Dr Davide Proment

(last update: September 13, 2022)

School of Mathematics
University of East Anglia
Norwich NR4 7TJ
United Kingdom

Spoken Languages: Italian, English and French
Email: d.proment@uea.ac.uk
Webpage: https://davideproment.github.io/research/
Tel: +44 (0)1603 591642

Academic positions

2021–present	Associate Professor at the School of Mathematics, University of East Anglia, United Kingdom.
2018–2021	Senior Lecturer at the School of Mathematics, University of East Anglia, United Kingdom.
2012–2018	Lecturer at the School of Mathematics, University of East Anglia, United Kingdom.
2011–2012	Postdoctoral position at the Dipartimento di Fisica, Università degli Studi di Torino, Italy. The postdoctoral research fellowship related to the project *Extreme Seas* funded by the European Research Council.

Education

2012–2014	Postgraduate Certificate in Higher Education Practice at the Centre for Staff and Educational Development, University of East Anglia.
2008–2010	Ph.D. in Physics at Dipartimento di Fisica Generale, Università degli Studi di Torino, Italy. Winner of a MIUR (Italian Ministry of University and Research) Ph.D. research studentship. Ph.D. thesis title: *Turbulence in open systems: a weakly nonlinear approach*; supervisor: Dr. Miguel Onorato.
2005–2007	Laurea Specialistica (Master's degree) in Theoretical Physics at Università degli Studi di Torino, Italy. Thesis title: *The Gross-Pitaevskii equation and the dynamics of Bose-Einstein condensates*; supervisor: Dr. Miguel Onorato.
2002–2005	Laurea Triennale (Bachelor's degree) in Physics at Università degli Studi di Torino, Italy. Final project title: *A variational approach to the three body plane problem*; supervisor: Prof. Anna Capietto.

Grants & Awards

2022	ExtreMe Matter Institute (EMMI) Visiting Professor, Kirchoff Institut für Physik, Universität Heidelberg, Germany.
2022	Professeur Invité, Laboratoire Lagrange, Université Côte d'Azur, Nice, France.
2019	2019 Young Scientist Award of the European Mechanics Society for the best presentation entitled "Flying in a superfluid" at the 17th European Turbulence Conference (ETC17) held in Turin, Italy.
2018	2018 François Naftali Frenkiel Award for Fluid Mechanics shared with Dr Alberto Villois and Dr Giorgio Krstulovic for the publication of the paper "Universal and nonuniversal aspects of vortex reconnections in superfluids" which appeared in the April 2017 issue of Physical Review Fluids.
2017	Chercheur Invité CNRS par la Fédération Doeblin, Observatoire de la Côte d'Azur, Nice, France.
2017	EPSRC First Grant (£101,217), project EP/P023770/1 entitled *On the interaction between quantum vortices and phonon radiation in Bose–Einstein condensates*. The project partners are Dr Giorgio Krstulovic (Observatoire de la Côte d'Azur, France), Prof. Sergey Nazarenko (University of Warwick, UK) and Dr Giacomo Roati (LENS, Italy) and will run between July 2017 and June 2019.
2015	Royal Society International Exchanges Cost Share Scheme (£9,140) to visit Dr Giorgio Krstulovic at the Observatoire de la Côte d'Azur in Nice (France) and invite him at UEA between January 2016 and January 2018.
2014	London Mathematical Society Research in Pairs Scheme (£1,150) to visit Prof. William Irvine and his group at the James Franck Institute in Chicago (IL, US) during Spring 2015.

2012 Marie Curie Intra-European Fellowships FP7-PEOPLE-2011-IEF, project 299233 entitled *Kelvulence*. The project was designed to spend 3 years at the University of Warwick with Prof. Sergey Nazarenko in the role of scientist in charge. Declined after winning the lectureship position at the University of East Anglia.

2011 (in collaboration with Dr. Miguel Onorato) B call of the 2011 ISCRA programme with 100.000 hours of cluster facility to be spent during 2011-2012 at CINECA, Bologna, Italy.

2011 Valle d'Aosta (Italy) travel grant to: (i) visit Prof. Carlo F. Barenghi at Newcastle University (Newcastle upon Tyne, UK) during spring 2011; (ii) participate at the 26th International Conference on Low Temperature Physics in Beijing, China.

2011 Postdoctoral research fellowship related to the project *Extreme Seas* funded by the European Research Council.

2008–2010 MIUR (Italian Ministry of University and Research) Ph.D. research studentship.

2007 Valle d'Aosta (Italy) travel grant to participate at: (i) CISM activities 2007, Udine, Italy. Title: Vortices and turbulence at very low temperatures; (ii) 2007 Lectures in Physics, Heraklion, Crete. Title: Bose-Einstein condensation.

