Physics and Physical Oceanography
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TILL J.W. WAGNER

Curriculum Vitae

Research Interests:
high-latitude climate physics; in particular ice–ocean interactions; glacier, iceberg, and sea ice mechanics; ice–ecosystem interactions; nonlinear dynamics

Research Methods:
formulation and analysis of mathematical models of physical processes using analytical and numerical methods; polar field experiments and analysis of observational in situ and remote sensing data; desktop laboratory experiments

Preparation and Appointments

2018 -	**Assistant Professor** Department of Physics and Physical Oceanography *University of North Carolina Wilmington*
2013 - 2017	**Postdoctoral Scholar** Scripps Institution of Oceanography, *University of California San Diego* Advisor: Ian Eisenman (2013-2017), Co-advisor: Fiamma Straneo (2017)
2009 - 2013	**Doctor of Philosophy (Ph.D.) in Mathematics** *University of Cambridge* and *British Antarctic Survey* Advisors: Dominic Vella, Ted Maksym, Peter Wadhams
2008 - 2009	**Master of Advanced Studies (MASt) in Mathematics (Part III)** *University of Cambridge, UK*
2004 - 2008	**Master of Science (M.Sci.) in Physics & Philosophy** *University of Bristol, UK*

External Funding and Fellowships

2018 - 2020	**NSF Polar - Antarctic Ocean and Atmospheric Science Grant** ($289,502) *"Collaborative Research: Modeling Giant Icebergs and Their Decay"* Role: PI Collaboration with Alistair Adcroft, Princeton University ($578,170 total)
2017 - 2020	**NSF Polar - Antarctic Ocean and Atmospheric Science Grant** ($399,570) *"The influence of sea ice motion on Antarctic sea ice expansion"* Role: Co-PI (PI: Eisenman)
2019	**Greenpeace International,** 3 weeks exclusive ship time on MY Arctic Sunrise *"Life on the edge: the marginal sea ice zone and the changing Arctic ecosystem"* Role: PI

External Funding and Fellowships (continued)

2016 - 2017	**Frontiers of Innovation Scholars Program (FISP)** ($25,000) Project Fellowship for Postdoctoral Scholars
2012	**Cambridge Philosophical Society** Research Fellowship
2012	**Mathematical Institute, University of Oxford** KAUST Visiting Student Fellowship
2011	**Woods Hole Oceanographic Institution** Guest Program Fellowship
	NASA, Goddard Space Flight Centre, Cyrospheric Science Branch Visiting Student
2008 - 2009	**Cambridge European Trust, University of Cambridge** Scholar of the Cambridge European Trust

Publications

[20] Polar amplification due to enhanced heat flux across the halocline
E. Beer, I. Eisenman, **T. J. W. Wagner**, *Geophysical Research Letters,* 47, e2019GL086706 (2020)

[19] Viscous and elastic buoyancy stresses as drivers of ice-shelf calving
C. Mosbeux, **T. J. W. Wagner**, M. K. Becker, H. A. Fricker *(in review)*

[18] Large spatial variations in the flux balance along the front of a Greenland tidewater glacier
T. J. W. Wagner, F. Straneo, C. G. Richards, D. A. Slater, L. A. Stevens, S. B. Das, H. Singh, *The Cryosphere,* 13, 911–925 (2019)

[17] Patterns of change in Antarctic sea ice extent from seasonal to longer timescales
C. Eayrs, D. Holland, D. Francis, **T. J. W. Wagner**, R. Kumar, X. Li, *Reviews of Geophysics,* 57, 631 (2019)

[16] Localized Plumes Drive Front–Wide Ocean Melting of A Greenlandic Tidewater Glacier
D. A. Slater, F. Straneo, S. B. Das, C. B. Richards, **T. J. W. Wagner**, P.W. Nienow, *Geophysical Research Letters,* 45, 12350–12358 (2018)

[15] The influence of layering and barometric pumping on firn air transport in a 2-D model
Benjamin Birner, Christo Buizert, **T.J.W. Wagner**, J.P. Severinghaus, *The Cryosphere*, 12, 2021-2037 (2018)

[14] Wave inhibition by sea ice enables trans-Atlantic ice rafting of debris during Heinrich Events
T.J.W. Wagner, R.W. Dell, I. Eisenman, R.F. Keeling, L. Padman, J.P. Severinghaus, *Earth & Planetary Science Letters,* 495, 157–163 (2018)

[13] On the Representation of Capsizing in Iceberg Models
T.J.W. Wagner, A.A. Stern, R.W. Dell, I. Eisenman, *Ocean Modelling,* 117, 88-96 (2017)

[12] An Analytical Model of Iceberg Drift
T.J.W. Wagner, R.W. Dell, I. Eisenman, *Journal of Physical Oceanography*, 47, 1605–1616 (2017)

Publications (continued)

[11] How Model Biases Skew the Distribution of Iceberg Meltwater
T.J.W. Wagner and I. Eisenman, *Geophysical Research Letters,* 44, 3691–3699 (2017)

