

Marco Caliarì's Curriculum Vitae

Personal information

Marco Caliarì
Via Pace, 12
37064 Povegliano Veronese (VR)
email marco.caliari@univr.it

Born on October 6, 1976, Villafranca di Verona, Verona,
ITALY

Research identifiers

ORCID	0000-0002-1277-069X
Scopus	6701600045
ResearcherID	B-6835-2013
MathSciNet	713004

Research interests

Exponential integrators for linear and nonlinear semidiscretized PDEs (finite differences, finite elements, spectral methods, “meshfree”), with particular emphasis on matrix exponential approximation and related functions (cf. [1, 2, 3, 4, 5, 6, 7, 11, 12] and [13, 14, 16, 20, 23, 26, 27, 31, 34, 35, 37, 44, 46, 51, 53, 54, 56, 57]).

Numerical integrators for nonlinear Schrödinger equations (finite differences, spectral methods, exponential splitting methods) (cf. [8, 9, 10] and [15, 18, 19, 24, 29, 30, 34, 41, 55]) and computation of ground states and self-preserving structures (cf. [9] and [25, 33, 36, 39, 40]).

Bivariate and trivariate polynomial interpolation and hyperinterpolation at optimal nodal sets such as Padua points (cf. [22, 32, 38, 42, 43, 45, 47, 48, 49, 50, 52]).

Current position

since 01/10/2025 **Chairperson of the Mathematics and Data Science Teaching Committee** for the Bachelor’s Degree in Applied Mathematics, Master’s Degree in Mathematics, and Master’s Degree in Data Science, University of Verona.

since 01/03/2024	Full Professor in MATH-05/A (ex MAT/08) - Numerical analysis, Department of Computer Science, University of Verona.
04/2025	Member of the Doctoral School Committee of Mathematics, Universities of Trento, 41st cycle.

Previous positions

since 01/10/2015	Associate Professor in MAT/08 - Numerical analysis, Department of Computer Science, University of Verona.
10/2019–09/2021	Co-Adviser of the Adviser of the Rector in Teaching and Education, University of Verona.
10/2018–09/2021	Chairperson of the Mathematics Teaching Committee for the Bachelor's Degree in Applied Mathematics and Master's Degree in Mathematics, University of Verona.
2013–2024	Member of the Doctoral School Committee of Mathematics, University of Trento and Verona, 29th–40th cycles.
2009–2012	Member of the Doctoral School Committee of Computer Science, University of Verona, 25th–28th cycles.
since 01/10/2007	Assistant Professor in MAT/08 Numerical Analysis, Department of Computer Science, University of Verona.
05/2006–08/2007	Visiting position at the Institut für Mathematik, University of Innsbruck, Austria, supervisor Prof. Alexander Ostermann, partially supported by “Fondazione Ing. Aldo Gini” fellowship.
09/2005–08/2007	Post-doc position at the Department of Pure and Applied Mathematics of the University of Padua.
03/2004–08/2005	Research fellowship <i>Approssimazione numerica con elementi finiti di PDEs e polinomiale di operatori integrali</i> at the Department of Computer Science of the University of Verona.
03/2003–02/2004	Fellowship <i>Studio numerico di un modello stocastico per fluidi quantistici</i> at the Department of Computer Science of the University of Verona.

Education

17/03/2003	Ph.D. in Computational Mathematics, 15-th cycle, Uni-
------------	---

versity of Padua. Dissertation title *Efficient implementation of exponential integrators for 2D and 3D advection-diffusion equations*. Supervisors: Prof. Marco Vianello and Dr. Luca Bergamaschi.

29/11/1999 M.Sc. Degree in Mathematics, University of Padua. Dissertation title *Calcolo dell'operatore esponenziale per matrici sparse, non simmetriche, di grande dimensione*. Supervisors: Prof. Marco Vianello and Dr. Luca Bergamaschi.

Talks, seminari, conferenze

- 06–07/2026 Co-organizer of the minisymposium “Recent advances and applications of exponential integrators” at SciCADE, June 29–July 3, Edinburgh, UK.
- 06/2025 *Split exponential integrators for semilinear parabolic problems*, **Invited speaker** at the 7th Workshop on Stability and Discretization Issues in Differential Equations, June 16–19, Salerno.
- 06/2025 *Split exponential integrators with applications to Turing pattern formation*, **Invited speaker** at mini-symposium “Advanced models and methods to enhance sustainability” at Math To Product June 4–6, Valencia, Spain.
- 09/2024 Member of the Organizing and Scientific Committees of *Dolomites Workshop on Constructive Approximation and Applications 2024*, September 9–13, 2024, Alba di Canazei (TN).
- 07/2024 *Directional split exponential integrators with applications to Turing patterns*, Department of Mathematics, University of Innsbruck, July 2, Innsbruck, Austria.
- 12/2023 Member of the Organizing Committee of *Geometric Evolution of Multi Agent Systems — Final Workshop*, December 20, Verona.
- 09/2023 *The $\varphi(A)$ bulous matrix functions in exponential integrators for problems with Kronecker structure*, **Invited speaker** at “The $f(A)$ bulous workshop on matrix functions and exponential integrators”, September 25–27, MPI, Magdeburg, Germany.
- 09/2023 *Exponential integrators for problems with d -dimensional Kronecker structure*, **Invited speaker** at mini-symposium

	“Adapted time-integrators for differential and integral problems with applications” at IMACS2023, September 11–15, Rome.
07/2023	<i>A μ-mode BLAS approach to tensor-structured problems, with applications to evolutionary equations</i> , Invited speaker at the special session “Recent advances in the approximation of matrix functions” at the International congress “Mathematical modeling in engineering & human behaviour 2023”, July 11–14, Valencia, Spain.
06/2023	<i>A μ-mode BLAS approach for tensor-structured problems, with an application to ODEs</i> , Invited speaker at the special session “Recent trends on ODEs methods, low-rank approximations, and image-processing techniques” at the 4th International Conference “Numerical Computations: Theory and Algorithms”, June 14–20, Pizzo Calabro.

