

Paola Gervasio

Scientific Curriculum

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Personal Data

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Education

- 1990–1994 **Ph.D in Mathematics**, *Università degli Studi di Milano*, Milano, Italy.
Thesis title: “Numerical solution of PDE by spectral methods and domain decomposition techniques” Supervisor: prof. A. Quarteroni.
- 1985–1990 **Master degree in Mathematics**, *Università Cattolica del Sacro Cuore*, Brescia, Italy, *cum laude*.
Thesis title: “Effective numerical algorithms of direct type for spectral methods” Supervisor: prof. G. Sacchi
- 1980–1985 **High School Diploma**, (*scientific oriented*), Italy, .

Professional Career

- 01.03.2005-
onwards **Associate professor** of Numerical Analysis (SSD - MAT08) at Università degli Studi di Brescia, Brescia, Italy.
- 01.09.1996 –
28.02.2005 **Researcher** of Numerical Analysis at Università degli Studi di Brescia, Brescia, Italy.
- A.Y.
1995–1996 **Adjunct lecturer** for the course “Calcolo Numerico” at Università degli Studi di Brescia, Brescia, Italy.
- 1994–1996 **High school teacher**, permanent employment for the Mathematics class (2 years).
- 15.09.1992 –
30.08.1993 **Visiting Ph.D. Student** at the Applied Mathematics and Simulation Group of CRS4 (Center for Advanced Research and Development in Sardinia), Cagliari, Italy

1.11.1990 – **Ph.D. Student** (with an Italian government scholarship) at Dipartimento di Matematica, Università degli Studi di Milano, Milano, Italy
31.10.1994

National Scientific Qualification

28.03.2017 Italian National Scientific Qualification for Full Professorship in Numerical Analysis. (Abilitazione scientifica nazionale, I fascia, settore 01/A5, bando D.D. 1532/2016)

Research fellowships

- 1990 Winner of an annual fellowship funded by C.N.R. (National Council for Research) for studies in Mathematics
- 1990-1991 Winner of a six-months fellowship funded by CILEA (Consorzio Interuniversitario Lombardo per la Elaborazione Automatica). Title of the research: "Development and implementation of algorithms on vector and parallel architectures".

Research Fields and Scientific Interests

The research activity concerns the numerical approximation of partial differential equations modeling fluid-dynamics, mechanics, and biology problems with special attention to both theoretical and computational points of view.

Key-words Spectral Methods, Spectral Element Methods, hp - Finite Element Methods, Stabilization Techniques, Domain Decomposition Methods, Preconditioners, Algebraic fractional step schemes, Computational fluid-dynamics, Incompressible Navier-Stokes equations, Heterogeneous problems, Multiphysics, Stokes-Darcy coupling, Non-conforming domain decomposition methods, Reduced Basis Methods, Isogeometric Analysis, Optimal control, Cardiac electrophysiology, Matrix-free solver, Mathematical modeling for insect populations.

ERC subject classification

- PE1_17 Numerical analysis
- PE1_18 Scientific computing and data processing
- PE1_19 Control theory and optimization
- PE1_11 Theoretical aspects of partial differential equations

- Scientific Collaborations**
- Valery I. Agoshkov, Russian Academy of Sciences, Moscow (Russia);
 - Pablo Blanco, LNCC, Petrópolis, RJ, Brazil;
 - Claudio Canuto, Dipartimento di Matematica, Politecnico di Torino;
 - Luca Dedè, MOX, Politecnico di Milano;
 - Simone Deparis, Institute of Mathematics, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne (CH);
 - Marco Discacciati, Department of Mathematical Sciences Loughborough University, Loughborough (UK);
 - Davide Forti, Institute of Mathematics, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne (CH);
 - Alessandro Giacomini, DICATAM, Università degli Studi di Brescia (Italy);
 - Gianni Gilioli, DMMT, Università degli Studi di Brescia (Italy);
 - Adriano M. Lezzi, DIMI, Università degli Studi di Brescia (Italy);
 - Maria Grazia Naso, DICATAM, Università degli Studi di Brescia (Italy);
 - Alfio Quarteroni, Institute of Mathematics, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne (CH) and MOX, Politecnico di Milano.

Bibliometrics (The complete list of publications is at the end of this document)

- Books** Author of **3 books (translated in English, french, Japanese for a total of 9 published editions)** on Scientific Computing, Numerical Analysis, Mathematical Modeling published by Springer-Verlag, Maruzen Publishing Co. (Japan), Zanichelli.
- Journal papers** Author of about **40 articles** with peer review process, published on international journals or as book chapter
- Conference papers** Author of about **10 conference papers** with peer review process published on international journals.

Invited research visits

- EPFL Lausanne (4-6 October 2017). Scientific collaboration with A. Quarteroni.
- EPFL Lausanne (9-10 July 2017). Scientific collaboration with A. Quarteroni.
- EPFL Lausanne (10-12 July 2016). Scientific collaboration with A. Quarteroni.
- EPFL Lausanne (21-23 January 2016). Scientific collaboration with A. Quarteroni, S. Deparis, D. Forti.
- EPFL Lausanne (7-10 July 2015). Scientific collaboration with A. Quarteroni, S. Deparis, D. Forti.
- EPFL Lausanne (26-27 may 2015). Scientific collaboration with A. Quarteroni, S. Deparis, D. Forti.
- EPFL Lausanne (5-7 September 2012). Scientific collaboration with A. Quarteroni.
- EPFL Lausanne (15-16 February 2012). Scientific collaboration with A. Quarteroni.
- EPFL Lausanne (29-31 august 2011). Scientific collaboration with A. Quarteroni.
- EPFL Lausanne (23-26 February 2010). Scientific collaboration with A. Quarteroni, M. Discacciati and P.B. Blanco.

- EPFL Lausanne (27-28 October 2009). Scientific collaboration with A. Quarteroni, M. Discacciati and P.B. Blanco.
- Politecnico di Torino (29-30 May 2007). Invited by Claudio Canuto.
- EPFL Lausanne (May 2006). Scientific collaboration with A. Quarteroni, V.I. Agoshkov.
- EPFL Lausanne (July 2005). Scientific collaboration with A. Quarteroni, V.I. Agoshkov.
- EPFL Lausanne (October 1999). Scientific collaboration with A. Quarteroni, L. Fatone.

Lectures, Conference Talks, Seminars

Invited speaker within 4 International Conferences and Workshops.

Invited talks within 22 Minisymposia in International Conferences and 1 minisymposium in National Conferences.

11 Contributed Talks within International Conferences, 8 within national conferences.

2 Series of Lectures within International Doctoral Schools.

2 Seminars.

Invited speaker at Conferences and Workshops

- [I4] *"Interface Control Domain Decomposition (ICDD) Method for multiphysics Fluid dynamics and electromagnetism: theory and numerical approximation."* Invited lecture at the Conference "Fluid Dynamics and Electromagnetism: Theory and Numerical Approximation" Levico Terme (Trento, Italy), June 3–4, 2014.
- [I3] *"Scientific Computing using Octave: a working experience."* Invited lecture at the Conference "OctConf2013, First European Octave Conference". June 24–26, 2013 Milano (Italy).
- [I2] *"Spectral methods and algebraic fractional step schemes for incompressible Navier-Stokes equations."* Invited lecture at the "EUA4X Event #14 WORKSHOP: High Order Methods for Large Scale Industrial Applications." CRS4, Cagliari (Italy) June 7-8-9, 2006.
- [I1] *"Hyperbolic Elliptic Coupling by Interface Equation and Virtual Control Methods."* Invited lecture at the conference "Modern Techniques in the Numerical Solution of Partial Differential Equations." Crete, Greece, September 19-23, 2011.

Minisymposium invitations

- [MS22] *"Validation of the ICDD method to model the filtration of fluid in porous media"*. Coupled Problems 2023, Chania, Crete (GR), 5–7 June 2023 (Keynote speaker).
- [MS21] *"The INTERNODES method for the solution of PDEs in multidomain settings featuring non-conforming interfaces"*. SIMAI 2020+2021, Parma (Italy) August 31 – September 3, 2021.
- [MS20] *"An Overlapping Approach for Modelling the Filtration of Fluids in Porous Media"*. 16th U.S. National Congress on Computational Mechanics (USNCCM16). July 25-29, 2021. On-line conference.

