

Cesar B. Rocha

Curriculum Vitae

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I study ocean dynamics through a combination of theory, observations, and computer simulations. Among other things, I'm currently leading the Saildrone efforts in the Submesoscale Ocean Dynamics Experiment (S-MODE).

Profesional preparation

- 2018 **Ph.D.**, *Physical Oceanography*.
Scripps Institution of Oceanography, University of California San Diego.
- 2013 **M.S. (w/ honors)**, *Physical Oceanography*.
University of São Paulo, Brazil.
- 2011 **B.S. (w/ honors)**, *Oceanography*.
University of São Paulo, Brazil.

Employment History

- Current **Postdoctoral Scholar**.
Woods Hole Oceanographic Institution.
- 2016–2018 **Graduate Writing Consultant**.
Writing + Critical Expression Hub, University of California San Diego.
Supervisor: Matthew Nelson.
- 2013–2018 **Graduate Student Researcher**.
Scripps Institution of Oceanography, University of California San Diego.
Advisor: William R. Young.

Achievements

- 2018 WHOI Postdoctoral Fellowship, Woods Hole Oceanographic Institution.
- 2017 French-American Doctoral Exchange Program Laureate, Embassy of France in the USA
- 2016 NASA Earth and Planetary Sciences Graduate Fellowship.
- 2015 Geophysical Fluid Dynamics Fellowship, Woods Hole Oceanographic Institution.
- 2011 Master's Research Fellowship, Fundação de Amparo à Pesquisa do Estado de São Paulo.
- 2011 Best Honors Thesis, Oceanographic Institute, University of Sao Paulo
- 2010 Undergrad Research Fellowship, Fundação de Amparo à Pesquisa do Estado de São Paulo.

Publications

Submitted

- [1] **C. B. Rocha**, N. Constantinou, S. G. Llewellyn Smith, and W. R. Young. The heat flux of horizontal convection: definition of the Nusselt number. *Journal of Fluid Mechanics*, submitted.

Published

- [1] **C. B. Rocha**, T. Bossy, S. G. Llewellyn Smith, and W. R. Young. Improved bounds on horizontal convection. *Journal of Fluid Mechanics*, 883:A41, 2020.
- [2] Adiv Paradise, **Rocha, Cesar B**, Pragallva Barpanda, and Noboru Nakamura. Blocking statistics in a varying climate: lessons from a ‘traffic jam’ model with pseudostochastic forcing. *Journal of the Atmospheric Sciences*, 76(2019):3013–3027, 2019.
- [3] D. C. Napolitano, I. C. A. da Silveira, **C. B. Rocha**, G. R. Flierl, P. H. R. Calil, and R. P. Martins. On the steadiness and instability of the Intermediate Western Boundary Current between 24°S and 18°S. *Journal of Physical Oceanography*, 49:3127–3143, 2019.
- [4] T. K. Chereskin, **C. B. Rocha**, S. T. Gille, D. Menemenlis, and M. Passaro. Characterizing the transition from balanced to unbalanced motions in the southern California Current. *Journal of Geophysical Research: Oceans*, 124:2088–2109, 2019.
- [5] **C. B. Rocha**, G. L. Wagner, and W. R. Young. Stimulated generation: Extraction of energy from balanced flow by near-inertial waves. *Journal of Fluid Mechanics*, 847:417–451, 2018.
- [6] F. Ardhuin, S. T. Gille, D. Menemenlis, **C. B. Rocha**, N. Rascle, b. Chapron, J. Gula, and J. Molemaker. Small-scale open-ocean currents have large effects on wind-wave heights. *Journal of Geophysical Research: Oceans*, 2017.
- [7] **C. B. Rocha**, W. R. Young, and I. Grooms. On Galerkin approximations of the surface active quasigeostrophic equations. *Journal of Physical Oceanography*, 46(1):125–139, 2016.
- [8] **C. B. Rocha**, S. T. Gille, T. K. Chereskin, and D. Menemenlis. Seasonality of sub-mesoscale dynamics in the Kuroshio Extension. *Geophysical Research Letters*, 43(21), 2016.
- [9] **C. B. Rocha**, T. K. Chereskin, S. T. Gille, and D. Menemenlis. Mesoscale to sub-mesoscale wavenumber spectra in Drake Passage. *Journal of Physical Oceanography*, 46(2):601–620, 2016.
- [10] **C. B. Rocha**, I. C. A. da Silveira, B. M. Castro, and J. A. M. Lima. Vertical structure, energetics, and dynamics of the Brazil Current System at 22 S–28 S. *Journal of Geophysical Research: Oceans*, 119(1):52–69, 2014.
- [11] **C. B. Rocha**, A. Tandon, I. C. A. da Silveira, and J. A. M. Lima. Traditional quasi-geostrophic modes and surface quasi-geostrophic solutions in the Southwestern Atlantic. *Journal of Geophysical Research: Oceans*, 118(5):2734–2745, 2013.

