

Waleed Abdalati

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Birth date: March 4, 1964
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Education

- Ph.D. 1996 Program in Atmospheric and Ocean Sciences/Dept. of Geography
 University of Colorado, Boulder, CO.
- M.S. 1991 Department of Aerospace Engineering Sciences
 University of Colorado, Boulder, CO.
- B.S. 1986 Department of Mechanical and Aerospace Engineering (*cum laude*)
 Syracuse University, Syracuse, NY.

Honors & Awards

National Aeronautics and Space Administration Exceptional Service Medal, 2004
 NASA Goddard Space Flight Center Special Act Award 2004
 NASA Agency Group Honor Award 2003
 NASA Terra Peer Award, 2002
 NASA Office of Earth Science Award, 2002
 NASA Fast Award, 2002
 NASA Office of Earth Science Award, 2001
Presidential Early Career Award for Scientists and Engineers, 1999
 NASA/GSFC Performance Award (2), 1999
 Tau Beta Pi National Engineering Honor Society
 Pi Tau Sigma Mechanical Engineering Honor Society

Professional Societies

American Geophysical Union
 International Glaciological Society

Professional History

- 01/04 – pres.: NASA Goddard Space Flight Center
- Head Oceans and Ice Branch: supervisor of a research group of 14 civil servants and approximately 50 contractors and post-doctoral scientists. I provide leadership to the group: a) insuring that they effectively serve the mission of NASA, and Goddard Space Flight Center, b) identifying opportunities for funding and working to position them to compete for that funding, c) creating a productive environment in which they can thrive, d) promoting satellite and research missions that exploit the interests and expertise of the branch, division and Center, e) ensuring growth opportunities for all employees and recognition for individual and group achievements. In addition, I also carry out my own research in changes of the glaciers, ice caps, and ice sheets of the world, the reasons behind them, and their contributions to sea level through a combination of remote sensing observations, in situ data collection, and modeling efforts.

- 11/00 – pres.: *NASA Headquarters, Office of Earth Science / Science Mission Directorate*
- Manager, Cryospheric Sciences Program: responsible for managing NASA's interests in cryospheric research, in particular the polar regions. This involves (1) defining and implementing the research agenda for the program, (2) representing cryospheric science community's interests in dealings with NASA management, other agencies, and the White House (4) representing NASA's interests to the scientific community and (3) supporting the research of more than 100 investigators with a budget of nearly \$10M.
 - Program Scientist for NASA's Ice Cloud and Land Elevation Satellite (ICESat) mission responsible for insuring consistency between the mission objectives, instrument capabilities, and NASA research objectives within engineering, science, and budget constraints. This involves serving as the scientific interface between the ICESat science team, NASA Headquarters and the Scientific community for NASA's first mission designed specifically for polar research.
 - Program Scientist for NASA's involvement with the RADARSAT mission serving as the scientific interface between NASA, the Canadian Space Agency, and the scientific community across a full range of geophysical disciplines: geology, ecology, oceanography, hydrology, land cover/land use, cryospheric sciences, applications, etc.
- 4/98 – 11/00: *NASA Goddard Space Flight Center, Laboratory for Hydrospheric Processes*
- Deputy Project Scientist for Ice Cloud and Land Elevation Satellite (ICESat) contributing to the scientific development of ICESat algorithms and mission activities.
 - Scientific analysis of airborne laser altimetry data, satellite imagery, and in situ data on Arctic glaciers for climatological/glaciological interpretation.
 - Analysis of ice-penetrating radar data to study and interpret the history and dynamics of the Greenland ice sheet.
- 11/96 - 4/98 *Universities Space Research Association (Visiting Fellow)*
NASA/Goddard Space Flight Center, Greenbelt, MD.
- Scientific analysis of airborne laser altimetry data over Arctic glaciers for climatological/glaciological interpretation, and for application to development of Geoscience Laser Altimetry System (GLAS).
 - Deployment of weather stations and Global Positioning System (GPS) receivers on the Greenland ice sheet climatological and glaciological applications.
- 5/92 - 11/96 *Cooperative Institute for Research in Environmental Sciences (CIRES),*
University of Colorado at Boulder
- Analysis of satellite data to infer ice sheet energy and mass exchanges with the atmosphere
 - Development of and algorithm for assessing melt characteristics of the Greenland ice sheet using passive microwave satellite data.
 - Development of a radiative transfer model to examine the impacts of snow accumulation and hoar growth on satellite observations of microwave emission from polar firn
 - Teaching classes in remote sensing, climatology, and environmental systems.
 - Participation and leadership in 4 Arctic field expeditions.
- 8/90 - 5/92 *Colorado Center for Astrodynamics Research, Univ. of Colorado - Boulder, CO.*