- [MS19] *"INTERNODES, an interpolation-based method for non-conforming discretizations of PDEs"*. XXI Congresso UMI, Pavia September 2–7, 2019.
- [MS18] *"Coupling Navier-Stokes and Darcy equations: an overlapping approach"*. VII International Conference in Coupled Problems in Science and Engineering (Coupled Problems 2017), an ECCOMAS thematic conference. 12-14 June 2017, Rhodes Island (Greece).
- [MS17] *"INTERNODES: an interpolation-based approach for the numerical solution of PDEs on nonconforming discretizations."* DD24, 24th International Conference on Domain Decomposition Methods. 6-11 February 2017, Longyearbyen, Svalbard (Norway).
- [MS16] *"Interface control domain decomposition (ICDD) method to couple Navier-Stokes and Darcy equations."* DD24, 24th International Conference on Domain Decomposition Methods. 6-11 February 2017, Longyearbyen, Svalbard (Norway).
- [MS15] *"An overlapping approach to couple Navier-Stokes and Darcy equations."* SIMAI 2016 Milano (Italy), September 13 - 16 , 2016.
- [MS14] *"INTERNODES (INTERpolation for NON-conforming DEcompositionS): an accurate approach for the numerical solution of PDEs on nonconforming discretizations."* Eccomas: European Congress on Computational Methods in Applied Sciences and Engineering. Crete Island (Greece), 5-10 June, 2016.
- [MS13] *"Interface Control Domain Decomposition Method."* USNCCM13, 13th US National Congress on Computational Mechanics, San Diego CA (USA), July 27-31, 2015.
- [MS12] *"Coupling Navier-Stokes and Darcy equations: an overlapping approach."* Coupled Problems 2015 Venezia, San Servolo (VE, Italy), May 18 -20 , 2015.
- [MS11] *"Coupling Navier-Stokes and Darcy equations by ICDD method."* InterPore 2015 Padova, (PD, Italy), May 18 -21 , 2015.
- [MS10] *"Interface Control Domain Decomposition (ICDD) Method for Stokes Darcy coupling."* SIMAI 2014 Taormina (CT, Italy), July 7 -10 , 2014.
- [MS9] *"Interface control domain decomposition method for heterogeneous problems."* Coupled Problems in Science and Engineering 2013. 17-19 June 2013 Ibiza (Spain).
- [MS8] *"Virtual control method for multiphysics."* ECCOMAS 2012, European Congress on Computational Methods in Applied Sciences and Engineering. 10-14 September 2012 Vienna (Austria). (Communication in minisymposium)
- [MS7] *"Virtual control method for heterogeneous problems."* DD21, 21th International Conference on Domain Decomposition Methods. 25-29 June 2012 INRIA Rennes-Bretagne-Atlantique (FR).
- [MS6] *"Virtual Controls and Extended Variational Formulation for Hyperbolic/Elliptic Couplings."* DD20, 20th International Conference on Domain Decomposition Methods. UC San Diego, in La Jolla, California, February 7-11, 2011.
- [MS5] *"Virtual control approach for heterogeneous couplings."* SIMAI 2010 conference, Cagliari, Italy, June 21-25, 2010.
- [MS4] *"On the coupling of heterogeneous problems: asymptotic analysis, virtual control approach, extended variational formulation."* SIAM Conference on Analysis of Partial Differential Equations. December, 7-10, 2009. Miami, Florida.

- [MS3] *"On the coupling of heterogeneous problems: asymptotic analysis, virtual control approach, extended variational formulation."* COUPLED PROBLEMS 2009, Computational Methods for Coupled Problems in Science and Engineering (an ECCOMAS Thematic Conference). June 8-10, 2009. Ischia, Italy.
- [MS2] *"Algebraic fractional step schemes for spectral methods."* 17th IMACS World Congress, Scientific Computation, Applied Mathematics and Simulation. Paris, France, July 11-15 2005.
- [MS1] *"Heterogeneous coupling in elasticity and in fluid dynamics."* COUPLED PROBLEMS 2005, Computational Methods for Coupled Problems in Science and Engineering. (an ECCOMAS Thematic Conference). May 25-27, 2005. Santorini, Greece.

Contributed Talks within International Conferences

- [CT11] *"Interface Control Domain Decomposition (ICDD) method: an overlapping approach to couple Stokes and Darcy equations"*. International Congress on Industrial and Applied Mathematics (ICIAM 2019). July 15-19 in Valencia, Spain.
- [CT10] *"Interface Control Domain Decomposition (ICDD) Method for Navier-Stokes Darcy coupling."* DD22, 22th International Conference on Domain Decomposition Methods. 16-20 September 2013, Lugano (Switzerland). (Communication in minisymposium)
- [CT9] *"Interface Control Domain Decomposition (ICDD) Method."* Domain Decomposition Methods for Optimization with PDE Constraints. 1-6 September 2013, Ascona (Switzerland).
- [CT8] *"Finite-Element Preconditioners for G-NI Spectral Methods: Theoretical and Efficiency Comparison."* ICOSAHOM09, International Conference on Spectral and High Order Methods. June 22-26, 2009, Trondheim, Norway.
- [CT7] *"Optimal control in heterogeneous domain decomposition methods."* Theory, Numeric and Applications, Workshop of the INDAM intergroup project "Controllo e Numerica", INDAM, Roma, March 30 - April 1, 2005.
- [CT6] *"Spectral methods and algebraic fractional step schemes for incompressible Navier-Stokes equations."* ICOSAHOM04, International Conference on Spectral and High Order Methods. June 21-25, 2004, Brown University, Providence, RI.
- [CT5] *"Virtual control for the heterogeneous fourth-second order coupling."* 4th European Conference on Numerical Mathematics and Advanced Applications (ENUMATH01), Ischia, Italy, July 2001.
- [CT4] *"Heterogeneous coupling by virtual control methods."* DD13, 13th International Conference on Domain Decomposition Methods, Lyon, France, October 9-12, 2000.
- [CT3] *"Multimodels for incompressible flows."* DD12, 12th International Conference on Domain Decomposition Methods, Chiba University, Chiba, Japan, October 25-29 1999.
- [CT2] *"Homogeneous and heterogeneous coupling for 2D viscous incompressible flows via domain decomposition methods."* The Fourth International Congress on Industrial and Applied Mathematics, ICIAM 99, Edinburgh, Scotland, July 5-9 1999.

- [CT1] *"Stabilized Spectral Element method for the incompressible Navier-Stokes equations."* Conference on Recent Advances in Numerical Methods for PDE, International Centre for Theoretical Physics, Trieste, September 1996.

Contributed Talks within National Conferences and Workshops

- [CTN8] *"Metodi di Decomposizione di Domini per problemi eterogenei e geometrie non conformi."* Giornata del DICATAM 2018. 6 febbraio 2018. Unibs, Brescia.
- [CTN7] *"Attività di ricerca del Gruppo di Analisi Numerica."* Giornata del DICATAM 2014. 21 gennaio 2014. Unibs, Brescia.
- [CTN6] *"Precondizionatori agli Elementi Finiti per Metodi Spettrali."* Convegno Nazionale GNCS, 2009. 3-5 Febbraio, 2009. Montecatini, Italy.
- [CTN5] *"Precondizionatori agli Elementi Finiti per Metodi Spettrali."* Giornate di Algebra Lineare Numerica ed Applicazioni. Dipartimento di Matematica, Università di Padova. Padova, 26-27 febbraio 2007.
- [CTN4] *"Approssimazione numerica del modello "Rational Large Eddy Simulation"."* XVII Congresso U.M.I., Milano, Italy, 8-11 Settembre 2003.
- [CTN3] *"Un metodo di decomposizione di domini eterogeneo per le equazioni di Navier-Stokes incompressibili."* AIMETA - XIII Convegno Italiano di Meccanica Computazionale, Brescia, Italy, 13-15 Novembre 2000.
- [CTN2] *"The Spectral Projection Decomposition Method for Elliptic Equations."* Convegno Nazionale di Analisi Numerica, Montecatini Terme, Italy, Aprile 1994.
- [CTN1] *"Tecniche vettoriali e parallele per l'approssimazione spettrale di equazioni differenziali alle derivate parziali"*. XIV Congresso U.M.I., Catania, Settembre 1991.