Publications

Refereed international journals

[31] Anomalous conduction in one-dimensional particle lattices: Wave-turbulence approach, *F. De Vita, G. Dematteis, R. Mazzilli, D. Proment, Y. V. Lvov, and M. Onorato*, Physical Review E, Volume 106, Issue 3, 034110 (2022)

[30] Equilibrium and nonequilibrium description of negative temperature states in a one-dimensional lattice using a wave kinetic approach, *M. Onorato, G. Dematteis, D. Proment, A. Pezzi, M. Ballarin, and L. Rondoni*, Physical Review E, Volume 105, Issue 1, 014206 (2022)

[29] Irreversible Dynamics of Vortex Reconnections in Quantum Fluids, *Alberto Villois, Davide Proment, and Giorgio Krstulovic*, Physical Review Letters, Volume 125, Issue 16, 164501 (2020)

[28] Matching theory to characterize sound emission during vortex reconnection in quantum fluids, *Davide Proment and Giorgio Krstulovic*, Physical Review Fluids, Volume 5, Issue 10, 104701 (2020)

[27] Coexistence of ballistic and Fourier regimes in the β Fermi-Pasta-Ulam-Tsingou lattice, *Giovanni Dematteis, Lamberto Rondoni, Davide Proment, Francesco De Vita, and Miguel Onorato*, Physical Review Letters, Volume 125, Issue 2, 024101 (2020)

[26] Breaking of Josephson junction oscillations and onset of quantum turbulence in Bose–Einstein condensates, *Adam Griffin, Sergey Nazarenko, and Davide Proment*, Journal of Physics A: Mathematical and Theoretical, Volume 53, Issue 17, 175701 (2020)

[25] Starting flow past an airfoil and its acquired lift in a superfluid, *Seth Musser, Davide Proment, Miguel Onorato, and William T.M. Irvine*, Physical Review Letters, Volume 123, Issue 15, 154502 (2019)

[24] Clustering and phase transitions in a 2D superfluid with immiscible active impurities, *Umberto Giuriato, Giorgio Krstulovic, and Davide Proment*, Journal of Physics A: Mathematical and Theoretical, Volume 52, 305501 (2019)

[23] Wind generated rogue waves in an annular wave flume, *A. Toffoli, D. Proment, H. Salman, J. Monbaliu, F. Frascoli, M. Dafilis, E. Stramignoni, R. Forza, M. Manfrin, M. Onorato*, Physical Review Letters, Volume 118, Issue 14, 144503 (2017)

[22] Universal and nonuniversal aspects of vortex reconnections in superfluids, *Alberto Villois, Davide Proment and Giorgio Krstulovic*, Physical Review Fluids, Volume 2, Issue 4, 044701 (2017)

[21] A vortex filament tracking method for the Gross–Pitaevskii model of a superfluid, *Alberto Villois, Giorgio Krstulovic, Davide Proment, and Hayder Salman*, Journal of Physics A: Mathematical and Theoretical, Volume 49, Issue 41, 415502 (2016)

[20] On the origin of heavy-tail statistics in equations of the Nonlinear Schrödinger type, *Miguel Onorato, Davide Proment, Gennady El, Stephane Randoux, Pierre Suret*, Physics Letters A, Volume 380, Issue 39, 3173–3177 (2016)

[19] Evolution of a superfluid vortex filament tangle driven by the Gross–Pitaevskii equation, *Alberto Villois, Davide Proment, Giorgio Krstulovic*, Physical Review E, Volume 93, Issue 6, 061103(R) (2016)

[18] Route to thermalization in the α-Fermi–Pasta–Ulam system, *Miguel Onorato, Lara Vozella, Davide Proment, and Yuri V. Lvov*, Proceedings of the National Academy of Sciences, Volume 112, Issue 14, pages 4208–4213 (2015)

[17] Scattering of Line-Ring Vortices in a Superfluid, *Alberto Villois, Hayder Salman, Davide Proment*, Journal of Low Temperature Physics, Journal of Low Temperature Physics, Volume 180, Issue 1, pages 68–81 (2015)

[16] Helicity conservation by flow across scales in reconnecting vortex links and knots, *Martin W. Scheeler, Dustin Kleckner, Davide Proment, Gordon L. Kindlmann, William T.M. Irvine*, Proceedings of the National Academy of Sciences, Volume 111, Issue 43, pages 15350–15355 (2014)

[15] Torus quantum vortex knots in the Gross–Pitaevskii model for Bose–Einstein condensates, *Davide Proment, Miguel Onorato, and Carlo F. Barenghi*, Journal of Physics: Conference Series, Volume 544, Issue 1, 012022 (2014)

[14] Bose–Einstein condensation and Berezinskii–Kosterlitz–Thouless transition in 2D Nonlinear Schrödinger model, *Sergey Nazarenko, Miguel Onorato, and Davide Proment*, Physical Review A, Volume 90, Issue 1, 013624 (2014)

[13] Experimental evidence of the modulation of a plane wave to oblique perturbations and generation of rogue waves in finite water depth, *A. Toffoli, L. Fernandez, J. Monbaliu, M. Benoit, E. Gagnaire-Renou, J. M. Lefevre, L. Cavaleri, D. Proment, C. Pakozdi, C. T. Stansberg, T. Waseda, and M. Onorato*, Physics of Fluids - Letters, Volume 25, Issue 9, 091701 (2013)

