1 Personal Information

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Language: Mandarin Chinese (native), English (fluent), German (beginner)

2 Degrees

- 08/2011-07/2015 B.S. in Atmospheric Sciences, University of Science and Technology of China, China. Dissertation advisor: Prof. Dr. Rui Li
- 09/2015 -07/2020 PhD in Atmosphere-Ocean Science and Mathematics, Courant Institute of Mathematical Sciences, New York University, United States. Dissertation advisor: Prof. Dr. Oliver Bühler

3 Employment History

- 09/2024-present Project Leader, Theoretical Oceanography, University of Hamburg
- 04/2022-09/2024 Postdoctoral Research Associate, School of Mathematics, University of Edinburgh
- 09/2020-03/2022 Postdoctoral Researcher, Department of Physics, University of Toronto

Leaves

- 07/2020 – 09/2020: Gap due to visa delays caused by Canadian governmental closures during COVID-19

4 Research Interests

Physical Oceanography and Fluid Dynamics

- Wave-mean interactions and disentanglement
- Submesoscale ocean dynamics
- Statistical fluid mechanics
- Deep learning

5 Scientific Expertise

5.1 Peer-reviewed Journal Articles

- **Wang, H.**, Bôas, A.B.V., Vanneste J. and Young, W.R. *The U2H map explains the effect of (sub)mesoscale turbulence on significant wave height statistics.* In press (2025) on Journal of Physical Oceanography. [access]
- **Wang, H.**, Bôas, A.B.V., Vanneste J. and Young, W.R. (2025). *Scattering of surface waves by ocean currents: the U2H map.* Journal of Fluid Mechanics, 1005. [access]
- **Wang, H.**, Bôas, A.B.V., Young, W.R. and Vanneste J. (2023). *Scattering of swell by currents.* Journal of Fluid Mechanics, 975. [access]
- **Wang, H.**, Grisouard, N., Salehipour, H., Nuz, A., Poon, M., and Ponte, A. L. (2022). *A deep learning approach to extract internal tides scattered by geostrophic turbulence.* Geophysical Research Letters, 49(11), e2022GL099400. [access]
- Khatri, H., Griffies, S. M., Uchida, T., **Wang, H.**, and Menemenlis, D. (2021). *Role of mixed-layer instabilities in the seasonal evolution of eddy kinetic energy spectra in a global submesoscale permitting simulation.* Geophysical Research Letters, 48(18), e2021GL094777. [access]
- **Wang, H.** and Bühler, O. (2021). *Anisotropic statistics of Lagrangian structure functions and Helmholtz decomposition.* Journal of Physical Oceanography, 51(5), 1375-1393. [access]
- **Wang, H.** and Bühler, O. (2020). *Ageostrophic corrections for power spectra and wave–vortex decomposition.* Journal of Fluid Mechanics, 882. [access]

  – Highlighted in Focus on Fluids

5.2 Submitted Manuscripts

- **Wang, H.**, Uncu J., Srinivasan K., Grisouard, N. *Disentangling internal tides from balanced motions with deep learning and surface field synergy.* In Revision Journal of Advances in Modeling Earth Systems. [access]

5.3 Research Grants

Received as principal applicant:

- Project W2: "Observed and simulated internal tides: generation, modification by eddies, and contribution to energy budget" of the Collaborative Research Centre TRR 181: "Energy transfers in Atmosphere and Ocean". Deutsche Forschungsgemeinschaft (Projektnummer 274762653). Award date 06/2024. Funded period 07/2024 - 06/2028. Funded value €621,100.

Named as intended postdoctoral researcher (not PI):

- "Disentangling internal waves and (sub–)mesoscale motions in satellite altimetry: Northeast Pacific". Canadian Space Agency. Award date 12/2023. Funded period 04/2024 – 03/2027 (estimated). Funded value $225,000. The other applicants are: Jody Klymak (principal applicant), Guoqi Han (co-applicant), Tetjana Ross (co-applicant).
- "Phase Averaged Deferred Correction for Multi-Timescale Systems". UK Research and Innovation (Project Reference: EP/Y032624/1). Funded period 06/2024 – 02/2025. Funded value £78,966. The other applicant is Hossein Kafiabad (principal applicant).

