

Curriculum Vitae

Education

- 2016 Ph.D. Geophysics, California Institute of Technology
Thesis: Mechanics of deformable glacier beds
Advisor: Mark Simons
- 2010 M.S. Aerospace Engineering, University of Texas at Austin
- 2008 B.S. Aerospace Engineering, University of Texas at Austin

Research Interests

Mechanics of fluids and solids

Glaciology: Deformable glacier beds, ice-ocean interactions, ice rheology, subglacial hydrology, grounding zone dynamics, erosion and deposition of glacial sediments, ice-flow modeling, inverse theory

Landslides: Distribution, environmental and tectonic controls, granular flow

Remote Sensing

Geodesy: Dynamic cryospheric and terrestrial systems observations, interferometric synthetic aperture radar, time-series analysis, data assimilation

Hazard response: Location and characterization of oil and hazardous chemical spills in marine environments using polarimetric synthetic aperture radar, extent and severity of wildfires using polarimetric synthetic aperture radar

Academic Positions

- 2018– Assistant Professor, Department of Earth, Atmospheric and Planetary Sciences, MIT
- 2016–2018 NSF Postdoctoral Fellow, British Antarctic Survey
- 2010–2015 Graduate Research and Teaching Assistant, Caltech
- 2009 & 2010 Graduate Research Fellow, Jet Propulsion Laboratory
- 2006–2010 Research and Teaching Assistant, University of Texas at Austin

Awards and Honors

- 2014 NSF Earth Sciences Postdoctoral Fellowship (tenure: 2016–2018)
- 2013–2015 ARCS and Albert Parvin Foundation Fellowship
- 2012 IEEE Transactions on Geoscience and Remote Sensing Editor's Choice Award
- 2011–2014 NASA Earth and Space Sciences Fellowship
- 2011–2013 ARCS Foundation Fellowship
- 2011 California Institute of Technology Graduate Fellowship

Publications

Refereed Publications (18)

- Meyer, C. R. and B. M. Minchew. "Melting in the shear margins of the Antarctic Ice Sheet". *submitted* (2017).
- Minchew, B. M., C. R. Meyer, A. A. Robel, G. H. Gudmundsson, and M. Simons. "The influence of crystalline fabric, shear heating, and crevassing on the evolution of ice rheology in glacier shear margins". *submitted* (2017).
- Meyer, C. R., A. Yehya, B. M. Minchew, and J. R. Rice. "Development of temperate ice and transitions in subglacial hydrology along ice stream shear margins". *submitted* (2017).

