Samuel B. Kachuck

(818) 307 2685 • sbk83@cornell.edu • georei.com
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I am seeking faculty positions researching the uncertainties in the geophysical models of global and local mean sea level changes.

Education

Cornell University Sep 2011 – August 2018
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
with Merit

Wesleyan University Sep 2006 – June 2010
B.A. in Physics and Mathematical Economics
with High Honors in Physics

Research Experience

Postdoctoral Research Fellow July 2018 – present
University of Michigan
Advisor: Prof. Jeremy Bassis
Area: Ice Sheet Dynamics
- Computational study of the effects of damage mechanics and glaical isostatic adjustment in DOE ice-sheetmodeler, BISICLES.

Graduate Research Fellow May 2012 – May 2018
Cornell University
Advisor: Prof. Lawrence M. Cathles, III
Area: Glacial Isostatic Modeling and Analysis
- Computational study of the physics and errors in models of glacial isostatic adjustment.

Graduate Research Assistant Sep 2011 – May 2012
Cornell University
Advisor: Prof. Itai Cohen
Area: Insect Flight Stability and Control
- Experimental study of the fluid dynamics and control mechanisms employed by Drosophilae to stabilize their flight against perturbations.

Research Assistant Oct 2010 – May 2011
GK Batchelor Fluids Laboratory
Advisor: Dr. Stuart B. Dalziel
Area: Buoyancy in Permeable Media
- Experimental study of the various fluid dynamical regimes present when a buoyant plume flows past a permeable medium.

Undergraduate Research Assistant Aug 2008 – June 2010
Wesleyan University
Advisor: Prof. Greg A. Voth
Area: Granular Gas Dynamics
- Experimental and computational study of the dynamics of 2D granular gases in gravity, both in steady state (when energy is continuously added) and in decay (when it is not).

Publications

[1] **Kachuck, Samuel B.**, "Geometric perspective on fitting glacial isostatic adjustment," in prep.

[2] ——, "Nondimensionalized relaxation method for efficient computation of time-domain viscoelastic love numbers," in prep.

[3] Z. Martinec, V. Klemann, . .., and **Kachuck, Samuel B.**., "A benchmark study of numerical implementations of the sea-level equation in gia modelling," in review.

[4] W. J. Durkin, **Kachuck, Samuel B.**, and M. E. Pritchard, "Sensitivity of southeast alaskan elastic uplift rates to uncertainty in earth structure and decadal ice thinning rates," in review.

[5] **Kachuck, Samuel B.** and L. M. Cathles, "Constraining the geometry and volume of the barents sea ice sheet," *Journal of Quaternary Science*, 2018. [Online]. Available: `https://doi.org/10.1002/jqs.3031`.

[6] **Kachuck, Samuel B.** and G. A. Voth, "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`.

[7] J. A. Perez, **Kachuck, Samuel B.**, and G. A. Voth, "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
- NSF GRFP Honorable Mention 2012
- 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

Service

- Letters to a Pre-Scientist 2016-
- Local Geology Walk 2016-
- Graduate Teaching Assistant Review 2013
- Graduate Teaching Assistant Training 2012, 2013
- Alumni Day Physics Demonstrations 2012
- Retrospective Degree Day Fluids Demonstrations 2011

All Publications

Google Scholar ID: nuMklOMAAAAJ

Journal Articles

[J1] **Kachuck, Samuel B.**, "Geometric perspective on fitting glacial isostatic adjustment," in prep.

[J2] ——, "Nondimensionalized relaxation method for efficient computation of time-domain viscoelastic love numbers," in prep.

[J3] Z. Martinec, V. Klemann, . .., and **Kachuck, Samuel B.**., "A benchmark study of numerical implementations of the sea-level equation in gia modelling," in review.

[J4] W. J. Durkin, **Kachuck, Samuel B.**, and M. E. Pritchard, "Sensitivity of southeast alaskan elastic uplift rates to uncertainty in earth structure and decadal ice thinning rates," in review.

[J5] **Kachuck, Samuel B.** and L. M. Cathles, "Constraining the geometry and volume of the barents sea ice sheet," *Journal of Quaternary Science*, 2018. [Online]. Available: `https://doi.org/10.1002/jqs.3031`.

[J6] **Kachuck, Samuel B.** and G. A. Voth, "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`.

[J7] J. A. Perez, **Kachuck, Samuel B.**, and G. A. Voth, "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] Z. Martinec, V. Klemann, . .., and **Kachuck, Samuel B.**, "A benchmark study of numerical implementations of the sea-level equation in gia modelling," in *EGU*, 2018.

[O2] W. J. Durkin, **Kachuck, Samuel B.**, and M. E. Pritchard, "Impact of different crustal elastic models on interpreting regional gia deformation in southeast alaska," in *EGU*, 2018.

[O3] **Kachuck, Samuel B.** and L. M. Cathles, "Nondimensionalized relaxation method for efficient computation of elastic love numbers," in *Workshop on Glacial Isostatic Adjustment and Elastic Deformation*, 2017.

[O4] **Kachuck, Samuel B.**, L. M. Cathles, A. Amantov, A. Hormes, and W. Fjeldskaar, "Emergence constraints on late weichselian barents sea ice sheet history," in *EGU*, 2014.

[O5] **Kachuck, Samuel B.**, "Velocity dependent energy loss in granular gravitational collapse," in *New York Condensed Matter Workshop*, 2011.

Posters

[P1] **Kachuck, Samuel B.** and L. M. Cathles, "Using geometry to improve model fitting and experiment design for glacial isostasy *(invited)*," in *American Geosciences Union*, 2017. [Online]. Available: https://agu2017fallmeeting-agu.ipostersessions.com/default.aspx?s=79-C9-40-04-72-E0-11-29-29-C2-76-FD-1E-DF-BA-09.

[P2] ——, "Sloppy inversion and optimal experiment design for last glacial maximum barents sea ice sheet configuration," in *American Geosciences Union*, 2016.

[P3] ——, "Gia response suggests thick lithosphere under the appalachians," in *Institute for the Study of the Continents*, 2014.

[P4] **Kachuck, Samuel B.**, L. M. Cathles, A. Amantov, and W. Fjeldskaar, "North american peripheral bulge constraints on mantle rheology," in *European Geosciences Union*, 2014.

[P5] L. M. Cathles, A. Amantov, **Kachuck, Samuel B.**, and W. Fjeldskaar, "The seamod methodology of gia interpretation," in *European Geosciences Union*, 2014.

[P6] **Kachuck, Samuel B.** and L. M. Cathles, "Lithosphere, ice history, local emergence," in *European Geosciences Union*, 2013.

[P7] **Kachuck, Samuel B.**, "Granular gravitational collapse in realistically simulated granular gases," in 5^{th} *Annual Thesis Celebration*, 2010.