

Milo Viviani

PERSONAL INFORMATION

Personal webpage:

CONTACT INFORMATION

Phone:

University:

RESEARCH INTERESTS

Geometric integration, fluid dynamics, Lie group methods, analytical mechanics

EMPLOYMENT

Scuola Normale Superiore, Pisa, Italy

Wallenberg Post-doctoral Position, Jan 2022 - Dec 2023

Junior Visiting Position, Oct 2020 - Dec 2021

EDUCATION

Chalmers University of Technology, Gothenburg, Sweden

Ph.D., Mathematics, Sept 2015 - Sept 2020

- Thesis Topic: *Symplectic methods for isospectral flows and 2D ideal hydrodynamics*
- Advisor: prof. Klas Modin, Chalmers University of Technology

Licentiate exam, Mathematics, June 2018

University of Pavia, Pavia, Italy

M.S., Mathematics, Aug 2013 - Sept 2015

- Topic: *Geometric integration of the point vortex equation on a rotating sphere*
- Advisor: prof. Carlo Lovadina, University of Pavia
- Co-advisor: prof. Antonella Zanna, University of Bergen, Bergen, Norway
- 110/110 cum laude

B.S., Mathematics, Oct 2010 - July 2013

- Topic: *An introduction to geometric mechanics*
- Advisor: prof. Riccardo Rosso, University of Pavia
- 110/110 cum laude

IUSS, Pavia, Italy

Science and technology, Oct 2010 - Oct 2016

PUBLICATIONS

1. P. Cifani, K. Modin and M. Viviani, An efficient geometric method for incompressible hydrodynamics on the sphere, *Journal of Computational Physics*, Volume 473, 2023. <https://doi.org/10.1016/j.jcp.2022.111772>
2. P. Cifani, B.J. Geurts, E. Luesink, K. Modin and M. Viviani, Casimir preserving spectrum of two-dimensional turbulence, *Phys. Rev. Fluids* 7, 2022. <https://link.aps.org/doi/10.1103/PhysRevFluids.7.L082601>
3. F. Flandoli, U. Pappalettera and M. Viviani, On the infinite dimension limit of invariant measures and solutions of Zeitlin's 2D Euler equations, *Journal of Statistical Physics* 189, 43, 2022. <https://doi.org/10.1007/s10955-022-03007-0>

	<ol style="list-style-type: none"> 4. M. Benzi and M. Viviani, Solving cubic matrix equations arising in conservative dynamics, to appear in Vietnam Journal of Mathematics, 2022. https://arxiv.org/abs/2111.12373 5. K. Modin and M. Viviani, Canonical scale separation in two-dimensional incompressible hydrodynamics, Journal of Fluid Mechanics, 2022. DOI: 10.1017/jfm.2022.457 6. M. Viviani, An algebraic approach to the spontaneous formation of spherical jets, Journal of Computational Dynamics, 2022. DOI: 10.3934/jcd.2021028 7. K. Modin and M. Viviani, Integrability of point-vortex dynamics via symplectic reduction: a survey, Arnold Mathematical Journal, 2021. DOI: 10.1007/s40598-020-00162-8 8. M. Viviani, A minimal-variable method for isospectral flows, <i>BIT journal</i>, 2020. DOI: 10.1007/s10543-019-00792-1 9. K. Modin and M. Viviani, A Casimir preserving scheme for long-time simulation of spherical ideal hydrodynamics, <i>Journal of Fluid Mechanics</i>, 2020. DOI: 10.1017/jfm.2019.944 10. K. Modin and M. Viviani, Lie–Poisson methods for isospectral flows, <i>Found. Comput. Math.</i>, 2020. DOI: 10.1007/s10208-019-09428-w 	
PREPRINTS	<ol style="list-style-type: none"> 1. P. Cifani, S. Ephrati, and M. Viviani Sparse-stochastic model reduction for 2D Euler equations, <i>ArXiv</i>, 2023 	
AWARDS	<i>New talent award</i> , SCiCADE, Innsbruck https://scicade2019.uibk.ac.at/new-talent-award	Jul 2019
GRANTS	Wallenberg Foundation https://kaw.wallenberg.org/en/milo-viviani	Jan 2022 - Jan 2024
SCHOLARSHIPS	Institut Henri Poincaré (IHP) Institut Henri Poincaré (IHP) Essénstipendium SVeFUM resestipendium Adlerbertska Stipendiestiftelsen ERASMUS scholarship for the University of Bergen, Norway IUSS scholarship for studies in Pavia	Autumn 2019 Autumn 2019 Spring 2019 Spring 2019 Summer 2018 Spring 2015 2010-2015
TEACHING EXPERIENCE	Scuola Superiore Sant’Anna <ul style="list-style-type: none"> • Full teacher, Complements of mathematics (Engineer) • Full teacher, Complements of mathematics (Engineer) Chalmers University of Technology <ul style="list-style-type: none"> • Full teacher, Series and derivatives in several variables (Engineer) • Full teacher, Series and derivatives in several variables (Engineer) • Teaching Assistant, Multivariable calculus (Engineer) • Teaching Assistant, Multivariable calculus (Engineer) • Teaching Assistant, Computational mathematics (Engineer) • Teaching Assistant, Series and derivatives in several variables (Engineer) • Teaching Assistant, Linear algebra and numerical analysis (Engineer) 	Spring 2022 Spring 2021 Summer 2018 Summer 2017 Spring 2017 Winter 2017 Autumn 2016 Summer 2016 Spring 2016

