

Samuel B. Kachuck

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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 Ph.D. in Geophysics	Sep 2011 – August 2018
Cornell University M.S. in Physics	Sep 2011 – Aug 2014
Cambridge University, St. Edmund's College M.A.St., in Applied Mathematics and Theoretical Physics <i>with Merit</i>	Oct 2010 – May 2011
Wesleyan University B.A. in Physics and Mathematical Economics <i>with High Honors in Physics</i>	Sep 2006 – June 2010

Research Experience

Postdoctoral Research Fellow University of Michigan <i>Advisor:</i> Prof. Jeremy Bassis <i>Area:</i> Ice Sheet Dynamics <ul style="list-style-type: none">○ Computational study of the effects of damage mechanics and glacial isostatic adjustment in BISICLES.	July 2018 – present
Graduate Research Fellow Cornell University <i>Advisor:</i> Prof. Lawrence M. Cathles, III <i>Area:</i> Glacial Isostatic Modeling and Analysis <ul style="list-style-type: none">○ Computational study of the physics and errors in models of glacial isostatic adjustment.	May 2012 – May 2018
Graduate Research Assistant Cornell University <i>Advisor:</i> Prof. Itai Cohen <i>Area:</i> Insect Flight Stability and Control <ul style="list-style-type: none">○ Experimental study of the fluid dynamics and control mechanisms employed by <i>Drosophila</i> to stabilize their flight against perturbations.	Sep 2011 – May 2012
Research Assistant GK Batchelor Fluids Laboratory <i>Advisor:</i> Dr. Stuart B. Dalziel <i>Area:</i> Buoyancy in Permeable Media <ul style="list-style-type: none">○ Experimental study of the various fluid dynamical regimes present when a buoyant plume flows past a permeable medium.	Oct 2010 – May 2011

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, S.B.**, D. Martin, J. Bassis, and S. Price, "Rapid viscoelastic deformation lows marine ice sheet instability at pine island glacier," *Geophysical Research Letters*, in review.
- [2] **Kachuck, S B** and I. Cathles L M, "Benchmarked computation of time-domain viscoelastic love numbers for adiabatic mantles," *Geophysical Journal International*, vol. 218, no. 3, pp. 2136–2149, Jun. 2019, ISSN: 0956-540X. DOI: 10.1093/gji/ggz276. eprint: <http://oup.prod.sis.lan/gji/article-pdf/218/3/2136/28921906/ggz276.pdf>. [Online]. Available: <https://doi.org/10.1093/gji/ggz276>.
- [3] W. Durkin, **Kachuck, Samuel B.**, and M. Pritchard, "The importance of the inelastic and elastic structures of the crust in constraining glacial density, mass change, and isostatic adjustment from geodetic observations in southeast alaska," *Journal of Geophysical Research: Solid Earth*, vol. 124, no. 1, pp. 1106–1119, 2019.
- [4] Z. Martinec, V. Klemann, W. v. d. Wal, R. E. M. Riva, G. Spada, Y. Sun, D. Melini, **Kachuck, S B**, V. Barletta, K. Simon, G. A, and T. S. James, "A benchmark study of numerical implementations of the sea level equation in gia modelling," *Geophysical Journal International*, vol. 215, no. 1, pp. 389–414, Jul. 2018, ISSN: 0956-540X. DOI: 10.1093/gji/ggy280. eprint: <http://oup.prod.sis.lan/gji/article-pdf/215/1/389/25336521/ggy280.pdf>. [Online]. Available: <https://doi.org/10.1093/gji/ggy280>.
- [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. 062202, 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

- Earth Systems Modeling (UM CLaSP 410), Instructor F2019
- Private Tutor (PHYS 2207, 2208, 1112, 2213, 2216; MAE 3780; CEE 3310), S2012 – S2018
- 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

