

UCHIDA, Takaya

A Physical Oceanographer with a flair of data science

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Languages

- Native: Japanese, English
- Conversational: French
- Learning: Russian

Education

Doctor of Philosophy, Physical Oceanography Columbia University in the City of New York, USA	October 2019
Master of Philosophy, Physical Oceanography Columbia University in the City of New York, USA	February 2018
Master of Arts, Physical Oceanography Columbia University in the City of New York, USA	May 2016
Bachelor of Engineering, Ocean Engineering The University of Tokyo (東大), 日本	March 2014

Research Experience

Senior Researcher, Physical Oceanography Climate Dynamics Laboratory, МФТИ, Россия	December 2026
Assistant Research Scientist, Physical Oceanography Center for Ocean-Atmospheric Prediction Studies, FSU, USA	December 2024
MOPGA Postdoctoral Fellow, Physical Oceanography Institut des Géosciences de l'Environnement, CNRS, France	September 2022

Publications

[M]: Work led by mentee

- **Uchida, T.**, B. Yadidya, V. Bertrand, J. Chang, B. Arbic, J. Shriver & J. Le Sommer. (Submitted). A strictly geostrophic product of sea-surface velocities from the SWOT fast-sampling phase. *Geophys. Res. Lett.*, doi:10.48550/arXiv.2601.18182;
- Sun, L.^[M], **T. Uchida**, T. Penduff, W. Dewar, B. Deremble, A. Poje, E. Chassignet & N. Wienders. (Submitted). On the dynamics of the subtropical mode water from an ensemble view. *J. Phys. Oceanogr.*, doi:10.22541/essoar.174802928.80389595/v1;
- Poje, A., **T. Uchida**, Q. Jamet, L. Sun, T. Penduff, B. Deremble, J. Schoonover, M. Trapanese, N. Wienders & W. Dewar. (Accepted). Thoughts on prognostically modeling an eddy double-gyre ensemble mean. *Front. Mar. Sci.*, doi:10.3389/fmars.2026.1739607;
- Richards, C., B. Evens, C. Parmesan, P. Amato, C. Andrade, G. Asatryan, V. Balaji, A. Ballantyne, M. Barbier, ..., **T. Uchida** & others. (Accepted). Multidisciplinary science

funding is more than ever a planetary priority: reflections from the Make Our Planet Great Again (MOPGA) program. *PLOS Clim.*, doi:10.1371/journal.pclm.0000849;

- **Uchida, T.**, A. Bodner, B. Reichl, A. Adcroft, B. Fox-Kemper, M. Ilicak, M. Bentsen, G. Marques & W. Large. (2026). Representation of surface mixed-layer eddies affects the large-scale ventilation of the global ocean. *Geophys. Res. Lett.*, doi:10.1029/2025GL116872;
- Yadidya, B., B. Arbic, J. Shriver, E. Zaron, M. Buijsman, L. Carrere, T. Lionel & **T. Uchida.** (2025). Advancing internal tide correction for SWOT Cal/Val: The role of ocean forecasts. *Earth Space Sci.*, doi:10.1029/2025EA004511;
- **Uchida, T.**, B. Yadidya, K. Lapo, X. Xu, J. Early, B. Arbic, D. Menemenlis, L. Hiron, E. Chassignet, J. Shriver & M. Buijsman. (2025). Dynamic mode decomposition of geostrophically balanced motions from SWOT Cal/Val in the separated Gulf Stream. *Earth Space Sci.*, doi:10.1029/2024EA004079;
- **Uchida, T.**, Q. Jamet, A. Poje, N. Wienders, L. Sun & W. Dewar. (2025). Dynamics and thermodynamics of the Boussinesq North Atlantic eddy kinetic energy spectral budget. *J. Adv. Model. Earth Syst.*, doi:10.1029/2024MS004781;
- **Uchida, T.**, Q. Jamet, W. Dewar, B. Deremble, A. Poje & L. Sun. (2024). Imprint of chaos on the ocean energy cycle from an eddying North Atlantic ensemble. *J. Phys. Oceanogr.*, doi:10.1175/JPO-D-23-0176.1;
- **Uchida, T.**, Q. Jamet, A. Poje, N. Wienders & W. Dewar. (2024). Wavelet-based wavenumber spectral estimate of eddy kinetic energy: Application to the North Atlantic. *Ocean Model.*, doi:10.1016/j.ocemod.2024.102392;
- **Uchida, T.**, Q. Jamet, A. Poje, N. Wienders, W. Dewar & B. Deremble. (2023). Wavelet-based wavenumber spectral estimate of eddy kinetic energy: Idealized quasi-geostrophic flow. *J. Adv. Model. Earth Syst.*, doi:10.1029/2022MS003399;
- Deremble, B., **T. Uchida**, W. Dewar & R. Samelson. (2023). Eddy-mean flow interaction with the Multiple Scale Quasi-Geostrophic Model. *J. Adv. Model. Earth Syst.*, doi:10.1029/2022MS003572;
- Chassignet, E., X. Xu, A. Bozec & **T. Uchida.** (2023). Impact of the New England seamount chain on the Gulf Stream pathway and variability. *J. Phys. Oceanogr.*, doi:10.1175/JPO-D-23-0008.1;
- **Uchida, T.**, D. Balwada, Q. Jamet, W. Dewar, B. Deremble, T. Penduff & J. Le Sommer. (2023). Cautionary tales from the mesoscale eddy transport tensor. *Ocean Model.*, doi:10.1016/j.ocemod.2023.102172;
- **Uchida, T.**, J. Le Sommer, C. Stern, R. Abernathey, C. Holdgraf, A. Albert, L. Brodeau, E. Chassignet, X. Xu, J. Gula, G. Roullet, N. Koldunov, S. Danilov, Q. Wang, D. Menemenlis, C. Bricaud, B. Arbic, J. Shriver, F. Qiao, B. Xiao, A. Biastoch, R. Schubert, B. Fox-Kemper, W. Dewar & A. Wallcraft. (2022). Cloud-based framework for inter-comparing submesoscale permitting realistic ocean models. *Geosci. Model Dev.*, doi:10.5194/gmd-15-5829-2022;

