**AVIV SOLODOCH**
July 2023- Senior Lecturer (identical to US ranking of Associate Professor), Institute of Earth Sciences, Hebrew University of Jerusalem, Israel
Postdoctoral researcher, Department of Atmospheric and Oceanic Sciences, UCLA
Research Assistant, Department of Mechanical Engineering, Tel Aviv University
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Rehovot, Israel. 051-233-9913.

## ACADEMIC POSITIONS

**July 2023-** **Senior Lecturer, Hebrew University of Jerusalem,** Institute of Earth Sciences
**2020-2023** **Postdoctoral researcher,** UCLA dept. of Atmospheric and Oceanic Sciences
**2021-2023** **Research assistant,** Tel Aviv University, dept. of Mechanical Engineering
**2020-2021** **Research assistant,** Tel Aviv University, dept. of Geophysics
**2017-2018** **Teaching Assistant,** UCLA dept. of Atmospheric and Oceanic Sciences
**2017** **Research Assistant,** UCLA Marine Operations

## ACADEMIC DEGREES

**2020** **PhD in Physical Oceanography,** UCLA
**2017** **MS in Atmospheric and Oceanic Sciences,** UCLA
**2010** **MS in Physics**, Applied Physics Track, Weizmann Institute of Israel
**2007** **BS in Physics and Math,** Tel Aviv University, Israel, Magna Cum Laude

## COMPETITIVE GRANTS

**2023-2025** **Collaborator/postdoc & co-writer, NASA grant**, "*Estimating Spatiotemporal Meridional Overturning Circulation Variability from Satellite Observations using Machine Learning*".
**2022-2024** **Cowriter and Collaborator, Israeli Ministry of Energy grant: "***Eastern Levantine cross-shelf transport: potential effect on pollutants spreading*".
**2021-2022** **IDRE Research Fellow:** UCLA Institute for Digital Research and Education. "*Machine Learning of the Ocean Overturning Circulation".*
**2021-2022** **Co-PI, XSEDE Computing Cluster Startup Allocation: "***Extreme Science and Engineering Discovery Environment; Dynamical regimes and controls of oceanic boundary current separation*".

## ACADEMIC AWARDS

**2019** **Jacob A. Bjerknes Award,** UCLA AOS annual award for excellence in PhD dissertation research.
**2007** **Magna Cum Laude,** BS in Physics and Math, Tel Aviv University, Israel
**2005** **Recognition of outstanding academic achievements** by the dean of exact sciences, Tel Aviv University, Israel

## RESEARCH AREAS

Physical Oceanography; Geophysical fluid Dynamics; Ocean overturning circulation and watermass transformations; Material transport and dispersion; Boundary currents variability; Topographic effects on circulation; Vortex interactions; Multi-scale interactions; Gravity currents and waves.

## RESEARCH TOOLS

Numerical modeling: from toy models to fully realistic ocean circulation models; Ocean observations and instrumentation; Theoretical geophysical fluid dynamics; Remote sensing; Machine learning.

**TEACHING and MENTORING**

**2016-2018** **Research Assistant and Captain,** research vessel educational cruises, UCLA.
**2017-2018** **Marine Operations Research Mentor** for undergraduate students, UCLA.
**2017-2018** **Teaching Assistant and Guest Lecturer,** Introduction to Physical Oceanography, UCLA.
**2019-2023** **Research Mentor** for undergraduate students in Physical Oceanography, UCLA; Including in two projects which have already made it to publication stage.