[12] Excitation of rogue waves in a variable medium: An experimental study on the interaction of water waves and currents, *A. Toffoli, T. Waseda, H. Houtani, T. Kinoshita, K. Collins, D. Proment, and M. Onorato*, Physical Review E, Volume 87, Issue 5, 051201 (2013)

[11] Experimental observation of Dark Solitons on the Surface of Water, *Amin Chabchoub, Olivier Kimmoun, Hubert Branger, Norbert Hoffmann, Davide Proment, Miguel Onorato, and Nail Akhmediev*, Physical Review Letters, Volume 110, Issue 12, 124101 (2013)

[10] Rogue waves: from nonlinear Schrödinger breathers to sea-keeping tests, *Miguel Onorato, Davide Proment, Günther F. Clauss, and Marco Klein*, PLOS ONE, Volume 8, Issue 2, e54629 (2013)

[9] Approximate rogue wave solutions of the forced and damped Nonlinear Schrödinger equation for water waves, *Miguel Onorato and Davide Proment*, Physics Letters A, Volume 376, Issue 45, 3057–3059 (2012)

[8] Vortex knots in a Bose–Einstein condensate, *Davide Proment, Miguel Onorato, and Carlo F. Barenghi*, Physical Review E, Volume 85, Issue 3, 036306 (2012)

[7] A note on an alternative derivation of the Benney equations for short-long wave interactions, *Davide Proment and Miguel Onorato*, European Journal of Mechanics - B/Fluids, Volume 34, 1–6 (2012)

[6] Warm cascade states in a forced-dissipated Boltzmann gas of hard spheres, *Davide Proment, Miguel Onorato, Pietro Asinari, and Sergey Nazarenko*, Physica D: Nonlinear Phenomena, Volume 241, Issue 5, 600-615 (2012)

[5] Sustained turbulence in the three-dimensional Gross–Pitaevskii model, *Davide Proment, Sergey Nazarenko, and Miguel Onorato*, Physica D: Nonlinear Phenomena, Volume 241, Issue 3, 304–314 (2012)

[4] Triggering rogue waves in opposing currents, *Miguel Onorato, Davide Proment, and Alessandro Toffoli*, Physical Review Letters, Volume 107, Issue 18, 184502 (2011)

[3] Warm turbulence in the Boltzmann equation, *Davide Proment, Sergey Nazarenko, Pietro Asinari, and Miguel Onorato*, Europhysics Letters, Volume 96, Number 2, 24004 (2011)

[2] Freak waves in crossing seas, *Miguel Onorato, Davide Proment, and Alessandro Toffoli*, European Physical Journal - Special Topics, Volume 185, Number 1, pages 45–55 (2010)

[1] Quantum turbulence cascades in the Gross–Pitaevskii model, *Davide Proment, Sergey Nazarenko, and Miguel Onorato*, Physical Review A, Volume 80, Issue 5, 051603(R) (2009)

Submitted or in preparation

(iii) Interaction and decay of Kelvin waves in the Gross–Pitaevskii model, *Davide Proment, Carlo F. Barenghi, Miguel Onorato*, in preparation, arXiv:1308:0852

(ii) Nonlinear Schrödinger turbulence, *Sergey Nazarenko, Miguel Onorato, Davide Proment*, in preparation

(i) A detailed analysis of vortex scattering mechanisms in a two-dimensional Bose–Einstein condensate, *Alberto Villois, Hayder Salman, Davide Proment, Sergey Nazarenko, and Miguel Onorato*, in preparation

Conference proceedings

- Rogue Waves in Wind Seas: An Experimental Model in an Annular Wind-Wave Flume, *A. Toffoli, D. Proment, H. Salman, J. Monbaliu, E. Stramignoni, R. Forza, M. Manfrin, and M. Onorato*, Proceedings of the ASME 2017 36th International Conference on Ocean, Offshore and Arctic Engineering in Trondheim (2017)
- Modulational instability and extreme waves in water of finite depth, *A. Toffoli, L. Fernandez, J. Monbaliu, M. Benoit, E. Gagnaire-Renou, L. Cavaleri, D. Proment, C. Pakozdi, C. T. Stansberg, T. Waseda, and M. Onorato*, Proceedings of the HYDRALAB IV Joint User Meeting in Lisbon (2014)
- Direct energy cascade in the nonlinear Schrödinger equation, *Davide Proment, Sergey Nazarenko, and Miguel Onorato*, Euromech Colloquium 512 "Small scale Tubulence and Related Gradient Statistics" conference proceedings (2009)

Book parts

- Nonlinear interactions and extreme waves: Envelope equations and experimental results, *Miguel Onorato and Davide Proment*, Marine Technology and Engineering - CENTEC Anniversary Book, CRC Press, Volume 1 (2012)

Conferences, workshops and seminars

03/2022 Center for Quantum Dynamics Colloquium, Universität Heidelberg, Germany. Talk: Equilibrium and nonequilibrium description of negative temperature states in a one-dimensional lattice using a wave kinetic approach.

