TOMÁS L. CHOR

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EDUCATION

Ph.D. Atmospheric and Oceanic Sciences
University of California, Los Angeles

September 2020

M.Sc. Atmospheric and Oceanic Sciences
University of California, Los Angeles

December 2018

M.Sc. Environmental Engineering
Federal University of Paraná, Curitiba

March 2014

B.Sc. Environmental Engineering
Federal University of Paraná, Curitiba

January 2012

RESEARCH EXPERIENCE

Submesoscale dynamics in the ocean bottom boundary layer   October 2020 — Present
University of Maryland, Dept of Atmospheric and Oceanic Science

· Numerically investigating the energetics and mixing implications of submesoscale instabilities in the ocean bottom boundary layer.

Mixing of passive materials in the upper ocean   September 2016 — September 2020
UCLA, Dept of Atmospheric and Oceanic Sciences

· Numerically investigated vertical mixing and horizontal transport of passive scalars in ocean surface boundary layers. Focus was given to wave effects, and new frameworks to model these conditions in global models were developed.

Turbulent fluxes in the Amazon forest   August 2015 — August 2016
Federal University of Paraná, Dept of Environmental Engineering

· Worked with data from the Amazonian Tall Tower Observatory (ATTO) project to better understand how the dense canopy impacts turbulent fluxes in parts of the Amazon forest.

Mathematical methods for modeling groundwater flows   March 2012 — March 2014
Federal University of Paraná, Dept of Environmental Engineering

· Developed novel solutions to a well-known equation that models groundwater flow (Boussinesq equation). These new solutions can be used as analytical models for water in porous aquifers.

Turbulent fluxes over grasslands and lakes   December 2010 — April 2014
Federal University of Paraná, Dept of Environmental Engineering

· Performed meteorological and micrometeorological field measurements as well as data processing with the main goal of better understanding the nature of turbulent fluxes over some grassland and lake locations in Brazil.

AWARDS AND SCHOLARSHIPS

Jacob A. Bjerknes memorial award   December 2020

· Awarded by UCLA's department of Atmospheric and Oceanic Sciences for contributions in advancing the understanding and modeling of scalar transport in the oceanic surface boundary layer

Richard P. Turco exceptional research award   November 2019

· Awarded by UCLA's department of Atmospheric and Oceanic Sciences for exceptional improvement in the understanding of tracer transport

National Institute for Amazonian Research grant   August 2015 — August 2016

· Awarded jointly with the Max Planck Institute for Chemistry to work on the Amazonian Tall Tower Observatory project

Odelar Leite Linhares award   October 2014

· Awarded by the Brazilian Society for Applied and Computational Mathematics for best Masters thesis in Applied mathematics in Brazil.

PUBLICATIONS

In preparation

[1] **Tomas Chor**, James C. McWilliams, and Marcelo Chamecki. "Dust-devil-like vortices in convective surface oceanic boundary layers". In: *In preparation* (2021).

Journal publications

[1] **Tomas Chor**, Jacob O. Wenegrat, and John Taylor. "Insights into the mixing efficiency of submesoscale Centrifugal-Symmetric instabilities". In: *Journal of Physical Oceanography* (2022). DOI: 10.1175/JPO-D-21-0259.1.

[2] **Tomas Chor**, James C. McWilliams, and Marcelo Chamecki. "Modifications to the K-Profile parameterization with nondiffusive fluxes for Langmuir turbulence". In: *Journal of Physical Oceanography* (2021). DOI: 10.1175/JPO-D-20-0250.1.

[3] **Tomas Chor**, James C. McWilliams, and Marcelo Chamecki. "Diffusive–Nondiffusive Flux Decompositions in Atmospheric Boundary Layers". In: *Journal of the Atmospheric Sciences* 77.10 (2020), pp. 3479–3494. ISSN: 0022-4928. DOI: 10.1175/JAS-D-20-0093.1.

[4] Marcelo Chamecki, **Tomas Chor**, Di Yang, and Charles Meneveau. "Material transport in the ocean mixed layer: recent developments enabled by large eddy simulations". In: *Reviews of Geophysics* (2019). DOI: 10.1029/2019RG000655.