**ACADEMIC SERVICE**

**2021**- **US CLIVAR AMOC Task Team 3 member**: Atlantic Meridional Overturning Circulation Mechanisms and Predictability (https://usclivar.org/amoc).
**2022** Initiator and **lead organizer**, UCLA IDRE Machine Learning for Climate Symposium.
**2022** **Co-organizer**, UCLA IDRE Open Science Symposium.
**2022** Student presentation award **Judge**, CalGFD conference, Caltech**.**

**AD HOC REVIEWER ROLES**

**2021, 2023** National Science Foundation (NSF) proposal reviewer.
**2018-** Ad-Hoc Manuscript reviewer: *Journal of Fluid Mechanics; Ocean Dynamics; Journal of Physical Oceanography; Deep Sea Research II; Polar Science; Journal of Geophysical Research: Oceans; Geophysical Research Letters.*

**MARINE OPERATIONS CERTIFICATIONS**

**2016** Small Boat piloting and safety certification.
**2016** University of California Marine Operations certification.
**2019** Unmanned Aerial Vehicle License (US FAA).

**FIELD CAMPAIGNS EXPERIENCE**

**2015-2019** UCLA Marine Operations: **boat captain and research cruises lead**
Santa Monica Bay, San-Pedro, and Santa Catalina Island research cruises
**2016-02** Lagrangian Submesoscale Experiment (“LASER”)
**Light plane imaging systems operator**
Gulf of Mexico DeSoto Canyon (1 week)
**2017-05** UCLA light research vessel **captain and science lead**
Submesoscale Processes and Lagrangian Analysis on the Shelf (SPLASH)
Gulf of Mexico, Louisiana Bight (3 weeks)
**2021-2022** **Observations Planning and Co-PI**: Near-shore coordinated in-situ and Unmanned Aerial Vehicle observations of fine scale sea properties. Collaboration with Charney School CROSSMAR (Y. Lehahn) lab, and Tel Aviv University MEPlab (Y. Toledo) group.
**2023** Israeli Continental Slope Submesoscale Circulation Campaign**, Pilot Experiment Chief Scientist**. Planning, coordination, and scientific leading of research cruises aboard the Medex research vessels and support systems (UAV, gliders, drifters, light vessel).

**INDUSTRY EXPERIENCE**

**2010-2014** **Experiments Physicist at Optigo Systems Ltd,** full-time employment**.**
Laboratory and field experiments in electro-optical systems.

Data analysis and simulation of electro-optics, mechanics, and vibrations. Leading a 3-person experiments team.

**2006-2007** **Physics Student position at Applied Materials** Israel, Rehovot.
Electro-optical systems testing and experiments, with focus on interferometry.

**LANGUAGES**

English - fluent; Hebrew – fluent.

**SCIENTIFIC PUBLICATIONS**

**Refereed Journal Articles:**

1. **Solodoch**, A., W. Boos, Z. Kuang, E. Tziperman (2011). Excitation of Intraseasonal Variability in the Equatorial Atmosphere by Yanai Wave Groups via WISHE-Induced Convection. *Journal of the Atmospheric Sciences*, 68: 210-225.
2. **Solodoch**, A., A. L. Stewart, J. C. McWilliams (2016). Baroclinic Instability of Axially symmetric Flow Over Sloping Bathymetry. *Journal of Fluid Mechanics*, 799: 265-296.
3. **Solodoch** A, McWilliams JC, Stewart AL, Gula J, Renault L. (2020). Why Does the Deep Western Boundary Current "Leak" around Flemish Cap? *Journal of Physical Oceanography*, 50(7):1989-2016.
4. **Solodoch** A, Molemaker JM, Srinivasan K, Berta M, Marie L, Jagannathan A. (2020). Observations of Shoaling Density Current Regime Changes in Internal Wave Interactions. *Journal of Physical Oceanography*, 50(6):1733-1751.
5. Stewart, A.L., McWilliams, J.C. and **Solodoch**, A. (2021). On the Role of Bottom Pressure Torques in Wind-Driven Gyres. *Journal of Physical Oceanography*, 51(5): 1441-1464.
6. **Solodoch** A, Stewart AL, McWilliams JC. (2021) Formation of Anticyclones Above Topographic Depressions. *Journal of Physical Oceanography,* 51 (1): 207-228.
7. Stewart, A.L., Chi X., **Solodoch**, A, Hogg, A. (2021). High-Frequency Fluctuations in Antarctic Bottom Water Transport Driven by Southern Ocean Winds. *Geophysical Research Letters*, 48(17).
8. **Solodoch**, A., A. L. Stewart, A. McC. Hogg, A. K. Morrison, A. E. Kiss, A. F. Thompson, S. G. Purkey, and L. Cimoli (2022). Antarctic Bottom Water Export from the Southern Ocean: Conduits vs Blender. *Geophysical Research Letters*, e2021GL097211.
9. Stewart, A., N. K. Neumann, A. **Solodoch** (2023). "Eddy" saturation of the Antarctic Circumpolar Current by standing waves. *Geophysical Research Letters*.
10. **Solodoch**, A., A. L. Stewart, A. McC. Hogg, G. Manucharyan (2023). Ocean Meridional Overturning Circulation Inference from Satellite-Observations. Accepted for publication in the *Journal of Advances in Modeling Earth Systems*.