[10] Journey of an Arctic Ice Island
A. Crawford, P. Wadhams, **T.J.W. Wagner**, A.A. Stern, E.P. Abrahamsen, I. Church, R. Bates, K.W. Nicholls, *Oceanography*, 29, (2) 254-263 (2016)

[9] On the Role of Buoyant Flexure in Glacier Calving
T.J.W. Wagner, T.D. James, T. Murray, D. Vella, *Geophysical Research Letters,* 43, 1, 232-240 (2016)

[8] False Alarms: How Early Warning Signals Falsely Predict Abrupt Sea Ice Loss
T.J.W. Wagner and I. Eisenman, *Geophysical Research Letters,* 42, (23) 10333 (2015)

[7] Wind-Driven Upwelling around Grounded Tabular Icebergs
A.A. Stern, E. Johnson, D.M. Holland, **T.J.W. Wagner,** P. Wadhams, R. Bates, E.P. Abrahamsen, K.W. Nicholls, A. Crawford, J. Gagnon, J.-E. Tremblay, *Journal of Geophysical Research - Oceans,* 10.1002/2015JC010805 (2015)

[6] How Climate Model Complexity Influences Sea Ice Stability
T.J.W. Wagner and I. Eisenman, *Journal of Climate,* 28 (10) 3998-4014 (2015)

[5] The 'Footloose' Mechanism: Iceberg Decay from Hydrostatic Stresses
T.J.W. Wagner, P. Wadhams, R. Bates, P. Elosegui, A. Stern, D. Vella, E.P. Abrahamsen, A. Crawford, K.W. Nicholls, *Geophysical Research Letters*, 41 (15) 5522 (2014)

[4] Switch on, Switch off: Stiction in Nanoelectromechanical Switches
T.J.W. Wagner and D. Vella, *Nanotechnology,* 24, 275501 (2013)

[3] The 'Sticky Elastica' – Delamination Blisters Beyond Small Deformations
T.J.W. Wagner and D. Vella, *Soft Matter*, 9, 1025-1030 (2013)

[2] The Sensitvity of Graphene 'Snap-Through' to Substrate Geometry
T.J.W. Wagner and D. Vella, *Applied Physics Letters*, 100, 233111 (2012)

[1] Floating Carpets and the Delamination of Thin Elastic Sheets
T.J.W. Wagner and D. Vella, *Physical Review Letters*, 107, 044301 (2011)

Invited Seminars & Talks

2020 Department of Earth Sciences, **University of Oxford**
Department of Atmospheric and Oceanic Sciences, **University of Wisconsin-Madison**
Centre for Earth Observation Science Seminar, **University of Manitoba**
2019 Earth and Atmospheric Sciences Seminar, **Georgia Institute of Technology**
Southeastern Section Meeting, **American Physical Society,** Wrightsville Beach, NC
Global Marine Science Summit, **University of North Carolina Wilmington**
2018 BiSEPPS Seminar Series, **Harvard University**
Center for Coastal Physical Oceanography Seminar, **Old Dominion University**

Invited Seminars & Talks (continued)

2018 Applied Mathematics Colloquium, **University of North Carolina Chapel Hill**
2017 5th Postdoctoral Research Symposium, **UCSD** (Award for Best Presentation)
Frontiers of Innovation Scholars Program (FISP) Symposium, **UCSD**
Sack Lunch Seminar, EAPS, **Massachusetts Institute of Technology**
Physics & Physical Oceanography Seminar, **University of North Carolina Wilmington**
2016 Physical Geography Seminar, **University of Bristol**
REAL 2016, Autodesk Conference, San Francisco
2015 Lunchtime Seminar, GFDL, **Princeton University**
Seminar, **Max Planck Institute for Meteorology**, Hamburg, Germany
2014 Climate, Atmospheric Science and Physical Oceanography Seminar, **UCSD**
2013 Ocean & Climate Physics Seminar, LDEO, **Columbia University**
Theory Seminar, Scripps Institution of Oceanography (SIO), **UCSD**
2012 Seminar, **IRPHE**, Marseille, France
Lunchtime Seminar Series, DAMTP, **University of Cambridge**, UK

Selected Contributed Presentations

2020 AGU Ocean Sciences Meeting, San Diego, CA
2019 AGU Fall Meeting, Washington D.C.
AMS Polar Meteorology and Oceanography Meeting, Boulder, CO
2018 AGU Fall Meeting, Washington D.C.
IGS Symposium, Buffalo, NY
2017 AGU Fall Meeting, New Orleans, LA
AMS Annual Meeting, Seattle, WA
2016 Polar Seminar, SIO, UCSD
International Glaciology Society (IGS) Symposium, San Diego, CA
EGU General Assembly, Vienna, Austria
2015 AGU Fall Meeting, San Francisco, CA
Polar Seminar, SIO, UCSD, CA
SIAM Conference on Dynamical Systems, Snowbird, UT
EGU General Assembly, Vienna, Austria
CMOS-AMS Joint Conference, Whistler, BC
2014 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA
Latsis Symposium on Climate Dynamics, ETH Zurich, Switzerland
Polar Seminar, SIO, UCSD, CA
2013 CASPO Seminar, SIO, UCSD, CA
2012 Seminar, Isaac Newton Institute, University of Cambridge, UK
American Physical Society (APS) March Meeting, Boston, MA
2011 15th Biannual Cambridge/Oxford Mathematics Meeting "Wooly Owl", Oxford, UK
2nd Year Ph.D. Student Talks, DAMTP, University of Cambridge, UK (Award for Best Presentation)