Research groups

since $\sim$ 2003	GNCS-INdAM http://www.altamatematica.it/gncs/
since 2015	CAA: Padova–Verona research group on “ <i>Constructive Approximation and Applications</i> ” https://sites.google.com/view/caa-padova-verona/home
since 2017	Rete Italiana di Approssimazione https://sites.google.com/view/ritanetworkapp/

Research projects

2026	GNCS Project “Metodi numerici per equazioni differenziali classiche e frazionarie: nuovi approcci avanzati” (coord. Dott. Fabio Cassini, University of Padua).
2025	GNCS Project “Metodi numerici e strumenti matematici innovativi per problemi differenziali non locali e frazionari” (coord. Prof. Angelamaria Cardone, University of Salerno).
2024	GNCS Project “Risoluzione numerica di problemi differenziali non-locali e/o frazionari” (coord. Prof. Roberto Garrappa, University of Bari).
2023	GNCS Project “Metodi avanzati per la risoluzione di PDEs su griglie strutturate, e non.” (coord. Dott. Maurizio Tavelli, University of Bolzano).

2022	GNCS Project “Tecniche avanzate per problemi evolutivi: discretizzazione, algebra lineare numerica, ottimizzazione” (coord. Dott. Davide Palitta, University of Bologna).
2020–2022	University of Verona “Progetto ricerca di base 2019” (peer reviewed), “Geometric Evolution of Multi Agent Systems”, project manager Prof. Marco Caliari, budget ~ 60.000 euro.
2019	GNCS Project “Approssimazione multivariata ed equazioni funzionali per la modellistica numerica” (coord. Prof.ssa Elisa Francomano, Università di Palermo).
2018	GNCS Project “Metodi, algoritmi e applicazioni dell’approssimazione multivariata” (coord. Dott.ssa Alessandra De Rossi, University of Turin).
2017	PRIN “Innovative Numerical Methods for Evolutionary Partial Differential Equations and Applications”, Principal Investigator Prof. Giovanni Russo, UO Verona.
2017	GNCS Project “Multivariate approximation: theory and applications” (coord. Prof. Marco Vianello, University of Padua).
2012	GNCS Project “Approssimazione multivariata con basi polinomiali e radiali” (coord. Prof. Marco Vianello).
2011	TWF-Projekt Nr. UNI-0404/880 (Tiroler Wissenschaftsfonds) “Meshfree exponential integrators” (coord. Dr. Stefan Rainer).
2010	GNCS Project “Near Optimal Points for Multivariate Interpolation” (coord. Prof. Leonard Peter Bos).
2009–2010	University of Padua Project “Progetto Interpolazione ed Estrapolazione: nuovi algoritmi ed applicazioni” (coord. Prof. Michela Redivo Zaglia).
2009	GNCS Young Researchers “Metodi numerici per equazioni di Schrödinger non lineari”.
2007–2008	University of Verona, Department of Computer Science Project “Soluzione groundstate per l’equazione di Gross–Pitaevskii”.
2004–2005	PRIN 2004 “Campi aleatori, evoluzioni stocastiche ed applicazioni a modelli di sistemi interagenti” (coord. Prof. Albert Gandolfi), Verona unity “Modelli stocastici in dimensione finita e infinita e limiti di scala” (coord. Prof.

	Laura Maria Morato).
2003–2004	PRIN 2003 “Sistemi dinamici su manifolds di matrici: metodi numerici ed applicazioni” (coord. Prof. Luciano Lopez), Padova unity “Approssimazione di funzioni di matrici per la soluzione numerica di equazioni differenziali” (coord. Prof. Marco Vianello).
2003	PRIN 2003 “Processi stocastici a struttura spaziale e loro applicazioni” (coord. Prof. Alberto Gandolfi), Verona unity “Problemi limite per processi con struttura spaziale e algoritmi stocastici” (coord. Prof. Laura Maria Morato).
2002	University of Padua Project “Metodi efficienti per l’approssimazione di trasformate discrete non locali” (coord. Prof. Marco Vianello).

Editorial boards

Journal of Approximation Software, peer-reviewed, open access.

Dolomites Research Notes on Approximation (Scopus CiteScore 2022: 1.7, SJR 2019 0.399, Mathscinet Journal MCQ 2022: 0.45), peer-reviewed, open access.

Teaching and supervision

03/2026	Supervisor of Michele Casarotto Master’s Thesis <i>Finite difference and fem schemes for the solution of pitting corrosion model</i> , University of Verona.
03/2026	Supervisor of Bianca Lorenzini’s Bachelor Thesis <i>Modelli matematici di apprendimento neurale: analisi numerica della teoria BCM ed altre equazioni differenziali per la plasticità sinaptica</i> , University of Verona.
10/2025	Supervisor of Alessio Zanella’s Bachelor Thesis <i>Numerical Simulations of Vortex Dynamics in Quantum Fluids</i> , University of Verona.
10/2025	Supervisor of Elisabetta Paroni’s Bachelor Thesis <i>Analisi della dinamica della clientela aziendale tramite il modello di Leslie</i> , University of Verona.
10/2025	Supervisor of Lorenzo Parise’s Bachelor Thesis <i>Tecniche di ottimizzazione per la risoluzione numerica del problema del p-Laplaciano</i> , University of Verona.