**Manuscripts, in revision:**

11. **Solodoch** A., R. Barkan, H. Gildor, Y. Toledo. East-Mediterranean Sea Circulation Spectrum: Basin Scale to Submesoscale. Submitted to the *Journal of Physical Oceanography*.

**Manuscripts in Advanced Preparation Stage:**

1. **Solodoch** A, Molemaker JM. Towed Instrument Array for Fine-Scale Ocean Measurements: Design, Modeling, and Tests.
2. Collective oriented swimming in jellyfish. D. Malul, **A. Solodoch**, O. Tal, N. Barak, Y. Toledo, D. Sher, T. Lotan, U. Shavit, Y. Lehahn.

**PhD Dissertation:**

Solodoch A. Topographic effects on mesoscale ocean circulation. Atmospheric and Oceanic Sciences, University of California, Los Angeles, 2020.

**MS thesis:**

Solodoch A. Excitation of slow Kelvin waves in the equatorial atmosphere by Yanai wave-group-induced convection. Faculty of physics, Weizmann Institute of Science, Israel, 2010.

**ORAL PRESENTATIONS AT SCIENTIFIC CONFERENCES**

1. Detailed observations of structure and erosion of a Mississippi-plume front in the Gulf of Mexico. **Solodoch, A.,** Molemaker, J., Srinivasan, K., Bertero, L. CARTHE-II Fall 2017 All-Hands Meeting. RSMAS, Miami, FL.
2. Leakiness of the Deep Western Boundary Current near Flemish Cap. **Solodoch, A.**, J. C. McWilliams, A. Stewart., Gula, J., Renault, L. GFD Days conference, Sde Boker, Israel. January 2019.
3. Emergence of long-lived ocean anticyclones in topographic depressions. **Solodoch, A.**, J. C. McWilliams, A. Stewart. 22nd Conference on Atmospheric and Oceanic Fluid Dynamics, June 2019.
4. Formation processes of topography-locked vortices. **Solodoch, A.,** J. C. McWilliams, A. Stewart. 1st annual CalGFD meeting, LA, CA, USA, September 2019.
5. Antarctic Bottom Water export across the Southern Ocean: Conduit vs Blender. **Solodoch, A.**, Stewart A.L., Hogg, A., Kiss, A., Morrison, A., Thompson, A., Purkey, S., Cimoli, L. US-Antarctic Science Online Meeting, July 2021.
6. Long-lived anticyclones formation above topographic depressions. **Solodoch, A.**, Stewart A.L., McWilliams, J.C. 3rd annual CalGFD meeting, LA, CA, USA, September 2021.
7. High resolution numerical modeling of the Eastern-Mediterranean Sea circulation and cross-shelf exchange. **Solodoch, A.**, Barkan R., Gildor H., Toledo Y., Verma V. GoMed 2021 meeting, HUJI, Jerusalem, October 2021.
8. Southern Ocean pathways of Antarctic Bottom Water: conduits vs blender. **Solodoch, A.**, Stewart A.L., Hogg, A., Kiss, A., Morrison, A., Thompson, A., Purkey, S., Cimoli, L. AGU fall meeting, New Orleans, LA, USA, December 2021.
9. Export pathways of Antarctic Bottom Waters: Conduits and Blenders. **Solodoch, A.**, Stewart A.L., Hogg, A., Kiss, A., Morrison, A., Thompson, A., Purkey, S., Cimoli, L. AGU Ocean Sciences 2022 Meeting, Hawaii, USA, March 2022.
10. Indirect Inference of the Ocean's Meridional Overturning Circulation Variability Using Machine Learning. **Solodoch, A.**, A. L. Stewart, A. M. Hogg, G. Manucharyan. 23rd Conference on Atmospheric and Oceanic Fluid Dynamics, Breckenridge, CO, UAS, June 2022.
11. Energy Spectrum of the East Mediterranean Sea: Basin Scale to Submesoscale. **Solodoch, A**., R. Barkan, V. Verma, H. Gildor, Y. Toledo. 4th annual CalGFD meeting, LA, CA, USA, August 2022. LA, CA, USA.
12. Meridional Overturning Circulation from Satellite Observables: a State Estimate Test. **Solodoch, A**., A. L. Stewart, A. McC. Hogg, G. Manucharyan. AGU fall meeting, Chicago, IL, USA, December 2022.
13. Measuring Surface Velocities and Waves from Unmanned Aerial Vehicles. **Solodoch A.**, Y. Lehahn, Y. Toledo. The Israeli Association for Aquatic Sciences conference, Tel Aviv, Israel, December 2022.

