Matematica del calcolo: modelli, strutture, algoritmi ed applicazioni" (Computational Mathematics)**, *University of Insubria*, Department of Science and High Technology.
Date of issue: February the 11th 2016

2009 − 2012 **Master's Degree in Mathematics**, *University of Calabria*, Department of Mathematics and Informatics, *Final grade* 110/110 *"cum laude" and mention of the curriculum studiorum*.
Date of issue: July the 23th 2012

2006 − 2009 **Bachelor's Degree in Mathematics**, *University of Calabria*, Faculty of Science MM. FF. NN., *Final grade* 110/110 *"cum laude" and mention of the curriculum studiorum*.
Date of issue: October the 2nd 2009

Research interests

Numerical linear algebra, numerical solution of PDEs, approximation theory, image deblurring, graph theory

Publications

Bibliometric information (last update: November the 28th 2024)

- First year of publication (Scopus): 2014
- Papers published in peer-reviewed international journals (Scopus): 33
- Conference papers/Book chapters (Scopus): 2
- Edited books (Scopus): 1
- h-index (Scopus): 12
- Total number of citations (Scopus): 508

All published papers (reverse chronological and, unless specified, author alphabetical orders)

[1] **A note on the convergence of multigrid methods for the Riesz-space equation and an application to image deblurring**, *D. Ahmad, M. Donatelli, M. Mazza, S. Serra-Capizzano, K. Trotti*, Mathematics (2024), vol. 12(12), 1916.

[2] **A smoothing analysis for multigrid methods applied to tempered fractional problems**, *D. Ahmad, M. Donatelli, M. Mazza, S. Serra-Capizzano, K. Trotti*, Linear and Multilinear Algebra (2024), DOI: 10.1080/03081087.2023.2242563.

[3] **Multigrid for two-sided fractional differential equations discretized by finite volume elements on graded meshes**, *M. Donatelli, R. Krause, M. Mazza, K. Trotti*, Journal of Computational and Applied Mathematics (2024), vol. 444, 115787.

[4] **Algebra preconditionings for 2D Riesz distributed-order space-fractional diffusion equations on convex domains**, *M. Mazza, S. Serra-Capizzano, R.L. Sormani*, Numerical Linear Algebra with Applications (2024), vol. 31(3), e2536.

[5] **A rational preconditioner for multi-dimensional Riesz fractional reaction-diffusion equations**, *L. Aceto, M. Mazza*, Computers & Mathematics with Applications (2023), vol. 143, pp. 372–382.

[6] **On the extreme eigenvalues and asymptotic conditioning of a class of Toeplitz matrix-sequences arising from fractional problems**, *M. Bogoya, S. Grudsky, M. Mazza, S. Serra-Capizzano*, Linear and Multilinear Algebra (2023), vol. 71(15), pp. 2462–2473.

[7] **A ghost-point smoothing strategy for geometric multigrid on curved boundaries**, *A. Coco, M. Mazza, M. Semplice*, Journal of Computational Physics (2023), vol. 478, 111982.

[8] **On the matrices in B-spline collocation methods for Riesz fractional equations and their spectral properties**, *M. Mazza, M. Donatelli, C. Manni, H. Speleers*, Numerical Linear Algebra with Applications (2023), vol. 30(1), e2462, [first author for contribution, the rest is alphabetical].

[9] **Rectangular GLT sequences**, *G. Barbarino, C. Garoni, M. Mazza, S. Serra-Capizzano*, Electronic Transactions on Numerical Analysis (2022), vol. 55, pp. 585–617.

[10] **Compatibility, embedding and regularization of non-local random walks on graphs**, *D. Bianchi, M. Donatelli, F. Durastante, M. Mazza*, Journal of Mathematical Analysis and Applications (2022), vol. 511, 126020.

[11] **Matrices associated to two conservative discretizations of Riesz fractional operators and related multigrid solvers**, *M. Donatelli, R. Krause, M. Mazza, M. Semplice, K. Trotti*, Numerical Linear Algebra with Applications (2022), vol. 29(5), e2436.

[12] **All-at-once multigrid approaches for one-dimensional space-fractional diffusion equations**, *M. Donatelli, R. Krause, M. Mazza, K. Trotti*, Calcolo (2021), vol. 58, article number: 45.

[13] **B-spline collocation discretizations of Caputo and Riemann-Liouville derivatives: a matrix comparison**, *M. Mazza*, Fractional Calculus and Applied Analysis (2021), vol. 24(6), pp. 1670–1698.

[14] **The asymptotic spectrum of flipped multilevel Toeplitz matrices and of certain preconditionings**, *M. Mazza, J. Pestana*, SIAM Journal on Matrix Analysis and Applications (2021), vol. 42(3), pp. 1319–1336.

[15] **A matrix-theoretic spectral analysis of incompressible Navier-Stokes staggered DG approximation and related solvers**, *M. Mazza, M. Semplice, S. Serra-Capizzano, E. Travaglia*, Numerische Mathematik (2021), vol. 149, pp. 933–971.

[16] **Symbol-based preconditioning for Riesz distributed-order space-fractional diffusion equations**, *M. Mazza, S. Serra-Capizzano, M. Usman*, Electronic Transactions on Numerical Analysis (2021), vol. 54, pp. 499–513.

[17] **Fractional Laplace operator in two dimensions, approximating matrices, and related spectral analysis**, *L. Aceto, M. Mazza, S. Serra-Capizzano*, Calcolo (2020), vol. 57, article number: 27.

