Short CV of Luisa Donatella Marini

Academic career

Graduated in Mathematics at the University of Pavia in 1970.
Researcher of C.N.R. at the Istituto di Analisi Numerica in Pavia (now IMATI-CNR) from April 1, 1973 to October 31, 1990.
Professor of Numerical Analysis at the University of Genova from November 1, 1990 to October 31, 1993, and then at the University of Pavia since November 1, 1993.
Presently, Emeritus Professor of Numerical Analysis at the University of Pavia.

Journals

- Associate editor of SISSC (SIAM Journal on Scientific and Statistical Computing) for two terms, from January 1988 to December 1993.
- Associate editor of CMAME (Computer methods in Applied Mechanics and Engineering) since 2001.
- Associate editor of Italian Journal of Pure and Applied Mathematics 2008-2023.
- Member of the Advisory Board of CAMES (Computer Assisted Methods in Engineering and Sciences) since 2014.
- Associate editor of IMA Journal of Numerical Analysis since 2017.
- Associate editor of SINUM (SIAM Journal of Numerical Analysis) since January 2022.

Various scientific activities and recognitions (last years)

- Member of the National Committee for evaluation of Research (C.N.V.R.) designated by the Minister of Research with D.M. 1026 dated 9.08.2022 for the period 2022-2026, ERC sector PE.
- Recipient of the "Kirk Distinguished Visiting Fellowship" for the GCS programme at Isaac Newton Institute (Cambridge, UK), July-December 2019.
- Member (corresponding) of the *Istituto Lombardo, Accademia di Scienze e Lettere*, 2019.

- Member of the scientific committee of the $20th$ International Conference on Finite Elements in Flow Problems (FEF 2019), Chicago, March 29-April 4, 2019.
- Director of the school "Numerical methods for Pde's", IESC, Cargese, September 5-9, 2016.
- Representative of SIMAI (The Italian Society of Applied and Industrial Nathematics) in the General Assembly and Managing Board of the European Community on Computational Methods in Applied Sciences (ECCOMAS) since 2014.
- Chair of the committee for the ICIAM (The International Council for Industrial and Applied Mathematic) 2015 Collatz prize.
- Elected member of the European Academy of Science (EURASC) since 2010.

Invited (recent) lectures

- Indian Institute of Space Science and Technology, March 7, 2024.
- Conference on Advances in Numerical analysis in Torino, November 2-4, 2023.
- INdAM day, Trento, June 16th, 2022.
- Distinguished Lecture Series, PennState University, October 12-13, 2021.
- Kirk Lecture, Cambridge (UK), October 21st, 2019.
- The future of structure-preserving algorithms, ICMS, Edinburgh, 14-18 October 2019.
- Montpellier Colloquium, September 24, 2019.
- POEMS (POlytopal Element Methods in Mathematics and Engineering), CIRM Marseille, April 29-May 3, 2019.
- GIMC XXII, Ferrara, 13-14 September, 2018.
- Workshop "Interplay of geometric processing, modelling, and adaptivity in Galerkin methods", July 16-20, 2018 Vienna.
- Contemporary Applied Mathematics, Conference in honour of Philippe G. Ciarlet 80th birthday, Fudan University, Shanghai, May 7-11, 2018.

- Advances in Computational Fluid-Structure Interactions and Flow Simulation (AFSI 2019), Banff, May 2-4, 2018.

- Recent Advances and Challenges in Discontinuous Galerkin Methods and related approaches, conference in honor of Bernardo Cockburn 60th birthday, University of Minnesota, Minneapolis, June 29-July 1, 2017.

- 19th International Conference on Finite Elements in Flow Problems (FEF2017), Rome, 5-7 April, 2017.

- Topics in Applied Nonlinear Analysis: Recent Advances and New Trend, conference in honor of David Kinderlehrer's 75th birthday, Carnegie Mellon University, July 18-20, 2016.

- MAFELAP 2016, Brunel University, 14-17 June, 2016.

- ECCOMAS 2016 Conference, Crete island, 5-10 June, 2016.

- Non-linear Partial Differential Equations: theories, numerics and applications, conference in honor of Peter Markowich 60th birthday, Hong Kong, May 20-23, 2016.

Scientific activity

My scientific production consists of about 100 scientific papers, most of them in international journals, mainly on Numerical Methods for Partial Differential Equations. My field of interest is, generally speaking, the analysis of numerical schemes for the solution of elliptic partial differential equations (of second and fourth order) by means of different kinds of finite element methods: conforming, non-conforming, hybrid, mixed, and equilibrium. More specifically, I applied finite element techniques for the treatment of problems coming from various applications: semiconductor device simulation, electromagnetism, fluid-dynamics, structural mechanics. Particular emphasis was given to the approximation of non-coercive problems, which lead to develop various techniques for stabilizing Galerkin formulations, for applications to domain decomposition methods with non-matching grids, and to advection dominated problems. In the last decade I was particularly interested in developing and analyzing schemes based on Discontinuous Galerkin methods, for the discretization of various applied problems, such as Darcy flows, advection-diffusion problems, and Reissner-Mindlin model for plate problems. The more recent production is devoted to a new technique, the Virtual Element Method, for the discretization of Pde's with applications.