- **Uchida, T.**, Q. Jamet, W. Dewar, J. Le Sommer, T. Penduff & D. Balwada. (2022). Diagnosing the thickness-weighted averaged eddy-mean flow interaction from an eddying North Atlantic ensemble: The Eliassen-Palm flux. *J. Adv. Model. Earth Syst.*, doi:10.1029/2021MS002866;
- **Uchida, T.**, B. Deremble & S. Popinet. (2022). Deterministic model of the eddy dynamics for a midlatitude ocean model. *J. Phys. Oceanogr.*, doi:10.1175/JPO-D-21-0217.1;
- **Uchida, T.**, Q. Jamet, A. Poje & W. Dewar. (2021). An ensemble-based eddy and spectral analysis, with application to the Gulf Stream. *J. Adv. Model. Earth Syst.*, doi:10.1029/2021MS002692;
- Khatri, H., S. Griffies, **T. Uchida**, H. Wang & D. Menemenlis. (2021). Role of mixed-layer instabilities in the seasonal evolution of eddy kinetic energy spectra in a global submesoscale permitting simulation. *Geophys. Res. Lett.*, doi:10.1029/2021GL094777;
- **Uchida, T.**, B. Deremble & T. Penduff. (2021). The seasonal variability of the ocean energy cycle from a quasi-geostrophic double gyre ensemble. *Fluids*, doi:10.3390/fluids6060206;
- **Uchida, T.**, B. Deremble, W. Dewar & T. Penduff. (2021). Diagnosing the Eliassen-Palm flux from a quasi-geostrophic double gyre ensemble. In proceedings of the *EarthCube Annual Meeting*, doi:10.5281/zenodo.5496375. https://earthcube2021.github.io/ec21_book/notebooks/ec21_uchida_etal/notebooks/TU_05_Diagnosing-the-Eliassen-Palm-flux-from-a-quasi-geostrophic-double-gyre-ensemble.html;
- Jamet, Q., B. Deremble, N. Wienders, **T. Uchida** & W. Dewar. (2021). On wind-driven energetics of subtropical gyres. *J. Adv. Model. Earth Syst.*, doi:10.1029/2020MS002329;
- Jones, S., J. Busecke, **T. Uchida** & R. Abernathey. (2020). Vertical regridding and remapping of CMIP6 ocean data in the cloud. In proceedings of the *EarthCube Annual Meeting*, https://github.com/earthcube2020/ec20_jones_etal;
- **Uchida, T.**, D. Balwada, R. Abernathey, G. McKinley, S. Smith & M. Lévy. (2020). The impact of seasonality in eddy iron fluxes on primary production in the Southern Ocean. *Nature Comm.*, doi:10.1038/s41467-020-14955-0;
- **Uchida, T.**, D. Balwada, R. Abernathey, G. McKinley, S. Smith & M. Lévy. (2019). The contribution of submesoscale over mesoscale eddy iron transport in the open Southern Ocean. *J. Adv. Model. Earth Syst.*, doi:10.1029/2019MS001805;
- **Uchida, T.**, D. Balwada, R. Abernathey, C. Prend, E. Boss & S. Gille. (2019). Southern Ocean Phytoplankton Blooms Observed by Biogeochemical Floats. *J. Geophys. Res.: Oceans*, doi:10.1029/2019JC015355;
- **Uchida, T.**, R. Abernathey & S. Smith. (2017). Seasonality of eddy kinetic energy in an eddy permitting global climate model. *Ocean Model.*, doi:10.1016/j.ocemod.2017.08.006.