10/2025	Supervisor of Francesca Battaglin's Bachelor Thesis <i>Risoluzione numerica di un modello a campo di fase per la corrosione puntiforme</i> , University of Verona.
07/2025	Supervisor of Luca Battestini Master's Thesis <i>Efficient numerical methods for PDEs through tensor approaches with an application to Turing patterns</i> , University of Verona.
07/2025	Supervisor of Giovanni Negretti's Bachelor Thesis <i>Catenaria e balistica: metodo di shooting per problemi ai limiti</i> , University of Verona.
01–02/2025	Lecturer in Advances in Numerical Analysis and Mathematical Modelling: exponential integrators for systems of Ordinary Differential Equations in the Doctoral Program in Mathematics, Universities of Trento and Verona.
2024–2025	Lecturer in Laboratorio di Calcolo Numerico 1, Metodi Numerici per le Equazioni Differenziali at Bachelor's Degree in Applied Mathematics and Numerical Methods for Partial Differential Equations at Master's Degree in Mathematics, University of Verona.
10/2024	Supervisor of Andrea Vantini Bachelor's Thesis <i>Calcolo di funzioni di matrici: implementazione dell'algoritmo di Schur-Parlett</i> , University of Verona.
09/2024–08/2026	Supervisor of dr. Fabio Cassini, post-doc position at INDAM at the University of Verona, <i>Exponential Integrators for Kronecker-Structured Equations</i> .
03/2024	Supervisor of Zeno Varalta Bachelor's Thesis <i>Analisi delle equazioni Black-Scholes tramite metodi a differenze finite</i> , University of Verona.
2023–2024	Lecturer in Laboratorio di Calcolo Numerico 1, Calcolo Numerico 2, Metodi Numerici per le Equazioni Differenziali at Bachelor's Degree in Applied Mathematics and Numerical Methods for Partial Differential Equations at Master's Degree in Mathematics, University of Verona.
10/2023	Supervisor of Michel Tirapelle Bachelor's Thesis <i>Equazione di Gross-Pitaevskii, trasformata di Hermite e Fourier a confronto</i> , University of Verona.
10/2023	Supervisor of Mattia Fiandaca's Bachelor Thesis <i>Soluzione numerica di un modello 3D di un acquario</i> , University of Verona.
10/2023	Supervisor of Luca Battestini's Bachelor Thesis <i>Risoluzione</i>

	<i>dell'equazione di Poisson su domini bucati</i> , University of Verona.
10/2023	Supervisor of Tiberio Aganetti's Bachelor Thesis <i>Studio di integratori esponenziali applicati ad un problema ADR</i> , University of Verona.
2022–2023	Lecturer in Laboratorio di Calcolo Numerico 1, Laboratorio di Calcolo Numerico 2, Metodi Numerici per le Equazioni Differenziali at Bachelor's Degree in Applied Mathematics and Numerical Methods for Partial Differential Equations at Master's Degree in Mathematics, University of Verona.
03/2023–11/2024	Supervisor of dr. Fabio Cassini, post-doc position at the University of Verona, <i>Innovative numerical methods of exponential-type for differential equations with special properties</i> .
2021–2022	Lecturer in Laboratorio di Calcolo Numerico 1, Laboratorio di Calcolo Numerico 2, Metodi Numerici per le Equazioni Differenziali at Bachelor's Degree in Applied Mathematics and Numerical Methods for Partial Differential Equations at Master's Degree in Mathematics, University of Verona.
10/2022	Supervisor of Gianmaria Lucca Bachelor's Thesis <i>Raffinamento uniforme locale per la dinamica di strutture quantistiche</i> , University of Verona.
07/2022	Supervisor of Pham Truong Hoang Nhan Master's Thesis <i>Finite Element Solution of Direct and Inverse p-Laplace Problems</i> , University of Verona.
07/2022	Supervisor of Stefano Muzzolon Bachelor's Thesis <i>Implementazione di un integratore esponenziale a bassa regolarità per l'equazione di Schrödinger quadratica</i> , University of Verona.
11/2021	Supervisor of dr. Elisa Calzola, post-doc position at the University of Verona, <i>Efficient numerical methods for multiscale evolutionary equations with non-local interaction and applications</i> .
10/2021	Supervisor of Michele Casarotto Bachelor's Thesis <i>Condizioni al bordo di Dirichlet per il modulo al quadrato (MSD) e applicazione all'equazione di Schrödinger</i> , University of Verona.

10/2021	Supervisor of Helena Biscevic Master's Thesis <i>Numerical methods for Bose–Einstein condensates with disorder potentials</i> , University of Verona.
2020–2021	Lecturer of Laboratorio di Calcolo Numerico 1, Laboratorio di Calcolo Numerico 2, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Numerical Methods for Partial Differential Equations in Master's Degree in Mathematics at University of Verona.
03/2021	Supervisor of Sara Baltieri Master's Thesis <i>Numerical approximation of fractional derivatives and applications</i> , University of Verona.
10/2020	Supervisor of Marco Feder Master's Thesis <i>Iterative methods for rational approximations to the action of the matrix exponential</i> , University of Verona.
03/2020	Supervisor of Alexander Moriggl Master's Thesis <i>A more accurate and reliable Rational EXponential Integrator</i> , University of Verona.
02/2019	Supervisor of dr. Simona Schiavi, post-doc position at the University of Verona, <i>Progettazione ed implementazione di strumenti avanzati e tutorials di supporto ai laboratori didattici di modellizzazione e simulazione numerica presso il CdLM in Mathematics</i> .
2019–2020	Lecturer of Laboratorio di Calcolo Numerico 1, Laboratorio di Calcolo Numerico 2, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Numerical Methods for Partial Differential Equations in Master's Degree in Mathematics at University of Verona.
08/2019	Supervisor of PhD student Fabio Cassini , University of Trento, XXXV cycle, winner of the Best PhD Thesis Award in Mathematics in May 2024.
07/2019	Supervisor of Fabio Cassini Master's Thesis <i>A general matrix function toolbox for exponential integrators</i> , University of Verona.
11/2018	Supervisor of Matteo Milani Bachelor's Thesis <i>Analysis and implementation of ParaExp method for High-Frequency Electromagnetic Simulations</i> , University of Verona.
2018–2019	Lecturer of Laboratorio di Calcolo Numerico 1, Labo-

