Gregory LeClaire Wagner

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Interests

Theoretical and computational fluid dynamics; physical oceanography, applied mathematics

Education

2010–2016 **PhD in Engineering Sciences**
Department of Mechanical and Aerospace Engineering
University of California, San Diego
Advisors—William Young and Eric Lauga

2009–2010 **MSE in Aerospace Engineering**
2005–2009 **BSE in Aerospace Engineering**, *magna cum laude*
Department of Aerospace Engineering
University of Michigan, Ann Arbor

Employment

2018–present **Postdoctoral Associate**
Department of Earth, Atmospheric, and Planetary Sciences
Massachusetts Institute of Technology
Ocean parameterization with the Climate Modeling Alliance
Funded by a consortium led by Schmidt Futures

2016–2018 **NOAA Climate and Global Change Postdoctoral Fellow**
Department of Earth, Atmospheric, and Planetary Sciences, MIT
Massachusetts Institute of Technology

2013–2014, 2016 **Graduate Research Assistant**
Scripps Institution of Oceanography
University of California, San Diego

2014–2015 **Teaching Assistant**
2010–2013 **Focht-Powell Graduate Fellow**
Department of Mechanical and Aerospace Engineering
University of California, San Diego

2009–2010 **Product Engineer**
Accio Energy, Ann Arbor, Michigan
Wind energy technology research and development

Publications

2019 **Squeeze dispersion and the effective diapycnal diffusivity of oceanic tracers**
Gregory L Wagner, Glenn Flierl, Raffaele Ferrari, Gunnar Voet, Glenn S Carter, Matthew H Alford, and James B Girton
Geophysical Review Letters, *in press* (May 2019)

2018 **Stimulated generation: extraction of energy from balanced flow by near-inertial waves**
Cesar B Rocha, **Gregory L Wagner**, and William R Young
Journal of Fluid Mechanics 847, 417-451

2017 **An asymptotic model for the propagation of oceanic internal tides through quasi-geostrophic flow**
Gregory L Wagner, Gwenäel Ferrando, and William R Young
Journal of Fluid Mechanics 828, 779-811

2016 **A three-component model for the coupled evolution of near-inertial waves, quasi-geostrophic flow, and the near-inertial second harmonic**
Gregory L Wagner and William R Young
Journal of Fluid Mechanics 802, 806-837

A tale of two spicy seas
Jennifer A MacKinnon, Jonathan D Nash, Matthew H Alford, Andrew J Lucas, John B Mickett, Emily L Shroyer, Amy F Waterhouse, Amit Tandon, D Sengupta, Amala Mahadevan, M Ravichandran, Robert Pinkel, Daniel L Rudnick, Caitlin B Whalen, Marion S Alberty, J Sreelekha, Elizabeth C Fine, D Chaudhuri, and **Gregory L Wagner**
Oceanography 29 (2), 50-61

Acoustically propelled nanoshells
Fernando Soto, **Gregory L Wagner**, Victor Garcia-Gradilla, Kyle T Gillespie, Deepak R Lakshmipathy, Emil Karshalev, Chava Angell, Yi Chen, and Joseph Wang
Nanoscale 8 (41), 17788-17793

2015 **Available potential vorticity and wave-averaged quasi-geostrophic flow**
Gregory L Wagner and William R Young
Journal of Fluid Mechanics 785, 401-424

2014 **Mixing by microorganisms in stratified fluids**
Gregory L Wagner, William R Young, and Eric Lauga
Journal of Marine Research 72 (2), 47-72

Bubble-Propelled Micromotors for Enhanced Transport of Passive Tracers
Jahir Orozco, Beatriz Jurado-Sanchez, **Gregory Wagner**, Wei Gao, Rafael Vazquez-Duhalt, Sirilak Sattayasamitsathit, Michael Galarnyk, Allan Cortes, David Santillan, and Joseph Wang
Langmuir 30 (18), 5082-5087

Publications
continued—2013

Crawling scallop: Friction-based locomotion with one degree of freedom
Gregory L Wagner and Eric Lauga
Journal of Theoretical Biology, 324, 42-51

2009 **Specific Charge Control for Micro/Nano-Particle Electrostatic Propulsion**
T Liu, **G L Wagner**, A Gallimore, B Gilchrist, and P Peterson
45th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, AIAA-2009-5090

Teaching
ug: undergrad
g: grad

Fall 2015 **Teaching Assistant**, Introduction to Mathematical Physics *(ug)*
with Prof David Santillian, Mech and Aero Engineering (MAE), UCSD
Recieved MAE Outstanding Teaching Assistant Award

Spring 2015 **Teaching Assistant**, Introduction to Mathematical Physics *(ug)*
with Prof Stefan Llewellyn Smith, MAE, UCSD