**Invited Presentations, Including Departmental Seminars**

1. Observations of a submesoscale front in the Gulf of Mexico. Solodoch, A., Molemaker, J., Srinivasan. UCLA Marine Center meeting, 2017.
2. Observations of a density current in a sheared stratified ambient. Solodoch, A., Molemaker, J., Srinivasan, K., Bertero, L.; Tel Aviv University, dept. of Mechanical Engineering, Toledo group invited seminar. Tel Aviv, Israel. January 2019.
3. Leakiness and separation of the Deep Western Boundary Current in the transition from the subpolar to the subtropical gyre. Solodoch, A., J. C. McWilliams, A. Stewart., J. Gula, L. Renault. Hebrew University of Jerusalem, Israel. January 2019. Climate Atmosphere and Oceanography seminar.
4. Observations vs theory for Stratified density current propagation and interntal wave interactions. Solodoch, A., J. Molemaker, K. Srinivasan, M. Berta. Ben Gurion University of the Negev, Solar Energy & Environmental Physics Department Seminar. January 2019.
5. Leakiness and separation of the Deep Western Boundary Current. Solodoch, A., J. C. McWilliams, A. Stewart., Gula, J., Renault, L. Caltech, Environmental Science & Engineering Dept.: Oceanography groups joint seminar. Pasadena, CA. March 2019.
6. What makes the Deep Western Boundary Current "leak"? Solodoch, A., J. C. McWilliams, A. Stewart., Gula, J., Renault, L. UCLA dept. of Atmospheric and Oceanic Sciences: departmental seminar. April 2019.
7. Emergence of semi-stationary vortices above topographic depressions. Solodoch, A., J. C. McWilliams, A. Stewart. Tel Aviv University Geophysics Dept. Colloquium. January 2021.
8. What causes the leakiness of the North Atlantic Deep Western Boundary Current? Solodoch, A., J. C. McWilliams, A. Stewart., J. Gula, L. Renault. Weizmann Institute of Science Dept. of Earth and Planetary Sciences Seminar, May 2021.
9. Observations of river outflow plume propagation, and its interaction with internal waves. Solodoch, A., J. Molemaker, K. Srinivasan, M. Berta, L. Marie, A. Jagannathan. The University of Haifa Dept. of Marine Geosciences Seminar, October 2021.
10. East-Mediterranean Sea Circulation and Transport: from the Basin Scale to the km Scale. Solodoch, A., R. Barkan, V. Verma, H. Gildor, Y. Toledo. Technion Environmental Engineering Dept. and Grand Water Research Institute Seminar. June 2022.
11. Machine Learning of the Ocean Overturning Circulation. Solodoch, A., A. L. Stewart, A. M. Hogg, G. Manucharyan. University of California Los Angeles (UCLA) Institute of Digital Research (IDRE), July 2022.
12. Understanding & Sensing the Oceanic Overturning Circulation. Solodoch, A., A. L. Stewart, A. McC. Hogg, G. Manucharyan. Ben Gurion University of the Negev, Solar Energy & Environmental Physics Department Seminar. November 2022.
13. Marine Material Uptake, Dispersion, and Overturning From the coastal sea to the deep ocean and back again. Solodoch, A. Technion Environmental Engineering Dept. and Grand Water Research Institute Seminar. November 2022.
14. Meridional Overturning Circulation from Satellite Observables - a State Estimate Test. “Estimating the Circulation and Climate of the Ocean” consortium (ECCO) 2023-01 meeting.
15. Ventilation pathways of the deep Southern Ocean. "Drifters" Research Group seminar at Royal Holloway University (London, UK). Scheduled for 2022-02-15.