	<ul style="list-style-type: none"> • Teaching Assistant, Computational mathematics (Engineer) 	Autumn 2015
University of Pavia		
	<ul style="list-style-type: none"> • Teaching Assistant, Analytical mechanics (Engineer) • Teaching Assistant, Analytical mechanics (Engineer) • Teaching Assistant, Mathematics (Economy) • Teaching Assistant, Mathematics (CTF) • Teaching Assistant, Mathematics (Biotechnology) 	Autumn 2014 Spring 2014 Year 2013 Autumn 2013 Autumn 2012
PRESENTATIONS	<ul style="list-style-type: none"> • DLES, Udine, Italy • GSSI workshop, L'Aquila, Italy • INI GFD Programme, Reading, UK • SciCADE 2022, Reykjavik, Iceland • 30th Birthday of Acta Numerica, Bedlewo, Poland • CAIMS Annual Meeting 2022, Kelowna, Canada (ONLINE) • 100UMI800UniPd, Padova, Italy • Due Giorni di Algebra Lineare Numerica e Applicazioni, Napoli, Italy • Winter School and Workshop Wisla 21-22, Wisla, Poland (ONLINE) • CASA colloquium - TU Eindhoven, Eindhoven, Netherlands (ONLINE) • VI ECCOMAS Young Investigators Conference, Valencia, Spain (ONLINE) • Geometric Numerical Integration, Oberwolfach, Germany (ONLINE) • STRUCTAPP2020, University of L'Aquila, Italy • Nonlinear and stochastic methods in climate and geophysical fluid dynamics, Institut Henri Poincaré (IHP), Paris, France • International Conference on Scientific Computation and Differential Equations (SCiCADE) - New talent award talk (plenary), Innsbruck, Austria • International Conference on Scientific Computation and Differential Equations (SCiCADE), Innsbruck, Austria • 13th International Young Researchers Workshop on Geometry, Mechanics and Control, Coimbra, Portugal (Poster) • BIT Circus, Helsinki, Finland • VI Iberoamerican meeting on Geometry, Mechanics and Control, Guanajuato, Mexico • 12th International Young Researchers Workshop on Geometry, Mechanics and Control, Padova, Italy (Poster) • Challenges in the preservation of structure (CHiPS), Trondheim, Norway • Manifolds and Geometric Integration Colloquia (MaGIC), Myrdal, Norway • 10GMCSCHOOL ICMAT, Madrid, Spain • Manifolds and Geometric Integration Colloquium, Myrkdalen, Norway 	Oct 2022 Sep 2022 Aug-Sep 2022 Jul 2022 Jun 2022 Jun 2022 May 2022 Feb 2022 Jan-Feb 2022 Feb 2022 Jul 2021 Mar 2021 Jan 2020 Oct 2019 Jul 2019 Jul 2019 Dec 2018 Aug 2018 Aug 2018 Jan 2018 Jun 2017 Mar 2017 Jun 2016 Feb 2015
CONFERENCES AND SUMMER SCHOOLS	<ul style="list-style-type: none"> • DLES, Udine, Italy • STUOD meeting, London, UK • GSSI workshop, L'Aquila, Italy • INI GFD Programme, Reading, UK • SciCADE 2022, Reykjavik, Iceland • 30th Birthday of Acta Numerica, Bedlewo, Poland • CAIMS Annual Meeting 2022, Kelowna, Canada (ONLINE) • A journey to numerical linear algebra: a workshop in honour of Michele Benzi, Pisa, Italy • 100UMI800UniPd, Padova, Italy • Due Giorni di Algebra Lineare Numerica e Applicazioni, Napoli, Italy • Winter School and Workshop Wisla 21-22, Wisla, Poland (ONLINE) 	Oct 2022 Sep 2022 Sep 2022 Aug-Sep 2022 Jul 2022 Jun 2022 Jun 2022 Jun 2022 May 2022 Feb 2022 Jan-Feb 2022