	ratorio di Calcolo Numerico 2, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Advanced Numerical Analysis II and Scientific Computing in Master's Degree in Mathematics at University of Verona.
11/2018	Supervisor of Marco Feder Bachelor's Thesis <i>Analysis and open implementation of ODE23t</i> , University of Verona.
07/2018	Supervisor of Paolo Bighignoli Bachelor's Thesis <i>Spiegazione e implementazione dettagliata del metodo Krylov-Schur per il calcolo di autovalori</i> , University of Verona.
04-05/2017	Co-lecturer of Splitting Methods for PDEs (together with Prof. Alexander Ostermann, University of Innsbruck) in PhD school in Mathematics of the University of Trento .
2017-2018	Lecturer of Laboratorio di Sistemi Stocastici, Laboratorio di Calcolo Numerico 2, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Advanced Numerical Analysis II and Scientific Computing in Master's Degree in Mathematics at University of Verona.
11/2017	Supervisor of Michela Ceraico Bachelor's Thesis <i>Metodi di splitting per l'equazione Korteweg-de Vries</i> , University of Verona.
11/2017	Supervisor of Giacomo Tabarelli Bachelor's Thesis <i>Simulazione in FreeFem++ della Dinamica di Vortici Quantistici</i> , University of Verona.
10/2017	Supervisor of Michele Ginesi Master's Thesis <i>Numerical evaluation of some special functions in GNU Octave</i> , University of Verona.
10/2017	Supervisor of Alessandro Festa Bachelor's Thesis <i>Approssimazione degli autovettori per il problema del PageRank</i> , University of Verona.
07/2017	Supervisor of Fabio Cassini Bachelor's Thesis <i>Analysis and implementation of TR-BDF2 in GNU Octave</i> , University of Verona.
07/2017	Supervisor of Alberto Carretta Bachelor's Thesis <i>Numerical solution of a model of optimal debt management and bankruptcy</i> , University of Verona.
07/2017	Supervisor of Jacopo Li Vigni Bachelor's Thesis <i>Metodi</i>

	<i>simplettici per il problema degli n-corpi</i> , University of Verona.
06–07/2017	Tutor of high school students Maddalena Tedeschi and Emanuele Farinazzo (ASL).
04/2017	Mentor of Google Summer of Code 2017 for Michele Ginesi, project <i>Special functions in GNU Octave</i> .
03/2017	Supervisor of Chiara Segala Master’s Thesis <i>Implementation of exponential integrators in GNU Octave</i> , University of Verona.
11/2016	Supervisor of PhD student Franco Zivcovich, University of Trento, XXXII cycle. Thesis title <i>Backward error accurate methods for computing the matrix exponential and its action</i> (discussed on January 24, 2020).
2016–2017	Lecturer of Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni Differenziali in Bachelor’s Degree in Applied Mathematics and Advanced Numerical Analysis II and Research and Scientific Computing in Master’s Degree in Mathematics at University of Verona.
07/2016	Supervisor of Franco Zivcovich Master’s Thesis <i>Hermite interpolation for the matrix exponential</i> , University of Verona.
06–07/2016	Tutor of high school students Davide Perini Toro and Paolo Venturini (internship).
2015–2016	Lecturer of Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni Differenziali in Bachelor’s Degree in Applied Mathematics and Advanced Numerical Analysis II and Research and Modelling Seminar in Master’s Degree in Mathematics at University of Verona.
05/2016	Mentor of ESA Summer of Code 2016 for Cristiano Dorigo, project <i>Iterative methods for sparse linear systems in GNU Octave</i> .
04/2016	Mentor of Google Summer of Code 2016 for Chiara Segala, project <i>Exponential integrators in GNU Octave</i> .
11/2015	Supervisor of Giada Basso Bachelor’s Thesis <i>Simulazione Numerica della Dinamica di Vortici Quantistici</i> , University of Verona.
2014–2015	Lecturer of Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni Differenziali in Bachelor’s Degree

	in Applied Mathematics and Advanced Numerical Analysis II and Scientific Computing in Master's Degree in Mathematics at University of Verona.
03/2015	Supervisor of Gregorio Pellegrini Master's Thesis <i>Polynomial Chaos Expansion with applications to PDEs</i> , University of Verona.
03/2015	Supervisor of Cristiano Dorigo Bachelor's Thesis <i>Is Householder orthogonalization better than Gram-Schmidt in GMRES?</i> , University of Verona.
03/2015	Supervisor of Franco Zivcovich Bachelor's Thesis <i>Interpolazione di Hermite-Newton-Leja per l'esponenziale di matrice</i> , University of Verona.
10/2014	Second advisor of Stefan Rainer Ph.D. Thesis <i>Mesh-free exponential integrators</i> , supervisor Prof. Alexander Ostermann, University of Innsbruck.
10/2014	Supervisor of Elena Gaburro Master's Thesis <i>Domain decomposition methods and high order edge finite elements in applied computational electromagnetism</i> , University of Verona.
2013–2014	Lecturer of Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Laboratory of Advanced Numerical Analysis in Master's Degree in Mathematics at University of Verona.
07/2013	Supervisor of Giulia Simeoni Master's Thesis <i>Numerical investigation of soliton dynamics for nonlinear Schrödinger equations</i> , University of Verona.
07/2013	Supervisor of Roberta Barbi Bachelor's Thesis <i>Computing the first eigenpair of the p-Laplacian</i> , University of Verona.
03/2013	Supervisor of Sara Novarini Bachelor's Thesis <i>Un metodo numerico per la valutazione dei bond a scadenza sul modello di Schaefer e Schwartz</i> , University of Verona.
03/2013	Supervisor of Mattia Tenuti Bachelor's Thesis <i>Inclusione di codice compilato in un ambiente per il calcolo numerico</i> , University of Verona.
03/2013	Co-supervisor of Marcello Bellomi Master's Thesis <i>Eigenvalue problems in anisotropic spaces</i> , supervisor Prof. Marco Squassina, University of Verona.

