

Kenneth D. Mankoff

Senior Scientist
kdm@geus.dk
<http://kenmankoff.com>

The Geological Survey of
Denmark and Greenland (GEUS)
Department of Glaciology and Climate
Øster Voldgade 10, 1350 Copenhagen K., Denmark

PROFESSIONAL EXPERIENCE

2017-	Geological Survey of Denmark & Greenland	Senior Scientist
2015-2017	Pennsylvania State University	Research Associate
2015-2017	American Museum of Natural History	Online Course Scientist
2013-15	Woods Hole Oceanographic Institution	Postdoctoral Scholar
2009-13	University of California, Santa Cruz	Graduate Research Assistant
2004-09	Columbia University, NASA GISS	Programmer / Analyst
2003-04	Honeybee Robotics	Technology Development
2001-02	Laboratory for Atmospheric and Space Physics	Professional Research Assistant
1998-01	Laboratory for Atmospheric and Space Physics	Undergraduate Research Assistant

EDUCATION

2013 Ph.D.	University of California, Santa Cruz	Earth and Planetary Science
2003	École Polytechnique Fédérale de Lausanne	Microtechnology & Robotics
2001 B.S.	University of Colorado, Boulder	Computer Science

JOURNAL PAPERS (h-index: 11; Erdős: 3; <https://goo.gl/yJCdV6>)

- [J17] K. D. Mankoff, J. D. Gulley, S. M. Tulaczyk, M. D. Covington, X. Liu, Y. Chen, D. I. Benn, and P. S. Głowacki. “Roughness of a subglacial conduit under Hansbreen, Svalbard”. *Journal of Glaciology*. **2017**, 63 (239), 423–435. doi: [10.1017/jog.2016.134](https://doi.org/10.1017/jog.2016.134).
- [J16] K. D. Mankoff and S. M. Tulaczyk. “The past, present, and future viscous heat dissipation available for Greenland subglacial conduit formation”. *The Cryosphere*. **2017**, 11, 303–317. doi: [10.5194/tc-11-303-2017](https://doi.org/10.5194/tc-11-303-2017).
- [J15] K. D. Mankoff, F. Straneo, C. Cenedese, S. B. Das, C. G. Richards, and H. Singh. “Structure and dynamics of a subglacial discharge plume in a Greenlandic fjord”. *Journal of Geophysical Research: Oceans*. **2016**, 121 (12), 8670–8688. doi: [10.1002/2016JC011764](https://doi.org/10.1002/2016JC011764).
- [J14] J. A. Mikucki, P. A. Lee, D. Ghosh, A. M. Purcell, A. C. Mitchell, K. D. Mankoff, A. T. Fisher, S. Tulaczyk, S. Carter, M. R. Siegfried, H. A. Fricker, T. Hodson, J. Coenen, R. Powell, R. Scherer, T. Vick-Majors, A. A. Achberger, B. C. Christner, and M. Tranter. “Subglacial Lake Whillans microbial biogeochemistry: a synthesis of current knowledge”. *Philosophical Transactions of the Royal Society A*. **2016**, 374 (2059), 20140290. doi: [10.1098/rsta.2014.0290](https://doi.org/10.1098/rsta.2014.0290).
- [J13] A. T. Fisher, K. D. Mankoff, S. M. Tulaczyk, S. W. Tyler, N. Foley, and the WISSARD Science Team. “High Geothermal Heat Flux Measured below the West Antarctic Ice Sheet”. *Science Advances*. **2015**, 1 (6), e1500093. doi: [10.1126/sciadv.1500093](https://doi.org/10.1126/sciadv.1500093).
- [J12] A. A. Harpold, J. A. Marshall, S. W. Lyon, T. B. Barnhart, B. Fisher, M. Donovan, K. M. Brubaker, C. J. Crosby, N. F. Glenn, C. L. Glennie, P. B. Kirchner, N. Lam, K. D. Mankoff, J. L. McCreight, N. P. Molotch, K. N. Musselman, J. Pelletier, T. Russo, H. Sangireddy, Y. Sjöberg, T. Swetnam, and N. West. “Laser Vision: Lidar as a Transformative Tool to Advance Critical Zone Science”. *Hydrology and Earth System Sciences*. **2015**, 19, 2881–2897. doi: [10.5194/hess-19-2881-2015](https://doi.org/10.5194/hess-19-2881-2015).