- Minchew, B. M., G. H. Gudmundsson, A. Gardner, F. S. Paolo, and H. A. Fricker. “Modeling the dynamic response of outlet glaciers in the Bellingshausen Sea Sector, West Antarctica, to observed ice-shelf thinning”. *submitted* (2017).
- Robel, A. A., V. C. Tsai, B. M. Minchew, and M. Simons. “Tidal modulation of ice shelf buttressing stresses”. *Annals of Glaciology* in press (2017).
- Fielding, E. J., M.-H. Huang, C. Liang, B. M. Minchew, and S. Sangha. “Three-dimensional coseismic deformation from large thrust earthquakes on the edges of the Tibetan Plateau”. *in revision* (2017).
- Milillo, P., B. M. Minchew, P. Agram, B. Riel, and M. Simons. “Geodetic imaging of time-dependent three-component surface deformation: application to tidal-timescale ice flow of Rutford Ice Stream, West Antarctica”. *IEEE Transactions on Geoscience and Remote Sensing* in press (2017).
- Angelliaume, S., B. M. Minchew, S. Chatiang, P. Martineau, and V. Mieggebielle. “Multifrequency radar imagery and characterization of hazardous and noxious substances at sea”. *IEEE Transactions on Geoscience and Remote Sensing* 55.5 (2017).
- Minchew, B. M., M. Simons, B. V. Riel, and P. Milillo. “Tidally induced variations in vertical and horizontal motion on Rutford Ice Stream, West Antarctica, inferred from remotely sensed observations”. *Journal of Geophysical Research: Earth Surface* 122 (2017), pp. 167–190.
- Minchew, B. M., M. Simons, H. Björnsson, F. Pálsson, M. Morlighem, H. Seroussi, E. Larour, and S. Hensley. “Plastic bed beneath Hofsjökull Ice Cap, central Iceland, and the sensitivity of ice flow to surface meltwater flux”. *Journal of Glaciology* 62.231 (2016), pp. 147–158.
- Milillo, P., B. Riel, B. M. Minchew, S. H. Yun, M. Simons, and P. Lundgren. “On the synergistic use of SAR constellations’ data exploitation for earth science and natural hazard response”. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 9.3 (2015), pp. 1095–1100.
- Collins, M. J., M. Denbina, B. M. Minchew, C.E. Jones, and B. Holt. “On the use of simulated airborne compact polarimetric SAR for characterizing oil-water mixing of the Deepwater Horizon oil spill”. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 8.3 (2015), pp. 1062–1077.
- Minchew, B. M., M. Simons, S. Hensley, H. Björnsson, and F. Pálsson. “Early melt-season velocity fields of Langjökull and Hofsjökull ice caps, central Iceland”. *Journal of Glaciology* 61.226 (2015), pp. 253–266.
- Scheingross, J. S., B. M. Minchew, B.H. Mackey, M. Simons, M.P. Lamb, and S. Hensley. “Fault zone controls on the spatial distribution of slow-moving landslides”. *GSA Bulletin* 125.3-4 (2013), pp. 473–489.
- Minchew, B. M., C.E. Jones, and B. Holt. “Polarimetric analysis of backscatter from the Deepwater Horizon oil spill using L-band synthetic aperture radar”. *IEEE Transactions on Geoscience and Remote Sensing* 50.10 (2012), pp. 3812–3830.
- Minchew, B. M. “Determining the mixing of oil and seawater using polarimetric synthetic aperture radar”. *Geophysical Research Letters* 39.16 (2012). L16607.
- Tsai, V. C., B. M. Minchew, M. P. Lamb, and J. P. Ampuero. “A physical model for seismic noise generation from sediment transport in rivers”. *Geophysical Research Letters* 39.2 (2012). L02404.
- Jones, C. E., B. M. Minchew, B. Holt, and S. Hensley. “Studies of the Deepwater Horizon Oil Spill with the UAVSAR radar”. *Monitoring and Modeling the Deepwater Horizon Oil Spill: A Record-Breaking Enterprise*. Vol. 195. Washington, DC: AGU, 2011, pp. 33–50.

Non-refereed Publications

- Minchew, B. M. “Mechanics of deformable glacier beds”. PhD thesis. California Institute of Technology, 2016.
- Minchew, B. M. “Polarimetric SAR decomposition of temperate ice cap Hofsjökull, Central Iceland”. MA thesis. University of Texas at Austin, 2010.

Invited Presentations

- Minchew, B. M. “Oceans and ice: How ocean tides influence inland ice flow”. *Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology*. May 2017.
- Minchew, B. M. “The response of ice flow to ocean tidal loading”. *Institute for Theoretical Geophysics Seminar, University of Cambridge*. Mar. 2017.
- Minchew, B. M. “Oceans and ice: How ocean tides influence inland ice flow”. *School of Earth and Atmospheric Sciences Seminar, Georgia Institute of Technology*. Mar. 2017.
- Minchew, B. M. “Oceans and ice: How ocean tides influence inland ice flow”. *Department of Earth Sciences Seminar, University of Oregon*. Jan. 2017.
- Minchew, B. M. “Observing glaciers in a warming world”. *Aerospace Engineering Seminar, University of Colorado Boulder*. May 2016.
- Minchew, B. M. “Oceans and ice: How ocean tides influence inland ice flow”. *Aerospace Engineering Seminar, University of Texas at Austin*. Feb. 2016.
- Minchew, B. M. “Oceans and ice: How ocean tides influence inland ice flow”. *CIRES Seminar, University of Colorado Boulder*. Feb. 2016.
- Minchew, B. M. “Tidally induced variability in ice stream flow on Rutford Ice Stream, West Antarctica”. *University of Washington Glaciology Seminar*. Jan. 2016.
- Minchew, B. M. “Rapid changes in glacier flow and what they teach us about glacier mechanics”. *Stanford Geophysics Department Seminar*. Dec. 2015.
- Minchew, B. M. “Hourly to seasonal timescale changes in glacier flow: InSAR observations as constraints on numerical ice flow models”. *Jet Propulsion Laboratory Radar Forum*. Nov. 2015.
- Minchew, B. M., M. Simons, S. Hensley, H. Björnsson, F. Pálsson, and P. Milillo. “Multiple glacier surges observed with airborne and spaceborne interferometric synthetic aperture radar”. *Geoscience and Remote Sensing Symposium (IGARSS), 2015 IEEE International*. July 2015, pp. 5316–5319.
- Minchew, B. M. “Glacier flow over deformable beds”. *Scripps GP Seminar*. May 2015.
- Minchew, B. M., S. Hensley, and M. Simons. “Using UAVSAR to measure seasonal variations in surface velocities and constrain basal mechanics of an ice cap”. *UAVSAR Workshop*. Oct. 2014.
- Simons, M and B. M. Minchew. “Glacier dynamics in a changing climate”. *University of Iceland and U.S. Embassy Iceland Public Outreach*. Feb. 2014.