02/2022 Day seminar, Northumbria University, UK. Talk: Thermalisation and heat transport in anharmonic chains.

09/2021 MAGIC Launch Lecture, MAGIC consortium, UK. Talk: Thermalisation in weakly nonlinear chains.

06/2021 Leeds Fluids Symposium 2021, University of Leeds, UK. Talk: Is it possible to fly in a superfluid?

05/2021 Day webinar, Applied and Interdisciplinary seminar series, University of Bath, UK. Talk: Flying in a superfluid.

03/2021 Nonlinear Waves series webinar, Lille, France. Talk: Flying in a superfluid: starting flow past an airfoil.

02/2021 UK Quantum Fluids webinar series. Talk: Direct energy cascade in the two-dimensional Gross–Pitaesvkii model.

10/2020 Day webinar, University of East Anglia, UK. Talk: Flying in a superfluid: starting flow past an airfoil.

06/2020 Day webinar, Università degli Studi di Torino, Italy. Talk: Sound emission and irreversible dynamics during vortex reconnections in quantum fluids.

05/2020 Day webinar, Aerospace Engineering Research Programme, University of Liverpool, UK. Talk: Flying in a superfluid: starting flow past an airfoil.

05/2020 Waves in One World webinar series, International Center for Mathematical Sciences, Edinburgh, UK. Talk: Sound emission and irreversible dynamics during vortex reconnections in quantum fluids.

12/2019 5th Eastern Arc Conference on Topological Solitons and Quantum Fluids, University of Kent, Canterbury, UK. Talk: Flying in a superfluid: starting flow past an airfoil.

09/2019 Universal features of hydrodynamical, optical and wave turbulence, Université Nice Sophia Antipolis, Nice, France. Talk: Irreversible dynamics of superfluid vortex reconnections.

09/2019 17th European Turbulence Conference (ETC17), Torino, Italy. Talk: Flying in a superfluid.

06/2019 IIP scientific programme *Vortex dynamics, turbulence and related phenomena in quantum fluids*, International Institute of Physics, Natal, Brazil. Lectures: Vortex dynamics and sound in the Gross–Pitaevskii model.

06/2019 Non perturbative solutions in field theory and their applications, Università del Salento, Lecce, Italy. Talk: Quantum turbulence cascades in the Gross–Pitaesvkii model.

03/2019 Day seminar, University of Kent, Canterbury, UK. Talk: Direct energy cascade in the two-dimensional Gross–Pitaesvkii model.

03/2019 Day seminar, Università di Roma Tor Vergata, Roma, Italy. Talk: Flying in a superfluid.

12/2018 Wave Interactions And Turbulence, Ecole Polytechnique, Palaiseau, France. Talk: Direct energy cascade in the two-dimensional Gross–Pitaesvkii model.

09/2018 Day seminar, LENS, Florence, Italy. Talk: Clustering and phase transitions in a 2D quantum fluid with impurities.

07/2018 Quantum Fluids and Solids 2018 (QFS2018), Tokyo, Japan. Talk: Quantum turbulence cascades in the Gross–Pitaevskii model; Poster: Vortex reconnections in superfluids: universal properties and sound emission.

06/2018 CISM summer school *Wave Turbulence and extreme events*, CISM, Udine, Italy. Lectures: Turbulence in the Nonlinear Schroedinger Model.

04/2018 Chasing tornadoes: vorticity above, below and in the Lab, Newcastle University, UK. Talk: Filament dynamics and sound emission during vortex reconnections in superfluids.

03/2018 Nonequilibrium Turbulence SIG annual meeting, Imperial College London, UK. Talk: Evolution of a superfluid vortex filament tangle driven by the Gross-Pitaevskii equation.

12/2017 SIG Meeting: Wave Turbulence In Nonlinear Optics, BECs, And Related Areas, Aston University, UK. Talk: Wave turbulence in Bose–Einstein condensates.

10/2017 Universal aspects of quantum turbulence, Nice, France. Talk: Universal and nonuniversal aspects of vortex reconnections in superfluids.

08/2017 ULT 2017: Frontiers of Low Temperature Physics, Heidelberg University, Germany. Poster: Universal and nonuniversal aspects of vortex reconnections in superfluids.

09/2017 Irreversibility and Turbulence, Les Treilles, France. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

06/2017 IUTAM symposium on Dynamics and Topology of Vorticity and Vortices, Carry-le-Rouet, Marseille, France. Talk: The evolution of helicity in a Bose–Einstein condensate: conservation, transfer and decay during the vortex filament dynamics.

05/2017 Theoretical challenges in wave turbulence, University of Warwick, UK. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

05/2017 3rd Eastern Arc Conference on Topological Solitons and Quantum Fluids, University of Essex, UK. Talk: Universal and nonuniversal aspects of vortex reconnections in superfluids.