6 Presentations

6.1 Conference Presentations

Oral Presentations

- Bornö workshop on surface waves, Stora Bornö, Sweden, " The U2H map explains effects of (sub)mesoscale currents on significant wave height", Aug 2025
- GFD Symposium in memory of Vladimir Zeitlin, Paris, France, "Synergizing Surface Fields in a Deep-learning Extraction of Internal Tides", May 2025.
- TAPGFD (Theoretical and Practical Perspectives in Geophysical Fluid Dynamics, Bengaluru, India, virtual presentation, "A deep learning approach to extract surface internal tidal signals scattered by geostrophic turbulence", May 2024.
- Ocean Sciences Meeting, New Orleans, United States, "Imprint of Currents on Surface Waves: solutions in two regimes ", Feb 2024.
- WISE Zoominar on Waves over spatial inhomogeneity, virtual."Imprint of Currents on Surface Waves", Oct 2023.
- Challenger Society Ocean Modelling Conference, Southampton, United Kingdom, "Dynamical insights from Lagrangian-filtered structure functions applied to drifter observations", Sep 2023.
- EGU General Assembly, Vienna, Austria, "Imprint of ocean currents on significant wave height", Apr 2023.
- TRR 181 Eddy-Wave Meeting, Hamburg, Germany, virtual presentation, "Dynamical insights from frequency-filtered Lagrangian structure functions", Feb 2023.
- 103rd American Meteorological Society Annual Meeting (23rd Conference on Air-Sea Interaction), United States, virtual presentation, "Imprint of ocean currents on significant wave height", Jan 2023.
- Oberwolfach Workshop 2238 - Multiscale Wave-Turbulence Dynamics in the Atmosphere and Ocean, Oberwolfach, Germany, "A deep learning approach to extract surface internal tidal signals scattered by geostrophic turbulence", Sep 2022.
- IX International Symposium on Stratified Flows, Cambridge, UK,"A deep learning approach to extract surface internal tidal signals scattered by geostrophic turbulence", Aug 2022.
- Surface Water and Ocean Topography (SWOT) Science Team Meeting, virtual presentation,"Internal tidal extraction: challenges from scatterings by vortices, and hopes for a deep learning solution", Jun 2022.

- Ocean Sciences Meeting, virtual, “Extraction of tidal signals from a machine learning approach”, Apr 2022.
- EGU General Assembly, virtual, “Anisotropic statistics of Lagrangian structure functions and Helmholtz decomposition”, Apr 2021.
- Meeting on eddies and internal waves with TRR Mercator fellows, TRR 181, virtual, “Generalizing the “BCF14” method to anisotropic cases”, Mar 2021.

Poster Presentations

- 12th Warnemünde Turbulence Days (WTD) on “Waves and Turbulence", Insel Vilm, Germany, “Synergizing Surface Fields in a Deep-learning Extraction of Internal Tides”, Sep 2025.
- Climate Exploration in Lively Liaison with the Ocean (CELLO), Hamburg, Germany, “The U2H map explains effects of (sub)mesoscale currents on significant wave height”, Sep 2025
- 22nd Conference on Atmospheric and Oceanic Fluid Dynamics, Maine, UNITED STATES, “Anisotropic Helmholtz decomposition of Lagrangian Tracer Data”, Jun 2019.
- 21st Conference on Atmospheric and Oceanic Fluid Dynamics, Oregon, United States, “Wave-Vortex Decomposition of 1D ship-track data with weak nonlinearity in the balanced flow”, Jun 2017.

6.2 Invited Seminars and Research Visits

- University of Bremen, Bremen, Germany, “Diagnosing scale-dependent dynamics from limited observations”. Jan 2025.
- University of Edinburgh, Edinburgh, United Kingdom. Research visit only (no talk given). Nov 2024.
- TIFR Centre for Applicable Mathematics, Bengaluru, India, virtual presentation, “A deep learning approach to extract internal tides scattered by geostrophic turbulence”. Oct 2024.
- Durham University, United Kingdom, “Scattering of surface waves by oceanic currents”. Jun 2024.
- University of California, Los Angeles, California, United States. Research visit only (no talk given). Mar 2024.
- California Institute of Technology , California, United States, “Scattering of surface waves by oceanic currents”. Mar 2024.
- University of California San Diego, California, United States, “Scattering of surface waves by oceanic currents”. Mar 2024.
- Colorado School of Mines, Colorado, United States, “Scattering of surface waves by oceanic currents”. Feb 2024.
- University of Hamburg, Hamburg, Germany,“A deep learning approach to extract internal tides scattered by geostrophic turbulence”. Jul 2023.
- University of Waterloo, Canada, “Disentangling balanced and unbalanced flows under weak nonlinearity”, virtual, Sep 2021.