

Kenneth D. Mankoff

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EDUCATION

UNIVERSITY OF CALIFORNIA AT SANTA CRUZ (UCSC) Santa Cruz, CA
PhD. candidate in Earth and Planetary Sciences 2009 - Present

- Research Focus: Ice-ocean interactions [J2] and novel sensors [J1, M2].
- Recipient of 2010 NASA Earth and Space Science Fellowship [F2].
- Advisors: Slawek Tulaczyk and Sharon Stammerjohn.

ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE (EPFL) Lausanne, Switzerland
Graduate level coursework in microtechnology and robotics 2002 - 2003

UNIVERSITY OF COLORADO AT BOULDER Boulder, CO
Bachelor of Science in Computer Science; Minor in Geological Science 1996 - 2001

PROFESSIONAL EXPERIENCE

COLUMBIA UNIVERSITY, GODDARD INSTITUTE FOR SPACE STUDIES (NASA GISS) New York, NY
PROGRAMMER/ANALYST 2004 - 2009

- Developed EdGCM: A graphical interface to a NASA global climate model (GCM) [P16].

ANDRILL Antarctica & Elsewhere
OUTREACH EDUCATOR 2007 - 2008

- Invited to Amundsen-Scott South Pole Station to present talk on climate change [I3].
- Performed outreach and informal education via software and lectures while off ice [F6, J4].
- Assisted science team with lab-work [O2] and Antarctic deep field-work [O3].

HONEYBEE ROBOTICS New York, NY
TECHNOLOGY DEVELOPMENT 2003 - 2004

- Designed robotic systems for planetary exploration, industrial automation, and other uses.

GEOPHYSICAL INSTITUTE, UNIVERSITY OF ALASKA FAIRBANKS Fairbanks, Alaska
LEAD DEVELOPER, SCIENCE OPERATIONS 2002

- Transferred satellite science operations system from U. of Colorado, Boulder to U. of Alaska, Fairbanks

LABORATORY FOR ATMOSPHERIC AND SPACE PHYSICS (LASP) Boulder, CO
PROFESSIONAL RESEARCH ASSISTANT 2001 - 2002
UNDERGRADUATE RESEARCH ASSISTANT 1998 - 2001

- Processed, documented, visualized, and published spacecraft (SNOE) data [P23].
- Received Outstanding Student Paper Award for research [P28]. Work resulted in two undergraduate publications [J9, J8] and seven AGU poster presentations [P26]-[P32].

FIELDWORK

- 2012 ENGABREEN GLACIER, SVARTISEN, NORWAY
Attended 2012 Subglacial Workshop 200 m under Engabreen Glacier [M1, I1].
- 2011 RIEPERBREEN GLACIER, SVALBARD, NORWAY [F2]
Measured roughness of sub-glacial cave surfaces for hydrologic conduit model [M2, P2, P4].
- 2011 MATANUSKA GLACIER, ALASKA [F2]
Deployed Microsoft Xbox[®] Kinects[™] on glacier to test new sensor [J1, P6].
- 2009 THE DRAKE PASSAGE
Helped collect oceanographic data.
- 2009 AMUNDSEN SEA AND PINE ISLAND BAY, ANTARCTICA
Collected oceanographic and ice shelf data [J2, P11].
- 2007 GRANITE HARBOR, ANTARCTICA
Assisted mini-ANDRILL seismic site survey for future drilling location [O3].
- 2007 McMURDO STATION, ANTARCTICA [F6]
Performed diatom abundance count for ANDRILL [O2]. Developed outreach and education material [P13].

PROFESSIONAL ACTIVITIES

- 2012 Session Chair, AGU Ocean Sciences Meeting.
- 2010 Teaching Assistant, Introduction to Scientific Computing.

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS

- 2011- American Academy of Underwater Sciences (AAUS).
- 2011- International Glaciological Society (IGS).
- 2010- Marine Technology Society (MTS).
- 1998- American Geophysical Union (AGU).