Other Selected Presentations (first author only)

- Minchew, B. M., C. R. Meyer, A. A. Robel, G. H. Gudmundsson, and M. Simons. “Back to the basics: How ice rheology evolves in glacier shear margins”. *IGS British Branch Meeting*. Sept. 2017.
- Minchew, B. M., C. R. Meyer, A. A. Robel, G. H. Gudmundsson, and M. Simons. “On the evolution of ice rheology in glacier shear margins”. *IGS International Symposium on Polar Ice, Polar Climate, Polar Change*. Aug. 2017.

- Minchew, B. M., G. H. Gudmundsson, A. Gardner, F. Paolo, and H. Fricker. “Response of outlet glaciers to ice-shelf thinning in the Bellingshausen Sea Sector, West Antarctica”. *AGU Fall Meeting Abstracts*. Dec. 2016.
- Minchew, B. M., G. H. Gudmundsson, and A. Gardner. “Outlet glacier response to ice-shelf thinning in the Bellingshausen Sea Sector, West Antarctica”. *International Glaciological Society British Branch Meeting*. Sept. 2016.
- Minchew, B. M., M. Simons, B. Riel, A. Robel, V. Tsai, and P. Milillo. “Ice shelf buttressing and the response of ice stream flow to vertical ocean tidal motion”. *International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean*. July 2016.
- Minchew, B. M. “How ocean tides influence ice stream flow tens of kilometers inland”. *ESA Living Planet Symposium*. May 2016.
- Minchew, B. M. “Insights into ice shelf buttressing and ice rheology on Rutford Ice Stream, West Antarctica, from synoptic-scale observations of tidally driven ice flow variations”. *EGU Meeting Abstracts*. Apr. 2016.
- Minchew, B. M. “4D surface velocity fields of Rutford Ice Stream, West Antarctica, inferred from continuous synthetic aperture radar observations”. *AGU Fall Meeting Abstracts*. Dec. 2015.
- Minchew, B. M. “4D surface velocity fields inferred from continuous synthetic aperture radar observations: Applications to Rutford Ice Stream, West Antarctica”. *WAIS Workshop*. Sept. 2015.
- Minchew, B. M. “Iceland to Antarctica: Rapid changes in glacier flow and what they teach us about glacier mechanics”. *PhD Defense*. Oct. 2015.
- Minchew, B. M. “Ice flow over deformable beds”. *Caltech Brown Bag Seminar*. Apr. 2015.
- Minchew, B. M., M. Simons, M. Morlighem, H. Björnsson, F. Pálsson, S. Hensley, and E. Larour. “Inferring basal plasticity in a temperate ice cap from observationally constrained ice-flow models”. *AGU Fall Meeting Abstracts*. Dec. 2014.
- Minchew, B. M., M. Simons, M. Morlighem, H. Björnsson, F. Pálsson, S. Hensley, and E. Larour. “Basal plasticity and the influence of surface meltwater flux on glacier flow”. *Northwest Glaciologists’ Meeting*. Oct. 2014.
- Minchew, B. M., M. Simons, M. Morlighem, H. Björnsson, F. Pálsson, S. Hensley, and E. Larour. “Ice flow over plastic beds”. *WAIS Workshop*. Sept. 2014.
- Minchew, B. M. “Insights into the basal mechanics of Icelandic ice caps”. *Caltech Brown Bag Seminar*. Mar. 2014.
- Minchew, B. M. “Insights into early melt season evolution of Hofsjökull’s subglacial hydrological system”. *University of Iceland Glaciological Seminar*. Feb. 2014.
- Minchew, B. M., M. Simons, S. Hensley, E. Larour, M. Morlighem, H. Björnsson, and F. Pálsson. “Temporal variation of basal stress in temperate Icelandic glaciers during the early melt season”. *AGU Fall Meeting Abstracts*. Dec. 2013.
- Minchew, B. M. “Subglacial mechanics of Iceland ice caps: Inferences from surface velocity measurements and numerical models”. *Caltech Brown Bag Seminar*. Apr. 2013.
- Minchew, B. M., C. E. Jones, and B. Holt. “Near real-time estimates of the mixing of oil and sea water using polarimetric synthetic aperture radar”. *UAVSAR Workshop*. Mar. 2013.
- Minchew, B. M., M. Simons, S. Hensley, H. Björnsson, F. Pálsson, and E. Y. Larour. “Inferring the surface velocity fields of glaciers in central Iceland using UAVSAR repeat-pass interferometry”. *UAVSAR Workshop*. Mar. 2013.
- Minchew, B. M., M. Simons, S. Hensley, H. Björnsson, F. Pálsson, and E. Y. Larour. “Influence of surface meltwater on the velocity of temperate glaciers in the early melt season inferred from collocated

