

ALEXANDER ROBEL

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ES&T 3232 ◊ 311 Ferst Drive ◊ Atlanta, GA 30318

PROFESSIONAL APPOINTMENTS

Assistant Professor, Earth and Atmospheric Sciences, Georgia Tech *Aug. 2018-Present*

NOAA CGC and Stanback Postdoctoral Fellow (Joint Appointment) *Sep. 2015-Aug. 2018*

California Institute of Technology, Division of Geological and Planetary Science (Host: Victor Tsai)

University of Chicago, Geophysical Sciences Department (Host: Doug MacAyeal)

EDUCATION

Harvard University, Cambridge, MA *2010-2015*

PhD, Earth & Planetary Sciences (Advisor: Eli Tziperman)

Duke University, Durham, NC *2006-2010*

BS w/Honors, Earth & Ocean Sciences ◊ BA, Physics ◊ Minor, Mathematics (Advisor: Susan Lozier)

PUBLICATIONS

1. **Robel, A.A.** and A. Banwell (2019), A speed limit on ice shelf collapse through hydrofracture, *Geophysical Research Letters*, *In Press*.
2. Pico, T. **A.A. Robel**, E. Powell, A.C. Mix and J.X. Mitrovica (2019). Leveraging the rapid retreat of Amundsen Ice Stream 13,000 yrs ago to reveal insight into North American deglaciation, *Geophysical Research Letters*, *In Press*.
3. **Robel, A.A.**, H. Seroussi and G. Roe (2019), Marine ice sheet instability amplifies and skews uncertainty in projections of future sea level rise, *Proceedings of the National Academy of Sciences*, 116, 30, 14887-14892, [DOI:10.1073/pnas.1904822116](https://doi.org/10.1073/pnas.1904822116).
4. Meyer, C., **A.A. Robel** and A.W. Rempel (2019), Frozen fringe explains sediment freeze-on during Heinrich events, *Earth and Planetary Science Letters*, 524, [DOI:10.1016/j.epsl.2019.115725](https://doi.org/10.1016/j.epsl.2019.115725).
5. **Robel, A.A.** and V. Tsai (2018), A simple model for deglacial meltwater pulses, *Geophysical Research Letters*, 45, [DOI:10.1029/2018GL080884](https://doi.org/10.1029/2018GL080884).
6. **Robel, A.A.**, G. Roe, M. Haseloff (2018), Response of marine-terminating glaciers to forcing: Time scales, sensitivities, instabilities and stochastic dynamics, *Journal of Geophysical Research - Earth Surface*, 123, 2205–2227, [DOI:10.1029/2018JF004709](https://doi.org/10.1029/2018JF004709).
7. Minchew, B.M., C. Meyer, **A.A. Robel**, G.H. Gudmundsson and M. Simons (2018), Processes controlling the downstream evolution of ice rheology in glacier shear margins: Case study on Rutford Ice Stream, West Antarctica, *Journal of Glaciology*, [DOI:10.1017/jog.2018.47](https://doi.org/10.1017/jog.2018.47).
8. **Robel, A.A.** (2017), Thinning sea ice weakens buttressing force of iceberg mélange and promotes calving, *Nature Communications*, 8, 14596, [DOI:10.1038/ncomms14596](https://doi.org/10.1038/ncomms14596).
9. **Robel, A.A.**, V. Tsai, B. Minchew, and M. Simons (2017), Tidal modulation of ice stream buttressing stresses, *Annals of Glaciology*, 58, 74, 12–20, [DOI:10.1017/aog.2017.22](https://doi.org/10.1017/aog.2017.22).
10. **Robel, A.A.** and E. Tziperman (2016), The role of ice stream dynamics in deglaciation, *Journal of Geophysical Research - Earth Surface*, 121, 1540–1554, [DOI:10.1002/2016JF003937](https://doi.org/10.1002/2016JF003937).
11. **Robel, A.A.**, C. Schoof, and E. Tziperman (2016), Persistence and variability of ice stream grounding lines on retrograde bed slopes, *The Cryosphere*, 10, 1883-1896, [DOI:10.5194/tc-10-1883-2016](https://doi.org/10.5194/tc-10-1883-2016).

