

# ALON STERN

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## WORK AND EDUCATION

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<b>Postdoctoral Researcher</b> Geophysical Fluid Dynamics Laboratory (GFDL), Princeton University	<i>January 2015 –Present</i>
<b>Junior Research Scientist</b> Courant Institute of Mathematical Sciences, New York University	<i>June 2014 - September 2014</i>
<b>Ph.D. in Mathematics and Atmosphere-Ocean Science</b> Courant Institute of Mathematical Sciences, New York University GPA – 4.00/4.00 (Dean’s Dissertation Fellowship Award) Advisor: Professor David M. Holland	<i>September 2009–June 2014</i>
<b>B.Sc. Honours Degree in Mathematics</b> University of Cape Town Graduation with distinction	<i>January 2008–December 2008</i>
<b>Exchange student in the Mathematics Department</b> University of California San Diego GPA – 4.00/4.00,	<i>September 2006–December 2006</i>
<b>Bachelor of Science in Mathematics and Applied Mathematics</b> University of Cape Town Graduation with distinction and distinction in both majors Top academic student 2007 (class medal)	<i>January 2005–December 2007</i>
<b>High School Certificate</b> Herzlia High School, Cape Town, South Africa Top academic student, 2002 (8 distinctions)	<i>January 2000–December 2002</i>

## FELLOWSHIPS AND AWARDS

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<b>Fulbright Scholarship</b> (full tuition and \$25,000 annually) Merit-based grant for international exchange offered by USA Department of State	<i>September 2009– Aug 2014</i>
<b>Henry MacCracken Fellowship</b> (full tuition and \$26,770 annually) Stipend earned upon excellent performance during my first year at Courant Institute	<i>September 2010– Aug 2014</i>
<b>Deans Dissertation Fellowship</b> (full tuition and \$26,770) Awarded for outstanding performance of a graduate student	<i>September 2013 - June 2014</i>
Summer Research Stipend, Courant Institute (\$8,663, re-awarded annually) Funding obtained for a research and field work preformed during summer	<i>Summer, 2010 - 2013</i>
<b>Antarctic Service Medal of the United States of America</b> Award offered by the National Science Foundation for scientific service in Antarctica The medal was awarded for my involvement in drilling through the McMurdo Ice Shelf, and installing temperature sensors in the ocean below.	<i>December 2012</i>
Council of Scientific and Industrial Research Scholarship (R40,000) Scholarship offered to student showing promise in scientific research in South Africa.	<i>January 2008 - December 2008</i>
University of Cape Town Tuition Scholarship (R10,000, re-awarded annually) Scholarship offered by to top academic students by University of Cape Town	<i>January 2005 - December 2007</i>

**Teaching Assistant at Courant Institute***Fall 2011–June 2014*

- Spring 2014                      Mathematics for Economics
- Fall 2013, 2012                Calculus 1
- Spring 2013                    Introduction to Earth's Atmosphere and Ocean

**Student Mentoring**

- Undergraduate student, Andres Fernandez, New York University in Abu Dhabi                      *2014 - 2015*  
Designed and implemented a summer research project to study the effects of desalination on the circulation in the Persian Gulf.
- Masters Student, Shayan Bigdeli, NYU Polytechnic School of Engineering                      *2013 - 2014*  
Co-authored masters research project about aeolian sand ripple formation
- Undergraduate student, Eric Johnson, New York University in Abu Dhabi                      *2013 - 2014*  
Co-authored undergraduate research project about iceberg induced ocean upwelling.
- Undergraduate student, Judy Mei, New York University in Abu Dhabi                      *2012 - 2013*  
Designed and implemented a summer research project about lidar point cloud data.
- Masters Student, Raj Agarwal, Courant Institute of Mathematical Science, NYU                      *2010 - 2011*  
Co-authored masters research project about fracture mechanics in numerical glacier modeling

**Private Tutoring***2001–2015*

Tutored various topics in Mathematics, Physics and Geoscience

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**OTHER RELEVANT ACTIVITIES**

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**Scientific field work**

- **Field scientist in BBC science television show *Operation Iceberg***                      *July 2012*  
The program followed scientists studying the formation and breakup of large tabular icebergs in Baffin Bay
- Drilling through the McMurdo Ice shelf in Antarctica                      *November 2011*
- Four field campaigns to Jakobshavn and Helhiem Glaciers, Greenland                      *2010 - 2013*

**Deputy President Courant Student Organization***May 2011–April 2012*

- Founded the Columbia-NYU Mathematics conference for graduate students
- Managed the first graduate student retreat and conference
- Upon success of my initiatives the department endowed the student organization with \$40,000 in additional funding

**Technical skills**

- Proficiency in many topics in applied mathematics including advance calculus, asymptotic methods, linear algebra, differential equations and probability.
- Technical presentations to specialist and non-specialist audiences.
- Mathematical modeling and ocean modeling
- Programming ability in matlab, python and fortran
- Synthesis and analysis of large data sets

