Han Wang

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RESEARCH INTERESTS

Physical Oceanography and Fluid Dynamics
- Wave-mean interactions and disentanglement
- Submesoscale ocean dynamics
- Statistical fluid mechanics
- Deep learning

EDUCATION

2015-2020, **Courant Institute, New York University(NYU)**
Ph.D. Atmosphere-Ocean Science and Mathematics
Dissertation advisor: Oliver Bühler

2011-2015, **University of Science and Technology of China(USTC)**
B.S. Atmospheric Sciences
Dissertation advisor: Rui Li

WORK EXPERIENCE

2020/09–2022/03 (1.5 years), Postdoctoral Researcher
Department of Physics, University of Toronto
Supervised by Nicolas Grisouard

2022/04-2024/04 (expected 2 years), Postdoctoral Research Associate
School of Mathematics, University of Edinburgh
Supervised by Jacques Vanneste and William R. Young

REFEREED ARTICLES

5. Wang, H., Bôas, A.B.V., Young, W.R. and Vanneste J. *Scattering of swell by currents.* Accepted by Journal of Fluid Mechanics. [arXiv]
4. 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.
3. 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.
2. Wang, H., and Bühler, O. (2021). *Anisotropic statistics of Lagrangian structure functions and Helmholtz decomposition.* Journal of Physical Oceanography, 51(5), 1375-1393.
1. Wang, H., and Bühler, O. (2020). *Ageostrophic corrections for power spectra and wave–vortex decomposition.* Journal of Fluid Mechanics, 882.
   – Highlighted in Focus on Fluids

RESEARCH IN PROGRESS

- Bôas, A.B.V., Vanneste J., Wang, H., and Young, W.R. *The imprint of weak ocean currents on surface wave significant wave height.*
- Balwada, D., Wang, H., and Xie, J.-H. *Lagrangian-filtered second order structure functions and applications to surface drifter data.* [slides] [talk]
- Grisouard, N., Jeffery U. and Wang, H., *Synergy with surface density observations in a deep learning approach to disentangle balanced flows and internal tides.* [slides]

TEACHING AND TUTORING

- Workshop tutor (University of Edinburgh): Mathematics in Action (Fluid Dynamics)
- Undergraduate recitation leader (Courant Institute): Vector Calculus
- Graduate course grader (Courant Institute): Applied Stochastic Analysis, Fluid Dynamics

RESEARCH SUPERVISION

- MSc project supervision : Sole supervisor for Simin Wang on Computational and Applied Mathematics MSc, 2023/06 - 2023/08
- PhD project supervision: Jeff Uncu, University of Toronto, 2022/10-2023/10(expected)
- Undergraduate students: Kerryn Van Rooyen, University of Toronto, 2022/05-2022/08; Lingxiao Guan, University of Michigan, 2021/07-2021/11

SELECTED CONFERENCE PRESENTATIONS

- "Dynamical insights from frequency-filtered Lagrangian structure functions". TRR 181 Eddy-Wave Meeting, virtual, Feb 2023
- "Imprint of ocean currents on significant wave height." 103rd American Meteorological Society Annual Meeting (23rd Conference on Air-Sea Interaction), virtual, Jan 2023
- "A deep learning approach to extract surface internal tidal signals scattered by geostrophic turbulence." Oberwolfach Workshop 2238 - Multiscale Wave-Turbulence Dynamics in the Atmosphere and Ocean, Oberwolfach, Germany, Sep 2022
- "Internal tidal extraction: challenges from scatterings by vortices, and hopes for a deep learning solution", Surface Water and Ocean Topography (SWOT) Science Team Meeting, virtual, Jun 2022
- "Extraction of tidal signals from a machine learning approach", The challenge of understanding rapidly changing small-scale ocean dynamics: preparation for SWOT, Ocean Sciences Meeting, virtual, Apr 2022
- "Generalizing the "BCF14" method to anisotropic cases". Meeting on eddies and internal waves with TRR Mercator fellows, TRR 181, virtual, Mar 2021
- "Anisotropic Helmholtz decomposition of Lagrangian Tracer Data". Poster session for Mesoscale and Submesoscale Ocean Dynamics, 22nd Conference on Atmospheric and Oceanic Fluid Dynamics, Maine, USA, Jun 2019
- "Wave-Vortex Decomposition of 1D ship-track data with weak nonlinearity in the balanced flow". Poster session for Theoretical Advances in AOFD, 21st Conference on Atmospheric and Oceanic Fluid Dynamics, Oregon, USA Jun 2017

HONORS

- MacCracken Fellowship, five-year graduate student award at NYU, 2015-2020

EDUCATIONAL EXPERIENCE

- 2017/07–2017/08, Participant of Les Houches Summer School on Fundamental Aspects of Turbulent Flows in Climate Dynamics, Les Houches, France; funded by organizer
- 2014/06–2014/08, Visiting scholar at University of Michigan, Ann Arbor, USA. Conducted pedagogical experiments on CMIP5 Models, advised by Xianglei Huang; funded by China Scholarship Council
- 2013/09–2014/01, Exchange student in Physics Department, National Tsing Hua University(NTHU), Taiwan; funded by NTHU and USTC

SERVICE

- Journal Referee: Geophysical Research Letters, Journal of Fluid Mechanics, Journal of Physical Oceanography, Quarterly Journal of the Royal Meteorological Society, Journal of Advances in Modeling Earth Systems, Journal of Atmospheric and Oceanic Technology
- Student Organizer: various seminars and colloquium lunches at CAOS, Courant Institute (2015–2019)
- Social Volunteer and outreach: Courant cSplash (2019/04), NYC H2O (2018-2020), Sutton Trust Summer School Info Station (2023)

Updated in August, 2023