[18] **Multigrid preconditioners for anisotropic space-fractional diffusion equations**, *M. Donatelli, R. Krause, M. Mazza, K. Trotti*, Advances in Computational Mathematics (2020), vol. 46, article number: 49.

[19] **Fast solvers for two-dimensional fractional diffusion equations using rank structured matrices**, *S. Massei, M. Mazza, L. Robol*, SIAM Journal on Scientific Computing (2019), vol. 41(4), pp. A2627–A2656.

[20] **Isogeometric analysis for 2D and 3D curl-div problems: Spectral symbols and fast iterative solvers**, *M. Mazza, C. Manni, A. Ratnani, S. Serra-Capizzano, H. Speleers*, Computer Methods in Applied Mechanics and Engineering (2019), vol. 344, pp. 970–997, [first author for contribution, the rest is alphabetical].

[21] **Spectral properties of flipped Toeplitz matrices and related preconditioning**, *M. Mazza, J. Pestana*, BIT Numerical Mathematics (2019), vol. 59(2), pp. 463–482.

[22] **Spectral analysis and multigrid methods for Finite Volume approximations of space-Fractional Diffusion Equations**, *M. Donatelli, M. Mazza, S. Serra-Capizzano*, SIAM Journal on Scientific Computing (2018), vol. 40(6), pp. A4007–A4039.

[23] **Staggered Discontinuous Galerkin methods for incompressible Navier-Stokes equations: Spectral analysis and computational results**, *M. Dumbser, F. Fambri, I. Furci, M. Mazza, S. Serra-Capizzano, M. Tavelli*, Numerical Linear Algebra with Applications (2018), vol. 25(5), e2151.

[24] **Block Generalized Locally Toeplitz Sequences: From the Theory to the Applications**, *C. Garoni, M. Mazza, S. Serra-Capizzano*, Axioms (2018), vol. 7(3), 49.

[25] **Spectral analysis and spectral symbol for the 2D curl-curl (stabilized) operator with applications to the related iterative solutions**, *M. Mazza, A. Ratnani, S. Serra-Capizzano*, Mathematics of Computation (2018), vol. 88(317), pp. 1155–1188.

[26] **Structure Preserving Preconditioners for Image Deblurring**, *P. Dell'Acqua, M. Donatelli, C. Estatico, M. Mazza*, Journal of Scientific Computing (2017), vol. 72(1), pp. 147–171.

[27] **Function-based block multigrid strategy for a two-dimensional linear elasticity-type problem**, *M. Donatelli, A. Dorostkar, M. Mazza, M. Neytcheva, S. Serra-Capizzano*, Computers & Mathematics with Applications (2017), vol. 74(5), pp. 1015–1028.

[28] **Spectral analysis and multigrid preconditioners for two-dimensional space-fractional diffusion equations**, *H. Moghaderi, M. Dehghan, M. Donatelli, M. Mazza*, Journal of Computational Physics (2017), vol. 350C, pp. 992–1011, [first author for contribution, the rest is alphabetical].

[29] **Preconditioned HSS method for large multilevel block Toeplitz linear systems via the notion of matrix-valued symbol**, *M. Donatelli, C. Garoni, M. Mazza, S. Serra-Capizzano, D. Sesana*, Numerical Linear Algebra with Applications (2016), vol. 23(1), pp. 83–119.

[30] **Image deblurring by sparsity constraint on the Fourier coefficients**, *M. Donatelli, T. Huckle, M. Mazza, D. Sesana*, Numerical Algorithms (2016), vol. 72(2), pp. 341–361.

[31] **Spectral analysis and structure preserving preconditioners for fractional diffusion equations**, *M. Donatelli, M. Mazza, S. Serra-Capizzano*, Journal of Computational Physics (2016), vol. 307, pp. 262–279.

[32] **On the constrained mock-Chebyshev least-squares**, *S. De Marchi, F. Dell'Accio, M. Mazza*, Journal of Computational and Applied Mathematics (2015), vol. 280, pp. 94–109.

[33] **Spectral behavior of preconditioned non-Hermitian multilevel block Toeplitz matrices with matrix-valued symbol**, *M. Donatelli, C. Garoni, M. Mazza, S. Serra-Capizzano, D. Sesana*, Applied Mathematics and Computation (2014), vol. 245, pp. 158–173.

Conference papers/Book chapters

[34] **Spectral Analysis of Matrices in B-Spline Galerkin Methods for Riesz Fractional Equations**, *M. Donatelli, C. Manni, M. Mazza, H. Speleers*, Springer INdAM Series (2023), vol. 50, pp. 53–73.

[35] **Spectral analysis of isogeometric discretizations of 2D curl-div problems with general geometry**, *M. Mazza, C. Manni, H. Speleers*, Lecture Notes in Computational Science and Engineering (2020), vol. 134, pp. 251–262, [first author for contribution, the rest is alphabetical].

Edited books

[36] **Fractional Differential Equations. Modeling, Discretization, and Numerical Solvers**, *A. Cardone, M. Donatelli, F. Durastante, R. Garrappa, M. Mazza, M. Popolizio (eds.)*, Springer INdAM Series 50, Springer International Publishing, vol. 50, 2023.

Lecture notes

[37] **Generalized Locally Toeplitz Sequences: A Spectral Analysis Tool for Discretized Differential Equations**, *C. Garoni, F. Durastante, M. Mazza, S. Serra-Capizzano*, Lecture Notes for the XVI Brazilian School of Cosmology and Gravitation, 2017.

Institutional activity

2024 − 2027 **Member of Senato Accademico** at University of Rome Tor Vergata since November 2024.