**Memberships and Affiliations**

- Member of the American Geophysical Union
- Member of the International Glaciological Society
- Reviewer for the Journal of Geophysical Research

## ACADEMIC PUBLICATIONS

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- Tyler, S. W., D.M. Holland, V. Zagorodnov, A.A. Stern, C. Sladek, S. Kobs, S. White, F. Suarez, J. Bryenton (2013): Using distributed temperature sensors to monitor an Antarctic ice shelf and sub-ice-shelf cavity, *Journal of Glaciology*, 59, 215.
- Stern, A. A., M. S. Dinniman, V. Zagorodnov, S. W. Tyler, and D. M. Holland (2013): Intrusion of warm surface water beneath the McMurdo Ice Shelf, Antarctica, *J. Geophys. Res. Oceans*, 118, 7036-7048.
- Stern, A. A., Holland, D. M., Holland, P. R., Jenkins, A., and Sommeria, J. (2014): The effect of geometry on ice shelf ocean cavity ventilation: a laboratory experiment. *Experiments in Fluids*, 55(5), 1-19.
- V. Zagorodnov, S. Tyler, D. Holland, A. Stern, L.G. Thompson, C. Sladek, S. Kobs, J. Nicols (2014): New technique for access-borehole drilling in shelf glaciers using lightweight drills. *Journal of Glaciology*, 60(223), 935-944.
- T.J.W. Wagner, R. Bates, P. Eloegui, P. Abrahamsen, A.A. Stern, D. Vella, A. Crawford, P. Wadhams, K. Nichols (2014): Footloose - iceberg decay from hydrostatic stresses, *Geophys. Res. Lett.*, 41, 55225529
- S. Kobs, . W., D.M. Holland, V. Zagorodnov, A.A. Stern, and Tyler, S (2014): Novel monitoring of Antarctic ice shelf basal melting using a fiber-optic distributed temperature seining mooring, *Geophys. Res Lett.*, 41(19), 6779-6786.
- D. Voytenko, A.A Stern, K. Christianson, R. Walker, T. Dixon (2015): Tidally driven ice speed variation at Helheim Glacier, Greenland, observed with terrestrial radar interferometry. *Journal of Glaciology*, 61(226), 301.
- Stern, A.A., D.M. Holland and L.P. Nadeau (2015): Instability and Mixing of Zonal Jets along an Idealized Continental Shelf Break. *J. Phys. Oceanogr.*, 45, 2315-2338.
- Stern A. A., D.M Holland, E. Johnson, T.J.W. Wagner, R. Bates, J. Gagnon, P. Abrahamsen, D. Vella, A.Crawford, P. Wadhams, K. Nichols (2015): Wind-driven upwelling around grounded tabular icebergs, *J. Geophys. Res. Oceans*, 120.
- Crawford, A.J., T.W Wagner, A.Stern, P. Abrahamsen, R. Bates, K.W. Nicholls, P. Wadhams, I. Church, 2015, Operation Iceberg: The life history and scientific exploits of Petermann Ice Island-B, Baffin Bay, Canada,, *Oceanography* (in review)

## CONFERENCES TALKS

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- Iceberg interactions in a coupled GCM, International Glaciological Society (IGS) meeting, Cambridge, 2015
- Effects of ice shelf geometry on ice shelf ventilation, West Antarctic Ice Sheet (WAIS) meeting, 2013
- The flux of Circumpolar Deep Water (CDW) across the continental shelf break in the Amundsen Sea, Antarctica, Graduate Climate Conference, Seattle, 2012
- A proposed mechanism for iceberg breakup and decay, Greenland Summer School in Tasiilaq, 2012
- Effects of ice shelf geometry on ice shelf ventilation, Atmosphere Ocean Science Day at Princeton University, 2012
- Use of fiber optic cables for Distributed Temperature Sensing (DTS) in ice covered oceans, Greenland Summer School in Ilulissat, 2011

## CONFERENCES POSTERS

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- Instability and mixing of ocean jets along idealized continental shelves, Atmosphere Ocean Fluid Dynamics (AOFD), in Minneapolis, 2015
- Warm water intrusions beneath the McMurdo Ice Shelf, Antarctica, American Geophysical Union (AGU), 2013
- Density driving circulation beneath Antarctic ice shelves: a laboratory experiment, West Antarctic Ice Sheet (WAIS) meeting, 2012
- Advanced ice sheet modeling: Incorporating the effects of scalar ice damage in a land ice model, World Climate Research Program in Denver, 2011

- A.A Stern, T. W. Wagner, A. Adcroft (2015): Parametrization of iceberg calving by the footloose mechanism, *Geophys. Res. Lett.*
- A.A Stern, A. Adcroft, O. Sergienko, R. Hallberg (2015): Iceberg bonds and interactions in a fully coupled general circulation model, *J. Geophys. Res.*
- A.A Stern, A. Adcroft (2015): Dependence of iceberg meltwater flux on iceberg calving size distributions in a coupled general circulation model, *J. Phys. Oceanogr.*