- [J11] P. Kimball, J. Bailey, S. B. Das, R. Geyer, T. Harrison, C. Kunz, K. Manganini, K. D. Mankoff, K. Samuelson, T. Sayre-McCord, F. Straneo, P. Traykovski, and H. Singh. “The WHOI Jetyak: An Autonomous Surface Vehicle for Oceanographic Research in Shallow or Dangerous Waters”. *2014 IEEE/OES Autonomous Underwater Vehicles (AUV)*. Institute of Electrical & Electronics Engineers (IEEE), 2014. DOI: [10.1109/AUV.2014.7054430](https://doi.org/10.1109/AUV.2014.7054430).
- [J10] S. M. Tulaczyk, J. A. Mikucki, M. R. Siegfried, C. G. Barcheck, L. H. Beem, A. Behar, J. Burnett, B. C. Christner, A. T. Fisher, H. A. Fricker, K. D. Mankoff, F. Rack, J. C. Priscu, R. D. Powell, D. Sampson, R. P. Scherer, S. Y. Schwartz, and the WISSARD Science Team. “WISSARD at Subglacial Lake Whillans: Scientific Operations and Initial Observations”. *Journal of Glaciology*. **2014**, 5 (65). DOI: [10.3189/2014AoG65A009](https://doi.org/10.3189/2014AoG65A009).
- [J9] K. D. Mankoff and T. A. Russo. “The Kinect: A low-cost, high-resolution, short-range, 3D camera”. *Earth Surface Processes and Landforms*. **2013**, 38 (9), 926–936. DOI: [10.1002/esp.3332](https://doi.org/10.1002/esp.3332).
- [J8] K. D. Mankoff, S. S. Jacobs, S. M. Tulaczyk, and S. E. Stammerjohn. “The role of Pine Island Glacier ice shelf basal channels in deep-water upwelling, polynyas and ocean circulation in Pine Island Bay, Antarctica”. *Annals of Glaciology*. **2012**, 53 (60), 23–28. DOI: [10.3189/2012AoG60A062](https://doi.org/10.3189/2012AoG60A062).
- [J7] S. P. Shukla, M. A. Chandler, J. Jonas, L. E. Sohl, K. D. Mankoff, and H. J. Dowsett. “Impact of a Permanent El Niño and Indian Ocean Dipole in Warm Pliocene Climates”. *Paleoceanography*. **2009**, 24 (PA2221). DOI: [10.1029/2008PA001682](https://doi.org/10.1029/2008PA001682).
- [J6] L. T. Huffman, R. H. Levy, L. Lacy, D. M. Harwood, M. Berg, M. Cattadori, J. Diamond, J. Dooley, L. Dahlman, R. Frisch-Gleason, J. Hubbard, R. Lehmann, K. D. Mankoff, V. Miller, K. Pound, G. S. di Clemente, A. Siegmund, J. Thomson, E. Trummel, R. Williams, and The ANDRILL SMS Project Science Team. “Education and Outreach in the ANDRILL McMurdo Ice Shelf (MIS) and the Southern McMurdo Sound (SMS) Projects, Antarctica”. *Terra Antarctica*. **2008**, 15 (1), 221–235.
- [J5] S. M. Petrinec, W. L. Imhof, C. A. Barth, K. D. Mankoff, D. N. Baker, and J. G. Luhmann. “Comparisons of thermospheric high-latitude nitric oxide observations from SNOE and global auroral X-ray bremsstrahlung observations from PIXIE”. *Journal of Geophysical Research*. **2003**, 108 (A3), 1223. DOI: [10.1029/2002JA009451](https://doi.org/10.1029/2002JA009451).
- [J4] C. A. Barth, K. D. Mankoff, S. M. Bailey, and S. C. Solomon. “Global observations of nitric oxide in the thermosphere”. *Journal of Geophysical Research*. **2003**, 108 (A1), 1027. DOI: [10.1029/2002JA009458](https://doi.org/10.1029/2002JA009458).
- [J3] C. A. Barth, D. N. Baker, K. D. Mankoff, and S. M. Bailey. “Magnetospheric control of the energy input into the thermosphere”. *Geophysical Research Letters*. **2002**, 29 (13), 1629. DOI: [10.1029/2001GL014362](https://doi.org/10.1029/2001GL014362).
- [J2] D. N. Baker, C. A. Barth, K. D. Mankoff, S. G. Kanekal, S. M. Bailey, G. M. Mason, and J. E. Mazur. “Relationships between precipitating auroral zone electrons and lower thermospheric nitric oxide densities: 1998-2000”. *Journal of Geophysical Research*. **2001**, 106 (A11), 24465–24480. DOI: [10.1029/2001JA000078](https://doi.org/10.1029/2001JA000078).
- [J1] C. A. Barth, D. N. Baker, K. D. Mankoff, and S. M. Bailey. “The northern auroral region as observed in nitric oxide”. *Geophysical Research Letters*. **2001**, 38 (8), 1463–1466. DOI: [10.1029/2000GL012649](https://doi.org/10.1029/2000GL012649).