[5] **Chor, Tomas**, Ailín Ruiz de Zárate, and Nelson L. Dias. "A generalized series solution for the Boussinesq equation with constant boundary conditions". In: *Water Resources Research* 55.4 (2019), pp. 3567–3575. DOI: 10.1029/2018WR024154.

[6] Cléo Quaresma Dias-Júnior, ..., **Tomas Chor**, and Antonio Manzi. "Is There a Classical Inertial Sublayer Over the Amazon Forest?" In: *Geophysical Research Letters* 46.10 (2019), pp. 5614–5622. DOI: 10.1029/2019GL083237.

[7] **Chor, Tomas**, Di Yang, Charles Meneveau, and Marcelo Chamecki. "A Turbulence Velocity Scale for Predicting the Fate of Buoyant Materials in the Oceanic Mixed Layer". In: *Geophysical Research Letters* 45.21 (2018), pp. 11, 817–11, 826. DOI: `10.1029/2018GL080296`.

[8] **Chor, Tomás**, Di Yang, Charles Meneveau, and Marcelo Chamecki. "Preferential concentration of noninertial buoyant particles in the ocean mixed layer under free convection". In: *Phys. Rev. Fluids* 3 (2018), p. 064501. DOI: `10.1103/PhysRevFluids.3.064501`.

[9] **Tomás L. Chor**, Nelson L. Dias, Alessandro Araújo, and ... "Flux-variance and flux-gradient relationships in the roughness sublayer over the Amazon forest". In: *Agricultural and Forest Meteorology* 239 (2017), pp. 213–222. ISSN: 0168-1923. DOI: `http://dx.doi.org/10.1016/j.agrformet.2017.03.009`.

[10] Einara Zahn, **Tomas L. Chor**, and N. L. Dias. "A Simple Methodology for Quality Control of Micrometeorological Datasets". In: *American Journal of Environmental Engineering* 6.4A (2016), pp. 135–142. DOI: `10.5923/s.ajee.201601.20`.

[11] **Chor, Tomas L.** and N. L. Dias. "Technical Note: A simple generalization of the Brutsaert and Nieber analysis". In: *Hydrology and Earth System Sciences* 19.6 (2015), pp. 2755–2761. DOI: `10.5194/hess-19-2755-2015`.

[12] Nelson L. Dias, **Chor, Tomás L.**, and Ailín Ruiz de Zárate. "A semianalytical solution for the Boussinesq equation with nonhomogeneous constant boundary conditions". In: *Water Resources Research* 50.8 (2014), pp. 6549–6556. ISSN: 1944-7973. DOI: `10.1002/2014WR015437`.

[13] **Chor, Tomas**, N. L. Dias, and Ailín Ruiz de Zárate. "An exact series and improved numerical and approximate solutions for the Boussinesq equation". In: *Water Resources Research* 49.11 (2013), pp. 7380–7387. DOI: `10.1002/wrcr.20543`.

[14] B. L. Crivellaro, N. L. Dias, and **Chor, Tomas**. "Spectral Effects on Scalar Correlations and Fluxes". In: *American Journal of Environmental Engineering* 3.1 (2013), pp. 13–17. DOI: `10.5923/j.ajee.20130301.03`.

Book chapters

[1] N. L. Dias, Cynara Cunha, Dornelles Vissotto Junior, Maurício F Gobbi, Fernando A S Armani, Lucas E B Hoeltgebaum, **Tomás L Chor**, and Bianca L Crivellaro. *BALCAR project: Greenhouse gas emissions from hydroelectric dam reservoirs (in Portuguese)*. Chapter 5: Modelling. CEPEL, 2014.

SUPPLEMENTAL TRAINING

The Burgers Program's Research School on Fluid Dynamics   June 2018
University of Maryland

· Attended talks and workshops on several aspects of turbulence.

The San Diego Supercomputing Center Summer Institute   August 2019
University of California, San Diego

· Attended Workshops on how to apply high-performance computing in scientific research.

SELECTED TALKS AND CONFERENCE PARTICIPATIONS

Invited talks

[1] T. Chor. "Insights into the mixing of centrifugal-symmetric instabilities". In: *Gordon Research Conference on Ocean Mixing 2022*. (Invited speaker). 2022.