12/2012	Supervisor of Diego Rigo Bachelor's Thesis <i>Analisi di un metodo del terzo ordine per le equazioni iperboliche</i> , University of Verona.
12/2012	Supervisor of Chiara Piazzola Bachelor's Thesis <i>Analisi di un metodo del terzo ordine per il trasporto di funzioni discontinue</i> , University of Verona.
2012–2013	Lecturer of Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Scientific Computing and Laboratory of Advanced Numerical Analysis in Master's Degree in Mathematics at University of Verona.
10/2012	Supervisor of Mauro Bonafini Bachelor's Thesis <i>Efficient numerical methods for soliton dynamics of nonlinear Schrödinger equations</i> , University of Verona.
12/2011	Supervisor of Alessandro Stella Bachelor's Thesis <i>Confronto tra integratori esponenziali per il pricing di opzioni americane</i> , University of Verona.
2010–2011	Lecturer of Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Scientific Computing in Master's Degree in Mathematics at University of Verona.
10/2011	Supervisor of Andrea Alban Bachelor's Thesis <i>Metodi numerici per il pricing di opzioni asiatiche</i> , University of Verona.
2010–2011	Lecturer of Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics and Scientific Computing in Master's Degree in Mathematics, University of Verona.
20/2010	Supervisor of Lisa Formis Bachelor's Thesis <i>Exponential integrators for option pricing</i> , University of Verona.
10/2010	Supervisor of Simone Parisotto Bachelor's Thesis <i>Nonequispaced Fourier Transform and Applications</i> , University of Verona.
03/2010	Supervisor of Matteo Merci Bachelor's Thesis <i>Metodi di calcolo per probabilità invarianti per catene di Markov</i> , University of Verona.
2009–2010	Lecturer of Laboratorio di Calcolo Numerico, Laboratorio di Sistemi Stocastici, Metodi Numerici per le Equazioni

	Differenziali in Bachelor's Degree in Applied Mathematics, University of Verona.
11/2009	Co-supervisor of Chiara Carraro Bachelor's Thesis <i>Simulazione di un modello stocastico di ecosistema cellulare</i> , supervisor Prof. Laura Maria Morato, University of Verona.
11/2009	Supervisor of Anna Bassi Bachelor's Thesis <i>The shooting method for a stock value</i> , University of Verona.
09/2009	Supervisor of Sara Mazzi Bachelor's Thesis <i>A numerical approach for computing the ground state of a nonlinear Schrödinger equation</i> , University of Verona.
03/2009	Co-supervisor of Mark Pianegonda Bachelor's Thesis <i>Orbite periodiche della mappa del gatto</i> , supervisor Prof. Gaetano Zampieri, University of Verona.
2008–2009	Lecturer of Laboratorio di Calcolo Numerico, Laboratorio di Sistemi Stocastici, Laboratorio di Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics, University of Verona.
2008–2009	Lecturer of “Introduzione ad un ambiente per il calcolo scientifico”, in PhD school in Neuroscienze e Scienze Psicologiche e Psichiatriche of the University of Verona .
2007–2008	Lecturer of Matematica di Base, Laboratorio di Calcolo Numerico, Laboratorio di Metodi Numerici per le Equazioni Differenziali in Bachelor's Degree in Applied Mathematics, University of Verona.
07/2007	Co-supervisor of Roberto Montagna Bachelor's Thesis <i>Iperinterpolazione su punti di Xu e interpolazione su punti di Padova: aspetti computazionali</i> , supervisor Prof. Stefano De Marchi, University of Verona.

Public engagement

03/2023	Lecturer at “Pi greco day” at Educandato Statale “Agli Angeli”, Verona, $\pi = 3.141592\dots$ e poi?, 14 Marzo.
03/2021	Lecturer at “Pi greco day” at Liceo Scientifico Statale “E. Medi”, Villafranca di Verona, $\pi = 3.141592\dots$ e poi?, March 15.
2017–2018	Lecturer in Piano Lauree Scientifiche entitled “Frattali e caos” at Liceo Scientifico Statale “E. Medi”, Villafranca

	di Verona.
04/2017	Mentor of Google Summer of Code 2017 for Michele Ginesi, project <i>Special functions in GNU Octave</i> .
2016–2017	Lecturer in Piano Lauree Scientifiche entitled “Frattali e caos” with Liceo Scientifico Statale “E. Medi”, Villafranca di Verona.
05/2016	Mentor of ESA Summer of Code 2016 for Cristiano Dorigo, project <i>Iterative methods for sparse linear systems in GNU Octave</i> .
04/2016	Mentor of Google Summer of Code 2016 for Chiara Segala, project <i>Exponential integrators in GNU Octave</i> .
2015–2016	Lecturer in Piano Lauree Scientifiche entitled “Dinamica delle popolazioni” with Liceo Scientifico Statale “E. Medi”, Villafranca di Verona.
2014–2015	Lecturer in Piano Lauree Scientifiche entitled “Ottimizzazione” with Liceo Scientifico Statale “E. Medi”, Villafranca di Verona.
2013–2014	Lecturer in Piano Lauree Scientifiche entitled “Crittografia” with ITIS “G. Marconi”, Liceo Scientifico “A. Messedaglia” and il Liceo Scientifico “G. Fracastoro” of Verona.
2013–2014	Lecturer in Piano Lauree Scientifiche entitled “Crittografia” with Liceo Scientifico Statale “E. Medi” of Villafranca di Verona.
2012–2013	Lecturer in Piano Lauree Scientifiche entitled “Crittografia” with Liceo Scientifico Statale “E. Medi” of Villafranca di Verona.
2011–2012	Lecturer in Piano Lauree Scientifiche entitled “Probabilità, statistica e false credenze” with Liceo Scientifico Statale “E. Medi” di Villafranca di Verona.
2010–2011	Lecturer in Piano Lauree Scientifiche entitled “Probabilità, statistica e false credenze” with Liceo Scientifico Statale “E. Medi” di Villafranca di Verona.
2009–2010	Lecturer in Progetto Lauree Scientifiche entitled “Dinamica di popolazioni” with Liceo Scientifico Statale “E. Medi” di Villafranca di Verona.
2008–2009	Lecturer in Progetto Lauree Scientifiche entitled “Dinamica di popolazioni” with Liceo Scientifico Statale “E. Medi” di Villafranca di Verona.