AWARDS AND FELLOWSHIPS

2013-15	WHOI Ocean and Climate Change Postdoctoral Scholar (\$91,000).
2010-13	NASA Earth and Space Science Fellowship (\$90,000).
2010-11	Marine Technology Society Scholarship for Graduate Students (\$2,000).
2003	First Prize (Team Leader), European Space Agency Mars mission design competition.
2000	AGU Outstanding Student Paper Award.

PAST GRANT SUPPORT

Co-PI 2015 2017	\$296,029	National Science Foundation Polar Cyberinfrastructure	Collaborative Research: Visualization, analysis, and HPC modeling of subglacial hydrology from high-resolution 3D conduit scans acquired with a novel sensor
PI 2016	\$22,750	National Geographic Society Committee for Research and Exploration	Subglacial Conduit Maps for Glacial Hydrological Studies
PI 2015	\$6,033	PSU Geosciences Dept.	An Augmented Reality Hydrological Sandbox
PI 2012	\$10,000	Svalbard Science Forum Arctic Field Grant	High-resolution 3D digital maps of the interior of subglacial caves for hydrologic modeling
Co-PI 2008	\$25,000	The Climate Project and Google.org	Raising environmental awareness and presenter effectiveness with Google Earth
2007	\$15,470	ANDRILL ARISE	PACE: Paleo Antarctic Cores for Education

INVITED TALKS (SELECTED) More than 100 invited talks on both my research and climate change since 2007, at locations including United Nations General Assembly Room, Amundsen-Scott South Pole Station, NSF HQ, many NYC Public Schools, & elsewhere.