Series of Lectures within International Doctoral School

- [DS2] October 2017. Lecturer for the course **Advanced topics in computational science for multiphysics problems**, offered by EDMA (the Doctoral School of Mathematics) at the Ecole Polytechnique Fédérale de Lausanne (EPFL). (6hours, English)
- [DS1] February 2016. Lecturer for the course **Power system dynamics and controls of in the presence of large penetration of renewables** Ph.D -MI(1381) Electrical Engineering of "Scuola di Dottorato di Ricerca" of Politecnico di Milano. Subjects: "Numerical solution of DAE", "Numerical approximation of Eigenvalues and Eigenvectors". (6 hours, English)

Seminars

- [S2] *"Spectral Methods."* MOX, Politecnico di Milano, Jan 20 2015.
- [S1] *"Precondizionatori agli Elementi Finiti per Matrici Spettrali."* Dipartimento di Matematica, Politecnico di Torino, May 30, 2007.

Conferences and Minisymposia organization

- 2022 Co-organizer of the minisymposium *"Domain Decomposition Methods for Multiphysics problems"* at **DD XXVII** (International Conference on Domain Decomposition Methods), Prague, July 2022.

- 2019 Co-organizer of the minisymposium “*Domain Decomposition Methods for Fluids*” at **FEF2019**, Chicago 2019.
- 2017 Co-organizer of the minisymposium “*DD-based Control and Control-based DD*” at **DD XXIV** (International Conference on Domain Decomposition Methods), Svalbard (Norway) 2017.

Funded Research Projects

- 2023–2026 **PRIN 2022**. Project title: *Full and Reduced order modelling of coupled systems: focus on non-matching methods and automatic learning (FaReX)*. Principal Investigator: Gianluigi Rozza, SISSA, Trieste. Role: member
- 2022–2024 **SafeAgroBee**: Safeguarding agroecosystem resilience under climate change through efficient pollination and sustainable beekeeping. PRIMA funded project. <https://www.safeagrobee.com/> Role: member. PI: Fani Hatjina (Greece)
- 2019–2023 **PRIN 2017**. Project title: *Modeling the heart across the scales: from cardiac cells to the whole organ*. Principal Investigator: Alfio Quarteroni, Politecnico di Milano. Role: member
- 2014–2017 **PRIN 2012**. Project title: *Metodologie innovative nella modellistica differenziale numerica*. Principal Investigator: Claudio Canuto, Politecnico di Torino. Role: member
- 2010–2012 **PRIN 2008**. Project title: *Interazione tra modelli differenziali e tra metodi di discretizzazione diversi per il loro trattamento numerico*. Principal Investigator: Franco Brezzi, Università di Pavia. Role: member
- 2004–2006 **PRIN 2004**. Project title: *Metodi numerici per simulazioni in fluidodinamica, elasticità ed elettromagnetismo*. Principal Investigator: Franco Brezzi, Università di Pavia. Role: member
- 2003–2005 **PRIN 2003**. Project title: *Modelli numerici per applicazioni avanzate in meccanica dei fluidi ed elettromagnetismo*. Principal Investigator: Alfio Quarteroni, Politecnico di Milano. Role: member
- 2001–2003 **PRIN 2001**. Project title: *Metodi di approssimazione numerica per problemi di fluidodinamica e di interazione fluido-strutture*. Principal Investigator: Franco Brezzi, Università di Pavia. Role: member
- 2000–2002 **PRIN 2000**. Project title: *Metodi e modelli multiscala per problemi di trasporto e di propagazione*. Principal Investigator: Claudio Verdi, Università di Milano. Role: member
- 1999–2001 **PRIN 1999**. Project title: *Approssimazione mediante elementi finiti di autovalori di problemi in forma mista e accoppiamento omogeneo ed eterogeneo per fluidi viscosi incompressibili mediante metodi spettrali e tecniche di decomposizione di domini*. Principal Investigator: Franco Brezzi, Università di Pavia. Role: member
- 1998–2000 **PRIN 1998**. Project title: *Modelli numerici avanzati per fluidodinamica ed elettromagnetismo*. Principal Investigator: Piero Colli Franzone, Università di Pavia. Role: member

- 2022 **GNCS-INDAM**. Project title: *Efficienza ed analisi di metodi numerici innovativi per la risoluzione di PDE*. Principal Investigator: Monica Montardini (Università degli Studi di Pavia). Role: member
- 2021 **GNCS-INDAM**. Project title: *Metodi numerici efficienti e innovativi per la risoluzione di PDE*. Principal Investigator: Mattia Tani (IMATI- Consiglio Nazionale delle Ricerche). Role: member
- 2020 **GNCS-INDAM**. Project title: *Metodi di discretizzazione per problemi di interazione fluido-struttura in domini complessi*. Principal Investigator: Marco Fedele (Politecnico di Milano). Role: member
- 2019 **GNCS-INDAM**. Project title: *Metodi numerici non-standard per PDEs: efficienza, robustezza e affidabilità*. Principal Investigator: Andrea Moiola (Università degli Studi di Pavia). Role: member
- 2018 **GNCS-INDAM**. Project title: *Metodi numerici avanzati per lo studio di problemi differenziali multifisica/multiscala alle derivate parziali*. Principal Investigator: Ilario Mazzieri (Politecnico di Milano). Role: member
- 2017 **GNCS-INDAM**. Project title: *Simulazione numerica di problemi di Interazione Fluido-Struttura (FSI) con metodi agli elementi finiti ed isogeometrici*. Principal Investigator: Daniele Boffi (University of Pavia). Role: member
- 2018–present **Research Local Funds - UNIBS**. Project title: *Approssimazione numerica di equazioni alle derivate parziali*.
- 1997–2017 **Research Local Funds - UNIBS**. “Analisi Numerica” group. Dipartimento di Matematica and DICATAM.
- 2015 **Internationalization Funds MIUR - DICATAM**, Università degli Studi di Brescia.
- 2002 **Internationalization Funds**, Università degli Studi di Brescia. Invitation of prof. V.I. Agoshokov, Institute of Numerical Mathematics, Russian Academy of Sciences.

Funded High Performance Computing (HPC) Projects

- Oct. 2017 – Feb. 2018 **CINECA funds**. Project title: *HPC per laureandi*. Amount: 500 CPU hours on Marconi1. Role: PI

Code Development

- 2007-onwards **CHQZlib**, Open-source MATLAB library for the approximation of PDEs by spectral methods and domain decomposition techniques. paola-gervasio.unibs.it/software
- 1992-onwards **SEM-f90**, Fortran library for the solution of PDEs using spectral methods and domain decomposition techniques (Incompressible Navier Stokes equations, Stokes-Darcy coupling, Overlapping and non-overlapping domain decomposition techniques, Heterogeneous coupling, FEM preconditioners for spectral matrices)

Computer Skills

Programming languages: Fortran, Matlab, Octave, Python, C++, Unix Shell

HPC tools: basics of MPI

Graphics programs: gimp

Markup languages: HTML

Typesetting languages: Latex

Referee activity

Referee for international journals

- Advances in Computational Mathematics,
- Applied Mathematics and Computation,
- Applied Numerical Mathematics,
- Calcolo,
- Computer Methods in Applied Mechanics and Engineering,
- Computers and Mathematics with Applications,
- Engineering Optimization,
- International Journal for Numerical Methods in Engineering,
- Journal of Computational and Applied Mathematics,
- Journal of Mechanics of MATERIALS and STRUCTURES,
- Linear Algebra and its Applications,
- M2AN,
- Mathematics in Engineering,
- Numerische Mathematik,
- Numerical Algorithms,
- Numerical Methods for Partial Differential Equations,
- Numerical Methods in Engineering,
- International Journal for Uncertainty Quantification,
- SIAM Journal on Numerical Analysis,
- SIAM Journal on Scientific Computing,

Referee for books proposal

- Springer Verlag,
- Wiley,
- Zanichelli.