Fall 2014 **Teaching Assistant**, Fluid Dynamics II *(g)*
with Prof Geno Pawlak, MAE, UCSD

Spring 2014 **Teaching Assistant**, Applied Mathematics III *(g)*
with Prof William R. Young, Scripps Institution of Oceanography, UCSD

Seminars and invited research talks

Aug 2018 Woods Hole Program in Geophysical Fluid Dynamics

Jan 2018 Department of Physical Oceanography, WHOI
Physical Oceanography Seminar

Nov 2017 Department of Atmospheric & Oceanic Sciences, McGill University
Departmental Seminar

Nov 2017 Earth, Atmospheric, and Planetary Sciences, MIT
Sack Lunch Seminar

Sep 2017 Earth, Environmental, and Planetary Sciences, Brown University
Lunch Bunch Seminar

May 2016 College of Atmospheric and Ocean Sciences, NYU
Atmospheric Ocean Sciences Colloquium

March 2016 Department of Mechanical Engineering, MIT
MSEAS Seminar

Feb 2016 College of Earth, Ocean and Atmospheric Sciences, Oregon State University
Physics of Oceans and Atmospheres Seminar Series

July 2015 Woods Hole Program in Geophysical Fluid Dynamics

March 2013 Theory Seminar, Scripps Institution of Oceanography, UCSD

Conference and workshop talks

Nov 2018	APS Division of Fluid Dynamics *Atlanta, Georgia, USA*
Feb 2018	BIRS Workshop *Banff, Alberta, Canada*
Feb 2018	AGU Ocean Sciences *Portland, Oregon, USA*
June 2017	Atmospheric and Oceanic Fluid Dynamics *Portland, Oregon, USA*
Feb 2016	AGU Ocean Sciences *New Orleans, Louisiana, USA*
July 2016	Liege Colliquium *Liège, Belgium*
Nov 2015	APS Division of Fluid Dynamics *Boston, Massachusetts, USA*
Feb 2014	AGU Ocean Sciences *Honolulu, Hawaii, USA*
Nov 2013	APS Division of Fluid Dynamics *Pittsburgh, Pennsylvania, USA*
April 2013	SoCal Fluids VII *Pasadena, California, USA*

Research cruises

June 2016 "Flow Encountering Abrupt Topography (FLEAT)"—Western Pacific off Palau
With PI's Matthew Alford, Jennifer Mackinnon, Gunnar Voet

Sep 2015 "Arctic Mix"—Beaufort Sea, Chukchi Sea, and Bering Strait, Arctic Ocean
With PI's Jennifer Mackinnon, Matthew Alford, John Mickett

Service and workshop participation

Since 2016 **Reviewer**— Geophysical Research Letters, Journal of Advances in Modeling of Earth Systems, Journal of Physical Oceanography, Journal of Fluid Mechanics, Quarterly Journal of the Royal Meterological Society

Since 2015 **Participant**—Woods Hole Program in Geophysical Fluid Dynamics, USA

Feb 2018 **Participant**—Banff International Research Station Workshop, Canada
Modeling imbalance in the atmosphere and ocean

Aug 2017 **Participant**—École de Physique des Houches summer school, France
Fundamental aspects of turbulent flows in climate dynamics

2013 **Fellow**—Woods Hole Program in Geophysical Fluid Dynamics, USA

2012 **Participant**—Cargèse Summer School, France
Softflow: Biological Complex Fluids

Software development

Oceananigans.jl
Pure-julia oceanic large eddy simulation on GPUs and CPUs
github.com/climate-machine/Oceananigans.jl

FourierFlows.jl
Ecosystem for solving partial differential equations with spectral methods on CPUs and GPUs
github.com/FourierFlows

dedaLES
Large eddy simulation with spectral methods in python using the dedalus framework
github.com/glwagner/dedaLES

Accolades

2016–2018	**Postdoctoral Fellowship**—NOAA Climate and Global Change Program
2016	**Award**—Outstanding Teaching Assistant, Department of Mechanical and Aerospace Engineering, UCSD
2013	**Fellow**—Woods Hole Program in Geophysical Fluid Dynamics
2010–2013	**Graduate Fellowship**—Focht-Powell Fellowship, Department of Mechanical and Aerospace Engineering, UCSD
2009	**James B. Angell Scholar**—University of Michigan

References

Raffaele Ferrari
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Massachusetts Institute of Technology
✉ rferrari@mit.edu | ferrari.mit.edu

William R. Young
Professor, Scripps Institution of Oceanography
University of California, San Diego
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Jennifer A. MacKinnon
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Glenn Flierl
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Massachusetts Institute of Technology
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