

# 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<br>2015<br>2017 | \$296,029 | National<br>Foundation<br>Polar Cyberinfrastructure | Science<br>Division of<br>Polar Cyberinfrastructure     | Collaborative Research: Visualization, analysis, and HPC modeling of subglacial hydrology from high-resolution 3D conduit scans acquired with a novel sensor |
| PI<br>2016            | \$22,750  | National<br>Society<br>Research and Exploration     | Geographic<br>Committee for<br>Research and Exploration | Subglacial Conduit Maps for Glacial Hydrological Studies   |
| PI<br>2015            | \$6,033   | PSU Geosciences Dept.                               |   | An Augmented Reality Hydrological Sandbox  |
| PI<br>2012            | \$10,000  | Svalbard Science Forum<br>Arctic Field Grant        |   | High-resolution 3D digital maps of the interior of subglacial caves for hydrologic modeling  |
| Co-PI<br>2008         | \$25,000  | The Climate Project<br>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 micro- and macro- 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), AIRE, & 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 top 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-isbreen-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>.