03/2017 Schrödinger equations: Asymptotics, Integrability and Beyond, University of Bristol, UK. Talk: Superfluid turbulence in the Gross–Pitaevskii model for Bose–Einstein condensates.

09/2016 Non-equilibrium Statistical Mechanics and Turbulence workshop, Roma La Sapienza, Italy. Talk: Superfluid turbulence in the Gross–Pitaevskii (aka NLS) model for BECs.

08/2016 Quantum Fluids and Solids 2016 (QFS2016), Prague, Czech Republic. Talk/Poster: Evolution of a superfluid vortex filament tangle driven by the Gross–Pitaevskii equation.

07/2016 Statistics of extreme and singular events in spatially extended systems, The University of Warwick, UK. Talk: Non-universality of vortex reconnections and Kelvin wave generation in the Gross–Pitaevskii model.

06/2016 Workshop on Abnormal Wave Events (W-AWE2016), Nice, France. Talk: On the origin of heavy tail statistics in equations of the nonlinear Schrödinger type: an exact relation.

05/2016 EuHIT Turbulence Conference, Max Planck Institute for Dynamics and Self-Organization, Göttingen, Germany. Talk: Non-Gaussian properties of wind-generated waves.

04/2016 Wave Interactions (WIN-2016), Johannes Kelpler Universität, Linz, Austria. Talk: Vortex energy decay in a superlfuid.

02/2016 Integrable System in Newcastle workshop, Northumbria University, UK. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

12/2015 Nonlinear physics meeting, Università degli Studi di Torino, Italy. Talk: Kelvin waves in Bose–Einstein condensates.

12/2015 Complex Systems with Interfaces Research Network (COSI) meeting, University of East Anglia, UK. Talk: Nonlinear interactions and rogue waves in ocean.

11/2015 Day seminar, University of Bristol, UK. Talk: Vortex knots in a Bose–Einstein condensate.

05/2015 Day seminar, The University of Chicago, US. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

06/2015 1st Eastern Arc Conference on Topological Solitons and Quantum Fluids, University of East Anglia, UK. Talk: Vortices in quantum fluids.

05/2015 Day seminar, The University of Chicago, US. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

03/2015 Day seminar, Universidad Adolfo Ibañez, Santiago, Chile. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

02/2015 Day seminar, University of Kent, Canterbury, UK. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

02/2015 Day seminar, University of Glasgow, UK. Talk: A route to thermalisation in the α-Fermi–Pasta–Ulam system.

07/2014 HYDRALAB IV Joint User Meeting, Lisbon, Portugal. Talk: Modulational instability and extreme waves in water of finite depth.

04/2014 Wave Interactions (WIN-2014), Johannes Kelpler Universität, Linz, Austria. Talk: Vortex knots in a Bose–Einstein condensate.

09/2013 Laser, Weather and Climate 2013, Geneva, Switzerland. Talk: Nonlinear interactions and rogue waves in ocean.

05/2013 Day seminar, The University of Chicago, US. Talk: Vortex knots in a Bose–Einstein condensate.

04/2013 Day seminar, Newcastle University, UK. Talk: The importance of finite-size effects in Bose–Einstein condensation and superfluid phase transition in two spatial dimensions.

04/2013 Rencontres Niçoise de Physique, Université de Nice Sophia-Antipolis, France. Talk: Coherent structure and knots in Bose–Einstein condensates.

02/2013 Day seminar, University of East Anglia, UK. Talk: Coherent structure dynamics and turbulence in a superfluid.

12/2012 Quantised Flux in Tightly Knotted and Linked Systems (TODW04), Cambridge, UK. Talk: Vortex knots in a Bose–Einstein condensate.

11/2012 European Workshop on Superfluid turbulence from the perspective of numerics: modeling, methods and challenges, Lyon, France. Talk: Kelvin wave interactions and decay in the Gross–Pitaevskii equation model.

08/2012 Quantum Fluids and Solids 2012 (QFS2012), Lancaster, UK. Poster: Kelvin wave interactions and decay in the Gross–Pitaevskii equation model.

08/2012 Quantum Fluids and Solids 2012 (QFS2012), Lancaster, UK. Poster: Vortex knots in a Bose–Einstein condensate.

06/2012 Relaxation, Turbulence, and Non-Equilibrium Dynamics of Matter Fields (RETUNE 2012), Heidelberg, Germany. Poster: Quantum turbulence in BECs.

05/2012 Day seminar, Eindhoven University of Technology, Netherlands. Talk: Rogue waves and statistical models for wave forecasting.

03/2012 Turbulence d'ondes (Wave turbulence), Les Houches, France. Talk: Warm turbulence in the Boltzmann equation.

03/2012 Turbulence d'ondes (Wave turbulence), Les Houches, France. Poster: Quantum turbulence in BECs.

02/2012 Wave Interactions (WIN-2012), Johannes Kelpler Universität, Linz, Austria. Talk: Warm turbulence in the Boltzmann equation.