**Poster Presentations at Scientific Conferences**

1. Modeling Baroclinic Instability on Curving Continental Slopes. **Solodoch, A.**, A. L. Stewart, and J. C. McWilliams. 20th Conference on Atmospheric and Oceanic Fluid Dynamics 2016, AMS. Poster presentation.
2. Eddy Shedding in the Deep Western Boundary Current. **Solodoch, A.**, J. C. McWilliams, and A. L. Stewart. AGU Fall Meeting 2016. Poster presentation.
3. Instabilities and Interior Transport Pathways of the Deep Western Boundary Current. **Solodoch, A.**, J. C. McWilliams, A. Stewart., J. Gula, L. Renault. 21st Conference on Atmospheric and Oceanic Fluid Dynamics 2017, AMS. Poster presentation.
4. Application of boat mounted dissolved CO2 sensor coupled with drone-based kelp canopy mapping to study the potential of kelp forests to modulate localized coastal CO2 concentrations and pH. B. A. Caraveo, J. Rosas, R. Ash, K. Cavanaugh, R. Eagle, E. Hockridge, K. Lo, A. Pezner, **A. Solodoch**, K. Wright, J. Xu. AGU 2017 fall meeting, Washington, DC. Virtual Poster Showcase.
5. What makes the Deep Western Boundary Current "leak"? **Solodoch, A.**, J. C. McWilliams, A. Stewart., J. Gula, L. Renault. AGU Ocean Sciences Meeting 2018. Poster presentation.
6. Mixing and wind-response in submesoscale fronts. **Solodoch, A.**, J. Molemaker, K. Srinivasan, L. Bertero. Gulf of Mexico oil spill & ecosystem science conference 2018. Poster presentation.
7. Leakiness of the Deep Western Boundary Current near Flemish Cap. **Solodoch, A.**, J. C. McWilliams, A. Stewart., J. Gula, L. Renault. 22nd Conference on Atmospheric and Oceanic Fluid Dynamics. June 2019. Poster presentation.
8. East Mediterranean Circulation Modelling: from the Basin scale to the kilometer scale. **Solodoch, A**., V. Verma, R. Barkan, H. Gildor, Y. Toledo, P. Khain; Y. Levi; Israeli Association for Aquatic Sciences (IAAS) 2022 conference. Poster presentation.
9. The Swimming Velocity of the Rhopilema Nomadica Jellyfish. O. Tal. D. Malul, N. Barak, A. Binyamin, **A. Solodoch**, D. Sher, T. Lotan, Y. Lehahn, U. Shavit. The Israeli Association for Aquatic Sciences (IAAS) 2022 conference. Poster presentation.