- Assimilation of satellite derived data into global and mesoscale climate models.
- 2/88 - 6/90 *General Electric Company*: Ocean Systems Division - Syracuse, NY.
Mechanical Engineer - Product Development
- Design, analysis, and testing of submersible ocean equipment.
- 6/86 - 8/87 *General Electric Company*: AstroSpace Division - East Windsor, NJ.
Mechanical Engineer - Spacecraft Analysis
- Design, analysis and environmental testing of space satellites and their components

Field Experience

7 field seasons making in situ measurements on the Greenland ice sheet two of which included acquisition and analysis of airborne laser altimetry data
1 field season in the Canadian Arctic conducting airborne elevation surveys of the major Canadian ice caps

Teaching Experience

Spring, 1998 Guest lecturing in remote sensing class, John's Hopkins University.
Spring, 1996 & Environmental Systems I: Climate and Vegetation (instructor and supervisor of
Fall, 1995 two teaching assistants), University of Colorado (CU)
Summer, 1995 Remote Sensing of the Environment (Instructor and TA supervisor), CU
Spring, 1995 Remote Sensing of the Environment (Lab instructor), CU
Fall, 1994 Introduction to Human Geography (Teaching Assistant), CU
Fall, 1993 - Guest lecturing in climatology and remote sensing classes, CU
Spring, 1996

Education and Outreach

National/International

- Various Newspaper interviews (*Washington Post*, *New York Times*, etc.) on changes in the polar regions.
- *NBC Nightly News with Tom Brokaw*: Alaskan Wildfires in the Changing Arctic Climate
- *Public Interest* with Kojo Nnamdi on National Public Radio: 1-hour talk show on Glaciers, Icebergs, and Antarctica, July, 2002
- *National Geographic Today Show*: Ten minute segment on the Changing Greenland Ice Sheet, October, 2002.
- CNN, NBC, and various local news channels nationwide: Interviews on changes in the Greenland ice sheet (June, 2001) and Antarctica (2002)
- *Earth and Sky Science Adviser* (Byrd and Block), 1999-present
- *Earth and Sky* Interview, National Public Radio, October, 1999

Other

- Mentor of two graduate students: Ohio State University – NASA Global Change Fellowship recipient, and University of Colorado
- Goddard Teacher Ambassador Program: Adviser of a team of secondary school teachers for development of Glaciers and Ice Sheets curriculum for grades 5-12, 1999
- Goddard Community Day, 1999, Public presentation on space-based earth science
- University of Maryland Ask a Scientist Day

Scientific Community Service

- Provided testimony on Antarctic Change before the Senate Science Committee
- Review of "Sea Level" Chapter for the 2001 IPCC Science Report

- Contributor to the Strategic Plan for the Climate Change Science Program (Climate Change Research Initiative)
- Various review panels for proposals submitted to NASA Research announcements and cooperative agreement Notices. These included: Antarctic research, hazards research, and Mission to Planet Earth information technology.
- Organized and hosted the 1996 and 1998 Program for Arctic Regional Climate Assessment (PARCA) Greenland Science and Planning Meetings for ~50 NASA and NSF investigators.
- Contributor to Polar Data Archiving working group (PoDAG)
- Manuscript reviews for *Journal of Geophysical Research*, *Journal of Applied Meteorology*, *Remote Sensing of Environment*, *IEEE Transactions in Geoscience and Remote Sensing*, *Journal of Glaciology*, and *Geophysical Research Letters*

Other Activities and Training

- Co-lead of Goddard Earth and Space Sciences Directorate Reorganization
- One of five scientists (only Earth scientist) on NASA Administrator's team to review science in what would become NASA's Exploration Vision
- Participation in the NASA Administrator's *Critical Review Panel for Future Space Exploration* May, 2003
- Brookings Institution Course *Science and Public Policy Debate: A Leadership Forum*, June 16-20, 2003

Research Support History (Prior to managing NASA's Cryospheric Sciences Program)

Comprehensive Analysis of Internal layering Structure: A window into the Greenland Ice Sheet Flow and History. PI: Waleed Abdalati, Co-investigators: H.J. Zwally and M. Fahnestock, October, 1997 - September, 2000. \$165,000.