Memberships

- 1990-1995 UMI, Unione Matematica Italiana.
- 1990-onwards GNCS-INDAM, Gruppo Nazionale di Calcolo Scientifico.
- 1990,2010-2015 SIMAI, Società Italiana di Matematica Applicata per l'Industria.
- 1990-onwards Seminario Matematico di Brescia.

Teaching Activity

Lecturer of 2 PhD courses in Numerical Analysis and of 2 series of lectures within International Doctoral Schools.

Lecturer of 2 first level Master Courses.

Lecturer of 22 Master's degree courses and 22 Bachelor's degree courses.

Lecturer-assistant of 13 Master's degree courses.

Co-lecturer at POLICOLLEGE (Politecnico di Milano), two years.

Supervisor of 5 master thesis, 14 bachelor thesis, and 8 1st level master thesis.

Co-Supervisor of 10 master thesis.

Lecturer of Ph.D. Courses

April-May 2020 Lecturer for the course **Numerical methods for partial differential equations**, Ph.D. Programme in Civil and Environmental Engineering, International cooperation and Mathematics (DICACIM) XXXV Cycle (A.Y. 2019/20) (22 hours).

March 2012 Lecturer for the course **Numerical method**, Ph.D. Programme in Natural Risks Assessment and Management. Università degli Studi di Brescia. (21 hours)

Invited lecturer of Ph.D. Courses

October 2017 Invited lecturer for the course **Advanced topics in computational science for multiphysics problems**, offered by EDMA (the Doctoral School of Mathematics) at the Ecole Polytechnique Fédérale de Lausanne (EPFL). (6hours)

February 2016 Invited lecturer for the course **Power system dynamics and controls of in the presence of large penetration of renewables** Ph.D -MI(1381) Electrical Engineering of "Scuola di Dottorato di Ricerca" of Politecnico di Milano. Subjects: "Numerical solution of DAE", "Numerical approximation of Eigenvalues and Eigenvectors". (6 hours)

Lecturer of first level Master Courses

2023 Lecturer (40 hours of theory/exercises/laboratory) for the course **Dalla realtà ai modelli matematici al calcolo scientifico**, 6CFU, Master in Matematica per l'accesso nei ruoli di docente della scuola secondaria classe A26 (MasterMath) a.a. 2022/2023. Università degli Studi di Brescia. (language: Italian)

2021 Lecturer (42 hours of theory/exercises/laboratory) for the course **Dalla realtà ai modelli matematici al calcolo scientifico**, 6CFU, Master in Matematica per l'accesso nei ruoli di docente della scuola secondaria classe A26 (MasterMath) a.a. 2020/2021. Università degli Studi di Brescia. (language: Italian)

Lecturer of Master Degree Courses

2014-onwards Lecturer (60 hours of theory/exercises/laboratory) for the course **Scientific Computing (Calcolo Scientifico)**, 6CFU, Master degree in Computer Science and Engineering, Electronics Engineering, Communication Technologies and Multimedia. Università degli Studi di Brescia. **8 courses** (language: Italian)

2010-2014 Lecturer (60 hours of theory/exercises/laboratory) for the course **Numerical Computing (Calcolo Numerico)**, 6CFU, Master degree in Computer Science and Engineering, Electronics Engineering, Communication Technologies and Multimedia. Università degli Studi di Brescia. **4 courses** (language: Italian)

2002-2010 Lecturer (60 hours of theory/exercises/laboratory) for the course **Numerical Computing A (Calcolo Numerico A)**, 6CFU, Master degree in Computer Science and Engineering, Electronics Engineering, Communication Technologies and Multimedia. Università degli Studi di Brescia. **8 courses** (language: Italian)

- 1995-1996 Adjunct Lecturer (100 hours of theory/exercises) for the course **Numerical Computing (Calcolo Numerico)**, Master degree in Civil, Electronic and Mechanical Engineering. Università degli Studi di Brescia. **1 course** (language: Italian)
- [Lecturer of Bachelor Degree Courses](#)
- 2008-onwards Lecturer (60 hours of theory/exercises) for the course **Mathematical Analysis 1 (Analisi Matematica 1)**, 9CFU, Bachelor degree in Computer Science and Engineering, Electronics Engineering and Communication Technologies and Multimedia. Università degli Studi di Brescia. **14 courses** (language: Italian)
- 2003-2008 Lecturer (60 hours of theory/exercises) for the course **Mathematical Analysis A (Analisi Matematica A)**, 6CFU, Bachelor degree in Civil and Environmental Engineering. Università degli Studi di Brescia. **5 courses** (language: Italian)
- 2007 **Mathematical Analysis A (Analisi Matematica A)**, 6CFU, Percorso di Preparazione agli Studi di Ingegneria. Università degli Studi di Brescia. **1 course** (language: italian)
- 1999–2001 **Numerical methods in engineering** (Metodi Numerici per l'Ingegneria), Diploma Universitario in Ingegneria Meccanica. Università degli Studi di Brescia. **2 academic years** (language: italian)
- [Assistant of Master Degree Courses](#)
- 1996-2005 Lecturer/assistant (60 hours of exercises/laboratory) for the course **Numerical Computing (Calcolo Numerico)**, Master degree in civil, Electronic, Mechanic Engineering. Università degli Studi di Brescia. **9 courses** (language: italian)
- 1990–1994 Lecturer/assistant (80 hours of exercises/laboratory) for the course **Sistemi per l'elaborazione dell'informazione**, Master degree in Mathematics Università Cattolica del Sacro Cuore, Sede di Brescia. **3 courses** (language: italian)
- 1992 Lecturer/assistant (exercises/laboratory) for the course **Numerical Calculus**, Master degree in Engineering. Politecnico di Milano. **1 course** (language: italian)
- [Innovative teaching for high schools](#)
- 2020-2021 Co-lecturer with A. Quarteroni for the course **Mathematical Models for understanding, simulating, exploring** within the POLICOLLEGE project of Politecnico di Milano (course repeated twice in 2020 and twice in 2021). policollege.polimi.it

Thesis supervised

- Supervisor of **5 master thesis**
- Supervisor of **14 bachelor thesis**
- Co-Supervisor of **10 master thesis**
- Supervisor of **8 first-level master thesis**

Master students supervised

- [MT5] Claudio Catterina. "Implementazione del metodo INTERNODES per Isogeometric Analysis in una libreria MATLAB/Octave". Master degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2018/19. (October 2019)

- [MT4] Marcello Zanardelli. "Il metodo INTERNODES per la simulazione numerica della filtrazione di fluidi in mezzi porosi". Master degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2016/17. (March 2018)
- [MT3] Marta Benedetti. "Calcolo con elementi spettrali 3D della trasmittanza termica puntuale di ponti termici in pannelli prefabbricati". Master degree in Electronics Engineering. Università degli Studi di Brescia. AY 2014/15. (May 2015)
- [MT2] Andrea Ghidini. "Algoritmi efficienti per la simulazione del moto di tessuti". Master degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2009/10.
- [MT1] Lorenzo Sala. "Approssimazione numerica mediante elementi finiti del processo di solidificazione di leghe metalliche". Master degree in Mechanical Engineering. Università degli Studi di Brescia. AY 2004/2005.