12. **Robel, A.A.**, C. Schoof, and E. Tziperman (2014), Rapid grounding line migration induced by internal ice stream variability, *Journal of Geophysical Research - Earth Surface*, 119, 2430–2447, DOI:10.1002/2014JF003251.
13. **Robel, A.A.**, E. DeGiuli, C. Schoof, and E. Tziperman (2013), Dynamics of ice stream temporal variability: Modes, scales, and hysteresis, *Journal of Geophysical Research - Earth Surface*, 118, 925–936, DOI:10.1002/jgrf.20072.
14. **Robel, A.A.**, M.S. Lozier, S.F. Gary, G.L. Shillinger, H. Bailey, S.J. Bograd, (2011). Projecting uncertainty onto marine megafauna trajectories. *Deep Sea Research I*, 58, 915-921, DOI:10.1016/j.dsr.2011.06.009.

NON-REFEREED AND IN-PREP PUBLICATIONS

*Group members under supervision of A.A. Robel

1. **Robel, A.A.**, S. Pegler and G. Catania. Illusory stability of marine-terminating glaciers at bedrock highs, *In prep.*
2. Boghosian, A., R. Bell, P. Alexander, **A.A. Robel**. Efficient meltwater export off the Petermann Ice Shelf, *In prep.*
3. Christian, J.E., **A.A. Robel**, C. Proistosescu, M. Koutnik, G. Roe, K. Christianson. Contrasting outlet glacier responses to ocean vs. interior forcing, *In prep.*
4. **Robel, A.A.** (2015), News and Views: The long future of Antarctic melting, *Nature*, 526, 327-328, DOI:10.1038/526327a.
5. **Robel, A.A.** (2015), Ice Stream Variability and Links to Climate. Dissertation, Earth & Planetary Sciences, Harvard University. Advisors: Eli Tziperman, Christian Schoof. Committee: Jim Rice, Jerry Mitrovica, Rick O’Connell. [Link](#).

FUNDED GRANT PROPOSALS

1. Quantifying the role of climate variability in driving the recent acceleration of Earth’s fastest glacier. NASA JPL SURP, \$126K, September 1, 2019 - August 31, 2022. **PI: A. Robel**. Co-PI: H. Seroussi.
2. Theory and Models of Ice Sheet Surface Melting Instabilities in the Past and Future. NSF-OPP Award 1735715, \$225K, September 1, 2017 - August 31, 2019. PI: V. Tsai. **Co-Investigator: A. Robel**.

HONORS AND RECOGNITIONS

- AGU Outstanding Reviewer - Journal of Advances in Modeling Earth Systems, 2019
- NOAA Climate & Global Change Postdoctoral Fellowship, 2015-2017
- Caltech Stanback Postdoctoral Fellowship in Environmental Science, 2015-2017
- National Science Foundation Graduate Research Fellowship, 2013-2015
- National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2010-2013
- Distinction in Teaching, Bok Center for Teaching & Learning, Harvard University, Spring 2012
- Angier B. Duke Memorial Scholarship, 2006-2010
- Robert C. Byrd Scholarship, 2006-2010
- Mellon-Mays Undergraduate Fellowship, 2008-2010
- American Physical Society Corporate Minority Scholarship 2006, 2007
- North Carolina Space Grant Undergraduate Scholarship, 2007

RECENT INVITED CONFERENCE PRESENTATIONS

- Robel, A. A.** (Invited) “Marine ice sheet instability amplifies and skews uncertainty in projections of future sea level rise.” AGU Fall Meeting, December 2019, San Francisco, CA.
- Robel, A. A.** et al. (Invited) “Rapid Sea Level Rise: What we do know, what we can know, and why

it matters.” Universities for a Greener Georgia, April 2019, Atlanta, GA.

Robel, A. A. et al. (Invited) “The case for large ice sheet model ensembles from theory and practice.” SIAM Computational Sci & Engineering, February 2019, Spokane, WA.

Robel, A. A. et al. (Invited) “How accurately can we predict the rate of marine ice sheet collapse in West Antarctica.” WAIS Workshop, September 2018, Stony Point, NY.

Robel, A. A. (Invited) “The direct mechanical influence of sea ice state on ice sheet mass loss via iceberg mélange.” AGU Fall Meeting, December 2017, New Orleans, LA.