08/2011 26th International Conference on Low Temperature Physics, Beijing, China. Poster: Anomalous diffusion of quantised vortices in two dimensions.

05/2011 Day seminar, Newcastle University, UK. Talk: An introduction to the Boltzmann equation: equilibrium and nonequilibrium steady states.

04/2011 Extreme Seas (Progress Meeting), Berlin, Germany.

03/2011 Day seminar, Newcastle University, UK. Talk: A review on vortices in Bose–Einstein condensates.

11/2010 Laboratory modelling of geophysical flows, Torino, Italy.

11/2010 Extreme Seas (Progress Meeting), Torino, Italy.

09/2010 Anomalous transport: from billiards to nanosystems, Sperlonga, Italy.

08/2010 Quantum Turbulence (QFS 2010 satellite conference), Grenoble, France. Talk: Quantum turbulence within Bose–Einstein condensates.

08/2010 Quantum Fluids and Solids 2010 (QFS2010), Grenoble, France. Poster: Quantum turbulence in BECs.

07/2010 ESOF2010 (Euroscience Open Forum), Torino, Italy.

05/2010 Seminari sulla complessità, Istituto di Chimica, Torino, Italy.

05/2010 Day seminar, Newcastle University, UK. Talk: Quantum turbulence within the Gross–Pitaevskii equation model.

03/2010 Optical Lattices and Bose Gases, Warwick University, UK.

02/2010 Burgers equation and applications, Warwick University, UK.

10/2009 Euromech Colloquium 512, Torino, Italy. Talk: Quantum turbulence within the Gross–Pitaevskii equation model.

04/2009 Wave Turbulence, Institut H. Poincaré, Paris, France.

03/2009 Giornata di Fluidodinamica, Istituto di Fisica, Torino, Italy.

02/2009 7th Séminaire Transalpin de Physique, Champex-Lac, Switzerland. Subject: *Climate and atmospheric physics.*

11/2008 Structures and waves in anisotropic turbulence, Warwick University, UK.

09/2008 The Gross–Pitaevskii equation and its application for BEC in optical lattice, Vienna, Austria. Talk: BEC formation and dynamics.

03/2008 YAO Conference 2008, Firenze, Italy. Poster: Wave turbulence in a three-dimensional Bose–Einstein condensate.

02/2007 5th Séminaire Transalpin de Physique, Torino, Italy. Subject: *Dynamics and statistics in complex systems.*

Supervision of research team members

2022–present Thomas Moorcroft, PhD primary supervisor. PhD project: Wave turbulence in discrete nonlinear dispersive systems.

2022–present Dalal Al Qarni, PhD primary supervisor. PhD project: Vortex-impurity interactions is quantum fluids.

2022–present Rabiah Taleb Alkorbi, PhD primary supervisor. PhD project: Aerodynamics in a quantum fluid.

2021–2022 Luthais McCash, MRes primary supervisor. MRes project: Coherent structures on discrete lattices.

2017–2020 Benjamin Young-Longstaff, MPhil primary supervisor (secondary supervisor Dr Hayder Salman). MPhil project: Vortex-sound interactions in Bose–Einstein condensates.

2017–2018 Dr Alberto Villois, PDRA line manager. PDRA funded through the EPSRC First Grant, project EP/P023770/1 entitled *On the interaction between quantum vortices and phonon radiation in Bose–Einstein condensates*.

2013–2017 Alberto Villois, PhD secondary supervisor (primary supervisor Dr Hayder Salman). PhD project: Dynamics of Quantized Vortices and Electron Bubbles in the Gross–Pitaevskii Model of a Superfluid.

Organisation of scientific meetings

12/2022 Organiser (together with Prof. Mark Hoefer and Prof. Ted Johnson) of the workshop *Physical applications* part of the INI scientific programme *Dispersive hydrodynamics: mathematics, simulation and experiments, with applications in nonlinear waves*, Isaac Newton Institute, Cambridge, UK.

2021–present Organiser (together with Dr Samuli Autti, Dr Andrew Baggaley, Dr Dmitry Zmeev, and Dr Kali Wilson) of the *UK Quantum Fluids Network webinar series*.

10/2019 Organiser (together with Dr Jason Laurie) of the workshop *Waves, coherent structures, and turbulence (WCST2019)*, University of East Anglia, UK.

06/2019 Organiser (together with Prof. Vanderlei Bagnato and Dr Giorgio Krstulovic) of the IIP scientific programme *Vortex dynamics, turbulence and related phenomena in quantum fluids*, International Institute of Physics, Natal, Brazil.

09/2018 Organiser of the *Superfluids and turbulence* mini-symposium at the Dynamics Days Europe 2018, Loughborough University, UK.

2017–present Co-leader (together with Dr Jason Laurie, Aston University, UK) of the Special Interest Group in Wave Turbulence funded by the EPSRC UK Fluids Network that organises two two-day meetings every year in the UK.

2015–present UEA organiser of the Eastern Arc Conference on *Topological Solitons and Quantum Fluids* running every year to promote the Eastern Arc consortium (UEA, University of Essex and the University of Kent).