Non-refereed

- **Uchida, T.** (2019). *Seasonality in surface (sub)mesoscale turbulence and its impact on iron transport and primary production*. (Ph.D. dissertation, Columbia University in the City of New York). doi:10.7916/d8-9s8r-m049.

Mentoring

- Postdoctoral fellows: Luolin Sun (CNRS, France/FSU, USA); Habib Micaël Aguedjou (CNES, France);
- Doctoral students: Ilkyeong Ma (FSU, USA);
- Master students: Даниил Макеев (МФТИ, Россия); Черносос Вячеслав Денисович (МФТИ, Россия);

Honors and Awards

- Co-investigator of the National Aeronautics and Space Administration (NASA) award ‘*Mesoscale eddies, internal waves, solitons in SWOT, global models, and downscaled regional models*’ with the reference 80NSSC24K1649, funded for the duration of 2025-2028;
- Co-investigator of the National Science Foundation (NSF) award ‘*Novel Ensemble Based North Atlantic Diagnostics*’ with the reference OCE-2123632, funded for the duration of 2022-2026;
- Co-investigator of the the French Les Enveloppes Fluides et l’Environnement (LEFE) award ‘*Assessing the Role of forced and internal Variability for the Ocean and climate Response in a changing climate (ARVOR)*’ funded for the duration of 2022-2024;
- Attendee of Les Houches Summer School on Fundamental Aspects of Turbulent Flows in Climate Dynamics, which took place during August 2017 at l’École de Physique des Houches, France;
- Scholarship from the Heiwa Nakajima Foundation from September 2014 - August 2016.
- Laureate of the 2014 Dean’s Award from the Faculty of Engineering, The University of Tokyo.

Technical Skills

- Proficient in compiling and running numerical models in Fortran, with experience using the MITgcm. Also experienced in tuning and running the Darwin biogeochemical model;
- Expert in big-data analysis and has continued contributing to the development of Python open-source software such as:

1. `xrft`: doi:10.5281/zenodo.1402635 (<https://xrft.readthedocs.io/en/latest/>);
2. `xwavelet`: doi:10.5281/zenodo.6984380 (<https://github.com/roxyboy/xwavelet>);
3. `xgcm`: doi:10.5281/zenodo.4821276 (<https://xgcm.readthedocs.io/en/latest/>);

available via the Github platform, and `pip` and `conda-forge` package managers. Also has contributed to the implementation of Pangeo Forge for cloud-based computational analyses (doi:10.5281/zenodo.6762536);

Service Activity

- Topic editor for the special edition ‘*In Memory of William Kurt Dewar: Exploring the Dynamics of Oceanic Boundary Currents and their Impact on Weather*’ under *Frontiers of Marine Science*;
- Panelist for the NASA Research Opportunities in Space and Earth Science (ROSES) to review scientific proposals;
- Special U.S. government employee of NSF as a panelist and reviewer for reviewing scientific proposals;
- Reviewer for the Wallenberg Academy Fellowship awarded by the Knut and Alice Wallenberg Foundation in Sweden;
- Reviewer for the BIENVENUE Call 2021 (H2020-MSCA-COFUND-2019) managed by the Regional Council of Brittany, France;
- Reviewed manuscripts for *J. Phys. Oceanogr.*, *J. Adv. Model. Earth Syst.*, *J. Geophys. Res.: Oceans*, *Geophys. Res. Lett.*, *Glob. Biogeochem. Cyc.*, *Nature Rev. Earth Env.*, *Nature Comm.*, *Ocean Model.*, *Climate Dyn.*, *Fund. Res.*, *J. Marine Syst.*, *Biogeosci.*, *Geosci. Model Dev.*, *Deep-Sea Res.: Part I*, *J. Limn. Oceanogr.*, *Front. Marine Sci.*, *Fluids*, *Maths.*, *J. Mari. Sci. Engineer.*, *J. Operat. Oceanogr.*, *Inter. J. Digi. Earth*, & *IEEE J. Select. Topic. Appli. Earth Obs. Rem. Sense.*;
- Technician for the Lowered Acoustic Doppler Current Profiler (LADCP) measurements on the 2016 GO-SHIP 109N transect (https://currents.soest.hawaii.edu/go-ship/ladcp_rst_2015-2018/2016_I8S9N.html).