Robel, A. A. (Invited) “Simulating sea ice interactions with ice sheets through granular iceberg mélange in a discrete element model.” SIAM Computational Sci & Engineering, February 2017, Atlanta, GA.

Robel, A. A. (Invited) “Thinning sea ice weakens buttressing force of iceberg mélange.” AGU Fall Meeting, December 2016, San Francisco, CA.

DEPARTMENTAL PRESENTATIONS

University of Virginia, Department of Environmental Sciences Seminar, January 2019. **Stanford University**, Geophysics Department Seminar, March 2018. **University of Oregon**, Earth Sciences Department Seminar, January 2018. **University of California, Los Angeles**, EPSS Tectonics/Seismology Seminar, October 2017. **University of Texas**, Institute for Geophysics Seminar, September 2017. **University of Washington**, ESS Glaciology Sack Lunch Seminar, August 2017. **Harvard University**, Earth and Planetary Sciences Colloquium, April 2017. **Georgia Institute of Technology**, Earth and Atmospheric Sciences Seminar, March 2017. **University of California, Irvine**, Earth System Science Department Seminar, February 2017. **Massachusetts Institute of Technology**, Oceanography Sack Lunch Seminar, November 2016. **Duke University**, Earth and Ocean Sciences Seminar, September 2016. **California Institute of Technology**, Environmental Science and Engineering Seminar, October 2015. **Penn State**, Dept. of Geosciences, Glaciology Seminar, June 2014. **University of Chicago**, James Franck Institute, Computations in Science Seminar, April 2014. **UMass Amherst**, Dept. of Geosciences, Guest Lecture Series, April 2014. **UC San Diego**, Scripps Institute of Oceanography, Climate, Atmospheric Science and Physical Oceanography Seminar, February 2014. **Columbia University**, Lamont-Doherty Earth Obs., Marine Geology. Geophysics, Seismology & Tectonophysics Seminar, April 2013.

SERVICE

- **Topical Editor**, Geoscientific Model Development (open access EGU journal)
- **Journal Reviewer**: Nature, Proceedings of the National Academy of Sciences, Nature Communications, Geophysical Research Letters, Journal of Geophysical Research, The Cryosphere, Journal of Glaciology, Journal of Advances in Modeling Earth Systems (JAMES), Journal of Climate, Climate Dynamics, Geology
- **Proposal Reviewer**: NSF Office of Polar Programs, NASA Earth Science Division, UK National Environment Research Council (NERC), US-Israel Binational Science Foundation (BNSF), Quebec FRQNT, NZ Marsden Fund
- **Conference Session Convener**: AGU Fall Meeting 2015, 2018, 2019, GSA Annual Meeting 2017

TEACHING

Georgia Tech (Instructor of Record):

- Earth & Atmospheric Sciences (EAS) 4803/8803, Glacier & Ice Sheet Dynamics (Spring 2019; UG/G)
- EAS 4610, Earth System Modeling (Fall 2019; UG)
- EAS / Civil & Env. Eng. 4803, Sea Level Rise and Coastal Engineering (Spring 2020; UG)

Harvard (Teaching Fellow):

- Applied Mathematics 205, Advanced Scientific Computing: Numerical Methods (G; Fall 2013)
- Earth & Planetary Sciences 231, Climate Dynamics (G; Spring 2013)
- Earth & Planetary Sciences 134, Global Warming Debates: The Reading Course (UG; Spring 2012)

ADVISING

Graduate Students (primary or co-advisor):

- Ziad Rashed, GT OSE PhD, 2018-

Postdoctoral Fellows:

- Samantha Buzzard, GT, 2019-
- John Christian, GT/UTIG, 2020-

Undergraduate research students:

- Hannah Verboncoeur, GT UG, 2019-
- Adriana Formby-Fernandez, GT REU, 2019-
- Blake Castleman, GT UG, 2019-

Committee Member:

- Chase Chivers, Ga Tech EAS PhD Anticipated 2022
- Justin Lawrence, Ga Tech EAS PhD Anticipated 2021
- Jacob Buffo, Ga Tech EAS PhD 2019
- Lucas Liuzzo, Ga Tech EAS PhD 2018
- John Christian, UWash ESS PhD, Anticipated 2020

Current as of October 2, 2019