Teaching

2018 – present	*Fluid Mechanics, PHY 350* (Lectures) Department of Physics & Physical Oceanography, **UNCW**
2018 – present	*Elementary College Physics, PHY 101* (Lectures and Laboratory classes) Department of Physics & Physical Oceanography, **UNCW**
2016 – 2018	Developing course materials and training high school teachers to incorporate *Climate Science* in the **Next Generation Science Standards, State of California**
2014 – 2017	Organizing and leading the weekly *Climate Journal Club Seminar Series,* Scripps Institution of Oceanography, **USCD**
2014	Guest lecturer, graduate course *"Numerical Modeling of the Climate System"*, Scripps Institution of Oceanography, **USCD**
2012 - 2013	Small group instructor, *"Mathematics for Natural Sciences"*, **University of Cambridge,** Natural Sciences Tripos

Advising

2019 - present	Mark England (Postdoc)
2019 - present	Andrew Castagno (Master of Marine Science)
2019 - present	Elizabeth Bailey, Conner Lester, Hassan Mason (all physics undergraduate majors)
2018 - 2019	Amanda Ceroli (physics undergraduate major, now Fulbright Fellow at NOC, UK)

Seagoing Polar Expeditions

May 2019	*"Life on the Ice Edge"*, **Fram Strait** Topic: Sea ice–ecosystem interactions during spring blooms in Fram Strait (PI)
Jul - Aug 2012	*"Operation Iceberg"*, **West Baffin Bay (West Greenland/Canada)** Iceberg decay processes
Jul 2012	"*Waves in Ice",* **Fram Strait** Sea ice deformation in the marginal ice zone
Sept 2011	*"Arctic Climate Impact Tour",* **Fram Strait (East Greenland/Svalbard)** Sea ice thickness & morphology in the marginal ice zone
Oct - Dec 2010	*"ICEBELL",* **Weddell & Bellingshausen Seas (Western Antarctica)** Sea ice & snow conditions in spring in Western Antarctica

Service and Memberships

Committee Member of *the American Meteorological Society Polar Meteorology and Oceanography Committee,* UNCW *Coastal and Marine Science Council,* UNCW *Marine Science Graduate Advisory Committee,* UNCW *Physics and Physical Oceanography Policies and Procedures Committee*

Primary Convener of "Birth, Life, and Death of Icebergs" at *AGU Fall Meeting 2017*, "Glacier Front Dynamics and the Fate of Icebergs" at *AGU Fall Meeting 2018*; **Co-Convener of** "Polar meteorology and climatology" at *EGU General Assembly 2019 and 2020*

Service and Memberships (continued)

Reviewer for *Nature, Nature Climate Change, Journal of Climate, Geophysical Research Letters, The Cryosphere, Journal of Geophysical Research - Atmosphere, Journal of Geophysical Research - Oceans, Atmospheric Science Letters, Journal of Glaciology, Arctic, npj Climate and Atmospheric Science, Polar Research, NSF Polar - Antarctic Oceans & Atmospheric Science, NSF Polar - Arctic Natural Sciences, NSF- Ocean Sciences Proposals, IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*

Panel Reviewer for NASA, Earth Science Division

Member of *the American Geophysical Union, European Geophysical Union, American Meteorological Society, Society Industrial and Applied Mathematics*

Selected Outreach

Presentations and workshops for non-expert audiences:

2020	Planet Ocean Evening Seminar, Center for Marine Science, UNCW
2019	Osher Lifelong Learning Institute, Wilmington, NC
	Marine Quest (High School Summer Camp), UNCW
2018	STEAM Team Summer Camp (Middle School Summer Camp), UNCW
	Summer Ventures in Science & Mathematics (Middle School), UNCW
2014 - 2017	BE WiSE (Better Education for Women in Science & Engineering) Birch Aquarium, UCSD
2016	Ostercamp #1 Future Factory, Kammerspiele Theatre Munich, Germany
	S.E.A. Days: Polar Express Featured Scientist, Birch Aquarium, UCSD
2012	Society for the Preservation of Wild Culture, London

Media interviews with news outlets covering field work (incl. *CNN, BBC Science, TIME Magazine, The Sun, The Guardian, National Geographic, NPR, ARTE, Discovery News, Bloomberg*)

Development of K-12 Curriculum for California Next Generation Science Standards as science advisor to *Math-Science Partnership, California Science Teachers Association* (2016 - 2018)

Communication workshop on Climate Change "*Revealing the New Arctic",* invited speaker, AGU, SF, 2015

Exhibition of frozen scaled sea ice floe replica at Architectural Association, London (collaboration with *ScanLAB Projects*, 2013)

Organizer of the Sammy C Hawkings: the UNCW Homecoming 5k *Physics and Physical Oceanography* running team, 2 x Champions (2019, 2020)