2020 − 2022 **Member of the Academic Board for the PhD program** in Computer Science and Computational Mathematics at University of Insubria (Cicli XXXVI, XXXVII).

- Member of the Dissertation Committee for the Thesis Defence of A. Adriani (Ciclo XXXV), December 7, 2022
- Member of the Selection Board for the Year 2020-2021 (Ciclo XXXVI)

Teaching experience

PhD courses

2023 − 2024 **PhD Course** (20 hours) on *Asymptotic Spectral Properties of Matrices arising from Differential Equations*; University of Rome Tor Vergata, November 27 2023 - 7 February 2024. Shared with Carlo Garoni

2019 **PhD Course** (12 hours) on *Fractional diffusion equations: spectral study and design of fast iterative solvers*; University of Insubria, April 5-15 2019

Bachelor courses

Since 2024 **Co-teaching** (30 out of 60 hours) for the Bachelor's Degree Course *Algebra Lineare e Model Order Reduction*; Bachelor's Degree of Metodi e Modelli per Data Science at University of Rome Tor Vergata, Academic Years:

- 2024-2025

Since 2023 **Instructor** (64 hours) for the Bachelor's Degree Course *Numerical Analysis 2*; Bachelor's Degree of Scienze e Tecnologie per i Media at University of Rome Tor Vergata, Academic Years:

- 2023-2024, 2024-2025

Instructor (40 hours) for the Bachelor's Degree Course *Laboratorio di Calcolo 2*; Bachelor's Degree of Mathematics at University of Rome Tor Vergata, Academic Years:

- 2023-2024, 2024-2025

2019 − 2023 **Instructor** (64 hours) for the Bachelor's Degree Course *Mathematical Analysis*; Computer Science Bachelor's Degree at University of Insubria, Academic Years:

- 2022-2023 (students evaluations for the course: 7.85/10, average evaluations for the remaining Computer Science courses: 7.85/10, data available at `sisvaldidat.it`)
- 2021-2022 (students evaluations for the course: 8.03/10, average evaluations for the remaining Computer Science courses: 7.56/10, data available at `sisvaldidat.it`)
- 2020-2021 (students evaluations for the course: 7.94/10, average evaluations for the remaining Computer Science courses: 7.69/10, data available at `sisvaldidat.it`)
- 2019-2020 (students evaluations not fully available due to Covid-19 related reasons)

2015 **Tutor** (12 hours) for the Course: *Numerical Analysis*; University of Insubria, Department of Science and High Technology

2013 **Tutor** (22 hours) for the Course: *Numerical Analysis*; University of Calabria, Department of Mathematics and Informatics

2010 **Tutor** (30 hours) for the Course: *Topology*; University of Calabria, Faculty of Science MM.FF.NN.

Other relevant teaching activities

2024 **Instructor** (12 hours) for *Analisi Numerica* within the program "Formazione Insegnanti e Corsi di Formazione" at University of Rome Tor Vergata

2014 **Tutor** (1 week) for *Stage in Mathematics and applications*; University of Insubria, Department of Science and High Technology

Supervising activity

Postdoc supervision

2023 − 2024 **Supervisor** of A. Adriani at University of Insubria. Project title: *"Numerical strategies for discretized fractional diffusion equations"*. Duration: February 1 2023 - January 31 2024

PhD students supervision

2020 − 2024 **PhD Supervisor** of the Thesis "Exploring numerical solvers for certain fractional equations and related discretizations" by D. Ahmad, PhD Program in Computer Science and Computational Mathematics at University of Insubria (Ciclo XXXVI). Defense date: May 31, 2024. Co-supervisor: Prof. Marco Donatelli

2018 − 2021 **PhD Supervisor** of the Thesis "Multigrid methods for fractional diffusion equations" by K. Trotti, PhD Program in Computer Science and Computational Mathematics at University of Insubria (Ciclo XXXIV, double degree with USI, Lugano). Defense date: December 15, 2021. Co-supervisors: Prof. Marco Donatelli, Prof. Rolf Krause

2018 − 2021 **PhD Supervisor** of the Thesis "Solving the Hermite interpolation problem with scalar subdivision schemes" by R. Diaz-Fuentes, PhD Program in Computer Science and Computational Mathematics at University of Insubria (Ciclo XXXIII). Defense date: November 2, 2021. Co-supervisor: Prof. Stefano Serra-Capizzano

Master students supervision

Ongoing **Master Thesis Supervisor** of G. Tento, University of Insubria, Department of Science and High Technology. Co-supervisor: Prof. Matteo Semplice

2019 **Master Thesis Supervisor**: *Band Preconditioners for the fast numerical solution of 1-dimensional fractional diffusion equations*, B. Cirilli, part of the joint Master Degree program between University of Insubria and Linnaeus University (Sweden). Co-supervisors: Prof. Christian Engström, Prof. Stefano Serra-Capizzano

2015 **Master Thesis Supervisor**: *Ricostruzione di immagini degradate mediante una stima automatica del livello di rumore (Automatic noise level estimate for image restoration)*, S. Balzarotti, University of Insubria, Department of Science and High Technology, Co-supervisor: Prof. Marco Donatelli

Member of PhD dissertation committees

2022 **Member of the Dissertation Committee** for the Thesis Defence of A. Adriani, PhD Program in Computer Science and Computational Mathematics at University of Insubria, December 7, 2022. Supervisors: Stefano Serra-Capizzano, Alberto Giulio Setti