- [T12] K. D. Mankoff. “Monitoring ice/ocean interactions in Greenland”. University of Rhode Island, Graduate School of Oceanography, Narragansett, RI, Mar. 2017.
- [T11] K. D. Mankoff. “A macro- and micro- view of thermal processes in subglacial conduits”. University of Silesia, Katowice, Poland, June 2016.
- [T10] K. D. Mankoff. “Greenland subglacial hydrology into conduits and into fjords”. École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, Feb. 2016.
- [T9] K. D. Mankoff. “Geospatial and temporal mapping of scientific publications”. Invited Lightning Talk at Science Hack Day hosted at GitHub. San Francisco, CA, Oct. 2014.
- [T8] K. D. Mankoff. “Greenland subglacial hydrology upstream and into fjords”. University of Rhode Island, Graduate School of Oceanography, Narragansett, RI, June 2014.
- [T7] K. D. Mankoff. “Mapping and Modeling Subglacial Conduits with a Low-Cost 3D Camera, Novel Algorithms, and Computational Fluid Dynamics”. NASA Goddard Institute for Space Studies (GISS), New York, New York, May 2013.
- [T6] K. D. Mankoff. “Using the Microsoft Kinect to Map Cave Surfaces”. Subglacial Workshop. Engabreen Tunnel, Svartisen, Norway, Apr. 2012.
- [T5] K. D. Mankoff. “Pale Blue Truth (A live oral presentation of *An Inconvenient Truth* and introduction to EdGCM)”. National Science Foundations (NSF) Headquarters. Washington, DC, Jan. 2008.
- [T4] K. D. Mankoff. “Pale Blue Truth: A Live Custom Version of *An Inconvenient Truth*”. Amundsen-Scott South Pole Station. South Pole, Antarctica, Dec. 2007.

- [T3] K. D. Mankoff. “Pale Blue Truth”. McMurdo Station, Antarctica. McMurdo Station, Antarctica, Oct. 2007.
- [T2] K. D. Mankoff. “An Inconvenient Truth”. United Nations General Assembly Room, UNIS-UN Conference. The United Nations, Mar. 2007.
- [T1] K. D. Mankoff. “MarsClock: A Clock for Mars”. Keynote talk at Palmsource Developers Conference. San Francisco, CA, Feb. 2004.

FIELDWORK

2016	Svalbard	Hansbreen
2016	Switzerland	Arolla Glacier
2013	Antarctica	Taylor Glacier > Blood Falls
2013	Iceland	Breiðamerkurjökull
2013	Greenland	Saqqarliup (Sarqardliup) Sermia
2012/13	Antarctica	Whillans Ice Stream
2012	Svalbard	Hansbreen
2012	Norway	Svartisen > Engabreen
2011	Svalbard	Rieperbreen
2011	Alaska	Matanuska Glacier
2009	Antarctica	The Drake Passage
2009	Antarctica	Amundsen Sea > Pine Island Bay
2007	Antarctica	Granite Harbor
2007	Antarctica	McMurdo Station

PROFESSIONAL SERVICE

REVIEWER NSF (PLR (x3), AIRF, & OCE divisions); Nature Geoscience; Geophysical Research Letters (GRL); Earth Surface Processes and Landforms (ESPL); Geoscience and Remote Sensing Letters (x4); Sensors; Computer-Aided Civil and Infrastructure Engineering.

SOFTWARE AND DATA PRODUCTS

Misc Contribute to open source projects on <http://github.com/mankoff> and elsewhere.

Kinect Multiple software utilities for working with Kinect sensor. <http://github.com/mankoff>

Mariner9 Re-release of Mariner 9 data in Google Earth. <http://lasp.colorado.edu/home/mariner9>

kdm-idl Developed IDL API for Google Earth KML. <http://code.google.com/p/kdm-idl/>

EdGCM Graphical interface for NASA GCM. <http://edgcm.columbia.edu>

SNOE Student Nitric Oxide Explorer data products. <http://lasp.colorado.edu/snoe>

MarsClock A clock for Mars, developed for and on PalmOS. <http://marsclock.sourceforge.net>

TEACHING AND EDUCATION & OUTREACH

2016 Co-teacher “Introduction to Photogrammetry”. PSU GEOSC 597.

2015- Online Course Scientist, American Museum of Natural History.

2012 Guest Lecturer, Our Changing Planet, UCSC-OS80B.

2010 Teaching Assistant, Introduction to Scientific Computing, UCSC-EART119.

2008-09 District Manager for The Climate Project. Provided support to ~100 presenters.

2007-08 Member of ANDRILL Antarctic ARISE project.
Performed outreach and informal education via software and lectures while off ice.