airborne InSAR, GPS, and *in situ* meteorological measurements”. *AGU Fall Meeting Abstracts*. Dec. 2012.

Grants

- 2016–2018 PI – Spatiotemporal characteristics of basal resistance to ice flow in the West Antarctic Ice Sheet from satellite observations and numerical modeling. NSF Earth Sciences Postdoctoral Fellowship award 1452587
- 2013–2015 Research assistant – Subglacial mechanics using repeat-pass InSAR measurements and numerical models of temperate ice caps in Iceland. NASA Cryospheric Science award NNX14AH80G, with M. Simons (PI)
- 2011–2014 PI – Investigating the mechanics of subglacial till using airborne radar interferometry and numerical ice flow models. NASA Earth and Space Science Fellowship
- 2011–2012 Research assistant – Temperate glacier studies with UAVSAR. NASA Cryospheric Science, with M. Simons (PI)

Large-scale Collaborations

- Ice Sheet Systems Model
- InSAR Scientific Computing Environment
- The Sleeping Giant: Measuring Ice Ocean Interactions in Antarctica

Mentorship

- 2016– PhD advisory committee member: Thomas Chudley, University of Cambridge
- 2015 Project advisor: Benjamin Lauer, Université de Lorraine
- 2015 Project advisor: Christine Rains, DEVELOP-JPL
- 2015 Project advisor: Jerry Heo, DEVELOP-JPL
- 2015 Project advisor: Erika Higa, DEVELOP-JPL
- 2013 Project advisor: Sandia Akhtar, Caltech

Major Fieldwork

- May 2015 UAVSAR deployment, Hofsjökull and Vatnajökull, Iceland
- February 2014 UAVSAR and campaign GPS deployment, Langjökull and Hofsjökull, Iceland
- June 2012 UAVSAR and campaign GPS deployment, Langjökull and Hofsjökull, Iceland

Outreach Efforts

- NASA Climate Day presenter
- US Embassy Iceland outreach on Arctic climate
- Iridescent Learning: Teaching children about scientific concepts

Synergistic and Professional Activities

Scientific Editor: Annals of Glaciology

Reviewer: Geophysical Research Letters, Journal of Glaciology, Annals of Glaciology, The Cryosphere, Journal of Geophysical Research, IEEE Transactions on Geoscience and Remote Sensing, Earth System Science Data, NSF

Member: International Glaciological Society, American Geophysical Union, European Geosciences Union

Military Service

Branch: U.S. Marine Corps

Dates: August 1996–February 2004 (active duty)

Rank: Staff Sergeant

Units: HMX-1, HMH-461, HMM-264, 26th MEU (aboard USS Iwo Jima)

Major campaigns: Operation Iraqi Freedom, Combined Joint Task Force–Horn of Africa, Joint Task Force Liberia

Selected awards: Air medal, Navy/Marine Corps Achievement Medal, Presidential Service Badge