Bachelor students supervised

- [BT14] Passi Rachele. "Interpolazione polinomiale in problemi di interazione fluido-struttura". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2021/22. (February 2023)
- [BT13] Perani Xavier. "Precondizionatori a precisione ridotta per la risoluzione di sistemi lineari mal condizionati". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2020/21. (March 2022)
- [BT12] Vigani Alex. "La matematica come strumento musicale". ". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2020/21. (March 2022)
- [BT11] Ghanami Sara. "Sperimentazione di Open-MPI sul cluster Marconi del CINECA". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2016/17. (February 2018)
- [BT10] Cantoni Emanuela. "Sperimentazione di Open-MPI sul cluster Marconi del CINECA". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2016/17. (February 2018)
- [BT9] Michele Zanotti. "Conversione dello spazio colore di un'immagine tramite OpenCL". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2016/17. (October 2017)
- [BT8] Alessandro Cherubini. "Parallelizzazione in OpenCL di algoritmi per l'analisi di grafi". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2015/16. (February 2017)
- [BT7] Emanuele Albini. "OpenCL parallelization of Machine Learning algorithms". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2015/16.
- [BT6] Claudio Catterina. "Realizzazione di animazioni con HTML5 Canvas per la comprensione dei concetti di derivata prima e funzione integrale." MathCanvas. Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2014/15.
- [BT5] Gallia Jonny. "Analisi di prestazioni dell'ambiente OpenCL." Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2014/15

- [BT4] Donatello Rovizzi. "Un applet JAVA a supporto dell'insegnamento dell'Analisi Matematica 1. Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2014/15
- [BT3] Ilaria Martinelli. "Strumenti per l'elaborazione parallela in MATLAB." Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2011/12
- [BT2] Davide Cagna. "Strumenti per l'elaborazione parallela su architetture multiprocessore in Octave". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2011/12
- [BT1] Riccardo Orizio. "Generazione di mesh 3D per metodi agli elementi spettrali". Bachelor degree in Computer Science and Engineering. Università degli Studi di Brescia. AY 2011/12

Master Students Co-advised

- [MTC10] Rebecca Faustini. "Metodi agli elementi spettrali per problemi ellittici del quarto ordine". Master Degree in Mathematics, Università Cattolica del Sacro Cuore, Brescia. (April 2024)
- [MTC9] Francesco Mantegazza. "Implementation of a CUDA GPU-accelerated parallel matrix-free solver for the cardiac electrophysiology in lifex." Master degree in Mathematical Engineering. Advisor Prof. Alfio Quarteroni. Politecnico di Milano (December 2022).
- [MTC8] Daniele Calandra. "Correlazione per il calcolo della trasmittanza lineare di ponti termici in pannelli prefabbricati a taglio termico alleggerito. Master Degree in Industrial Engineering. Advisor Prof. Adriano Maria Lezzi A.Y. 2014/15
- [MTC7] Alberto Trainini. "Digital Image Correlation". Master degree in Land and Environmental Engineering. Advisor Prof. Giovanni Plizzari. A.Y. 2014/15
- [MTC6] Marianna Signorini. "Interface Control Domain Decomposition Problems". Master degree in Mathematical Engineering. Advisor Prof. Alfio Quarteroni. Politecnico di Milano. A.Y. 2011/12
- [MTC5] Andrea Colombi. "H matrices: a literature survey, engineering applications, and patent policies". Master degree in Industrial Engineering. Advisor Dr. Alberto Salvadori. Università degli Studi di Brescia. A.Y. 2007/08
- [MTC4] Nicola Rossini. "Procedure iterative per l'analisi dell'interazione dinamica tra veicolo e ponte." Master degree in Civil Engineering. Advisor Dr. Anna Feriani. Università degli Studi di Brescia. A.Y. 2007/08
- [MTC3] Alessio Masi. "Aspetti computazionali della propagazione di fratture in mezzi elastici lineari." Master degree in Civil Engineering. Advisor Dr. Alberto Salvadori. Università degli Studi di Brescia. A.Y. 2005/06
- [MTC2] Federico La Torre. "Confronto numerico per flussi turbolenti: RLES e modello multiscala". Laurea degree in Aerospace Engineering. Advisor Prof. Fausto Saleri. Politecnico di Milano. A.Y. 2004/05
- [MTC1] Paola Causin. "Metodi spettrali multidomini per le equazioni di Navier-Stokes tridimensionali". Laurea degree in Aerospace Engineering. Advisor Prof. Alfio Quarteroni. Politecnico di Milano. A.Y. 1997/98

MasterMath Students advised

- [MMT8] Silvia Sartor. "Modello della catena alimentare tra tre specie viventi". Mastermath, Università degli Studi di Brescia. AA 2022/23. October 27, 2023
- [MMT7] Bernardel Flora. "Elaborazione numerica dei segnali: progettazione di un'attività didattica con il software Octave". Mastermath, Università degli Studi di Brescia. AA 2022/23. October 27, 2023
- [MMT6] Marco Bertella. "Il Metodo di Eliminazione di Gauss: applicazione al calcolo delle reazioni vincolari di una trave semplice e di una struttura reticolare". Mastermath, Università degli Studi di Brescia. AA 2022/23. October 6, 2023
- [MMT5] Manuel Tira. "Matrici Sparse, Fattorizzazione e problema del Fill-in". Mastermath, Università degli Studi di Brescia. AA 2022/23. October 6, 2023
- [MMT4] Valentina Andreoli. "Progetto M.I.B. (Matematica, Informatica, Biologia): Utilizzo integrato di Matematica, Informatica e Biologia per la modellizzazione dell'evoluzione di una pandemia". Mastermath, Università degli Studi di Brescia. AA 2022/23. October 6, 2023
- [MMT3] Alessandro Gnutti. "Una lezione sulla trasformata di Fourier Teoria e applicazioni nell'era digitale". Mastermath, Università degli Studi di Brescia. AA 2020/21. February 28, 2022
- [MMT2] Giuseppe Lecchi. "Formule di quadratura numerica per la stima del prezzo di vendita di un insaccato." Mastermath, Università degli Studi di Brescia. AA 2020/21. February 28, 2022
- [MMT1] Gianluca Stucchi. "Un algoritmo che sa consigliarmi cosa guardare". Mastermath, Università degli Studi di Brescia. AA 2020/21. January 31, 2022

Service activities

- 2020-onwards Member of the Scientific Committee and teacher of the first level *Master in Matematica per l'accesso nei ruoli di docente della scuola secondaria classe A26*, Università degli Studi di Brescia.
- 2014-2017 Member of the Ph.D. Committee of the "Civil and Environmental Engineering" Ph.D. Programme, Università degli Studi di Brescia. Cycles: XXIX (beginning A.Y. 2013/14), XXX (beginning A.Y. 2014/15), XXXI (beginning A.Y. 2015/16).
- 2016- onward Member of the Ph.D. Committee of the "Civil and Environmental Engineering, International cooperation and Mathematics" Ph.D. Programme (DICACIM) Università degli Studi di Brescia. Cycles: 32 (beginning A.Y. 2016/17), 33 (beginning A.Y. 2017/18), 34 (beginning A.Y. 2018/19), 37 (beginning A.Y. 2021/22), 38 (beginning A.Y. 2022/23), 39 (beginning A.Y. 2023/24).
- 2021 - Reference teacher for the Department Web Pages. (Resolution of the DICATAM onward Board, 03.03.2021)

- 2018 Editor for the Web-sites of the Study programmes of the Department of Civil, Environmental, Architectural Engineering and Mathematics:
- Corso di Laurea in Ingegneria per l'Ambiente e il Territorio
 - Corso di Laurea in Ingegneria Civile
 - Corso di Laurea Magistrale in Ingegneria per l'Ambiente e il Territorio
 - Corso di Laurea Magistrale in Ingegneria Civile
 - Corso di Laurea in Ingegneria Magistrale a ciclo unico in Ingegneria Edile e Architettura
- 2018 Member of "Commissione di Riesame Ciclico per la laurea magistrale in Ingegneria Informatica", Department of Information Engineering, Università degli Studi di Brescia.
- 14.11.2012- Delegate to IT Services of DICATAM and Editor of the Web-sites of DICATAM.
31.10.2020 Università degli Studi di Brescia. (Resolution of the DICATAM Board, 14.11.2012)
- 01.11.2010- Member of the "Commission for orientation and study plans" for students in "Com-
14.12.2021 puter Science and engineering", "Electronics and telecommunications engineering".
Università degli Studi di Brescia.
- 2002-2012 Member of "Commissione Rete della Facoltà di Ingegneria." Università degli Studi di Brescia.
- 2007-2012 Head of the "IT Commission" and person in charge of computer equipment of the Department of Mathematics, Università degli Studi di Brescia.