Below the list of the latest publications. For a complete list I refer to my webpage: https://mate.unipv.it/marini

List of publications (last years)

1. *A Virtual Element Method on polyhedra with curved faces*, Math. Models Methods. Appl. Sci. **36(03)**, 2026, 601-628 (with D. Prada and F. Brezzi)

2. *Basic principles of Virtual Element Methods*, Math. Models Methods. Appl. Sci. **23(1)**, 2013, 199-214 (with L. Beirão da Veiga, F. Brezzi, A. Cangiani, G. Manzini, A. Russo) **ISI Highly cited paper**

3. *Virtual Elements for linear elasticity problems*, SIAM J. Numer. Anal. **51(2)**, 2013, 794-812 (with L. Beirão da Veiga, F. Brezzi) **ISI Highly cited paper**

4. *Virtual Element Method for plate bending problems*, Comput. Methods Appl. Mech. Engrg. (online: 27 Sept. 2012, DOI:10.1016), **253**, 2013, 455-462 (with F. Brezzi) **ISI Highly cited paper**

5. *Equivalent projectors for Virtual Element Methods*, Comput. Math. Appl. **66(3)**, 2013, 376-391 (with B. Ahmad, A. Alsaedi, F. Brezzi, A. Russo) **ISI Highly cited paper**

6. *Basic principles of mixed Virtual Element Methods*, ESAIM: Math. Mod. Numer. Anal. **48(4)**, 2014, 1227-1240 (with F. Brezzi, R.S. Falk) **ISI Highly cited paper**

7. *The Hitchhiker's Guide to the Virtual Element Method*, Math. Models Methods. Appl. Sci. **24(8)**, 2014, 1541-157 (with L. Beirão da Veiga, F. Brezzi, A. Russo) **ISI Highly cited paper**

8. *Virtual Element and Discontinuous Galerkin Methods*, in The IMA Volumes in Mathematics and its Applications 157, 2014, 209-221 (with F. Brezzi)

9. *Serendipity Nodal VEM spaces*, Computers and Fluids **141**, 2016, 2-12 (with L. Beirão da Veiga, F. Brezzi, A. Russo)

10. *Virtual Element Methods for fourth order problems: L2 estimates*, Comput. Math. Appl. **72(8)**, 2016, 1959-1967 (with C. Chinosi)

11. *H(div) and H(curl)-conforming VEM*, Numer. Math.**133(2)**, 2016, 303-332 (with L. Beirão da Veiga, F. Brezzi, A. Russo) **ISI Highly cited paper**

12. *Mixed Virtual Element Methods for general second order elliptic problems on polygonal meshes*, ESAIM: M2AN **50(3)**, 2016, 727-747 (with L. Beirão da Veiga, F. Brezzi, A. Russo) **ISI Highly cited paper**

13. *Virtual Element Methods for general second order elliptic problems on polygonal meshes*, Math. Models Methods. Appl. Sci. **26(4)**, 2016, 729-750 (with L. Beirão da Veiga, F. Brezzi, A. Russo) **ISI Highly cited paper**

14. *Virtual Element approximation of 2D magnetostatic problems*, Comput. Methods Appl. Mech. Engrg. **327**, 2017, 173-195 (with L. Beirão da Veiga, F. Brezzi, F. Dassi, A. Russo)

15. *Serendipity Virtual Elements for General Elliptic Equations in Three Dimensions*, Chin. Ann. Math. Ser. B **39(2)**, 2018, 315-334 (with L. Beirão da Veiga, F. Brezzi, F. Dassi, A. Russo)

16. *Lowest order Virtual Element approximation of magnetostatic problems*, Comput. Methods Appl. Mech. Engrg. **332**, 2018, 343-362 (with L. Beirão da Veiga, F. Brezzi, F. Dassi, A. Russo)

17. *A Family of Three-Dimensional Virtual Elements with Applications to Magnetostatics*, SIAM J. Numer. Anal. **56**, 2018, 2940-2962 (with L. Beirão da Veiga, F. Brezzi, F. Dassi, A. Russo)

18. *Virtual Element approximations of the Vector Potential Formulation of Magnetostatic problems*, SMAI-Journal of computational mathematics **4**, 2018, 399-416 (with L. Beirão da Veiga, F. Brezzi, A. Russo)

19. *Polynomial preserving virtual elements with curved edges*, Math. Models Methods. Appl. Sci. **30(8)**, 2020, 1555-1590 (with L. Beirão da Veiga, F. Brezzi, A. Russo)

20. *Finite Elements and Virtual Elements on classical meshes*, Vietnam Journal of Mathematics **49(3)**, 2021, 871-899 (with F. Brezzi)

21. *The virtual element method*, Acta Numerica **32**, 2023, 123-202 (with L. Beirão da Veiga, F. Brezzi, A. Russo)