MISCELLANEOUS

- 2008 Astronaut Candidate Applicant, European Space Agency. Selected to final 200 of 8413 applicants.
- SCUBA Advanced diver (NAUI). Dry suit & public safety (ACUC/LGS).
- Fluent English. Conversational French.
 - Swiss and American citizenship.

FUNDING: GRANTS, FELLOWSHIPS, AND SCHOLARSHIPS

- [F1] **K. D. Mankoff**. High-resolution 3D digital maps of the interior of subglacial caves for hydrologic modeling. Svalbard Science Forum Arctic Field Grant (Arktisstipend). 56,430 NOK (~\$10,000 USD), 2012.
- [F2] S. M. Tulaczyk and **K. D. Mankoff**. Sub-Ice-Shelf Channels and Their Impact on Ice Shelf Melting, Stability, and Sea Level Rise. NASA Earth and Space Science Fellowship. \$90,000, 2010 – 2013.
- [F3] **K. D. Mankoff**. Marine Technology Society scholarship for graduate students. \$2,000, 2010 – 2011.
- [F4] **K. D. Mankoff** and H. R. Mankoff. Field video packages highlighting The Climate Project presenters. The Climate Project grant for \$1,600, 2009.
- [F5] J. Richardson, **K. D. Mankoff**, and The Climate Project. Raising environmental awareness and presenter effectiveness with Google Earth. Google.org grant for \$25,000, 2008.
- [F6] **K. D. Mankoff**. PACE: Paleo Antarctic Cores for Education. ANDRILL ARISE award for \$15,470, 2007.

PUBLICATIONS (peer-reviewed: 8; ISI h-index: 5; ISI citations: 97; Erdős: ≤ 6)

JOURNAL PAPERS

- [J1] **K. D. Mankoff** and T. A. Russo. The Kinect: A low-cost, high-resolution, short-range, 3D camera. *Earth Surface Processes and Landforms*. **In Review**.
- [J2] **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*, 53(60):23 – 28, 2012. doi:10.3189/2012AoG60A062.
- [J3] 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*, 24(PA2221), 2009. doi:10.1029/2008PA001682.
- [J4] 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.
- [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*, 108(A3):1223, 2003. doi:10.1029/2002JA009451.
- [J6] 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*, 108(A1):1027, 2003. doi:10.1029/2002JA009458.
- [J7] 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*, 29(13):1629, 2002. doi:10.1029/2001GL014362.
- [J8] D. N. Baker, **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*, 106(A11):24465 – 24480, 2001.
- [J9] 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*, 38(8):1463 – 1466, 2001.

INVITED TALKS (SELECTED)

- [I1] **K. D. Mankoff**. Using the Microsoft Kinect to Map Cave Surfaces. Engabreen Tunnel, Svartisen, Norway, April 16 – 17 2012. Subglacial Workshop.
- [I2] **K. D. Mankoff**. Pale Blue Truth (A live oral presentation of *An Inconvenient Truth* and introduction to EdGCM). Washington, DC, January 13, 2008. National Science Foundations (NSF) Headquarters.
- [I3] **K. D. Mankoff**. Pale Blue Truth: A Live Custom Version of An Inconvenient Truth. South Pole, Antarctica, December 3, 2007. Amundsen-Scott South Pole Station.
- [I4] **K. D. Mankoff**. Pale Blue Truth, October 23, 2007. McMurdo Station, Antarctica.
- [I5] **K. D. Mankoff**. An Inconvenient Truth, March 1, 2007. United Nations General Assembly Room, UNIS-UN Conference.
- [I6] **K. D. Mankoff**. MarsClock: A Clock for Mars. San Francisco, CA, February 8-10, 2004. Keynote talk at Palmsource Developers Conference.

Trained by Al Gore to present a custom live version of *An Inconvenient Truth*. Approximately 80 invited talks 2007 - 2009. Audience size from 10 to approximately 800. Locations include:

- United Nations General Assembly Room, New York, NY (800)
- Amundsen-Scott South Pole Station, South Pole, Antarctica (90)
- National Science Foundation Headquarters, Washington, DC (100)
- Public Schools, New York, NY (multiple)
- Many more...

