

SAGY EPHRATI

Curriculum vitae

PERSONAL DETAILS

Name: Sagy Richard Ephrati
Nationality: Dutch
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Primary affiliation: Imperial College London
Department of Mathematics
South Kensington Campus
London SW7 2AZ, United Kingdom
Current office: Technical University of Munich
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Boltzmannstr. 3, Room 03.04.059
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APPOINTMENTS

Research Associate , Imperial College London	Mar 2026 - Present London, UK
Guest Researcher , Technical University of Munich	Jan 2026 - Present Munich, Germany
Postdoctoral Researcher , Chalmers University of Technology	Dec 2023 - Feb 2026 Gothenburg, Sweden
Researcher , University of Twente	Sep 2023 - Nov 2023 Enschede, The Netherlands

EDUCATION

PhD in Applied Mathematics , University of Twente PhD awarded on September 11 th , 2023 Thesis: <i>Data-driven Stochastic Modeling for Coarsened Computational Geophysical Fluid Dynamics</i> Supervisor: Prof. dr. ir. Bernard J. Geurts	Sep 2019 - Sep 2023 Enschede, The Netherlands
MSc in Applied Mathematics , University of Twente Thesis: <i>Direct numerical simulation of bubble-wall interaction</i> Supervisor: Prof. dr. ir. Bernard J. Geurts	Sep 2017 - Jul 2019 Enschede, The Netherlands
Internship , Technische Universität Dresden Assignment: <i>Comparison of numerical methods for multiphase flows</i> Supervisor: Prof. Jochen Froehlich	Sep 2018 - Mar 2019 Dresden, Germany
BSc in Applied Mathematics , University of Twente Thesis: <i>A numerical study of the Ecovat with IFISS</i> Supervisor: Prof. dr. ir. Bernard J. Geurts	Sep 2013 - Jul 2017 Enschede, The Netherlands

Updated September 3, 2026

TEACHING EXPERIENCE

At the University of Twente

Numerical Mathematics, Bachelor Applied Mathematics	Fall 2022
Numerical Mathematics, Bachelor Applied Mathematics	Fall 2021
Numerical Mathematics, Bachelor Applied Mathematics	Fall 2020
Student Assistant, Linear Algebra, Bachelor Applied Mathematics	Fall 2017
Student Assistant, Linear Algebra, Bachelor Applied Mathematics	Fall 2016
Student Assistant, Linear Algebra, Bachelor Applied Mathematics	Fall 2015
Student Assistant, Linear Algebra, Bachelor Applied Mathematics	Fall 2014
Student Assistant, Calculus, various study programmes	2014-2019

SCHOLARSHIPS

Resestipendium, Stiftelsen Wilhelm och Martina Lundgrens Vetenskapsfond	Summer 2025
Resestipendium, Stiftelsen för Vetenskaplig Forskning och Utbildning i Matematik (SVeFUM)	Summer 2025
Scholarship Mathematics 2024, The Royal Swedish Academy of Sciences (KVA)	Fall 2024
Resestipendium, The Royal Society of Arts and Sciences in Gothenburg (KVVS)	Summer 2024
Workshop organisation scholarship, Stiftelsen för Vetenskaplig Forskning och Utbildning i Matematik (SVeFUM) <i>Joint scholarship with Erik Jansson, Klas Modin, Michael Roop</i>	Summer 2024

ORGANIZED ACTIVITIES

Minisymposium co-organizer	Jun 2026
Scientific Computing and Differential Equations (SciCADE)	Edinburgh, UK
Workshop co-organizer	Oct 2024
Four-day workshop on geometric methods and stochastic reduction for fluid models	Kristineberg, Sweden
Workshop co-organizer	May 2023
Five-day workshop on geometric methods and stochastic reduction for fluid models	Enschede, The Netherlands

PUBLICATIONS

Preprints

6. **Numerical comparison of energy- versus circulation-preserving stochastic vortex dynamics** (joint with D.D. Holm). (2026).
5. **Minimum-entropy solutions in topographic quasi-geostrophic flow on the rotating sphere** (joint with E. Jansson). (2026).
4. **Trajectory learning for ensemble forecasts via the continuous ranked probability score: a Lorenz'96 case study** (joint with J. Woodfield). (2025).
3. **Critical latitude in global quasi-geostrophic flow on a rotating sphere** (joint with A.D. Franken, E. Luesink and B.J. Geurts). (2024).
2. **An exponential map free implicit midpoint method for stochastic Lie-Poisson systems** (joint with E. Jansson, A. Lang and E. Luesink). (2024).
1. **Geometric derivation and structure-preserving simulation of quasi-geostrophy on the sphere** (joint with E. Luesink, A.D. Franken and B.J. Geurts). (2024).

