

SHUWEN TAN

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EDUCATION

Ph.D., Physical Oceanography *September 2014 - September 2020*
University of Chinese Academy of Sciences (UCAS), Beijing, China
Dissertation: “Hydraulic control and turbulent mixing of deep overflows in key passages of the Indonesian Seas and Pacific Ocean”
B.S., Marine Science *September 2010 - July 2014*
Ocean University of China, Qingdao, China

RESEARCH EXPERIENCE

Postdoctoral Scholar *July 2024 - December 2024*
Supervised by Dr. Kristen Davis
Oceans Department, Stanford University, Stanford, USA

Postdoctoral Scholar *December 2022 - June 2024*
Supervised by Dr. Kristen Davis
Department of Civil and Environmental Engineering, University of California, Irvine, USA

Postdoctoral Research Scientist *April 2021 - December 2022*
US GO-SHIP Postdoctoral Fellow, supervised by Dr. Andreas Thurnherr
Ocean & Climate Physics Division, Lamont-Doherty Earth Observatory, USA

Graduate Research Assistant *September 2015 - September 2020*
Supervised by Dr. Dongliang Yuan
Institute of Oceanology, Chinese Academy of Sciences, China

Guest student *September 2017 - September 2019*
Supervised by Dr. Larry Pratt
Physical Oceanography Department, Woods Hole Oceanographic Institution, USA

Guest student *April 2019 - May 2019*
Multiscale Ocean Dynamics Group, Scripps Institution of Oceanography, USA

TEACHING EXPERIENCE

Research mentor *Summer 2023 - Spring 2024*
University of California, Irvine, USA

- undergraduate research project: “Internal Wave-Induced Mixing and Instability at Dongsha Atoll” with Dr. Kristen Davis
- student’s work presented as a poster at the 2024 UCI Undergraduate Research Opportunities Program Symposium; thesis submitted for Campuswide Honors Collegium

Substitute Lecturer *Spring 2023, Spring 2024*
University of California, Irvine, USA

- undergraduate course: “Computational Problem Solving”

Guest Lecturer *Fall 2022*
Columbia University, New York, USA

- graduate course: “Introduction to Physical Oceanography”

Research mentor

Summer 2021 - Spring 2022

Columbia University, New York, USA

- undergraduate research project: “Different flavors of bottom boundary layer stratification profiles” with Dr. Andreas Thurnherr
- student’s work presented in poster sessions: AGU Fall Meeting 2021, Ocean Sciences Meeting 2022