Other activities

2023	Member of the committee for the selection of one “Ricercatore a tempo determinato senior” in 01/A5 Numerical Analysis MAT/08 at the Department of Civil, Environmental and Architectural Engineering, University of Padova, G.U. 46, 20/06/2023.
since 2021	Member of the committee for the selection of substitute teachers and of tutor students in mathematics and physics at the Department of Computer Science, University of Verona.
~2014–2018	Chairman of the committee for the selection of tutor students in mathematics and physics at the Department of Computer Science.
2016	Member of the committee for the selection of one “Ricercatore a tempo determinato junior” in 01/A5 Numerical Analysis MAT/08 at the Department of Computer Science, University of Verona, G.U. 59, 26/07/2016.
~2014–2018	Member (chairman since 2016) of the committee for the selection of substitute teachers in mathematics and physics at the Department of Computer Science, University of Verona.
~2014–2018	Chairman of the committee for the selection of tutor students in mathematics and physics at the Department of Computer Science.
since ~2003	Referee activities for several journals in numerical analysis (AIAA J., J. Comp. Phys., Num. Alg., Comp. Math. Appl., Comp. Phys. Commun., Appl. Math. Comp., J. Comput. Appl. Math., SIAM J. Numer. Anal., Int. J. Comp. Math., among others).

Publications

- [1] M. Caliori and F. Cassini. Exponential quadrature rules for problems with time-dependent fractional source. *J. Comput. Appl. Math.*, 474:116993, 2026. doi: <https://doi.org/10.1016/j.cam.2025.116993>.
- [2] M. Caliori, F. Cassini, L. Einkemmer, and A. Ostermann. Accelerating Exponential Integrators to Efficiently Solve Semilinear Advection-Diffusion-Reaction Equations. *SIAM J. Sci. Comput.*, 46(2):A906–A928, 2024. doi: <https://doi.org/10.1137/23M1562056>.
- [3] M. Caliori and F. Cassini. A second order directional split exponential integrator for systems of advection–diffusion–reaction equations. *J. Comput. Phys.*, 498:112640, 2024. doi: <https://doi.org/10.1016/j.jcp.2023.112640>.
- [4] M. Caliori and F. Cassini. Efficient simulation of complex Ginzburg–Landau equations using high-order exponential-type methods. *Appl. Num. Math.*, 206:340–357, 2024. doi: <https://doi.org/10.1016/j.apnum.2024.08.009>.
- [5] M. Caliori and F. Cassini. Direction splitting of φ -functions in exponential integrators for d -dimensional problems in Kronecker form. *J. Approx. Softw.*, 1(1):1, 2024. doi: <https://doi.org/10.13135/3103-1935/10813>.
- [6] M. Caliori, F. Cassini, and F. Zivcovich. A μ -mode BLAS approach for multidimensional tensor-structured problems. *Numer. Algorithms*, 92(4):2483–2508, 2023. doi: <https://doi.org/10.1007/s11075-022-01399-4>.
- [7] M. Caliori, F. Cassini, and F. Zivcovich. BAMPHI: Matrix-free and transpose-free action of linear combinations of φ -functions from exponential integrators. *J. Comput. Appl. Math.*, 423:114973, 2023. doi: <https://doi.org/10.1016/j.cam.2022.114973>.
- [8] M. Caliori, F. Cassini, L. Einkemmer, A. Ostermann, and F. Zivcovich. A μ -mode integrator for solving evolution equations in Kronecker form. *J. Comput. Phys.*, 455:110989, 2022. doi: <https://doi.org/10.1016/j.jcp.2022.110989>.
- [9] S. Zuccher and M. Caliori. Accurate numerical determination of a self-preserving quantum vortex ring. *J. Phys. A: Math. Theor.*, 54:015301, 2021.
- [10] M. Caliori and S. Zuccher. A Fast Time Splitting Finite Difference Approach to Gross–Pitaevskii Equations. *Commun. Comput. Phys.*, 29(5):1336–1364, 2021.