Other type of supervision

2020 **Supervision** of the work by R. Pini (Bachelor Student in Mathematics at University of Insubria) and R. Diaz-Fuentes (PhD Student in Computer Science and Computational Mathematics at University of Insubria) as part of the scientific advisory for Terzopiano s.r.l. on the feasibility of a project that involves the use of 3D printers for textiles. May - October 2020. Co-supervisor: Prof. Marco Donatelli

Scientific organization activities

Conferences

2025 **Co-organizer and member of the scientific committee** for the international workshop *"Fast Methods for Isogeometric Analysis"* granted by INdAM (17000 Euro) and held in Rome, Italy on May 5-9 2025

2024 **Co-organizer and member of the scientific committee** for the workshop *"Computational Aspects of Complex Networks"* granted by MIUR Excellence Department Project Mat-Mod@TOV, Department of Mathematics, University of Rome Tor Vergata (3000 Euro) and held in Rome, Italy on December 6 2024

2022 **Co-organizer and member of the scientific committee** for the workshop *"Lombardy Young Numerical Analysts Meeting (LYNum-IV)"* granted by University of Insubria (1000 Euro) and held in Como, Italy on May 10 2022

2021 **Co-organizer and member of the scientific committee** for the international workshop *"Fractional Differential Equations: Modeling, Discretization, and Numerical Solvers"* granted by INdAM (15000 Euro) and held in Rome, Italy on July 12-14 2021

Minisymposia

2021 **Co-organizer** of the minisymposium *"New trends and applications of Fractional Differential Equations"*, at SIMAI 2020+2021 Conference, Parma, Italy, August 30 - September 3 2021

2019 **Co-organizer** of the minisymposium *"Advances in Fractional Differential Equations: Discretization Methods and Efficient Solvers"*, at the international ICIAM Conference, Valencia, Spain, July 15-19 2019

Research visits (total number: 16)

2024 **University of Edinburgh**, School of Mathematics, Edinburgh, UK, January 21-27 2024. Host: Prof. Francesco Tudisco

2023 **University of Pavia**, Department of Mathematics, Pavia, Italy, March 27 2023. Host: Dr. Pietro Zanotti

2022 **University of Pisa**, Department of Mathematics, Pisa, Italy, November 28-December 1 2022. Host: Dr. Stefano Massei

2021 **University of Pisa**, Department of Mathematics, Pisa, Italy, November 15-19 2021. Host: Dr. Leonardo Robol

2019 **École Polytechnique Fédérale de Lausanne**, Mathematics Section, Lausanne, Switzerland, July 3-6 2019. Host: Prof. Daniel Kressner, Dr. Stefano Massei

2019 **Strathclyde University**, Department of Mathematics and Statistics, Glasgow, UK, June 24-28 2019. Host: Prof. Jennifer Pestana

2019 **University of Rome "Tor Vergata"**, Department of Mathematics, Rome, Italy, March 13-15 2019. Host: Prof. Carla Manni, Prof. Hendrik Speleers

2018 **University of Genova**, Department of Mathematics, Genova, Italy, December 6 2018. Host: Prof. Fabio Di Benedetto

2018 **University of Rome "Tor Vergata"**, Department of Mathematics, Rome, Italy, October 16-18 2018. Host: Prof. Carla Manni, Prof. Hendrik Speleers

2018 **CNR, Istituto di Scienza e Tecnologie dell'Informazione "A. Faedo"**, Pisa, Italy, July 30 - August 5 2018. Host: Dr. Leonardo Robol

2018 **Strathclyde University**, Department of Mathematics and Statistics, Glasgow, UK, March 5-9 2018. Host: Prof. Jennifer Pestana

2017 **University of Insubria**, Department of Science and High Technology, Como, Italy, May 16-19 2017. Host: Prof. Marco Donatelli, Prof. Stefano Serra-Capizzano

2017 **University of Insubria**, Department of Science and High Technology, Como, Italy, February 13-17 2017. Host: Prof. Marco Donatelli, Prof. Stefano Serra-Capizzano

2017 **University of Rome "Tor Vergata"**, Department of Mathematics, Rome, Italy, February 8-10 2017. Host: Prof. Carla Manni, Prof. Hendrik Speleers

2016 **Uppsala University**, Department of Information Technology, Uppsala, Sweden, November 28-December 2 2016. Host: Prof. Maya Neytcheva

2015 **Uppsala University**, Department of Information Technology, Uppsala, Sweden, May 2015. Host: Prof. Maya Neytcheva

Grant activity

Granted research projects as Principal Investigator

2023 **GNCS-INdAM (Italy)**: Research Projects 2023. Title: *"Tecniche numeriche per equazioni di diffusione frazionarie e loro applicazioni"* (leading a team of 13 researchers, 5.600 Euro)

2022 **University of Insubria (Italy)**: Grant for hiring a post-doc on the project *"Numerical strategies for discretized fractional diffusion equations"* (individual project, about 24.000 Euro)

2020 − 2021 **GNCS-INdAM (Italy)**: Young Researchers program 2021. Title: *"Numerical methods for image restoration and cultural heritage deterioration"* (individual project, 1.500 Euro)

2018 **CIRM (France)**: Grant for a "Research in pairs" workshop on "Fast solvers for fractional differential equations" (in collaboration with S. Massei and L. Robol, the grant covered all the workshop expenses)

2017 − 2018 **GNCS-INdAM (Italy)**: Young Researchers program 2018. Title: *"Spectral analysis and numerical algorithms for magnetohydrodynamics equations and fractional diffusion equations arising in Plasma Physics"* (individual project, 1.300 Euro)