PUBLICATIONS

Peer-reviewed articles

13. **Tan, S.** and Thurnherr, A.M., 2023. On the global decrease in the deep and abyssal density stratification along the spreading pathways of Antarctic Bottom Water since the 1990s. *Geophysical Research Letters*, 50(11), p.e2022GL102422.
12. Voet, G., Alford, M.H., Cusack, J.M., Pratt, L.J., Girton, J.B., Carter, G.S., Klymak, J.M., **Tan, S.** and Thurnherr, A.M., 2023. Energy and momentum of a density-driven overflow in the Samoan Passage. *Journal of Physical Oceanography*, 53(6), pp.1429-1452.
11. Yuan, D., Yin, X., Li, X., Corvianawatie, C., Wang, Z., Li, Y., Yang, Y., Hu, X., Wang, J., **Tan, S.** and Surinati, D., 2022. A Maluku Sea intermediate western boundary current connecting Pacific Ocean circulation to the Indonesian Throughflow. *Nature Communications*, 13(1), p.2093.
10. **Tan, S.**, Pratt, L.J., Voet, G., Cusack, J.M., Helfrich, K.R., Alford, M.H., Girton, J.B. and Carter, G.S., 2022. Hydraulic control of flow in a multi-passage system connecting two basins. *Journal of Fluid Mechanics*, 940, p.A8.
9. Zhou, H., Liu, H., **Tan, S.**, Yang, W., Li, Y., Liu, X., Ren, Q. and Dewar, W.K., 2021. The observed North Equatorial Countercurrent in the far western Pacific Ocean during the 2014-16 El Niño. *Journal of Physical Oceanography*, 51(6), pp.2003-2020.
8. **Tan, S.**, Pratt, L.J., Yuan, D., Li, X., Wang, Z., Li, Y., Corvianawatie, C., Surinati, D., Budiman, A.S. and Bayhaqi, A., 2020. Hydraulics and mixing of the deep overflow in the Lifamatola Passage of the Indonesian seas. *Journal of Physical Oceanography*, 50(9), pp.2797-2814.
7. Zhang, Z., Pratt, L.J., Wang, F., Wang, J. and **Tan, S.**, 2020. Intermediate intraseasonal variability in the western tropical Pacific Ocean: Meridional distribution of equatorial Rossby waves influenced by a tilted boundary. *Journal of Physical Oceanography*, 50(4), pp.921-933.
6. Cusack, J.M., Voet, G., Alford, M.H., Girton, J.B., Carter, G.S., Pratt, L.J., Pearson-Potts, K.A. and **Tan, S.**, 2019. Persistent turbulence in the Samoan Passage. *Journal of Physical Oceanography*, 49(12), pp.3179-3197.
5. Carter, G.S., Voet, G., Alford, M.H., Girton, J.B., Mickett, J.B., Klymak, J.M., Pratt, L.J., Pearson-Potts, K.A., Cusack, J.M. and **Tan, S.**, 2019. A spatial geography of abyssal turbulent mixing in the Samoan Passage. *Oceanography*, 32(4), pp.194-203.
4. Girton, J.B., Mickett, J.B., Zhao, Z., Alford, M.H., Voet, G., Cusack, J.M., Carter, G.S., Pearson-Potts, K.A., Pratt, L.J., **Tan, S.** and Klymak, J.M., 2019. Flow-topography interactions in the Samoan Passage. *Oceanography*, 32(4), pp.184-193.
3. Pratt, L.J., Voet, G., Pacini, A., **Tan, S.**, Alford, M.H., Carter, G.S., Girton, J.B. and Menemenlis, D., 2019. Pacific abyssal transport and mixing: Through the Samoan Passage versus around the Manihiki Plateau. *Journal of Physical Oceanography*, 49(6), pp.1577-1592.

2. **Tan, S.** and Zhou, H., 2018. The observed impacts of the two types of El Niño on the North Equatorial Countercurrent in the Pacific Ocean. *Geophysical Research Letters*, 45(19), pp.10-493.

1. Yuan, D., Li, X., Wang, Z., Li, Y., Wang, J., Yang, Y., Hu, X., **Tan, S.**, Zhou, H., Wardana, A.K. and Surinati, D., 2018. Observed transport variations in the Maluku Channel of the Indonesian Seas associated with western boundary current changes. *Journal of Physical Oceanography*, 48(8), pp.1803-1813.

Manuscripts in preparation

Tan, S., Davis, K., Rogers, J., Fringer, O., Pawlak, G., Okun, K., Energetics of nonlinear internal waves interacting with a conical island.

Rogers, J., **Tan, S.**, , Davis, K., Pawlak, G., Fringer, O., Enhanced upwelling from internal waves in a warming ocean increases cooling effects on a shallow island reef

Tan, S., Davis, K., Rogers, J., Fringer, O., Pawlak, G., Okun, K., Three-dimensional shoaling of nonlinear internal waves interacting with a conical island.

Tan, S. and Thurnherr, A.M., Implications of the decadal stratification changes for hydraulic control of abyssal channel flow.

Cusack, J. M., **Tan, S.**, Voet, G., Pratt, L. J., Alford, M. H., Carter, G. S. Girton, J. B., The structure and stability of a deep ocean overflow.

SEMINAR AND CONFERENCE PRESENTATIONS

Tan, S. et al., (2024), Energetics of Nonlinear Internal Waves Interacting with 3-Dimensional Topography. **Poster**, Ocean Science Meeting, New Orleans, USA.

Tan, S. et al., (2023), From the Deep Ocean to the Coast: Topographic Effects on Stratified Flows in the Context of Climate Change. **Invited talk**, Department of Marine Sciences, University of Connecticut, USA.

Tan, S. et al., (2023), Topographic Effects on Stratified Ocean Flows in the Context of Global Warming. **Invited talk**, College of Marine Science, University of South Florida, USA.

Tan, S. et al., (2023), Topographic Effects on Stratified Ocean Flows in the Context of Global Warming. **Invited talk**, Physics of Oceans and Atmospheres Seminar Series, Oregon State University, USA.