- [11] M. Caliari, L. Einkemmer, A. Moriggl, and A. Ostermann. An accurate and time-parallel rational exponential integrator for hyperbolic and oscillatory PDEs. *J. Comput. Phys.*, 437:110289, 2021. doi: <https://doi.org/10.1016/j.jcp.2021.110289>.
- [12] M. Caliari, F. Cassini, and F. Zivcovich. Approximation of the matrix exponential for matrices with a skinny field of values. *BIT Numer. Math.*, 60(4):1113–1131, 2020. doi: <https://doi.org/10.1007/s10543-020-00809-0>.
- [13] S. Parisotto, L. Calatroni, M. Caliari, C.-B. Schönlieb, and J. Weickert. Anisotropic osmosis filtering for shadow removal in images. *Inverse Probl.*, 35(5):054001, 2019.
- [14] M. Caliari and F. Zivcovich. On-the-fly backward error estimate for matrix exponential approximation by Taylor algorithm. *J. Comput. Appl. Math.*, 346:532–548, 2019. doi: <https://doi.org/10.1016/j.cam.2018.07.042>.
- [15] M. Caliari and S. Zuccher. Reliability of the time splitting Fourier method for singular solutions in quantum fluids. *Comput. Phys. Commun.*, 222:46–58, 2018.
- [16] M. Caliari, P. Kandolf, and F. Zivcovich. Backward error analysis of polynomial approximations for computing the action of the matrix exponential. *BIT Numer. Math.*, 58(4):907–935, 2018. doi: <https://doi.org/10.1007/s10543-018-0718-9>.
- [17] M. Caliari and S. Zuccher. Quasi-Newton minimization for the $p(x)$ -Laplacian problem. *J. Comput. Appl. Math.*, 309:122–131, 2017.
- [18] M. Caliari and S. Zuccher. INFFTM: Fast evaluation of 3d Fourier series in MATLAB with an application to quantum vortex reconnections. *Comput. Phys. Commun.*, 213:197–207, 2017.
- [19] M. Caliari, A. Ostermann, and C. Piazzola. A splitting approach for the magnetic Schrödinger equation. *J. Comput. Appl. Math.*, 316:74–85, 2017.
- [20] M. Caliari, P. Kandolf, A. Ostermann, and S. Rainer. The Leja Method Revisited: Backward Error Analysis for the Matrix Exponential. *SIAM J. Sci. Comput.*, 38(3):A1639–A1661, 2016. doi: <https://doi.org/10.1137/15M1027620>.
- [21] M. Caliari and S. Zuccher. The inverse power method for the $p(x)$ -Laplacian problem. *J. Sci. Comput.*, 65(2):698–714, 2015. doi: <https://doi.org/10.1007/s10915-015-9982-x>.
- [22] L. P. Bos and M. Caliari. Application of modified Leja sequences to polynomial interpolation. *Dolomites Res. Notes Approx.*, 8:66–74, 2015.

- [23] M. Caliari, P. Kandolf, A. Ostermann, and S. Rainer. Comparison of software for computing the action of the matrix exponential. *BIT Numer. Math.*, 54(1):113–128, 2014. doi: <https://doi.org/10.1007/s10543-013-0446-0>.
- [24] A. J. Allen, S. Zuccher, M. Caliari, N. P. Proukakis, N. G. Parker, and C. F. Barenghi. Vortex reconnections in atomic condensates at finite temperature. *Phys. Rev. A*, 90:013601, 2014.
- [25] M. Caliari and S. Rainer. GSGPEs: a MATLAB code for computing the ground state of systems of Gross–Pitaevskii equations. *Comput. Phys. Commun.*, 184(3):812–823, 2013.
- [26] M. Caliari, A. Ostermann, and S. Rainer. A Meshfree splitting method for soliton dynamics in nonlinear Schrödinger equations. In M. Griebel and M. A. Schweitzer, editors, *Meshfree Methods for Partial Differential Equations VI*, volume 89 of *Lect. Notes Comput. Sci. Eng.*, pages 127–139. Springer, 2013. Sixth International Workshop on Meshfree Methods, Bonn, Germany, October 2011.
- [27] M. Caliari, A. Ostermann, and S. Rainer. Meshfree exponential integrators. *SIAM J. Sci. Comput.*, 35(1):A431–A452, 2013. doi: <https://doi.org/10.1137/100818236>.
- [28] M. Bellomi, M. Caliari, and M. Squassina. Computing the first eigenpair for problems with variable exponents. *J. Fix. Point Theory Appl.*, 13(2):561–570, 2013.
- [29] S. Zuccher, M. Caliari, A. W. Baggaley, and C. F. Barenghi. Quantum vortex reconnections. *Phys. Fluids*, 24(125108):1–21, 2012.
- [30] M. Caliari and M. Squassina. On a bifurcation value related to quasilinear Schrödinger equations. *J. Fix. Point Theory Appl.*, 12(1–2):121–133, 2012.
- [31] M. Caliari, A. Ostermann, and S. Rainer. Meshfree integrators. *Oberwolfach Reports*, 8(1):883–885, 2011.
- [32] M. Caliari, S. De Marchi, A. Sommariva, and M. Vianello. Padua2DM: fast interpolation and cubature at the Padua points in Matlab/Octave. *Numer. Algor.*, 56(1):45–60, 2011. doi: <https://doi.org/10.1007/s11075-010-9373-1>.
- [33] M. Caliari and M. Squassina. Numerical computation of soliton dynamics for NLS equations in a driving potential. *Electron. J. Diff. Eqns.*, 89:1–12, 2010.
- [34] M. Thalhammer, M. Caliari, and C. Neuhauser. High-order time-splitting Hermite and Fourier spectral methods. *J. Comput. Phys.*, 228(3):822–832, 2009. doi: <https://doi.org/10.1016/j.jcp.2008.10.008>.