Commissions of trust

2022–present EPSRC Peer Review College member, acting as reviewer and panel member.

2021–present EQA Network of Expert Evaluators, acting as reviewer.

2020–present UK Quantum Fluids Network, organiser.

2020–present London Mathematical Society member.

2019–present Low Temperature Group, IOP Institute of Physics, committee member.

2018–present Horizon 2020, Marie Skłodowska-Curie Individual Fellowships Call, acting as evaluator.

2018–present Institute of Physics member.

2018–present UKRI Future Leaders Fellowships Peer Review College member, acting as reviewer.

2017–2021 EPSRC Full College member, acting as reviewer and panel member.

2016–2017 EPSRC Associate College member, acting as reviewer.

2014–2015 British Council Researcher reviewer and panel member.

Institutional responsibilities

2020–present Director of Innovation at the UEA School of Mathematics.

2020–present UEA node coordinator for the MAGIC consortium.

2018–2020 Director of Admissions (together with Dr Robert D. Gray) at the UEA School of Mathematics.

2016–present Member of the Exam Board for the BSc Actuarial Sciences degree at the UEA School of Mathematics, Computing and Economics.

2016–2018 Coordinator of the BSc with a Year In Industry degree at the UEA School of Mathematics.

2013–2018 Organiser of the Applied Mathematics research seminars running every Mondays (during teaching terms) at the UEA School of Mathematics.

Academic teaching experience

2019–present Lecturer of the *Special Relativity* part of the optional course *Quantum Mechanics and Special Relativity* at the School of Mathematics, University of East Anglia, UK.

2018–present Lecturer of the MAGIC group course *Numerical methods in Python* at the School of Mathematics, University of East Anglia, UK.

2016–present Lecturer of the MAGIC group course *Introduction to superfluids and turbulence* at the School of Mathematics, University of East Anglia, UK.

2016–present Lecturer of the course *Financial Mathematics* at the School of Mathematics, University of East Anglia, UK.

2014–present Lecturer of the *Introduction to Ocean Waves* part of the course *Wave, Tidal, and Hydro Energy* at the School of Mathematics, University of East Anglia, UK.

2013–2018 Lecturer of the *Special Relativity* optional topic part of the course *Topics in Mathematics* at the School of Mathematics, University of East Anglia, UK.

2013–2018 Lecturer of the *Probability* part of the course *Sets, Numbers and Probability* at the School of Mathematics, University of East Anglia, UK.

2008–2011 Physics lecturer assistant at SUISM (gymnastics and physical sciences) of Università degli Studi di Torino.

2003–2007 Academic collaboration at the physics department in Torino as a tutor. Topics treated in the past years: fundamental analysis, computer science, mechanics.

Engagement and outreach events

03/2022 Guest lecture, Wymondham College, Norwich, UK. Talk: The Chladni Patterns.

05/2019 Guest lecture, Wymondham College, Norwich, UK. Talk: The Chladni Patterns.

05/2019 Guest lecture, University Technical College Norfolk, Norwich, UK. Talk: The Chladni Patterns.

10/2018 Norwich Science Festival, The Forum, Norwich, UK. Stand: Vortices and Sound in Fluids. Talk: Fundamentals of Resonance.

06/2018 Insight Into Science day, Wymondham College, Norwich, UK. Talk: The Chladni Patterns.

06/2017 Insight Into Science day, Wymondham College, Norwich, UK. Talk: The Wonders of Sound Waves.

10/2016 Norwich Science Festival, The Forum, Norwich, UK. Stand: The Wonders of Sound Waves.

06/2016 Insight Into Science day, Wymondham College, Norwich, UK. Talk: Fundamentals of Resonance.

05/2015 Science in Norwich Day, The Forum, Norwich, UK. Stand: Mathematicians walk on water.

04/2015 Wymondham Science Society day seminar, Wymondham College, Norwich, UK. Talk: Turbulence in Real World.

2011 Lecturer of the physics course at the 2011 Mathematics, Physics and Sports Summer Campus for high school students at Bard, Italy.

2007–2011 Physics tutor at the annual dissemination event "La notte dei Ricercatori" (*The Researchers' Night*) taking place the last Saturday of September in Torino, Italy.

Students supervised and VIVA examinations

05/2022 Ben McCanna, external VIVA examiner at the University of Birmingham, UK. PhD thesis title: Superfluid Vortices in Four Spatial Dimensions.

05/2022 Ryan Doran, external VIVA examiner at the Newcastle University, UK. PhD thesis title: Rotation, Vortex Dynamics and Disorder in Non-Equilibrium Bose Gases.

11/2021 Giacomo Roberti, external VIVA examiner at Northumbria University, UK. PhD thesis title: Analysis and Control of Rogue Waves in Fibre Lasers and Hydrodynamics: Integrable Turbulence Framework.

06-08/2021 Joseph Windsor-Freeman, LMS summer student project supervisor. Project title: Vortices in Quantum Fluids with extensions to more than three spatial dimensions.