2004-09 Assisted with ~6 workshops for high-school teachers on the use of EdGCM (educational software) and how to use it within state teaching guidelines.

2004-09 Developed educational software (EdGCM) designed for high-school and undergraduate students.

2003 Lectures at NJ museum and NY schools on the Mars Exploration Rover (MER).

2002 Knowledge transfer at University of Alaska, Fairbanks. Taught students and scientists protocols for the scientific operation of a spacecraft. Taught IDL programming crash-course.

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS

2000- American Geophysical Union (AGU)
2010- Marine Technology Society (MTS)
2011- International Glaciological Society (IGS)
2011- American Academy of Underwater Sciences (AAUS)

MISCELLANEOUS

2016 Astronaut Candidate Applicant, NASA. Selected to interview with final 50 of ~18,300 applicants.
2008 Astronaut Candidate Applicant, European Space Agency. Selected to 200 of 8,413 applicants.
SCUBA Sub-ice (PADI). Rescue (PADI). Dry suit & public safety (ACUC/LGS). Advanced (NAUI).

- American, Italian, and Swiss citizen.
- Expert knitter.

OTHER

- [O3] K. D. Mankoff. "Multi-scale investigations of subglacial and sub-ice shelf conduit hydrology". Advisors: Slawek Tulaczyk (UCSC) & Sharon Stammerjohn (INSTAAR). PhD thesis. University of California, Santa Cruz, Dec. 2013.
- [O2] L. E. Sohl, M. A. Chandler, R. B. Schmunk, K. D. Mankoff, J. A. Jonas, K. M. Foley, and H. J. Dowsett. "PRISM3/GISS topographic reconstruction". *US Geological Survey Data Series*. **2009**, 419 (6).
- [O1] S. Michaud, K. D. Mankoff, J. Braure, F. Sommer, J. Ferriero, and S. Javor. *PREMARS: Plant and Rocket Experiment for Mars Aurora Research Support*. Tech. rep. École Polytechnique Fédérale de Lausanne, 2003.

CONFERENCE TALKS AND POSTERS (FIRST AUTHOR ONLY)

- [C15] K. D. Mankoff. "Remote Sensing of Deep Fjord Water Temperature". *Forum for Research into Ice Shelf Processes*. Bergen, Norway, June 2017.
- [C14] K. D. Mankoff and F. Straneo. "Ice melt rates in a subglacial outflow plume". *International Symposium on Contemporary Ice Sheet Dynamics*. Cambridge, UK, Aug. 2015.
- [C13] K. D. Mankoff, F. Straneo, H. Singh, and S. B. Das. "In-Situ Observations of a Subglacial Outflow Plume in a Greenland Fjord". *American Geophysical Union, Fall Meeting*. Abstract #C23A-0391. San Francisco, CA, Dec. 2014.
- [C12] K. D. Mankoff and J. Gulley. "Small scale high resolution LiDAR measurements of a subglacial conduit". *Geophysical Research Abstracts*. Vol. 14. Abstract #EGU2012-245. Vienna, Austria: EGU General Assembly, Apr. 2012.
- [C11] K. D. Mankoff and T. A. Russo. "The Kinect as a low cost high resolution small scale LiDAR for water surface and shallow subsurface measurements". *Geophysical Research Abstracts*. Vol. 14. Abstract #EGU2012-244-1. Vienna, Austria: EGU General Assembly, Apr. 2012.
- [C10] K. D. Mankoff and J. Gulley. "A 3D Surface of the Interior of a Sub-Glacial Cave Acquired Using a Microsoft Kinect as a LIDAR Sensor". *Association of American Geographers Annual Meeting*. New York, NY, Feb. 2012.