External Committees Member

- August 2021 External expertise and member of the Jury for the Master thesis of Yannis Voet. Master degree in Civil Engineering, EPFL, Lausanne.
- Dec. 2020 External referee and member of the Jury for the Ph.D. defense of Luca Pegolotti, EPFL, Lausanne.
- Apr. 2019 External referee for the Master thesis of Giulia Sambataro, master degree in Mathematical Engineering. Politecnico di Milano, Milano.
- Jul. 2018 Co-Examiner for the Master thesis of Antonio Iubatti, master degree in Mathematical Engineering. Politecnico di Milano, Milano.
- Oct. 2017 Member of the Jury for the Ph.D. defense of Michele Annese in "Ingegneria Civile e Ambientale", Università degli Studi di Brescia.
- Feb. 2017 Member of the Jury for the Ph.D. defense in "MATHEMATICAL MODELS AND METHODS IN ENGINEERING", A.Y. 2016/17, Politecnico di Milano, Milano.
- Jul. 2016 External referee and member of the Jury for the Ph.D. defense of Ondine Chanon, EPFL, Lausanne.
- Sep. 2012 External referee and member of the Jury for the Ph.D. defense of Laura Iapichino, EPFL, Lausanne.

Hiring Committees for Faculty Members

- 2023 Member of the Hiring Committee for a fixed-term Assistant Professor Position (RTD-B) in Numerical Analysis at Università degli Studi di Milano.
- 2021 Member of the Hiring Committee for a fixed-term Assistant Professor Position (RTD-B) in Numerical Analysis at Politecnico di Milano.
- 2020-21 Member of the Hiring Committee for a fixed-term Assistant Professor Position (RTD-B) in Numerical Analysis at Università Cattolica del Sacro Cuore, Brescia.
- 2020 Member of the Hiring Committee for a fixed-term Assistant Professor Position (RTD-B) in Numerical Analysis at Politecnico di Milano.
- 2016 Member of the Hiring Committee for a fixed-term Assistant Professor Position (RTD-A) in Numerical Analysis at Politecnico di Milano.
- 2013 Member of the Hiring Committee for a fixed-term Assistant Professor Position (RTD-A) in Numerical Analysis at Politecnico di Milano.
- 2004 Member of the Hiring Committee for n.1 Research position in Numerical Analysis at Università degli Studi di Milano.
- 2001 Member of the Hiring Committee for n.1 Research position in Numerical Analysis at Politecnico di Milano.

Dissemination of Mathematics

Communications

- August 2023 “Modelli matematici per comprendere, simulare, esplorare”. 51^o Seminario Nazionale del Centro Ricerche Didattiche “Ugo Morin”. Paderno del Grappa 23 – 25 agosto 2023. (invited lecture)
- August 2023 “Prede e predatori nel mare della matematica”. 51^o Seminario Nazionale del Centro Ricerche Didattiche “Ugo Morin”. Paderno del Grappa 23 – 25 agosto 2023. (invited lecture)
- September 2022 “La matematica svela la musica dell’arte”. Riemann International School of Mathematics and Fondazione Morandini. Varese, 13 October 2022. <https://www.rism.it/events/la-matematica-svela-la-musica-dell-arte>
- August 2021 “Dalla realtà ai modelli matematici al calcolo scientifico”. Keynote communication at Edu-SIMAI

Publications

- November 2023 Paola Gervasio, “*Modelli matematici per comprendere, simulare, esplorare*”, L’insegnamento della matematica e delle scienze integrate, Rivista del centro Ricerche didattiche Ugo Morin. (2023), vol. November, pp. 408–421
- November 2023 Paola Gervasio, “*Prede e predatori nel mare della matematica*”, L’insegnamento della matematica e delle scienze integrate, Rivista del centro Ricerche didattiche Ugo Morin. (2023), vol. November, pp. 522–531
- January 2020 Paola Gervasio, “*La realtà ha la matematica nel sangue*”, Prisma Magazine n.15, January 2020, pp. 62–65 (www.prismamagazine.it)

Publications

Books

- [B9] A. Quarteroni, P. Gervasio. *A Primer on Mathematical Modelling*. 2020, Springer Nature. ISBN 978-3-030-44540-9
- [B8] A. Quarteroni, P. Gervasio. *I delfini delle Eolie, i battiti del cuore, i motori di ricerca Modelli matematici per comprendere, simulare, esplorare*. 2019, Zanichelli. ISBN 9788808920553
- [B7] A. Quarteroni, F. Saleri, P. Gervasio. *Calcolo Scientifico. Esercizi e problemi risolti con MATLAB e Octave*. 6a Edizione., 2017, Springer. ISBN: 978-88-470-3953-7.
- [B6] A. Quarteroni, F. Saleri, P. Gervasio. *Scientific Computing with MATLAB and Octave (Japanese)* 2014, Maruzen Publishing Co. ISBN 978-4-621-06521-1
- [B5] A. Quarteroni, R. Sacco, F. Saleri, P. Gervasio. *Matematica Numerica*. 4a edizione., 2014, ca. 520 pagg., Springer. ISBN: 978-88-470-5643-5
- [B4] A. Quarteroni, F. Saleri, P. Gervasio. *Scientific Computing with MATLAB and Octave*. Series: Texts in Computational Science and Engineering, Vol. 2. 4th Edition., 2014, XVI, 442 p., Hardcover. Springer. ISBN: 978-3-642-45366-3
- [B3] A. Quarteroni, F. Saleri, P. Gervasio. *Calcolo Scientifico. Esercizi e problemi risolti con MATLAB e Octave*. 5a Edizione., 2012, XVIII, 450 p. Springer. ISBN: 978-88-470-2744-2.
- [B2] A. Quarteroni, F. Saleri, P. Gervasio. *Scientific Computing with MATLAB and Octave*. Series: Texts in Computational Science and Engineering, Vol. 2. 3rd Edition., 2010, XVI, 360 p., Hardcover. Springer. ISBN: 978-3-642-12429-7
- [B1] A. Quarteroni, F. Saleri, P. Gervasio. *Calcul Scientifique - Cours, exercices corrigés et illustrations en Matlab et Octave*. 2nd Edition., 2010, 360 p., Broché. Springer. ISBN: 978-88-470-1675-0

Submitted manuscripts

- [S1] D. Cassani, P. Gervasio, A. Quarteroni. (2022) "Let do paintings play". <https://arxiv.org/abs/2206.14142v2>
- [S4] Zappon, E., Manzoni, A., Gervasio, P., Quarteroni, A. (2022) "A reduced order model for domain decompositions with non-conforming interfaces" <https://arxiv.org/abs/2206.09618v2>

Refereed Journal Papers and Book Chapters

- [P43] G. Gilioli, G. Sperandio, A. Simonetto, M. Ciampitti, B. Cavagna, A. Bianchi, A. Battisti, N. Mori, A. De Francesco, P. Gervasio. (2024) Predicting the spatio-temporal dynamics of *Popillia japonica* populations. *Journal of Pest Science*. DOI: 0.1007/s10340-023-01738-x. Published 23 January 2024.
- [P42] E. Zappon, A. Manzoni, P. Gervasio, and A. Quarteroni. (2024) A reduced order model for domain decompositions with non-conforming interfaces. Accepted for publication in *Journal of Scientific Computing* (January 2024). arXiv:2206.09618
- [P41] Pasquale Claudio Africa, Matteo Salvador, Paola Gervasio, Luca Dede', Alfio Quarteroni. (2023) "A matrix-free high-order solver for the numerical solution of cardiac electrophysiology". *Journal of Computational Physics*. 111984. (Published on-line: 03 February 2023) DOI: 10.1016/j.jcp.2023.111984.