2015 − 2016 **GNCS-INdAM (Italy)**: Young Researchers program 2016. Title: *"Multigrid methods for 1D fractional diffusion equations and for 2D linear elasticity-type problems in saddle point form"* (individual project, 1.000 Euro)

Participation at granted research projects

2024 − 2026 **Horizon Europe program**: HORIZON JU Research and Innovation Actions. Title: *"dealii-X: an Exascale Framework for Digital Twins of the Human Body"*, Coordinated by Ruhr-Universitaet Bochum (3.939.780 Euro)

2024 **INdAM (Italy)**: Grant for organizing the workshop on *"Fast Methods for Isogeometric Analysis"* to be held in Rome in May 2025, principal investigator: Prof. Hendrik Speleers (17.000 Euro)

2024 **INdAM (Italy)**: Research Projects 2024. Title: *"Tecniche numeriche efficienti per problemi differenziali avanzati: BEM e paradigma isogeometrico"*, principal investigator: Prof. Lucia Sampoli (5.000 Euro)

2023 − 2025 **MIUR (Italy)**: Progetti di Rilevante Interesse Nazionale 2022 PNRR (PRIN 2022 PNRR). Title: *"MATHematical tools for predictive maintenance and PROtection of CULTtural heritage (MATHPROCULT)"*, principal investigator: Prof. Matteo Semplice (224.867 Euro)

2021 **INdAM (Italy)**: Grant for organizing the workshop on *"Fractional Differential Equations: Modeling, Discretization, and Numerical Solvers"* held in Rome on July 12-14 2021, principal investigator: Prof. Roberto Garrappa (15.000 Euro)

2018 − 2020 **MIUR-DAAD (Italy-Germany)**: Joint Mobility 2017 Programme. Title: *"Advanced Tools for numerical simulatiOn of Magnetized plAsmas (ATOMA)"*, principal investigators: Prof. Hendrik Speleers, Dr. Ahmed Ratnani (32.862 Euro)

2016 − 2017 **MIUR (Italy)**: Futuro in Ricerca 2013 (FIR 2013). Title: *"Design of Reliable, Exact, and Application-oriented techniques for geometric Modeling and numerical Simulation (DREAMS)"*, principal investigator: Prof. Carlotta Giannelli (688.769 Euro)

2014 − 2017 **MIUR (Italy)**: Progetti di Rilevante Interesse Nazionale 2012 (PRIN 2012). Title: *"Structured Matrices in Signal and Image Processing (SMaSIP)"*, principal investigator: Prof. Marco Donatelli (52.000 Euro)

Editor/Reviewer activity

Editoring

Since 2024 **Associate Editor** for the Springer Journal *Computational and Applied Mathematics*

Since 2022 **Associate Editor** for *Electronic Transactions on Numerical Analysis*

Since 2022 **Associate Editor** for the Elsevier Journal *Software Impacts*

Since 2021 **Managing Editor** and occasionally **Editor** for *Electronic Transactions on Numerical Analysis*

2021 − 2022 **Guest Editor** in the *Springer INdAM Series* for the volume on "INdAM workshop on Fractional Differential Equations: Modeling, Discretization, and Numerical Solvers"

2019 − 2020 **Guest Editor** in MDPI Journal *Mathematics* for the Special Issue "*Matrix Structures: Numerical Methods and Applications*"

Reviewing (alphabetic order)

Since 2015   Reviewer for: *Applied Mathematics and Computation, Applied Mathematics Letters, Applied Numerical Mathematics, Calcolo, Computers and Mathematics with Applications, Computational and Applied Mathematics, Electronic Transactions on Numerical Analysis, International Journal of Computer Mathematics, Journal of Applied Mathematics and Computing, Journal of Computational Physics, Journal of Scientific Computing, Linear and Multilinear Algebra, Mathematical Methods in the Applied Sciences, Mathematical Reviews/MathSciNet Reviews, Mathematics, Numerical Algorithms, Numerical Linear Algebra with Applications, Numerische Mathematik, Rivista Matematica dell'Università di Parma, SIAM Journal on Matrix Analysis and Applications, SIAM Journal on Scientific Computing, Springer INdAM Series.*

Other relevant scientific activities

2020   **Scientific Advisory** together with Prof. Marco Donatelli for Terzopiano s.r.l. on the feasibility of a project that involves the use of 3D printers for textiles. May - October 2020

2016   **Scientific Advisory** for the DREAMS Project (Futuro in Ricerca 2013) at University of Rome "Tor Vergata", Department of Mathematics, October 1 - November 14 2016

Service activities

2020 − 2023   **Member of the Selection Committee** for 6 postdoc fellowships in MAT/08 at University of Insubria and 1 at University of Rome Tor Vergata

2023   **Member of the Degree Commission** for both Mathematics Bachelor and Pure and Applied Mathematics Master's Degree at University of Rome Tor Vergata: July 2024, July 2023

2021 − 2022   **Member of the Degree Commission** for both Mathematics Bachelor and Master's Degrees at University of Insubria: December 2022, October 2022, July 2022, December 2021, October 2021

Participation at national or international research groups

2013 − 2023   Member of the *(Hidden) Matrix Structures In Analysis, Algorithms and Applications (MaSI3A) Group* at Department of Science and High Technology, University of Insubria, Como, Italy. Webpage: `http://scienze-como.uninsubria.it/masi3a/index.html`