CONFERENCE TALKS & POSTERS

- [P1] K. E. Simmons, **K. D. Mankoff**, and C. A. Barth. MARINER 9 GoogleMars. In *Planetary Data: A Workshop for Users and Software Developers*. Flagstaff, AZ, June 25 – 29 2012. **Submitted.**
- [P2] **K. D. Mankoff** and J. Gulley. Small scale high resolution LiDAR measurements of a subglacial conduit. In *Geophysical Research Abstracts*, vol. 14. EGU General Assembly, Vienna, Austria, April 22 – 27 2012. Abstract #EGU2012-245.
- [P3] **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. In *Geophysical Research Abstracts*, vol. 14. EGU General Assembly, Vienna, Austria, April 22 – 27 2012. Abstract #EGU2012-244-1.
- [P4] **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. In *Association of American Geographers Annual Meeting*. New York, NY, February 24 – 28 2012.
- [P5] **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. In *American Geophysical Union, Ocean Sciences Meeting*. Salt Lake City, UT, February 20-24 2012.
- [P6] **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. In *American Geophysical Union, Fall Meeting*. San Francisco, CA, December 5 - 9, 2011. Abstract #C41D-0442.
- [P7] **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. In *International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean*. San Diego, CA, June 5 - 10, 2011.
- [P8] **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. In *Gordon Polar Research Conference*. Ventura, CA, March 21 - 25, 2011.
- [P9] E. M. Randall-Goodwin, S. E. Stammerjohn, R. M. Sherrell, P. L. Yager, and **K. D. Mankoff**. Mixing at Mid-Depths in the Vicinity of an Iceberg in the Amundsen Sea Polynya. In *Gordon Polar Research Conference*. Ventura, CA, March 21 - 25, 2011.
- [P10] S. M. Tulaczyk, L. H. Beem, J. I. Walter, S. Hossainzadeh, and **K. D. Mankoff**. Ice Streams as the Critical Link Between the Interior Ice Reservoir of the Antarctic Ice Sheet and the Global Climate System - a WISSARD Perspective. In *American Geophysical Union, Fall Meeting*. San Francisco, CA, December 13 - 17, 2010. C51B-04.
- [P11] **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. In *American Geophysical Union, Fall Meeting*. San Francisco, CA, December 14 - 18, 2009.
- [P12] M. A. Chandler, J. Haller, **K. D. Mankoff**, A. Mckee, and L. E. Sohl. Acting on Inevitable Climate Change: How Should Scientists Participate? In *2008 Joint Meeting of The Geological Society of America*. Houston, TX, October 5 - 9, 2008.
- [P13] **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. In *SCAR / IASC Open Science Conference*. St. Petersburg, Russia, July 8 - 11, 2008.