[2] T. Chor. "Nondiffusive turbulent mixing in surface oceanic boundary layers". In: *University of Cambridge, Department of Applied Mathematics and Theoretical Physics*. (Invited speaker). 2021.

[3] T. Chor. "Modifications to the K-Profile parameterization with nondiffusive fluxes for wave effects". In: *University of Maryland, Oceans Lunch Seminar*. (Invited speaker). 2020.

[4] T. Chor. "New analytic solutions to the nonlinear Boussinesq equation for underground water". In: *CNMAC – National Conference on Applied and Computational Mathematics*. (Invited speaker). 2014.

Recent conference participations

[1] **T Chor** and Gregory L. Wagner. "Theory, software, and best practices for large eddy simulations of small-scale ocean turbulence". In: *American Geophysical Union's Ocean Sciences Meeting*. Tutorial. 2022.

[2] **T Chor**, Jacob Wenegrat, and John Taylor. "Insights into the mixing efficiency of centrifugal-symmetric instabilities in the ocean". In: *American Geophysical Union's Ocean Sciences Meeting*. Talk. 2022.

[3] Chris Hill, Francis Poulin, Gregory Wagner, Valentin Churavy, Simone Silvestri, **Tomas Chor**, Suyash Bire, Rodrigo Duran, and Jean-Michel Campin. "Hands-on ocean modeling and ML with Oceananigans.jl". In: *JuliaCon 2022*. Tutorial. 2022.

[4] **T Chor**, J C McWilliams, and M Chamecki. "Mixing in oceanic boundary layers: a method to guide KPP development". In: *CalGFD*. Talk. 2020.

[5] **T Chor**, J C McWilliams, and M Chamecki. "Revisiting Eddy-diffusivity models in atmospheric boundary layers". In: *72nd Annual Meeting of the APS Division of Fluid Dynamics*. Talk. 2019.

TEACHING EXPERIENCE

Teaching assistant   Winter 2018, Fall 2018 and Winter 2020
UCLA, Dept of Atmospheric and Oceanic Sciences

· Course: "Introduction to the Atmospheric Environment", Undergraduate level
· Helped prepare and led discussion sessions for up to 90 students of diverse background. Also helped prepare course structure, exams and lab activities, as well as graded homeworks and exams.

Special reader   Fall 2019
UCLA, Dept of Atmospheric and Oceanic Sciences

· Course: "Introduction to Atmospheric and Oceanic Fluid", Graduate level
· Graded homeworks and papers that cover a range of topics in dynamics and thermodynamics of the atmosphere and ocean.

OTHER RELEVANT SKILLS

Software developer

· Creator and developer of Pymicra, the Python tool for Micrometeorological Analyses, among other Python and Julia packages.
· Contributor to several open-source community packages (most notably Oceananigans)

Languages
· Portuguese as native language
· Fluent English and Spanish
· Basic French

Programming languages
· Python, Julia, Fortran, Bash

RELEVANT OUTREACH AND MENTORSHIP

Research advisor
University of Maryland
Fall 2021

· Advising an undergraduate student on a project that aims to characterize mixing at the ocean bottom by analyzing Radon 222 and potential density profiles.

Author of TED-Ed video on Turbulence
April 2019

· Conceived and wrote script for TED-Ed video with the goal or popularizing the topic of Turbulence. It has over a million views on YouTube alone.

Research mentor
UCLA
Fall 2018

· Mentored an undergraduate student on a small project collecting high-frequency atmospheric data at the top of a building.

Volunteer in the Exploring Your Universe (EYU) event
UCLA
April 2018

· Performed experiments and interacted with attendees of EYU, which is a large outreach event focusing on popularizing science to children.

Student Recruitment Chair
XEP, UCLA
Fall 2017 to Fall 2018

· Organized recruitment efforts and events for incoming graduate students.

RELEVANT PROFESSIONAL EXPERIENCE

Climatempo
Researcher
June 2014 — July 2015
São Paulo, Brazil

· Ran pollution dispersion models and forecasted wind power supply for the wind energy industry