2016 − 2018   Member of the *MagnetoHydroDynamics (MHD) Group* lead by Dr. Ahmed Ratnani and part of the Numerical Methods in Plasma Physics Division at Max Planck Institute for Plasma Physics, Garching, Germany. Webpage: `https://www.ipp.mpg.de/4119345/mhd`

Other relevant memberships

Since 2013   Member of **INdAM-GNCS** (Istituto Nazionale di Alta Matematica, Gruppo Nazionale per il Calcolo Scientifico)

2022 − 2023   Member of **ILAS** (International Linear Algebra Society) and **SIMAI** (Società Italiana di Matematica Applicata e Industriale)

2015 − 2023   Member of **SIAM** (Society for Industrial and Applied Mathematics)

2013 − 2023   Member of **UMI** (Unione Matematica Italiana)

Conferences and seminars

Keynote talks (total number: 2)

2019   **IGA 2019**, Munich, Germany, "B-spline approximation of anisotropic diffusion problems: spectral symbols and anisotropic multi-iterative solvers", M. Donatelli, C. Manni, M. Mazza, H. Speleers, in the Symposium "Mathematics of isogeometric methods", September 18-20 2019

2018   **SIMAI Congress**, Rome, Italy, "The GLT class as a generalized Fourier analysis and applications", in the Minisymposium "Numerical Methods for Integral Equations and Applications", July 2-6 2018

Invited talks (total number: 28)

2024 **Convegno GNCS 2024**, Rimini, Italy, "Tecniche numeriche per equazioni di diffusione frazionarie e loro applicazioni", presentation of the results obtained in the related GNCS Research Project 2023, February 14-16, 2024

2023 **IMACS 2023**, Rome, Italy, "A Rational Preconditioner for Multi-dimensional Riesz Fractional Diffusion Equations", L. Aceto, M. Mazza, in the Minisymposium "Numerical methods fo fractional-derivative differential equations", September 11-15, 2023

2023 **ICIAM 2023**, Tokio, Japan, "A Rational Preconditioner for Multi-dimensional Riesz Fractional Diffusion Equations", L. Aceto, M. Mazza, in the Minisymposium "Recent Advances in Fast Iterative Methods for PDE Problems", August 20-25, 2023

2023 **ILAS2023**, Madrid, Spain, "A Rational Preconditioner for Multi-dimensional Riesz Fractional Diffusion Equations", L. Aceto, M. Mazza, in the Minisymposium "The interplay between linear-multilinear algebra and rational approximation", June 12-16, 2023

2023 **14th International Conference on Large-Scale Scientific Computations**, Sozopol, Bulgaria, "A Rational Preconditioner for Multi-dimensional Riesz Fractional Diffusion Equations", L. Aceto, M. Mazza, in the Special Session "Fractional Differential Problems: Theoretical Aspects, Algorithms and Applications", June 5-9, 2023

2023 **Inverse Problems, Computing and Imaging**, Shenzhen, China, "Compatibility, embedding and regularization of non-local random walks on graphs", D. Bianchi, M. Donatelli, F. Durastante, M. Mazza, April 14-17, 2023

2022 **IGA 2022**, Banff, Canada, "On the matrices in B-spline collocation/Galerkin methods for a kind of fractional differential equation and their properties", M. Donatelli, C. Manni, M. Mazza, H. Speleers, in the Symposium "Mathematical Foundation of IGA", November 6-9 2022

2022 **WCCM-APCOM 2022**, Online, "On the matrices in B-spline collocation methods for Riesz fractional equations and their spectral properties", M. Donatelli, C. Manni, M. Mazza, H. Speleers, in the Minisymposium "Advanced HPC Methods for Eigenvalue Problems and Beyond", July 31 - August 5 2022

2022 **Householder Symposium XXI on Numerical Linear Algebra**, Bari, Italy "On the Schur Complement of Incompressible Navier-Stokes Staggered DG Approximations in Elongated Domains and Related Preconditioning", M. Mazza, M. Semplice, S. Serra-Capizzano, E. Travaglia, June 12-17 2022

2021 **SIAM ALA 2021**, Online, "Spectral Analysis of Matrices in Isogeometric Collocation Methods for Riesz Fractional Equations", M. Donatelli, C. Manni, M. Mazza, H. Speleers, in the Minisymposium "Advances in Iterative Methods and Preconditioning for PDE Problems", May 17-21 2021

2019 **UMI Congress XXI**, Pavia, Italy, "Fast structure-based methods for finite volume approximations of space-fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, in the Minisymposium "Algebra lineare numerica e applicazioni", September 2-7 2019

2019 **ICIAM 2019**, Valencia, Spain, "B-spline approximation of 2D/3D MHD subproblems: spectral symbols and multigrid-type solvers", C. Manni, M. Mazza, A. Ratnani, S. Serra-Capizzano, H. Speleers, in the Minisymposium "Recent advances in fast iterative solvers for structured matrices", July 15-19 2019

2019 **The 28th Biennial Numerical Analysis Conference**, Glasgow, UK, "Multigrid preconditioners for anisotropic space-Fractional Diffusion Equations", M. Donatelli, R. Krause, M. Mazza, K. Trotti, in the Minisymposium "Preconditioning and iterative methods for differential equations", June 25-28 2019

2019 **ETNA 25**, Cagliari, Italy, "Rank structure based solvers for 2D fractional diffusion equations", S. Massei, M. Mazza, L. Robol, in the Minisymposium "Matrix Equations: Analysis and Algorithms", May 27-29 2019