- Peer Reviewer: JGR: Solid Earth, Solid Earth 2018-
- Letters to a Pre-Scientist 2016-
- International Thwaites Glacier Collaboration: Early Career Retreat 2019
- AGU Fall Meeting OSPA Judge 2018
- Antarctic Week 2018
- Local Geology Walk 2016-2018
- 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] **Kachuck, S.B.**, D. Martin, J. Bassis, and S. Price, "Rapid viscoelastic deformation slows marine ice sheet instability at pine island glacier," *Geophysical Research Letters*, in review.
- [J3] **Kachuck, S B** and I. Cathles L M, "Benchmarked computation of time-domain viscoelastic love numbers for adiabatic mantles," *Geophysical Journal International*, vol. 218, no. 3, pp. 2136–2149, Jun. 2019, ISSN: 0956-540X. DOI: 10.1093/gji/ggz276. eprint: <http://oup.prod.sis.lan/gji/article-pdf/218/3/2136/28921906/ggz276.pdf>. [Online]. Available: <https://doi.org/10.1093/gji/ggz276>.
- [J4] W. Durkin, **Kachuck, Samuel B.**, and M. Pritchard, "The importance of the inelastic and elastic structures of the crust in constraining glacial density, mass change, and isostatic adjustment from geodetic observations in southeast alaska," *Journal of Geophysical Research: Solid Earth*, vol. 124, no. 1, pp. 1106–1119, 2019.
- [J5] Z. Martinec, V. Klemann, W. v. d. Wal, R. E. M. Riva, G. Spada, Y. Sun, D. Melini, **Kachuck, S B**, V. Barletta, K. Simon, G. A, and T. S. James, "A benchmark study of numerical implementations of the sea level equation in gia modelling," *Geophysical Journal International*, vol. 215, no. 1, pp. 389–414, Jul. 2018, ISSN: 0956-540X. DOI: 10.1093/gji/ggy280. eprint: <http://oup>.

prod.sis.lan/gji/article-pdf/215/1/389/25336521/ggy280.pdf. [Online]. Available: <https://doi.org/10.1093/gji/ggy280>.

- [J6] **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>.
- [J7] **Kachuck, Samuel B.** and G. A. Voth, "Simulations of granular gravitational collapse," *Physical Review E*, vol. 88, no. 6, p. 062202, Dec. 2013, ISSN: 1539-3755. DOI: 10.1103/PhysRevE.88.062202. [Online]. Available: <http://link.aps.org/doi/10.1103/PhysRevE.88.062202>.
- [J8] 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] **Kachuck, Samuel B.**, "" in *INSTOC*, 2018.
- [O2] —, "Rapid viscous response slows pine island grounding-line retreat," in *GIA Workshop*, 2019.
- [O3] 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.
- [O4] 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.
- [O5] **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.
- [O6] **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.
- [O7] **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, "Giapy: glacial isostatic adjustment in python: nondimensionalized relaxation method for computation of time-domain viscoelastic love numbers," in *American Geosciences Union*, 2018.
- [P2] **Kachuck, Samuel B.** and J. Bassis, "Low viscosity mantle feedback in amundsen sea embayment dynamics," in *American Geosciences Union*, 2018.
- [P3] **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>.
- [P4] —, "Sloppy inversion and optimal experiment design for last glacial maximum barents sea ice sheet configuration," in *American Geosciences Union*, 2016.
- [P5] —, "Gia response suggests thick lithosphere under the appalachians," in *Institute for the Study of the Continents*, 2014.
- [P6] **Kachuck, Samuel B.**, L. M. Cathles, A. Amantov, and W. Fjeldskaar, "North american peripheral bulge constraints on mantle rheology," in *European Geosciences Union*, 2014.
- [P7] L. M. Cathles, A. Amantov, **Kachuck, Samuel B.**, and W. Fjeldskaar, "The seamod methodology of gia interpretation," in *European Geosciences Union*, 2014.
- [P8] **Kachuck, Samuel B.** and L. M. Cathles, "Lithosphere, ice history, local emergence," in *European Geosciences Union*, 2013.
- [P9] **Kachuck, Samuel B.**, "Granular gravitational collapse in realistically simulated granular gases," in *5th Annual Thesis Celebration*, 2010.