

# TILL J.W. WAGNER

## Curriculum Vitae

Atmospheric and Oceanic Sciences  
University of Wisconsin–Madison  
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### 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

- |             |   |
|-------------|---|
| 2021 -      | <b>Assistant Professor</b><br>Department of Atmospheric and Oceanic Sciences<br><i>University of Wisconsin–Madison</i>  |
| 2018 - 2021 | <b>Assistant Professor</b><br>Department of Physics and Physical Oceanography<br><i>University of North Carolina Wilmington</i>   |
| 2013 - 2017 | <b>Postdoctoral Scholar</b><br>Scripps Institution of Oceanography, <i>University of California San Diego</i><br>Advisor: Ian Eisenman (2013-2017), Co-advisor: Fiamma Straneo (2017) |
| 2009 - 2013 | <b>Doctor of Philosophy (Ph.D.) in Mathematics</b><br><i>University of Cambridge and British Antarctic Survey</i><br>Advisors: Dominic Vella, Ted Maksym, Peter Wadhams               |
| 2008 - 2009 | <b>Master of Advanced Studies (MASt) in Mathematics (Part III)</b><br><i>University of Cambridge, UK</i>  |
| 2004 - 2008 | <b>Master of Science (M.Sci.) in Physics &amp; Philosophy</b><br><i>University of Bristol, UK</i>   |

### External Funding and Fellowships

- |             |   |
|-------------|---|
| Pending     | <b>NSF Polar - Antarctic Ocean and Atmospheric Science Grant</b> (\$622,183)<br><i>"Wave Erosion at Ice Cliffs"</i><br>Role: PI (Co-PIs Lucas Zoet, Geosciences; Nimish Pujara, Engineering)  |
| 2018 - 2020 | <b>NSF Polar - Antarctic Ocean and Atmospheric Science Grant</b> (\$289,502)<br><i>"Collaborative Research: Modeling Giant Icebergs and Their Decay"</i><br>Role: PI (Collaboration with Alistair Adcroft, Princeton University; \$578,170 total) |

## External Funding and Fellowships (continued)

- 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
- 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 (\* denotes member of my group)

- [27] Spurious climate impacts in sea ice loss simulations  
M.R. England\*, I. Eisenman, **T.J.W. Wagner**, *in review*
- [26] Asymmetry in the seasonal cycle of Antarctic sea ice due to insolation  
L. Roach, I. Eisenman, **T.J.W. Wagner**, E. Blanchard-Wrigglesworth, C. Bitz, *in review*
- [25] How winds and currents determine the drift of floating objects  
**T.J.W. Wagner**, I. Eisenman, A. Ceroli\*, Navid Constantinou, *in review*
- [24] How sea ice drift influences sea ice area and volume  
**T.J.W. Wagner**, I. Eisenman, and H.C. Mason\*, *Geophysical Research Letters*, e2021GL093069 (2021)
- [23] The recent emergence of Arctic Amplification  
M. R. England\*, I. Eisenman, N. Lutsko, **T.J.W. Wagner**, *Geophysical Research Letters*, e2021GL094086 (2021)
- [22] The Influence of Meltwater on Phytoplankton Blooms Near the Sea-Ice Edge  
C.W. Lester\*, **T.J.W. Wagner**, D.E. McNamara, M.R. Cape, *Geophysical Research Letters*, 48 (2)  
e2020GL091758 (2021)
- [21] Modeling the breakup of tabular icebergs  
M. R. England\*, **T.J.W. Wagner**, I. Eisenman, *Science Advances*, 6 (51) eabd1273 (2020)
- [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, *Journal of Glaciology*, doi.org/10.1017/jog.2020.35 (2020)
- [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)
- [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 Sensitivity 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**

- 2021 Iceberg Mechanics Session, Invited Presentation, **AGU Fall Meeting**  
Nicholas School of the Environment, **Duke University**  
Climate, People, and Environment Program, **University of Wisconsin–Madison**
- 2020 Geography 2050 Symposium, **American Geographical Society**  
Department of Physical Oceanography, **Woods Hole Oceanographic Institution**  
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**  
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 (First Author Only)

- 2022 AGU Ocean Sciences Meeting, Honolulu, CA  
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 15<sup>th</sup> Biannual Cambridge/Oxford Mathematics Meeting "Wooly Owl", Oxford, UK  
2<sup>nd</sup> Year Ph.D. Student Talks, DAMTP, University of Cambridge, UK (Award for Best Presentation)

## Teaching

- 2022 – *Global Warming Science and Impacts, GEOG 332*, Department of Atmospheric and Oceanic Sciences, **UW–Madison**
- 2021 – *Ice and Climate Dynamics, AOS 801*, Department of Atmospheric and Oceanic Sciences, **UW–Madison**
- 2018 – 2021 *Fluid Mechanics, PHY 350*, Department of Physics & Physical Oceanography, **UNCW**
- 2018 – 2021 *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 - 2021 Mark England (Postdoc, now at UC Santa Cruz)
- 2019 - 2021 Andrew Castagno (Master of Marine Science, now Fulbright Scholar in Iceland)
- 2019 - 2021 Elizabeth Bailey (B.Sc. senior honors thesis, now at Yale University)
- 2019 - 2021 Conner Lester (B.Sc. senior honors thesis, now at Duke University)
- 2018 - 2020 Hassan Mason (B.Sc. summer student, now at New York University)
- 2018 - 2019 Amanda Ceroli (B.Sc. senior honors thesis, 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

**Working Group Lead** of the NSF-funded Greenland Ice Sheet-Oceans Interactions Network (GRISO) working group on "Ocean-Forcing-Ice"

**Committee Member** of the American Meteorological Society Polar Meteorology and Oceanography Committee (2016 - 2019), UNCW Coastal and Marine Science Council (2018 - 2020), UNCW Marine Science Graduate Advisory Committee (2019 - 2021)

**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

**Reviewer** for *Nature*, *Nature Climate Change*, *Nature Communications*, *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*, *Cold Regions Science and Technology*, *Ecological Indicators*, *Frontiers of Marine Science*, *Natural Sciences and Engineering Research Council of Canada*, *NSF Polar - Antarctic Oceans & Atmospheric Science*, *NSF Polar - Arctic Natural Sciences*, *NSF- Ocean Sciences Proposals*, *IPCC SROCC*

**Panel Reviewer for** NASA, Earth Science Division; NSF, Office of Polar Programs

**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:

- 2021 Climate Science Workshop for K-12 teachers, San Diego Unified School District (remote)
- 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)