Samuel Kachuck

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I am in the final year of a Ph.D. in Geophysics at Cornell University. My interests include fluid dynamics and statistical physics in general. My thesis research focuses on computing how the earth responds to the mass redistributions of the last ice age, when over 4 million Gigatons of water (about 3% of the oceans) moved from the ocean to the continents, and predicting the effects this is having on sea level changes today using sparse surface observations.
I believe that communicating and teaching science honestly is vitally important for its continued success, perhaps now more than ever. I am thus dedicated to studying and implementing modern pedagogical methods in my classrooms, presentations, and with my peers in a way that emphasizes the social, historical, and human aspects of science.

Education

Cornell University Sep 2011 – Jun 2018 (expected)
Ph.D. in Geophysics
Cornell University Sep 2011 – Aug 2014
M.S. in Physics
Cambridge University, St. Edmund's College Oct 2010 – May 2011
M.A.St., in Applied Mathematics and Theoretical Physics
Wesleyan University Sep 2006 – June 2010
B.A. in Physics and Mathematical Economics

Research Experience

Graduate Research Fellow May 2012 – Present
Cornell University
Advisor: Prof. Lawrence M. Cathles, III
Area: Glacial Isostatic Modeling and Analysis

Graduate Research Assistant Sep 2011 – May 2012
Cornell University
Advisor: Prof. Itai Cohen
Area: Insect Flight Stability and Control

Research Assistant Oct 2010 – May 2011
GK Batchelor Fluids Laboratory
Advisor: Dr. Stuart B. Dalziel
Area: Buoyancy in Permeable Media

Undergraduate Research Assistant Aug 2008 – June 2010
Wesleyan University
Advisor: Prof. Greg A. Voth
Area: Granular Gas Dynamics

Publications

[1] and, "Constraining the geometry and volume of the barents sea ice sheet," *Journal of Quaternary Science*, in review.

[2] and, "Simulations of granular gravitational collapse," *Physical Review E*, vol. 88, no. 6, p. 062 202, Dec. 2013, ISSN: 1539-3755. DOI: 10.1103/PhysRevE.88.062202. [Online]. Available: http://link.aps.org/doi/10.1103/PhysRevE.88.062202.

[3] , "Visualization of collisional substructure in granular shock waves," *Physical Review E*, vol. 78, no. 4, pp. 1–6, Oct. 2008, ISSN: 1539-3755. DOI: 10.1103/PhysRevE.78.041309. [Online]. Available: http://link.aps.org/doi/10.1103/PhysRevE.78.041309.

Teaching Experience

- Private Tutor (PHYS 2207, 2208, 1112, 2213, 2216; MAE 3780; CEE 3310), S2012 – present
- Analytical Mechanics (CU PHYS 3318), GTA S2017
- Physics II: Electromagnetism (CU PHYS 2213), GTA F2011, S2012, Su2012
- Physics I: Mechanics and Heat (CU PHYS 1112), GTA F2012
- Quantum Mechanics I (W PHYS 214), UTA S2010
- Mathematical Economics (W ECON 380), UTA F2009
- General Physics II (W PHYS 116), UTA S2009
- General Physics I (W PHYS 113), UTA F2008

Skills

Languages Python, C/C++, FORTRAN, APL, LaTeX, Matlab

Honors & Awards

- Douglas A Fitchen Scholar 2017
- AGU Outstanding Student Paper Award 2016
- Phi Beta Kappa 2010
- Graham Prize 2010
- Karl van Dyke Prize 2010
- Plukas Teaching Apprentice Award 2010
- White Prize 2010
- Dean's List, Wesleyan University 2006 – 2010
- Squire Fund Fellow 2007
- Chadbourne Prize 2007

All Publications

Google Scholar ID: nuMklOMAAAAJ

Journal Articles

[J1] and, "Constraining the geometry and volume of the barents sea ice sheet," *Journal of Quaternary Science*, in review.

[J2] and, "Simulations of granular gravitational collapse," *Physical Review E*, vol. 88, no. 6, p. 062 202, Dec. 2013, ISSN: 1539-3755. DOI: 10.1103/PhysRevE.88.062202. [Online]. Available: http://link.aps.org/doi/10.1103/PhysRevE.88.062202.

[J3] , "Visualization of collisional substructure in granular shock waves," *Physical Review E*, vol. 78, no. 4, pp. 1–6, Oct. 2008, ISSN: 1539-3755. DOI: 10.1103/PhysRevE.78.041309. [Online]. Available: http://link.aps.org/doi/10.1103/PhysRevE.78.041309.

Oral Presentations

[O1] and, "Nondimensionalized relaxation method for efficient computation of elastic love numbers," in *Workshop on Glacial Isostatic Adjustment and Elastic Deformation*, 2017.

[O2] , "Emergence constraints on late weichselian barents sea ice sheet history," in *EGU*, 2014.

[O3] , "Velocity dependent energy loss in granular gravitational collapse," in *New York Condensed Matter Workshop*, 2011.

Posters

[P1] and, "Sloppy inversion and optimal experiment design for last glacial maximum barents sea ice sheet configuration," in *American Geosciences Union*, 2016.

[P2] ——, "Gia response suggests thick lithosphere under the appalachians," in *Institute for the Study of the Continents*, 2014.

[P3] , "North american peripheral bulge constraints on mantle rheology," in *European Geosciences Union*, 2014.

[P4] , "The seamod methodology of gia interpretation," in *European Geosciences Union*, 2014.

[P5] and, "Lithosphere, ice history, local emergence," in *European Geosciences Union*, 2013.

[P6] , "Granular gravitational collapse in realistically simulated granular gases," in 5^{th} *Annual Thesis Celebration*, 2010.