- [C9] K. D. Mankoff and S. E. Stammerjohn. "Mixing and circulation of ice shelf and ocean waters in Pine Island Bay derived from SST and sea ice". *American Geophysical Union, Ocean Sciences Meeting*. Salt Lake City, UT, Feb. 2012.
- [C8] K. D. Mankoff, T. A. Russo, B. K. Norris, S. Hossainzadeh, L. H. Beem, J. I. Walter, and S. M. Tulaczyk. "Kinects as sensors in earth science: glaciological, geomorphological, and hydrological applications". *American Geophysical Union, Fall Meeting*. Abstract #C41D-0442. San Francisco, CA, Dec. 2011.
- [C7] K. D. Mankoff, S. E. Stammerjohn, S. M. Tulaczyk, S. S. Jacobs, and K. A. Gavahan. "Ocean and ice properties at the calving edge of the Pine Island Glacier and Dotson Ice Shelf, Antarctica". *International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean*. San Diego, CA, June 2011.
- [C6] K. D. Mankoff, K. A. Gavahan, E. M. Randall-Goodwin, R. M. Sherrell, P. L. Yager, and S. E. Stammerjohn. "Ocean and ice properties at the calving edge of the Dotson Ice Shelf". *Gordon Polar Research Conference*. Ventura, CA, Mar. 2011.
- [C5] K. D. Mankoff, S. S. Jacobs, K. C. Leonard, C. M. Little, K. A. Gavahan, and F. O. Nitsche. "Pine Island Glacier Ice Shelf: Draft, Outflow Channels, and Polynyas as Observed via Fieldwork, Modeling, and Spacecraft". *American Geophysical Union, Fall Meeting*. San Francisco, CA, Dec. 2009.
- [C4] K. D. Mankoff and The ANDRILL SMS Project Science Team. "An ANDRILL SMS ARISE Educational Software Package: From a microscope in Antarctica 20 million years ago to a global overview 100 years in the future". *SCAR / IASC Open Science Conference*. St. Petersburg, Russia, July 2008.
- [C3] K. D. Mankoff, M. A. Chandler, S. J. Richards, L. E. Sohl, and M. F. Shopsin. "A Sampling of EdGCM Experiments: Paleo to Future, Regional to Global". *Teaching Climate Change Workshop*. Bozeman, MT, Aug. 2006.
- [C2] K. D. Mankoff, C. A. Barth, and S. M. Bailey. "The Student Nitric Oxide Explorer (SNOE) Database". *American Geophysical Union, Fall Meeting*. San Francisco, CA, Dec. 2001.
- [C1] K. D. Mankoff, C. A. Barth, D. N. Baker, A. W. Merkel, S. M. Petrinec, D. L. Chenette, W. L. Imhof, J. G. Luhmann, S. G. Kanekal, and G. M. Mason. "Comparison of SNOE, POLAR, and SAMPEX Observations of the Magnetosphere-Thermosphere Interaction During the 1998 Geomagnetic Storms". *American Geophysical Union, Spring Meeting*. Washington, DC, May 2000.

MEDIA

- [M6] European Union Parliament. Participant in short film highlighting European Union polar research. Film shown in EU Parliament and visitor centers and translated into 28 languages. 2017.
- [M5] D. Fox. *The Frozen Underworld*. Muse. July 2014. URL: <http://www.musemagkids.com/new/julyaugust-2014>.
- [M4] Norwegian TV 2 Interview. *Subglacial Workshop, Engabreen Tunnel, Svartisen, Norway*. <http://www.tv2.no/nyheter/innenriks/denne-isebreen-har-krympet-300-meter-paa-elleve-aar-3761093.html>. Apr. 2012.
- [M3] A. Mann. *Scientists Hack Kinect to Study Glaciers and Asteroids*. Wired.com. <http://www.wired.com/wiredscience/2011/12/hacked-kinect-science/>. Dec. 2011.
- [M2] G. Mattison. *Radio interview about Antarctic research*. WRSU, 88.7 FM, New Brunswick, NJ. June 2010.

[M1] C. Sayre. *Al Gore's Foot Soldiers*. Time.com. Jan. 2007. URL: <http://www.time.com/time/printout/0,8816,1583869,00.html>.