Analysis of Airborne Laser/GPS Data for the Study of Ice Sheet Mass Balance Parameters, PI: W.B. Krabill, Co-investigator: W. Abdalati, October, 1997 - September, 2000. \$500,000.

Investigation of Mass Balance Characteristics of Canadian Ice Caps and Their Relationship to Climate, PI: W. Abdalati, September, 1999 – September 2002. \$315,000.

Presidential Early Career Award for Scientists and Engineers (PECASE), PI: W. Abdalati, through 2005, \$200,000

Publications

PEER-REVIEWED PUBLICATIONS (28)

Joughin, I., W. Abdalati, and M. Fahnestock, Large fluctuations in speed on Greenland's Jakobshavn Isbrae glacier, *Nature*, Vol. 432, 608-610, 2004

Abdalati, W. W.B. Krabill, E.B. Frederick, S. Manizade, C. Martin, J. Sonntag, R. Swift, R.H. Thomas, J. Yungel, and R. Koerner, Elevation changes of ice caps in the Canadian archipelago, *Journal of Geophysical Research – Earth Surface*, Vol. 109, No. F4, F00407 2004.

Jacka, J. and 20 others, Recommendations for the Collection and Synthesis of Antarctic Ice Sheet Mass Balance Data, *Global and Planetary Change*, Vol 42, 1-4, 2004.

- Thomas, R.H., W. Abdalati, W.B. Krabill, S. Manizade, K. Steffen, Investigation of surface melting and dynamic thinning of Jakobshavn Isbrae, Greenland, *Journal of Glaciology*, Vol. 49, No. 165, 231-239, 2003.
- Abdalati, W., W. Krabill, E. Frederick, S. Manizade, C. Martin, J. Sonntag, R. Swift, R. Thomas, W. Wright, J. Yungel, Aircraft laser altimetry mapping of the Greenland ice sheet: application to mass balance assessment, *Journal of Geodynamics*, Vol. 34, No. 4, 391-403, 2002.
- Krabill, W., E. Frederick, C. Martin, S. Manizade, J. Sonntag, R. Swift, R. Thomas, W. Wright, J. Yungel, W. Abdalati. Aircraft laser altimetry measurement of elevation changes of the Greenland ice sheet: technique and accuracy assessment, *Journal of Geodynamics*, Vol. 34, No. 4, 357-376, 2002.
- Zwally, H.J., R. Schutz, W. Abdalati, J. Abshire, C. Bentley, J. Bufton, D. Harding, T. Herring, B. Minster, S. Palm, J. Spinhirne and R. Thomas, ICESat's Laser Measurements of Polar Ice, Atmosphere, Ocean, and Land, *Journal of Geodynamics*, Vol. 34, No. 4, 405-445, 2002.
- Zwally, H.J., W. Abdalati, T. Herring, K. Larson, J. Saba, K. Steffen, Surface melt acceleration of Greenland ice sheet flow, *Science*, Vol. 297, No. 5579, 218-222, 2002.
- Larson, K., J. Plumb, H.J. Zwally, W. Abdalati, Analysis of GPS data collected on the Greenland ice sheet, *Polar Geography*, Vol 25, No. 1, 22-40, 2002
- Fahnestock, M., W. Abdalati, and C. Shuman, Long melt seasons on ice shelves of the Antarctic Peninsula: an analysis using satellite-based microwave emission measurements, *Annals of Glaciology*, Vol. 34, 127-133, 2002.
- Wang, W., H.J. Zwally, W. Abdalati, S. Luo, Modeling of ice flow and internal layers along a flow line through Swiss Camp in West Greenland, *Annals of Glaciology*, Vol. 34, 303-308, 2002.
- Abdalati, W. The Greenland Ice Sheet, in *Encyclopedia of Global Environmental Change*, T. Munn, M. MacCracken, and J. Perry (eds.), John Wiley and Sons, 3000 pp. 2002.
- Abdalati, W., and K. Steffen, Update on the Greenland ice sheet melt extent, *Journal of Geophysical Research Atmospheres* , Vol. 106, No. D24, pp. 33,983-33,988, 2001.
- Abdalati, W., W. Krabill, E. Frederick, S. Manizade, C. Martin, J. Sonntag, R. Swift, R. Thomas, W. Wright, J. Yungel, Near-coastal thinning of the Greenland ice sheet, *Journal of Geophysical Research Atmospheres*, Vol. 106, No. D24, pp. 33,729-33,742, 2001.
- Fahnestock, M., W. Abdalati, I. Joughin, J. Brozena, S. Gogineni, High Geothermal heat flow, basal melt, and the origin of rapid ice flow in central Greenland, *Science*, Vol. 294, 2338-2342, 2001.
- Fahnestock, M., W. Abdalati, S. Gogineni, S. Luo, Investigation of internal layering structure of the Northern Greenland ice sheet and the links between deep ice cores. *Journal of Geophysical Research Atmospheres* , Vol. 106, No. D24, pp. 33,789-33,798, 2001.
- Thomas, R.H. and PARCA investigators, Program for Arctic Regional Climate Assessment (PARCA): Overview and key findings, *Journal of Geophysical Research Atmospheres*, Vol. 106, No. D24, pp. 33,691-33,706, 2001.