- [35] A. Martínez, L. Bergamaschi, M. Caliori, and M. Vianello. A massively parallel exponential integrator for advection-diffusion models. *J. Comput. Appl. Math.*, 231(1):82–91, 2009.
- [36] M. Caliori, A. Ostermann, S. Rainer, and M. Thalhammer. A minimisation approach for computing the ground state of Gross–Pitaevskii systems. *J. Comput. Phys.*, 228(2):349–360, 2009.
- [37] M. Caliori and A. Ostermann. Implementation of exponential Rosenbrock-type methods. *Appl. Numer. Math.*, 59(3–4):568–581, 2009. doi: <https://doi.org/10.1016/j.apnum.2008.03.021>.
- [38] M. Caliori, M. Vianello, and S. De Marchi. Algorithm 886: Padua2D—Lagrange Interpolation at Padua Points on Bivariate Domains. *ACM Trans. Math. Software*, 35(3):21:1–21:11, 2008.
- [39] M. Caliori and M. Squassina. Spatial patterns for the three species Gross–Pitaevskii system in the plane. *Electron. J. Diff. Eqns.*, 2008(79):1–15, 2008.
- [40] M. Caliori and M. Squassina. Location and phase segregation of ground and excited states for 2D Gross–Pitaevskii systems. *Dyn. Partial Differ. Equ.*, 5(2):117–137, 2008.
- [41] M. Caliori, M. I. Loffredo, L. M. Morato, and S. Zuccher. Cubic nonlinear Schrödinger equation with vorticity. *New J. Phys.*, 10:123020, 2008.
- [42] M. Caliori, S. De Marchi, and M. Vianello. Hyperinterpolation in the cube. *Comp. Math. Appl.*, 55(11):2490–2497, 2008.
- [43] M. Caliori, S. De Marchi, and M. Vianello. Bivariate Lagrange interpolation at the Padua points: Computational aspects. *J. Comput. Appl. Math.*, 221(2):284–292, 2008.
- [44] M. Caliori, M. Vianello, and L. Bergamaschi. The LEM exponential integrator for advection-diffusion reaction equations. *J. Comput. Appl. Math.*, 210(1–2):56–63, 2007. doi: <https://doi.org/10.1016/j.cam.2006.10.055>.
- [45] M. Caliori, S. De Marchi, and M. Vianello. Hyperinterpolation on the square. *J. Comput. Appl. Math.*, 210(1–2):78–83, 2007. Proc. of Numerical Analysis: the State of the Art (NAC2005), Rende (CS), Italy, May 19–21, 2005.
- [46] M. Caliori. Accurate evaluation of divided differences for polynomial interpolation of exponential propagators. *Computing*, 80(2):189–201, 2007. doi: <https://doi.org/10.1007/s00607-007-0227-1>.

- [47] M. Caliarì, M. Vianello, S. De Marchi, and R. Montagna. HYPER2D: a numerical code for hyperinterpolation at Xu points on rectangles. *Appl. Math. Comp.*, 183(2):1138–1147, 2006.
- [48] L. P. Bos, M. Caliarì, S. De Marchi, M. Vianello, and Y. Xu. Bi-variate Lagrange interpolation at the Padua points: the generating curve approach. *J. Approx. Theory*, 143(1):15–25, 2006. doi: <https://doi.org/10.1016/j.jat.2006.03.008>.
- [49] L. P. Bos, M. Caliarì, S. De Marchi, and M. Vianello. A numerical study of the Xu interpolation formula in two variables. *Computing*, 76(3–4):311–324, 2006.
- [50] L. P. Bos, M. Caliarì, S. De Marchi, and M. Vianello. Bivariate interpolation at Xu points: results, extensions and applications. *Electron. Trans. Numer. Anal.*, 25:1–16, 2006.
- [51] L. Bergamaschi, M. Caliarì, A. Martínez, and M. Vianello. Comparing Leja and Krylov approximations of large scale matrix exponentials. In V. N. Alexandrov, G. D. van Albada, P. M. A. Sloot, and J. Dongarra, editors, *Computational Science — ICCS 2006*, volume 3994 of *Lecture Notes in Comput. Sci.*, pages 685–692, Berlin Heidelberg, 2006. Springer. 6th International Conference, Reading, UK, May 28–31, 2006, Proceedings, Part IV.
- [52] M. Caliarì, S. De Marchi, and M. Vianello. Bivariate polynomial interpolation on the square at new nodal sets. *Appl. Math. Comput.*, 165(2):261–274, 2005. doi: <https://doi.org/10.1016/j.amc.2004.07.001>.
- [53] L. Bergamaschi, M. Caliarì, A. Martínez, and M. Vianello. A parallel exponential integrator for large-scale discretizations of advection-diffusion models. In B. Di Martino, D. Kranzlmüller, and J. Dongarra, editors, *Recent Advances in Parallel Virtual Machine and Message Passing Interface*, volume 3666 of *Lecture Notes in Comput. Sci.*, pages 483–492, Berlin Heidelberg, 2005. Springer. 12th European PVM/MPI Users’ Group Meeting Sorrento, Italy, September 18–21, 2005. Proceedings.
- [54] M. Caliarì, M. Vianello, and L. Bergamaschi. Interpolating discrete advection–diffusion propagators at Leja sequences. *J. Comput. Appl. Math.*, 172(1):79–99, 2004. doi: <https://doi.org/10.1016/j.cam.2003.11.015>.
- [55] M. Caliarì, G. Inverso, and L. M. Morato. Dissipation caused by a vorticity field and generation of singularities in Madelung fluid. *New J. Phys.*, 6:69, 2004.
- [56] L. Bergamaschi, M. Caliarì, and M. Vianello. The ReLPM exponential integrator for FE discretizations of advection-diffusion equations. In M. Bubak, G. D. v. Albada, P. M. A. Sloot, and J. Dongarra, editors,

Computational Science — ICCS 2004, volume 3039 of *Lecture Notes in Comput. Sci.*, pages 434–442, Berlin Heidelberg, 2004. Springer. 4th International Conference, Kraków, Poland, June 6–9, 2004, Proceedings, Part IV.

- [57] L. Bergamaschi, M. Caliori, and M. Vianello. Efficient approximation of the exponential operator for discrete 2D advection-diffusion problems. *Numer. Linear Algebra Appl.*, 10(3):271–289, 2003. doi: <https://doi.org/10.1002/nla.288>.

Verona, September 15, 2026

Marco Caliori