2018   **IGA 2018**, Austin, Texas, "Isogeometric analysis for a 2D and 3D MHD subproblem: spectral symbol and fast iterative solvers", C. Manni, M. Mazza, A. Ratnani, S. Serra-Capizzano, H. Speleers, in the Symposium "Computational Efficiency", October 10-12 2018

2018   **SIMAI Congress**, Rome, Italy, "Isogeometric analysis for a 2D and 3D MHD subproblem: spectral symbol and fast iterative solvers", C. Manni, M. Mazza, A. Ratnani, S. Serra-Capizzano, H. Speleers, in the Minisymposium "New Trends in Numerical Linear Algebra and Applications", July 2-6 2018

2018   **ECCM-ECFD Conference**, Glasgow, UK, "Isogeometric analysis for a 2D and 3D MHD subproblem: spectral symbol and fast iterative solvers", C. Manni, M. Mazza, A. Ratnani, S. Serra-Capizzano, H. Speleers, in the Minisymposium "Mathematical aspects of isogeometric analysis", June 11-15 2018

2018   **SIAM ALA 2018**, Hong Kong, "Spectral analysis and multigrid preconditioners for space-fractional diffusion equations", M. Dehghan, M. Donatelli, M. Mazza, H. Moghaderi, in the Minisymposium "Preconditioners for fractional partial differential equations and applications", May 4-8 2018

2018   **INdAM Workshop DREAMS**, Rome, Italy, "Isogeometric analysis for a 2D and 3D MHD subproblem: spectral symbol and fast iterative solvers", C. Manni, M. Mazza, A. Ratnani, S. Serra-Capizzano, H. Speleers, January 22-26 2018

2017   **ENUMATH 2017 Conference**, Voss, Norway, "Spectral analysis and spectral symbol for the 2D curl-curl (stabilized) operator with applications to the related iterative solutions", M. Mazza, A. Ratnani, S. Serra-Capizzano, in the Minisymposium "Advances in Numerical linear algebra methods and applications to PDEs", September 25-29 2017

2017   **INdAM Meeting Structured Matrices in Numerical Linear Algebra: Analysis, Algorithms and Applications**, Cortona, Italy, "Spectral analysis and spectral symbol for pure and stabilized 2D curl-curl operator with applications to the related iterative solutions", C. Manni, M. Mazza, A. Ratnani, S. Serra-Capizzano, H. Speleers, September 4-8 2017

2017   **The PASC17 Conference**, Lugano, Switzerland, "Spectral analysis for the 2D curl-curl (stabilized) operator with applications to the related iterative solutions", M. Mazza, A. Ratnani, S. Serra-Capizzano, in the Minisymposium "Fast Numerical Linear Algebra Methods in Isogeometric Analysis", June 26-28 2017

2017   **Householder Symposium XX on Numerical Linear Algebra**, Blacksburg, Virginia, USA, "Spectral analysis and numerical methods for space-Fractional Diffusion Equations", M. Dehghan, M. Donatelli, M. Mazza, H. Moghaderi, S. Serra-Capizzano, June 18-23 2017

2016   **20th IMACS World Congress**, Xiamen, China, "Spectral analysis and spectral symbol for the 2D curl-curl (stabilized) operator with applications to the related iterative solutions", M. Mazza, A. Ratnani, S. Serra-Capizzano, in the Minisymposium "Preconditioning and Iterative Methods Based on Splittings", December 10-14 2016

2016   **20th IMACS World Congress**, Xiamen, China, "Spectral analysis and structure preserving preconditioners for fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, in the Minisymposium "High accuracy high efficiency solutions for time-dependent fractional differential equations", December 10-14 2016

2016   **9th Workshop Structural Dynamical Systems: Computational Aspects (SDS2016)**, Capitolo, Monopoli (BA), Italy, "Spectral analysis and structure preserving preconditioners for fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, June 14-17 2016

2015   **SIAM ALA 2015**, Atlanta, Georgia, USA, "Structure preserving preconditioners for image deblurring", P. Dell'Acqua, M. Donatelli, C. Estatico, M. Mazza, in the Special Session "Recent Advances in Numerical Linear Algebra for Inverse Problems", October 26-30 2015

2014 **First Joint International Meeting RSME-SCM-SEMA-SIMAI-UMI**, Bilbao, Spain, "On the constrained mock-Chebyshev least-squares", S. De Marchi, F. Dell'Accio, M. Mazza, in the Special Session "Special Functions, Orthogonal Polynomials and Applications", June 30-July 4 2014

Invited seminars (total number: 12)

2024 **University of Rome La Sapienza**, Department of Mathematics, "Exploring numerical challenges in differential models with fractional derivatives", May 14 2024

2024 **University of Rome La Sapienza**, Department of Statistics, "Fractional derivatives and models: some numerical aspects", April 18 2024

2023 **University of Pavia**, Department of Mathematics, "Some numerical linear algebra considerations on fractional derivatives", March 27 2023

2021 **University of Pisa**, Department of Mathematics, "Caputo and Riemann-Liouville fractional derivatives: a matrix comparison", November 19 2021

2019 **École Polytechnique Fédérale de Lausanne**, Mathematics Section, "Some structured matrices in plasma physics related problems", July 4 2019

2018 **University of Genova**, Department of Mathematics, "Generalized locally Toeplitz sequences and some applications to MHD subproblems", December 6 2018

2018 **CNR, Istituto di Scienza e Tecnologie dell'Informazione "A. Faedo"**, "Generalized locally Toeplitz sequences and some applications to MHD subproblems", July 30 2018