- Zwally, H.J. and W. Abdalati, Ice Sheets, in *Encyclopedia of Global Climate Change: Environmental Change and Human Society*, A. Goudie, D. Cuff, eds., Oxford University Press, New York, 1440 pp, 2001.
- Krabill, W., W. Abdalati, E. Frederick, S. Manizade, C. Martin, J. Sonntag, R. Swift, R. Thomas, W. Wright, J. Yungel, Greenland ice sheet: high-elevation balance and peripheral thinning, *Science*, 289, 428-429, 2000.
- Thomas, R.H., W. Abdalati, T. Akins, B. Csatho, E. Frederick, S. Gogineni, W. Krabill, S. Manizade, E. Rignot, Substantial thinning of a major east Greenland outlet glacier, *Geophysical Research Letters*, Vol 27, No. 9, pp. 1291-1294, 2000.
- Abdalati, W., W.B. Krabill, Calculation of ice velocities in the Jakobshavn Isbrae area using airborne laser altimetry, *Remote Sensing of Environment*. Vol. 67, pp. 194-204, 1999.
- Steffen, K., W. Abdalati, and I. Sherjal, Hoar development on the Greenland ice sheet. *Journal of Glaciology*, Vol. 45, No. 149, pp. 63-68, 1999.
- Abdalati, W., K. Steffen, Accumulation and hoar effects on microwave emission in the Greenland ice sheet dry snow zones. *Journal of Glaciology*, Vol. 44, No. 148. pp. 523-531, 1998.
- Abdalati, W., K. Steffen, Snow melt on the Greenland ice sheet as derived from passive microwave satellite data. *Journal of Climate*, Vol. 10, No. 2, pp. 165-175, 1997.
- Abdalati, W., K. Steffen, The apparent effect of the Mt. Pinatubo eruptions on the Greenland ice sheet melt conditions. *Geophysical Research Letters*, Vol. 24, No. 14, pp. 1795-1797, 1997.
- Abdalati, W., K. Steffen, C. Otto, and K. Jezek, Comparison of brightness temperatures from SSM/I instruments on the DMSP F8 and F11 satellites for Antarctica and the Greenland ice sheet. *International Journal of Remote Sensing*, Vol. 16, No. 7, pp.1223-1229, 1995,
- Abdalati, W., K. Steffen, Passive microwave-derived snow melt regions of the Greenland ice sheet. *Geophysical Research Letters*, Vol. 22, No. 7, pp. 787-790, 1995.
- Steffen, K., W. Abdalati, J. Stroeve, Climate sensitivity studies of the Greenland ice sheet using satellite AVHRR, SMMR, SSM/I and in situ data. *Meteorology and Atmospheric Physics*, Vol. 51, pp. 239-258, 1993.

PH.D. THESIS

- Abdalati, W., *Investigation of Mass Balance Parameters on the Greenland Ice Sheet Using Passive Microwave Satellite Data*, University of Colorado at Boulder, 1996.

OTHER PUBLICATIONS (18)

- Emery, W., W. Abdalati, P. Hildebrand, 20,000 Leagues Under the Sea: A Journey to the Future of Observing Deep Oceans, *Proceedings from the 2003 IGARSS Symposium*, Toulouse, France, in press.
- Abdalati, Preface to Mass Balance of the Greenland Ice Sheet, *Journal of Geophysical Research Atmospheres*, Vol. 106, No. D24, p. 33,689, 2001.