- [P14] S. P. Shukla, M. A. Chandler, L. E. Sohl, H. J. Dowsett, J. Jonas, and **K. D. Mankoff**. Impact of the Indian Ocean Dipole and El Padre SSTs on Mid-Pliocene Atmospheric Circulation. In *Pliocene Model Intercomparison Project*. New York, NY, June 4 - 6 2008.
- [P15] M. A. Chandler, L. E. Sohl, and **K. D. Mankoff**. Global Climate Models in the Classroom: Tools for Exploring the Impacts of Climate Change and Energy Policies. In *2007 GSA Denver Annual Meeting*. Denver, CO, October 28 - 31 2007.
- [P16] **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. In *Teaching Climate Change Workshop*. Bozeman, MT, August 14 - 15, 2006.
- [P17] D. Mankoff, A. Dey, J. Mankoff, and **K. D. Mankoff**. Supporting interspecies social awareness: using peripheral displays for distributed pack awareness. In *Proceedings of the 18th annual ACM symposium on User interface software and technology*, pp. 253–258. ACM New York, NY, USA, 2005.
- [P18] S. Michaud, **K. D. Mankoff**, J. Braure, F. Sommer, J. Ferriero, and S. Javor. PREMARS: Plant and Rocket Experiment for Mars Aurora Research Support. ESA/ESTEC Industry Space Days, Noordwijk, The Netherlands, November 24 - 26, 2003.
- [P19] S. Michaud, **K. D. Mankoff**, J. Braure, F. Sommer, J. Ferriero, and S. Javor. PREMARS: Plant and Rocket Experiment for Mars Aurora Research Support. ESA Aurora Student Design Competition, Barcelona, Spain, September 8 - 9, 2003. **First Prize**.
- [P20] K. E. Simmons, **K. D. Mankoff**, A. R. Hendrix, and C. A. Barth. Mars ultraviolet reflectance compared with imaging, topography and geology. In *EGS-AGU-EUG Joint Assembly*. Nice, France, April 6 - 11 2003.
- [P21] A. R. Hendrix, **K. D. Mankoff**, and K. E. Simmons. Characterizing the oxidizing properties of Mars' polar regions. In *Sixth International Conference on Mars*. Pasadena, CA, July 20 - 25 2003.
- [P22] D. N. Baker, T. A. Fisher, C. A. Barth, **K. D. Mankoff**, S. G. Kanekal, S. M. Bailey, S. M. Petrinec, J. G. Luhmann, G. M. Mason, J. E. Mazur, and D. S. Evans. Precipitating auroral electrons and lower thermospheric nitric oxide densities: SNOE, POLAR, SAMPEX, and NOAA/POES Comparisons for Geomagnetic Storms in 1998-2001. In *American Geophysical Union, Spring Meeting*. Washington, DC, May 30 - June 3, 2002.
- [P23] **K. D. Mankoff**, C. A. Barth, and S. M. Bailey. The Student Nitric Oxide Explorer (SNOE) Database. In *American Geophysical Union, Fall Meeting*. San Francisco, CA, December 10 - 14, 2001.
- [P24] S. M. Petrinec, D. L. Chenette, W. L. Imhof, D. N. Baker, C. A. Barth, **K. D. Mankoff**, J. G. Luhmann, G. M. Mason, J. E. Mazur, and D. S. Evans. A Multi-spacecraft Study of the Magnetospheric Influence on Ionospheric Chemistry - a Detailed Examination of Recent Geomagnetically Active Periods. In *American Geophysical Union, Fall Meeting*. San Francisco, CA, December 10 - 14, 2001.
- [P25] C. A. Barth, S. M. Bailey, and **K. D. Mankoff**. Energy Input into the Auroral Region Lower Thermosphere. In *American Geophysical Union, Fall Meeting*. San Francisco, CA, December 10 - 14, 2001.
- [P26] D. N. Baker, C. A. Barth, **K. E. 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. In *American Geophysical Union, Spring Meeting*. Boston, MA, May 29 - June 2, 2001.
- [P27] S. M. Petrinec, D. L. Chenette, W. L. Imhof, C. A. Barth, **K. D. Mankoff**, D. N. Baker, and J. G. Luhmann. Comparing Energetic Auroral Precipitation as Observed by PIXIE and Nitric Oxide Observed by SNOE. In *S-RAMP*. Sapporo, Japan, October 2-5, 2000.
- [P28] **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. In *American Geophysical Union, Spring Meeting*. Washington, DC, May 30 - June 3, 2000. Received **Outstanding Student Paper Award**.