- [P40] Y.D. Voet, G. Anciaux, S. Deparis, P. Gervasio. (2022) "The INTERNODES method for applications in contact mechanics and dedicated preconditioning techniques". *Computers and Mathematics with Applications*, 127, pp. 48–64. Published online October 2022, printed version 1st December 2022
- [P39] L. Formaggia, P. Gervasio, Y. Maday, H.Z. Phu. (2022) "Mathematical Modelling and Scientific Computing: an Effective Way to Understand Reality." (Editorial) Preface to Two Special Issues Dedicated to Alfio Quarteroni on the occasion of his 70th birthday. *Vietnam Journal of Mathematics*, 2022, 50(4), pp. 829–832
- [P38] G. Gilioli, G. Sperandio, A. Simonetto, M. Ciampitti, P. Gervasio. (2022) "Risk of establishment and potential impacts of transient populations of *Spodoptera frugiperda* in Europe". *Journal of Pest Science* (Published on-line: 03 June 2022). doi: 10.1007/s10340-022-01517-0.
- [P37] Simone Deparis, Paola Gervasio. (2022) "Conservation of Forces and Total Work at the Interface Using the Internodes Method". *Vietnam Journal of Mathematics*. 50(4), pp. 901–928. DOI: 10.1007/s10013-022-00560-9. Published 10 May 2022.
- [P36] Zhouxiang Ding, Paola Gervasio, Wenjun Zhang, and Zhaohui Yang. (2022) "Fillunger–Heinrich's Theory of Porodynamics: Predictive Power and Analytical Solution". *Journal of Engineering Mechanics (ASCE)*. Volume 148 Issue 3. DOI: 10.1061/%28ASCE%29EM.1943-7889.0002058
- [P35] G. Gilioli, G. Sperandio, A. Simonetto, M. Colturato, A. Battisti, N. Mori, M. Ciampitti, B. Cavagna, A. Bianchi, P. Gervasio. (2022) "Modelling diapause termination and phenology of the Japanese beetle, *Popillia japonica*." *Journal of Pest Science*. 95(2), pp. 869–880. DOI: 10.1007/s10340-021-01434-8. Published online 20 September 2021. Print version March 2022
- [P34] G. Gilioli, G. Sperandio, A. Simonetto, M. Ciampitti, P. Gervasio. (2022) "Assessing the risk of establishment and transient populations of *Spodoptera frugiperda* in Europe". *Journal of Pest Science*. DOI: 10.1007/s10340-022-01517-0. Published 03 June 2022
- [P33] Francesca Colasuonno, Fausto Ferrari, Paola Gervasio, Alfio Quarteroni. (2022) "Some evaluations of the fractional p -Laplace operator on radial functions". *Mathematics in Engineering (AIMS)*. Volume 5, Issue 1: 1-23. doi: 10.3934/mine.2023015
- [P32] G. Gilioli, G. Sperandio, M. Colturato, S. Pasquali, P. Gervasio, A. Wilstermann, A.R. Dominic, G. Schrader. (2022) "Non-linear physiological responses to climate change: the case of *Ceratitis capitata* distribution and abundance in Europe." *Biological Invasions*, 2022, 24(1), pp. 261–279. DOI: 10.1007/s10530-021-02639-9. Published online: 05 October 2021. Print version January 2022
- [P31] G. Gilioli; P.L. Colli; M. Colturato; P. Gervasio; G. Sperandio. (2021) "A nonlinear model for structured population dynamics with density-dependent regulation: an application to the fall armyworm moth". *Mathematical Biosciences* 335, 2 March 2021, Article number 108573. DOI: 10.1016/j.mbs.2021.108573
- [P30] P. Gervasio, L. Dedè, O. Chanon, A. Quarteroni. (2020) A computational comparison between Isogeometric Analysis and Spectral Element Methods: accuracy and spectral properties. *Journal on Scientific Computing*. 83, 1 April 2020, Article number 18. DOI: 10.1007/s10915-020-01204-1, shareable link: <https://rdcu.be/b3mes>

- [P29] P. Gervasio, F. Marini (2020) The INTERNODES method for the treatment of non-conforming multipatch geometries in Isogeometric Analysis. *Computer Methods in Applied Mechanics and Engineering*. 358, 1 January 2020, Article number 112630. DOI: 10.1016/j.cma.2019.112630
- [P28] P. Gervasio, and A. Quarteroni. (2019) The INTERNODES Method for Non-conforming Discretizations of PDEs. *Communications on Applied Mathematics and Computation*, 1, pp. 361-401. DOI doi.org/10.1007/s42967-019-00020-1
- [P27] M. Benedetti, P. Gervasio, D. Luscietti, M. Pilotelli, A.M. Lezzi. (2019) Point Thermal Transmittance of Rib Intersections in Concrete Sandwich Wall Panels. *Heat Transfer Engineering*, 40, Issue 13-14, pp. 1075-1084. DOI: 10.1080/01457632.2018.1457208
- [P26] P. Gervasio, and A. Quarteroni. (2018) Analysis of the INTERNODES method for non-conforming discretizations of elliptic equations. *Computer Methods in Applied Mechanics and Engineering*, vol. 334, pp. 138-166. DOI 10.1016/j.cma.2018.02.004
- [P25] D. Forti, S. Deparis, P. Gervasio, A. Quarteroni. INTERNODES: an accurate interpolation-based method for coupling the Galerkin solutions of PDEs on subdomains featuring non-conforming interfaces. (2016) *Computers & Fluids*. 141, pp. 22-41. DOI dx.doi.org/10.1016/j.compfluid.2016.03.033
- [P24] P. Pacciarini, P. Gervasio, A. Quarteroni. Spectral Based Discontinuous Galerkin Reduced Basis Element Method for Parametrized Stokes Problems. (2016) *Computers & Mathematics with Applications*. 72 Issue 8, pp. 1977-1987. DOI doi:10.1016/j.camwa.2016.01.030
- [P23] M. Discacciati, P. Gervasio, A. Giacomini, and A. Quarteroni. Interface Control Domain Decomposition (ICDD) Method for Stokes Darcy coupling. (2016) *SIAM J. Numer. Anal.* 54 (2), 1039-1068. DOI : dx.doi.org/10.1137/15M101854X
- [P22] M. Discacciati, P. Gervasio, and A. Quarteroni. Interface Control Domain Decomposition Methods for Heterogeneous Problems. *Int. J. Num. Meth. Fluids* (2014) vol. 76 Issue 8, pp. 471-496, doi: 10.1002/flid.3942
- [P21] M. Discacciati, P. Gervasio and A. Quarteroni. The interface control domain decomposition (ICDD) method for the Stokes problem. *J. Coupled Syst. Multiscale Dyn.* 1 (2013), 372-392
- [P20] M. Discacciati, P. Gervasio and A. Quarteroni. The Interface Control Domain Decomposition (ICDD) Method for Elliptic Problems. (2013) *SIAM J. Control Optim.*, 51(5), 3434–3458.
- [P19] M. Discacciati, P. Gervasio, A. Quarteroni. Heterogeneous mathematical models in fluid dynamics and associated solution algorithms, in *Multiscale and Adaptivity: Modeling, Numerics and Applications*, C.I.M.E. Summer School, Cetraro, Italy 2009. Editors: Giovanni Naldi, Giovanni Russo. Series: *Lecture Notes in Mathematics*, Vol. 2040 . January, 2012.
- [P18] P. Blanco, P. Gervasio, A. Quarteroni. Extended variational formulation for heterogeneous partial differential equations. *Comp. Meth. in Applied Math. (CMAM)* 11 (2011), no. 2, 141–172.