	<ul style="list-style-type: none"> • Transport, Fluids and Mixing, Pisa, Italy (ONLINE) Jan 2022 • Numerical Aspects of Hyperbolic Balance Laws and Related Problems - Young Researchers Conference, Verona, Italy Dec 2021 • VI ECCOMAS Young Investigators Conference, Valencia, Spain (ONLINE) Jul 2021 • Geometric Numerical Integration, Oberwolfach, Germany (ONLINE) Mar 2021 • Winter School and Workshop Wisla 20-21: Groups, invariants, and moving frames, Wisla, Poland (ONLINE) Jan-Feb 2021 • Turbulence: Problems at the Interface of Mathematics and Physics, Bangalore, India (ONLINE) Dec 2020 • XLV Summer school on mathematical physics, Ravello, Italy Sep 2020 • Mathematics of Planet Earth Webinars: Analysis and Modelling (ONLINE) May-Jul 2020 • STRUCTAPP2020, University of L'Aquila, Italy Jan 2020 • Big Data, Data Assimilation and Uncertainty Quantification, Institut Henri Poincaré (IHP), Paris, France Nov 2019 • Nonlinear and stochastic methods in climate and geophysical fluid dynamics, Institut Henri Poincaré (IHP), Paris, France Oct 2019 • The Mathematics of Climate and the Environment, Cargese, France Sep 2019 • The Mathematics of Climate and the Environment, Institut Henri Poincaré (IHP), Paris, France Sep-Dec 2019 • International Conference on Scientific Computation and Differential Equations (SCiCADE), Innsbruck, Austria Jul 2019 • 13th International Young Researchers Workshop on Geometry, Mechanics and Control, Coimbra, Portugal Dec 2018 • BIT Circus, Helsinki, Finland Aug 2018 • VI Iberoamerican meeting on Geometry, Mechanics and Control, Guanajuato, Mexico Aug 2018 • 12th International Young Researchers Workshop on Geometry, Mechanics and Control and Dynamics and Integrability of nonholonomic and other non-Hamiltonian systems, Padova, Italy Jan 2018 • Challenges in the preservation of structure (CHiPS), Trondheim, Norway Jun 2017 • Manifolds and Geometric Integration Colloquia (MaGIC), Myrdal, Norway Mar 2017 • 11th Young Researcher Workshop on geometry mechanics and control and V Iberoamerican meeting on Geometry, Mechanics and Control, La Laguna, Spain Jan 2017 • XLI Summer school on mathematical physics, Ravello, Italy Sep 2016 • 10th GMC school ICMAT, Madrid, Spain Jun 2016 • Levico Terme Summer school 2015, Ninth School on Analysis and Geometry in Metric Spaces, Levico Terme, Italy Jul 2015 • Nordfjordeid Summer school 2015, Lie groups and pseudogroups actions: From classical to differential invariants, Norway Jun 2015 • Manifolds and Geometric Integration Colloquium, Myrkdalen, Norway Feb 2015 	
CONFERENCES ORGANIZED	<ul style="list-style-type: none"> • Mathematics of Planet Earth Webinars: Analysis and Modelling, https://sites.google.com/view/mpe2020-webinars/home May-Jul 2020 	
SHORT PROFESSIONAL TRAVELS	<ul style="list-style-type: none"> • University of Perugia, Perugia, Italy Jun 2022 • Isaac Newton Institute, Cambridge, UK Nov 2019 • Isaac Newton Institute, Cambridge, UK Aug 2019 	
EXTENDED PROFESSIONAL TRAVELS	<ul style="list-style-type: none"> • Institut Henri Poincaré (IHP), Paris, France Sept-Dec 2019 • Victoria University, Wellington and Massey University, Palmerston North, New Zealand 	

	Zealand	Feb - Apr 2018
	• Massey University, Palmerston North, New Zealand	Jan - Mar 2016
	• University of Bergen, Bergen, Norway	Jan - Jun 2015
LANGUAGES	<ul style="list-style-type: none"> • Italian - mother tongue • English - fluent • French - good (B1) • Swedish - basic (A2) • Spanish - basic (A2) 	
COMPUTER PROGRAMMING	<ul style="list-style-type: none"> • Matlab, L^AT_EX, C, Pascal 	