- [P29] A. R. Hendrix, C. A. Barth, and **K. D. Mankoff**. SNOE Observations of Auroral Ultraviolet Emissions and Nitric Oxide Density During Geomagnetic Storms. In *American Geophysical Union, Spring Meeting*. Washington, DC, May 30 - June 3, 2000.
- [P30] S. M. Petrinec, D. L. Chenette, W. L. Imhof, C. A. Barth, **K. D. Mankoff**, D. N. Baker, and J. G. Luhmann. Comparisons of X ray mappings from PIXIE and nitric oxide emissions from SNOE for magnetospheric storm intervals. In *American Geophysical Union, Spring Meeting*. Washington, DC, May 30 - June 3, 2000.
- [P31] D. N. Baker, C. A. Barth, **K. D. Mankoff**, S. C. Solomon, S. G. Kanekal, J. G. Luhmann, S. Petrinec, D. L. Chanette, G. M. Mason, and J. E. Mazur. Large Solar Disturbances and Their Geospace Impacts: SNOE, SAMPEX, and POLAR Observations. In *American Geophysical Union, Spring Meeting*. Washington, DC, May 30 - June 3, 2000.
- [P32] C. A. Barth, S. C. Solomon, S. M. Bailey, and **K. D. Mankoff**. Global Images of Nitric Oxide in the Thermosphere. In *American Geophysical Union, Fall Meeting*. San Francisco, CA, December 13 - 17, 1999.

OUTREACH & MEDIA

- [M1] Norwegian TV 2 Interview. Subglacial Workshop, Engabreen Tunnel, Svartisen, Norway, April 25 2012. <http://www.tv2.no/nyheter/innenriks/denne-isbreen-har-krympet-300-meter-paa-elleve-aar-3761093.html>.
- [M2] A. Mann. Scientists Hack Kinect to Study Glaciers and Asteroids. *Wired.com*, December 2011. <http://www.wired.com/wiredscience/2011/12/hacked-kinect-science/>.
- [M3] W. R. Stevenson III. Science, the South Pole, and the Japanese expedition of 1910-1912. *Endeavour*, 2011. doi:10.1016/j.endeavour.2010.11.002. Supplied Photograph of Pancake Ice.
- [M4] G. Mattison. Radio interview about Antarctic research, June 10, 2010. WRSU, 88.7 FM, New Brunswick, NJ.
- [M5] G. A. Schmidt, J. Wolfe, and J. D. Sachs. *Climate Change: Picturing the Science*. W. W. Norton & Company, 2009. ISBN 0393331253. Self-portrait photograph at South Pole.
- [M6] V. Elliott. UK team finds ice vanishing at increasing rate. *The London Times*, p. 18, August 15 2009. Supplied Photograph of Pine Island Glacier, Antarctica.
- [M7] P. Taylor. Calls from the Wild. *The Financial Times*, April 17 2009. <http://www.ft.com/cms/s/0/82a30516-2a96-11de-8415-00144feabdc0.html>.
- [M8] C. Sayre. Al Gore's Foot Soldiers. *Time.com*, January 2007. <http://www.time.com/time/printout/0,8816,1583869,00.html>.
- [M9] V. Gornitz, ed. *Encyclopedia of Paleoclimatology and Ancient Environments*. Springer, 2006. Supplied Scientific Data Visualization Graphics and Artwork.
- [M10] Museum Display. Harvard Museum of Natural History, Fall 2005. Scientific Data Visualization and Artwork for Global Warming Display.

OTHER

- [O1] L. E. Sohl, M. A. Chandler, R. B. Schmunk, **K. Mankoff**, J. A. Jonas, K. M. Foley, and H. J. Dowsett. PRISM3/GISS topographic reconstruction. *US Geological Survey Data Series*, 419(6), 2009.
- [O2] E. Tuzzi, M. Olney, C. Riesselman, D. M. Harwood, and **The ANDRILL SMS Project Science Team**. Middle Miocene biostratigraphy of the McMurdo Sound region, Antarctica: The first diatom perspective from the ANDRILL Southern McMurdo Sound Project. In *2008 Joint Meeting of The Geological Society of America*. Houston, TX, October 5 - 9, 2008.

- [O3] M. A. Speece, R. H. Levy, D. M. Harwood, S. F. Pekar, R. Powell, T. Patterson, T. Wonik, S. Henrys, D. Handwerker, D. Schmitt, and **The ANDRILL SMS Project Science Team**. Over-sea-ice seismic reflection surveys in Antarctica using a GI air gun. In *33rd International Geological Congress*. Oslo, Norway, August 6 - 14, 2008.
- [O4] 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., Ecole Polytechnique Fédéral de Lausanne, 2003.