- [P17] C. Canuto, P. Gervasio, A. Quarteroni. Finite-Element Preconditioning of G-NI Spectral Methods. *SIAM J. Sci. Comput.* 31 (2010), no. 6, 4422–4451. <http://dx.doi.org/10.1137/090746367> (preliminary form: *Quaderno del Seminario Matematico di Brescia* n.01/2009)
- [P16] Paola Gervasio. Convergence Analysis of High Order Algebraic Fractional Step Schemes for Time-Dependent Stokes Equations. *SIAM J. Numer. Anal.* 46 (2008), no. 4, 1682–1703. <http://dx.doi.org/10.1137/070682800> (preliminary form: *Quaderno del Seminario Matematico di Brescia* n.24/2006)
- [P15] V. Agoshkov, P. Gervasio, A. Quarteroni. Optimal control in heterogeneous domain decomposition methods for advection-diffusion equations. *Mediterr. J. Math.* 3 (2006), no. 2, 147–176.
- [P14] P. Gervasio, F. Saleri. Algebraic fractional-step schemes for time-dependent incompressible Navier-Stokes equations. *Journal of Scientific Computing* 27 (2006) no. 1-3, pp. 257–269.
- [P13] P. Gervasio, F. Saleri, A. Veneziani. Algebraic fractional-step schemes with spectral methods for the incompressible Navier-Stokes equations. *Journal of Computational Physics.* 214 (2006), no. 1, 347-365. doi:10.1016/j.jcp.2005.09.018
- [P12] V. Agoshkov, P. Gervasio, A. Quarteroni. Optimal control in heterogeneous domain decomposition methods. *Russian J. Numer. Anal. Math. Modelling* 20 (2005), no. 3, 229–246.
- [P11] Paola Gervasio. Homogeneous and heterogeneous domain decomposition methods for plate bending problems. *Comput. Methods Appl. Mech. Engrg.*, 194 (2005), no. 42-44, 4321-4343.
- [P10] P. Gervasio, M.G. Naso. Numerical approximation of controllability of trajectories for Euler-Bernoulli thermoelastic plates. *Math. Models Methods Appl. Sci.*, 14 (2004), no. 5, pp. 701-734.
- [P9] P. Gervasio, J.-L. Lions, A. Quarteroni. Heterogeneous coupling by virtual control methods, *Numer. Math.* 90 (2001), no. 2, pp. 241-264.
- [P8] L. Fatone, P. Gervasio, A. Quarteroni. Multimodels for incompressible flows: iterative solutions for the Navier-Stokes/Oseen coupling, *Mathematical Modelling and Numerical Analysis* 35 (2001), no. 3, pp. 549-574.
- [P7] L. Fatone, P. Gervasio, A. Quarteroni. Multimodels for incompressible flows, *Journal of Mathematical Fluid Mechanics*, 2 (2000), no. 2, 126–150.
- [P6] P. Gervasio, A. Quarteroni, F. Saleri. Spectral Approximation of Navier-Stokes Equations, in *Fundamental Directions in Mathematical Fluid Mechanics*, P. Galdi, J. Heywood and R. Rannacher, Eds., Birkhäuser, Basel 2000, pp 71-128.
- [P5] P. Gervasio, F. Saleri. Stabilized Spectral Element Approximation for the Navier Stokes Equations. *Numerical Methods for Partial Differential Equations* 14 (1998), no. 1, 115–141.
- [P4] P. Gervasio, E. Ovtchinnikov, A. Quarteroni. The Spectral Projection Decomposition Method for elliptic equations in 2D. *J. Numer. Anal.* 34 (1997), no. 4, 1616–1639. <http://dx.doi.org/10.1137/S0036142994265334>

- [P3] P. Gervasio. Fractional Step Methods for Spectral Approximation of Advection Diffusion Equations, *Mathematical Models & Methods in Applied Sciences*, 6 (1996), no. 7, 1027–1050.
- [P2] P. Gervasio, A. Quarteroni, L. Valdettaro. Effective Algorithms for Spectral Methods with Applications, *Surv. Math. Ind.* 4 (1995), no. 4, 319-336.
- [P1] C. Carlenzoli, P. Gervasio. Effective Numerical Algorithms for the Solution of Algebraic Systems Arising in Spectral Methods *Applied Numerical Mathematics* 10 (1992), 87-113.
- [Conference Proceedings \(with peer review\)](#)
- [CP10] P. Gervasio, and A. Quarteroni. (2018) INTERNODES for elliptic problems. in *Domain Decomposition Methods in Science and Engineering XXIV (DD24)*. pp. 347-356. *Lecture Notes in Computational Science and Engineering*, Vol. 125. Springer International Publishing. DOI: 10.1007/978-3-319-93873-8_32
- [CP9] P. Gervasio, and A. Quarteroni. (2018) INTERNODES for heterogeneous couplings. in *Domain Decomposition Methods in Science and Engineering XXIV (DD24)*. pp. 61-73. *Lecture Notes in Computational Science and Engineering*, Vol. 125. Springer International Publishing. DOI: 10.1007/978-3-319-93873-8_5
- [CP8] D. Luscietti, P. Gervasio, A.M. Lezzi. Computation of linear transmittance of thermal bridges in precast concrete sandwich panels. *Journal of Physics: Conference Series*. Vol. 547 Issue 1 (2014) doi:10.1088/1742-6596/547/1/012014
- [CP7] P. Blanco, P. Gervasio, A. Quarteroni. Mortar coupling for heterogeneous partial differential equations. in *Domain Decomposition Methods in Science and Engineering XX (DD20)*. pp. 443-450. Bank, R.; Holst, M.; Widlund, O.; Xu, J. (Eds.) *Lecture Notes in Computational Science and Engineering*, Vol. 91. Springer-Verlag, Berlin, / 2013, XVI, 680 p. ISBN 978-3-642-35274-4.
- [CP6] P. Gervasio, S. Piccagli, A. Visioli. On the Practical Implementation of Feedforward Control Signals Given in Polynomial Form. In *Proceedings of 14th IEEE International Conference on Emerging Technologies and Factory (ETFA'09)*, Mallorca, Spain, September 22-26, 2009, p. 1-7
- [CP5] Paola Gervasio. Virtual Control for Fourth-Order Problems and for Heterogeneous Fourth-Order Second-Order Coupling. *Numerical Mathematics and Advanced Applications*. Brezzi F., Buffa A., Corsaro S., Murli A., (Eds.) In *Numerical Mathematics and Advanced Applications*. *Proceedings of ENUMATH 2001, the 4th European Conference on Numerical Mathematics and Advanced Applications*, Ischia, July 2001. Springer, 2003. pp. 827-836.
- [CP4] P. Gervasio, J.-L. Lions, A. Quarteroni. Domain decomposition and virtual control for fourth order problems. In N. Debit et al. (eds) *Proceedings of 13th International Conference on Domain Decomposition Methods*. *Centro Internacional de Metodos Numericos en Ingegneria*. Barcelona, 2002. p. 263-269.

- [CP3] L. Fatone, P. Gervasio, A. Quarteroni. Numerical solution of vascular flows by heterogeneous domain decomposition methods for incompressible flows. in Domain Decomposition Methods in Sciences and Engineering. Proceedings of 12th International Conference on Domain Decomposition Methods, Chiba, Japan, 1999. T. Chan, T. Kako, H. Kawarada, O. Pironneau (eds), DDM.org, Japan, 2001, pp. 297-304.
- [CP2] L. Fatone, P. Gervasio, A. Quarteroni. Iterative solutions of multimodels for incompressible flows. ENUMATH 99 - Proceedings of the 3rd European Conference on Numerical Mathematics and Advanced Applications, Jyväskylä, Finland, July 26-30, 1999, ed. by P. Neittaanmäki, T. Tiihonen and P. Tarvainen, World Scientific, Singapore 2000, pp 470-477.
- [CP1] A. Brambilla, C. Carlenzoli, G. Gazzaniga, P. Gervasio, G. Sacchi. Implementation of domain decomposition Techniques on nCUBE2 Parallel Machine, Domain decomposition methods in science and engineering (Como, 1992), 345–351, Contemp. Math., 157, Amer. Math. Soc., Providence, RI, 1994.

Technical Reports

- [TR2] A. Brambilla, C. Carlenzoli, G. Gazzaniga, P. Gervasio, G. Sacchi. Solving elliptic boundary-value problems on a distributed memory parallel computer, Quaderno n. 11/93 del Seminario Matematico di Brescia.
- [TR1] C. Carlenzoli, P. Gervasio. Implementation of the Dirichlet- Neumann procedure on hypercube architecture. Quaderno n. 2/92 del Seminario Matematico di Brescia.

Other Publications

- Ph.D. Thesis P. Gervasio. “PDE approximation by spectral methods and domain decomposition methods” (in italian). Università degli Studi di Milano, February 1995.
- Master Thesis P. Gervasio. “ Efficient Algorithms for spectral methods: direct techniques” (in italian). Università Cattolica del Sacro Cuore, Brescia, July 1990.