2018 **Strathclyde University**, Department of Mathematics and Statistics, "Generalized locally Toeplitz sequences and some applications to fractional diffusion equations", March 6 2018

2017 **Technische Universität München**, Department of Mathematics and Informatics, "The GLT theory and some applications to fractional diffusion equations", December 8 2017

2016 **Uppsala University**, Department of Information Technology, "The GLT theory and some applications to canonical and fractional partial differential equations", in the CoSy lunch seminar series of CIM (Centre for Interdisciplinary Mathematics), November 29 2016

2016 **Max Planck Institute for Plasma Physics**, Division of Numerical Methods in Plasma Physics "Spectral features of matrix-sequences, GLT, symbol, and applications", February 23 2016

2013 **University of Padova**, Department of Mathematics, "On the constrained mock-Chebyshev least-squares", November 28 2013

Contributed talks (total number: 12)

2022 **SMART 2022**, Rimini, Italy, "On the matrices in B-spline collocation/Galerkin methods for a kind of fractional differential equation", M. Donatelli, C. Manni, M. Mazza, H. Speleers, September 20-24 2022

2022 **ALAMA2022-ALN2gg**, Alcalá, Spain, "Caputo and Riemann-Liouville fractional derivatives: a matrix comparison", M. Mazza, June 1-3 2022

2021 **INdAM Workshop on fractional Differential Equations: Modeling, Discretization, and Numerical Solvers**, Rome, Italy, "On B-spline collocation matrices for Riemann-Liouville or Caputo Riesz fractional operator and their spectral properties", M. Donatelli, C. Manni, M. Mazza, H. Speleers, July 12-14 2021

2019 **Due Giorni di Algebra Lineare Numerica**, Rome, Italy, "Spectral properties of flipped Toeplitz matrices and related preconditioning", M. Mazza, J. Pestana, February 18-19 2019

2017 **CIME Summer School: Splines and PDEs: Recent Advances from Approximation Theory to Structured Numerical Linear Algebra**, Cetraro (CS), Italy, "Spectral analysis and spectral symbol for pure and stabilized 2D curl-curl operator with applications to the related iterative solutions", C. Manni, M. Mazza, A. Ratnani, S. Serra-Capizzano, H. Speleers, July 3-7 2017

2017 **Due Giorni di Algebra Lineare Numerica**, Como, Italy, "Spectral analysis and spectral symbol for the 2D curl-curl (stabilized) operator with applications to the related iterative solutions", M. Mazza, A. Ratnani, S. Serra-Capizzano, February 16-17 2017

2016 **Theory Ringberg Meeting**, Ringberg, Germany, "The GLT theory applied to curl-curl problem", M. Mazza, A. Ratnani, S. Serra-Capizzano, November 7-11 2016

2016 **20th Conference of the International Linear Algebra Society (ILAS 2016)**, Leuven, Belgium, "Spectral analysis and structure preserving preconditioners for fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, July 11-15 2016

2015 **XX Congresso UMI**, Siena, Italy, "Spectral analysis and structure preserving preconditioners for fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, September 7-12 2015

2015 **CIME Summer School: Exploiting Hidden Structure in Matrix Computations. Algorithms and Applications**, Cetraro (CS), Italy, "Spectral analysis and structure preserving preconditioners for fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, June 22-26 2015

2015 **New Trends in Numerical Analysis: Theory, Methods, Algorithms and Applications (NETNA2015)**, Falerna (CZ), Italy, "Spectral analysis and structure preserving preconditioners for fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, June 18-21 2015

2013 **Conference Numerical Computations: Theory and Algorithms (NUMTA2013)**, Falerna (CZ), Italy, "On the constrained mock-Chebyshev least-squares", S. De Marchi, F. Dell'Accio, M. Mazza, June 17-23 2013

Posters (total number: 6)

2024 **Numerical Linear Algebra CIRM**, Luminy, France, "Exploring rational approximations of nonlocal operators for preconditioning", L. Aceto, M. Mazza, September 16-20, 2024

2018 **Calcolo Scientifico e Modelli Matematici: alla ricerca delle cose nascoste attraverso le cose manifeste 2.0**, Como, Italy, "Fast structure-based methods for space-fractional diffusion equations", M. Donatelli, M. Mazza, S. Serra-Capizzano, May 16-18 2018

2015 **Calcolo Scientifico e Modelli Matematici**, Genova, Italy, "Image deblurring by sparsity constraint on the Fourier coefficients", M. Donatelli, M. Mazza, D. Sesana, June 3-5 2015

2014 **Dolomites Research Week on Approximation (DRWA14)**, Alba di Canazei (TN), Italy, "Image deblurring by sparsity constraint on the Fourier coefficients", M. Donatelli, M. Mazza, D. Sesana, September 8-12 2014

2013 **Dolomites Research Week on Approximation (DRWA13)**, Alba di Canazei (TN), Italy, "On Simultaneous Polynomial Interpolation and Regression II: the degree of Regression", S. De Marchi, F. Dell'Accio, M. Mazza, September 9-13 2013

2012 **3rd Dolomites Workshop on Constructive Approximation and Applications (DWCAA12)**, Alba di Canazei (TN), Italy, "On Simultaneous Polynomial Interpolation and Regression", S. De Marchi, F. Dell'Accio, M. Mazza, September 9-14 2012

Computer skills

Basic	Linux, Maple, Python
Advanced	Matlab, LaTeX, OpenOffice, Microsoft Windows

Languages

Italian	Mother tongue
English	Level B2, Cambridge ESOL First Certificate of English, FCE
French	Level A2
German	Level A2