Peer-reviewed articles

13. **Convergence of Zeitlin truncation for multilayer critical latitude predictions of quasi-geostrophic flow on an earth-like planet** (joint with A.D. Franken, E. Luesink and B.J. Geurts). J. Comput. Dyn. (2026).
12. **Diffusive behavior of transport noise on $\mathbb{S}^2$** (joint with A. Papini and E. Jansson). J. Comput. Dyn. (2025).
11. **Thermal quasi-geostrophic model on the sphere: Derivation and structure-preserving simulation** (joint with M. Roop). Phys. Fluids (2025).
10. **Probabilistic data-driven turbulence closure modeling by assimilating statistics**. J. Comp. Phys. (2025).
9. **On spectral scaling laws for averaged turbulence on the sphere** (joint with E. Jansson and K. Modin). Physica D (2025).
8. **Casimir preserving numerical method for global multilayer geostrophic turbulence** (joint with A.D. Franken, E. Luesink and B.J. Geurts). J. Comp. Phys. (2025).

7. **Two minimal-variable symplectic integrators for stochastic spin systems** (joint with E. Jansson). Phys. Rev. E. (2025).
6. **Continuous data assimilation closure for modeling statistically steady turbulence in large-eddy simulation** (joint with A.D. Franken, E. Luesink, P. Cifani and B.J. Geurts). Phys. Rev. Fluids. (2025).
5. **Casimir preserving stochastic Lie–Poisson integrators** (joint with E. Luesink, P. Cifani and B.J. Geurts). Adv. Contin. Discrete Models (2024).
4. **Data-driven spectral turbulence modeling for Rayleigh–Bénard convection** (joint with P. Cifani and B.J. Geurts). J. Fluid Mech. (2023).
3. **Data-driven stochastic spectral modeling for coarsening of the two-dimensional Euler equations on the sphere (2023)** (joint with P. Cifani, M. Viviani and B.J. Geurts). Phys. Fluids (2023).
2. **Data-driven stochastic Lie transport modelling of the 2D Euler equations** (joint with P. Cifani, E. Luesink and B.J. Geurts). J. Adv. Model. Earth Syst. (2023).
1. **Computational modeling for high-fidelity coarsening of shallow water equations based on subgrid data** (joint with E. Luesink, G. Wimmer, P. Cifani and B.J. Geurts). Multiscale Model. Simul. (2022).

Refereed proceedings

2. **Stochastic data-driven POD-based modeling for high-fidelity coarsening of two-dimensional Rayleigh–Bénard turbulence** (joint with P. Cifani and B.J. Geurts). Direct and Large Eddy Simulation XIII: Proceedings of DLES13 (2023).
1. **Sparse-stochastic model reduction for 2D Euler equations** (joint with P. Cifani and M. Viviani). Stochastic Transport in Upper Ocean Dynamics II (STUOD 2022) (2023).

INVITED PRESENTATIONS

2026

Developments in transport noise in geophysical and magnetohydrodynamic flow. WCCM-ECCOMAS, Munich, Germany, Jul 2026.

Geometric regularisation of two-dimensional turbulence. SciCADE, Edinburgh, UK, Jun 2026.

Stochasticity in computational turbulence modelling. Oberseminar Dynamics, Technical University Munich, Munich, Germany, May 2026.

2025

Geometric integration of Lie-Poisson systems with transport noise. Numerical solutions to (S)PDEs with complex geometries, Aristotle University of Thessaloniki, Thessaloniki, Greece, Dec 2025.

2024

On stochastic computational geophysical fluid dynamics: geometric integration and data-driven modeling. Seminar for Numerical Methods in Plasma Physics, Max Planck Institute for Plasma Physics, Garching bei München, Germany, Nov 2024.

Low-dimensional stochastic closure models by assimilating statistics. Workshop on geometric methods and stochastic reduction for fluid models, Kristineberg, Sweden, Oct 2024.

Data assimilation closure for low-dimensional fluid models. ECCOMAS, Lisbon, Portugal, Jun 2024.

2023

Stochastic modeling for coarse computational geophysical fluid dynamics. Seminar on Computational and Applied Mathematics, Chalmers University of Technology, Gothenburg, Sweden, Sep 2023.

Data-driven stochastic forcing for uncertainty quantification and subgrid-scale modeling in geophysical fluid dynamics. Seminar for Machine Learning and UQ in Scientific Computing, Centrum Wiskunde & Informatica (CWI), Amsterdam, The Netherlands, May 2023.

2022

Structure-preserving data-driven modeling for the two-dimensional Euler equations. Workshop on geometric methods and stochastic reduction for fluid models, L'Aquila, Italy, Sep 2022.

RESEARCH VISITS

Technical University of Munich, Germany	Jan 2026 - Present
Imperial College, London, United Kingdom	Feb 2025
Gran Sasso Science Institute, L'Aquila, Italy	Sep 2022
Gran Sasso Science Institute, L'Aquila, Italy	Sep 2021
Imperial College, London, United Kingdom	Oct 2019

OTHER ACTIVITIES

Participant, Summer School on Bayesian Filtering: fundamental theory and numerical methods at ICMS, Bayes Centre, Edinburgh, United Kingdom	May 2024
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Referee activity

Physics of Fluids, IMA Journal of Numerical Analysis, Journal of Computational Dynamics, SIAM Journal on Scientific Computing, Journal of Fluid Mechanics

OUTREACH

Twente Pre-U, hosting one-day mathematical workshops for high school students	2014-2019
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SKILLS

Programming

Matlab, Python

Languages

Dutch	Native speaker
English	Fluent
German	Good working knowledge
Swedish	Good working knowledge
Hebrew	Basic knowledge