2020-2021 Toby Maskell, Master project supervisor. Project title: Vortex-Impurity Interactions in Superfluids.

2020-2021 Ethan Smith, undergraduate project supervisor. Project title: How do Vortices Manifest themselves in Superfluids?

2020-2021 Taylor Rutt, undergraduate project supervisor. Project title: A survey on the Photogrammetry software Meshroom.

11/2020 Connor Francis Swales, external examiner at the Newcastle University, UK. Physics MRes thesis title: Stabilising Multi-Charge Quantum Vortices in a Large, Two-Species Bose-Einstein Condensate.

06-08/2020 Martha Hobby, LMS summer student project supervisor. Project title: Mathematical models of multi-scale brain network interactions.

03/2020 Lorenzo Pistone, external VIVA examiner at the Università degli Studi di Torino, Italy. PhD thesis title: Wave Turbulence dynamics in one-dimensional nonlinear lattices with nearest-neighbour interactions.

2019-2020 Todd Blyth, Master project supervisor. Project title: Mathematical models of bike-sharing.

2019-2020 William Card, undergraduate project supervisor. Project title: Rogue waves in the ocean.

2018-2019 Nikolai Mills, undergraduate project supervisor. Project title: Quantum Fluids.

12/2018 Nicholas Kieran Bell, external VIVA examiner at the University of Warwick, UK. PhD thesis title: Wave Turbulence in Rotating and Non-rotating Magnetohydrodynamics.

08/2018 Antonino Savojardo, external VIVA examiner at the University of Warwick, UK. PhD thesis title: Rare Events in Optical Fibers.

04/2018 Jack Keeler, internal VIVA examiner at the University of East Anglia, UK. PhD thesis title: Free-surface flow over bottom topography.

2016-2017 Kieran Montgomery, Master project supervisor. Project title: Integrable partial differential equations.

2016-2017 Audie Warren, Master project supervisor (together with Dr Johannes Siemons). Project title: Spontaneous Magnetisation of the Ising Model.

06-08/2016 Benjamin Young-Longstaff, LMS summer student project supervisor. Project title: Vortices in superfluids.

06/2016 George W. Stagg, external VIVA examiner at Newcastle University, UK. PhD thesis title: A Numerical Study of Vortices and Turbulence in Quantum Fluids.

2015-2016 James Griffiths, Master project supervisor. Project title: Pattern formation in nature.

2015-2016 Benjamin Young-Longstaff, undergraduate project supervisor. Project title: Solitons: travelling waves in shallow water.

2015-2016 Sam Verdon, undergraduate project supervisor. Project title: Rogue waves in ocean.

10/2015 Benjamin S. Collyer, external VIVA examiner at the University of Warwick, UK. PhD thesis title: On the Fokker-Planck approximation to the Boltzmann collision operator.

2014-2015 Holly Smith, Master project supervisor. Project title: Pattern formation in nature.

2014-2015 Nathan Hensley, undergraduate project supervisor. Project title: Rogue waves in ocean.

2013-2017 Alberto Villois, PhD (secondary) supervisor. PhD thesis title: Dynamics of Quantized Vortices and Electron Bubbles in the Gross-Pitaevskii Model of a Superfluid.

2013-2014 Simon Calver, undergraduate project supervisor. Project title: The Brownian motion.

2013-2014 Ross Lemmon, undergraduate project supervisor. Project title: How to describe a gas of many particles?

2013 Alberto Villois, Laurea Magistrale (Master) thesis co-supervisor at Università degli Studi di Torino. Thesis title: Vortex dynamics and condensation in the Gross–Pitaevskii model.

2012 Mauro Mariazzi, Laurea Triennale (Bachelor) thesis co-supervisor at Università degli Studi di Torino. Final project title: Nonlinear X-waves.

2011 Davide Maestrini, Laurea Magistrale (Master) thesis co-supervisor at Università degli Studi di Torino. Thesis title: The dynamics of a Bose–Einstein condensate: numerical simulations of the Gross–Pitaevskii equation.

2010 Mauro Morra, Laurea Triennale (Bachelor) thesis co-supervisor at Università degli Studi di Torino. Final project title: Current effects in the formation of freak waves.

2010 Irene Santandrea, Laurea Triennale (Bachelor) thesis co-supervisor at Università degli Studi di Torino. Final project title: Wave forecasting using the WAM model.

2009 Jacopo Agagliate, Laurea Triennale (Bachelor) thesis co-supervisor at Università degli Studi di Torino. Final project title: Numerical simulations and analytical solutions of the Boltzmann equation.

2009 Luca Cottini, Laurea Triennale (Bachelor) thesis co-supervisor at Università degli Studi di Torino. Final project title: Statistical description of capillary-gravity waves.

2008 Simone Faldella, Laurea Triennale (Bachelor) thesis co-supervisor at Università degli Studi di Torino. Final project title: Bose–Einstein condensates and the Gross–Pitaevskii equation.