Tan, S., Davis K., et al., (2023), How do solitary waves distribute their energy at Dongsha Atoll? **Poster**, Coastal Ocean Dynamics Gordon Research Conference, Bryant University, USA.

Tan, S., Davis K., et al., (2023), On the energy budget of solitary waves at Dongsha Atoll: an idealized model study. **Invited talk**, International Workshop on the 2019 Internal Solitary Waves Experiment in the South China Sea, virtual.

Tan, S. and Thurnherr A.M., (2022), Decadal changes in stratification of the abyssal oceans and implications for hydraulic control of abyssal channel flow. **Oral**, Woods Hole Oceanographic Institution PO Seminar, Woods Hole, USA.

Tan, S. and Thurnherr A.M., (2022), Decadal changes in stratification of the abyssal oceans and implications for hydraulic control of abyssal channel flow. **Oral**, Ocean Science Meeting, virtual.

Tan, S., Thurnherr A.M., et al., (2022), Hydraulically Controlled Flow in Abyssal Ocean Passages. **Invited talk**, Atmospheres and Oceans Seminar at Johns Hopkins University, virtual.

Tan, S., Pratt L.J., et al., (2020), Hydraulic control and wave adjustment in a channel+plateau system: Deep Western Boundary Current passing through the Samoan Passage. **Poster**, AGU Fall Meeting, virtual.

Tan, S., Pratt L.J., Yuan D., and Corvianawatie C. (2019), Hydraulics and mixing in the deep branch of the Indonesian Throughflow. **Oral**, Woods Hole Oceanographic Institution PO Seminar, Woods Hole, USA.

Tan, S., Yuan D., and Zhou H. (2018), Significant Cooling in the Deep Philippine Sea during the recent Global Warming Hiatus. **Poster**, AGU Fall Meeting, Washington, D.C., USA.

Tan, S., Li B. and Yuan D. (2016), Interannual Variations of Low Latitude Western Boundary Currents in the Tropical Western Pacific Ocean. **Poster**, CLIVAR Open Science Conference, Qingdao, China.

FIELD EXPERIENCE

R/V Roger Revelle *44 Days, April –June 2022*

- GO-SHIP cruise P02W, Guam-Honolulu, Co-chief Scientist. Chief Scientist: Dr. Alison Macdonald

R/V Kexue *31 Days, August–October 2015*

- NSFC Western Pacific Open Cruise, mooring recovery team, winch driver, CTD watch-stander. Chief Scientist: Dr. Dongliang Yuan

SERVICE

Student/Early Career Chair of the 2024 Ocean Sciences Meeting *February 2024*
for session “Our Changing Ocean: Findings from 30 Years of Sustained Observations”

Mentor for ASLO Multicultural Program *March 2022, February 2024*
at the 2022 and 2024 Ocean Sciences Meetings

Co-chair of the Gordon Research Seminar on Coastal Ocean Dynamics *Summer 2023*
with Dr. Elizabeth Brasseale

Member of US GO-SHIP PI Committee *Spring 2021 –Ongoing*
lead of chief/co-chief scientist training subcommittee and member of software writing subcommittee

Coordinator of the OCP Seminar Series *Fall 2021 –Spring 2022*
Department Seminar Series at Lamont-Doherty Earth Observatory, Columbia University

Reviewer *Spring 2022 –Ongoing*
Journal of Physical Oceanography, Nature Communications,
Ocean Dynamics, Nature Communications Earth & Environment
UK Natural Environment Research Council grant proposal,
NSF Physical Oceanography Program proposal, NSF Polar Programs panelist

PROPOSALS AND AWARDS

National Science Foundation *January 2025 –December 2027*
Collaborative Research: Alongshelf Currents Driven by Obliquely Incident Shoaling Internal Bores
co-PIs: Shuwen Tan (UCI), Walter Torres (UW), collaborator: Falk Feddersen (UCSD), \$484,568

US GO-SHIP Postdoctoral Fellowship *April 2021 –April 2022*
proposed project on “Changes in Bottom Water Stratification in Recent Decades, and their Implications
for Water Transformation and Mixing” with Andreas Thurnherr, \$72,000

2021 National Marine Science and Technology Award (13th place) *April 2022*
Chinese Society for Oceanography