- Koblinsky, C., M. Rienecker, D. Adamec, W. Abdalati, and E. Lindstrom, Oceans and ice: the slow dance of a complex system, *Proceedings from the 2001 IGARSS Symposium*, Sydney Australia, 2001.
- Abdalati, W., W.B. Krabill, Application of aircraft laser altimetry to glacier and ice cap mass balance studies, *Archives of the International Society for Photogrammetry and Remote Sensing, Proceedings of the Workshop in Mapping Surface Structure and Topography by Airborne and Spaceborne Lasers, Lajolla, CA, November 9-11, 1999*, 161-166, 2000.
- Abdalati, W., and 7 others, a strategy for estimating Greenland ice sheet ablation rates, in *PARCA (Program for Arctic Regional Climate Assessment) Greenland Science and Planning Meeting, September 21-22, 1999*, 71-73, J. McConnell, ed., 2000.
- Abdalati, W., J. Box, K. Steffen, Application of climate station data to the interpretation of ATM-derived ice sheet elevation changes, in *PARCA (Program for Arctic Regional Climate Assessment) Greenland Science and Planning Meeting, October 5-6, 1998*, 71-73, S. Gogineni, ed., 1999.
- Abdalati, W., ed., *PARCA (Program for Arctic Regional Climate Assessment) Report, Greenland Science and Planning Meeting, October 6-8, 1999*. NASA Technical Memorandum 209205, NASA Goddard Space Flight Center, Greenbelt, MD, 1999.
- Abdalati, W., J. Box, and K. Steffen, Application of climate station data to the interpretation of ATM-derived ice sheet elevation changes, in *PARCA (Program for Arctic Regional Climate Assessment) Greenland Science and Planning Meeting, October 5-6, 1998*, 71-73, W. Abdalati, ed., 1999.
- Abdalati W., R. Bales, and R.H. Thomas, Program for Arctic Regional Climate Assessment: an improved understanding of the Greenland ice sheet. *Arctic Research of the United States*, vol. 12, pp. 38-54, 1998.
- Abdalati, W., W.B. Krabill, Calculation of surface velocity in the Jakobshavn Isbrae area using airborne laser altimetry, in *PARCA (Program for Arctic Regional Climate Assessment) Greenland Science and Planning Meeting, October 15-16, 1997*. 76-79, 1997., R. Bales, ed., 1997.
- Abdalati, W., ed., *PARCA (Program for Arctic Regional Climate Assessment) Report, Greenland Science and Planning Meeting, Sept. 17-18, 1996*. Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO. 98 pp, 1996.
- Steffen, K., J. Box, W. Abdalati, Greenland climate network: GC-Net, in *CRREL Special Report on Glaciers, Ice Sheets and Volcanoes*, Colbeck, S., ed., No. 96-27, pp. 98-103, 1996.
- Anderson, M.R., T.M. Mote, W. Abdalati, Comparison of passive microwave techniques for detecting snowpack melt on the Greenland ice sheet. *CRREL Special Report on Glaciers, Ice Sheets, and Volcanoes*, Colbeck, S., ed., No. 96-27, 1996.
- Abdalati, W., K. Steffen, Accumulation and hoar: effects of microwave emission in firn. *PARCA Report, Greenland Science and Planning Meeting, Sept. 17-18, 1996*, W. Abdalati, ed., 75-77, 1996.
- Abdalati, W., K. Steffen, The response of the Greenland ice sheet to the eruption of Mt. Pinatubo. *PARCA Report, Greenland Science and Planning Meeting, Sept. 17-18, 1996*, W. Abdalati, ed., 78-79, 1996.

Steffen, K., J. Box, W. Abdalati, Greenland surface Climatology and the GC-Net. *PARCA Report, Greenland Science and Planning Meeting, Sept. 17-18, 1996*, W. Abdalati, ed., 25-29, 1996.

Abdalati, W., K. Steffen, M. Anderson, and T. Mote, Passive microwave-derived melt conditions on the Greenland ice sheet. *PARCA Report, Greenland Science and Planning Meeting, Sept. 5, 1995*. K. Steffen, ed., 28-29, 1995.

Steffen, K., A. Nolin, W. Abdalati, and J. White, Ice core interpretation. *PARCA Report, Greenland Science and Planning Meeting, Sept. 5, 1995*. K. Steffen, ed., 10-11, 1995.