Teaching, Mentorship, and Outreach

- 2019–2019 **Roger Wu**, *Woods Hole Oceanographic Institution*.
Summer Student Fellow co-supervised with Tom Farrar.
- 2019–2019 **Falmouth Public Schools**, *Science & Engineering Fair*.
Served as a judge of K-6 and high-school projects.
- 2018–2018 **Thomas Bossy**, *University of California San Diego*.
Intern from ENS Lyon (faculty advisor at SIO: William R. Young).
Mentorship: Co-advised the student on his research project, helping him to set up and run computational simulations of horizontal convection.
- 2015–2016 **Momme Hell**, *University of California San Diego*, Peer-mentoring program.
SIO Ph.D student.
Mentorship: Assisted the student in navigating through the first year of graduate school, helping him tailor his coursework and choose an advisor.
- 2012–2012 **Teaching Assistant for *Oceanografia Dinâmica II***, *University of São Paulo*.
Instructor: Professor Ilson Silveira.
Tasks: Assisted the instructor in preparing and grading problem sets, quizzes, and exams; taught review sessions and recitations; and held weekly office hours.
- 2010–2011 **Volunteer Physics Instructor**, *Rede Emancipa de Cursinhos Populares*.
Tasks: Taught standard lectures of classical mechanics to underprivileged high schoolers, preparing them for college entrance exams; and mentored students interested in STEM careers.

Service

- 2020 **Ad hoc referee for scientific journals**.
Journal of Physical Oceanography; *Deep-Sea Research I*; *Remote Sensing*.
- 2019 **Ad hoc referee for funding agency**.
National Science Foundation.
- 2019 **Ad hoc referee for scientific journals**.
Geophysical Research Letters; *Journal of Physical Oceanography*; *Deep-Sea Research I*; *Journal of Marine Systems*; *Climate Dynamics*.
- 2018 **Ad hoc referee for scientific journals**.
Journal of Geophysical Research–Oceans; *Journal of Physical Oceanography*; *Journal of Atmospheric and Oceanic Technology*; *Geophysical Research Letters*.
- 2017 **Ad hoc referee for scientific journals**.
Journal of Geophysical Research–Oceans; *Journal of Physical Oceanography*; *Journal of Fluid Mechanics*.
- 2017 **Member of student committee**.
SIO teaching award.
- 2016 **Ad hoc referee for scientific journals**.
Deep-Sea Research–I; *Journal of Fluid Mechanics*; *Nature Communications*; *Journal of Geophysical Research–Oceans*; *Ocean Modelling*; *Geophysical Research Letters*.
- 2016 **Member of student committee**.
SIO faculty search in large-scale observational physical oceanography; SIO teaching award.

Software

The codes are open source, written in Python, and distributed under the MIT license.

niwqg QG-NIW coupled model in Python, <https://github.com/crocha700/niwqg>
pyqg Python Quasigeostrophic Model, <http://pyqg.readthedocs.io>
pyspec Spectral Analysis in Python, <https://github.com/pyspec/pyspec>

Languages

Portuguese Native fluency (written and spoken).

English Full fluency (written and spoken).

Spanish Working proficiency (written and spoken).