

Dustin M. Schroeder

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Education

Ph.D. Geophysics, Jackson School of Geosciences, University of Texas at Austin Expected 2014

Thesis: Characterizing the Subglacial Hydrology of Thwaites Glacier Using Focused Airborne Radar Sounding

Advisor: D.D. Blankenship (*Committee Chair*) GPA: 3.88/4.0

Committee Members: O. Ghattas, M.A. Hesse, C.S. Jackson, H. Ling, M.K. Sen

B.S. Electrical Engineering with Departmental Honors, Bucknell University 2007

Honors Thesis: Design of a Dielectric Rod Antenna for Ground Penetrating Radar Landmine Detection Applications

Advisor: D.F. Kelley GPA: 3.92/4.0

B.A. Physics, Magna Cum Laude, Bucknell University 2007

Minors: Mathematics and Philosophy GPA: 3.83/4.0

Appointments

University of Texas Institute for Geophysics	<i>Graduate Researcher</i>	2008 - Present
Johns Hopkins University Applied Physics Lab	<i>Graduate Researcher</i>	Spring 2012
Freescale Semiconductor	<i>Platform Hardware Engineer</i>	2007 - 2008
Bucknell University	<i>Undergraduate Researcher</i>	2003 - 2007
Cleveland Clinic Foundation Lerner Research Institute	<i>Undergraduate Researcher</i>	Summer 2005
Harvard-Smithsonian Center for Astrophysics	<i>Undergraduate Researcher</i>	Summer 2004
Parker Hannifin Corporation	<i>Summer Intern</i>	Summer 2003
Case Western Reserve University	<i>Undergraduate Researcher</i>	Summer 2002

Honors

University of Texas Institute for Geophysics, Gale White Fellowship	2012
Friar Society, <i>Oldest Honor Society at the University of Texas</i>	2010
NSF Graduate Research Fellowship	2009, 2013, 2014
University of Texas Graduate School Recruitment Fellowship , <i>Top 10% in Discipline</i>	2008
Bucknell University, Thelma Johns Showalter Prize, <i>For Greatest Promise in Public Affairs</i>	2007
COMAP Mathematical Contest in Modeling, Meritorious Winner	2005
Phi Beta Kappa , <i>Liberal Arts Honor Society</i>	
Tau Beta Pi , <i>Engineering Honor Society</i>	
Sigma Pi Sigma, <i>Physics Honor Society</i>	

Research and Teaching Interests

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Research Experience

- University of Texas Institute for Geophysics** Austin, TX 2008 - Present
 Advisor: D.D. Blankenship
Use focused airborne radar sounding data to constrain the configuration and dynamic state of subglacial water systems beneath Thwaites Glacier, West Antarctica and their potential impact on future ice-sheet stability
- Johns Hopkins University Applied Physics Lab** Laurel, MD Spring 2012
 Advisor: R.K. Raney
Developed a theoretical framework for processing focused radar sounding data to measure the scattering functions of subglacial interfaces by comparing energy from focusing with different reference-function Doppler-bandwidths
- Bucknell University, Electrical Engineering Department** Lewisburg, PA 2006 - 2007
 Advisor: D.F. Kelley
Optimized design of an antenna for ground penetrating radar using finite difference time domain simulation
- Cleveland Clinic Foundation Lerner Research Institute** Cleveland, OH Summer 2005
 Advisor: S. Roy
Observed and modeled adult stem-cell kinetics on micro-fabricated surfaces for tissue engineering
- Harvard-Smithsonian Center for Astrophysics** Cambridge, MA Summer 2004
 Advisor: P.B. Reid
Developed protocol and produced first profile of grazing-incidence optics for the IXO x-ray telescope
- Case Western Reserve University, Physics Department** Cleveland, OH Summer 2002
 Advisor: D.S. Akerib
Assisted with experimental setup, maintenance, and improvement for the Cryogenic Dark Matter Search II

Field Experience

- The ICECAP Project and Operation Ice Bridge** Antarctic Seasons: 2008, 2009, 2010
International Airborne Antarctic Geophysical Survey
 Role: **Lead RF Field Engineer** and Radar Operator
 Sponsoring Agencies: NSF (US), NASA (US), NERC (UK), AAD (AUS), IPEV (FR), and PNRA (IT)
 Bases of Operation: McMurdo (US), Casey (AUS), Terra Nova (IT) Cap Prud'homme (FR)
 Targets: Byrd Glacier, Totten Glacier, Wilkes Glacier, Astrolabe Glacier, and Aurora Subglacial Basin
 Instruments: VHF Radar, HF Radar, Gravimeter, Magnetometer, GPS, Photon-Counting Lidar
- Led the development, testing, and operation of antennas, receivers, and system settings for the University of Texas Institute for Geophysics HiCARS II airborne ice-penetrating radar sounder and its multi-frequency and multi-channel upgrades*

Teaching Experience

- Short Course on Ice Sheet Sounding Radar UTIG Airborne Geophysics Group Spring 2010
 High School Science Olympiad Coach Liberal Arts and Sciences Academy 2007 - Present
Placement Nationally: 30th (2007), 19th (2008), 8th (2009), 7th (2010), 9th (2011), 7th (2012)
- Astronomy National Event Supervisor Science Olympiad National Championships 2003 - Present
Write rules and National Championship Exam for High School (2003 - 2011) and Middle School (2012 - Present) students and co-developed events on Geologic Mapping and Antenna Design.

Synergistic Activities

Radar Sounder Working Group	<i>Jupiter Icy Moon Explorer</i>	2011 - Present
Physics Committee	<i>National Science Olympiad</i>	2011 - Present
Earth and Space Sciences Committee	<i>National Science Olympiad</i>	2003 - Present
Clinton Global Initiative University	<i>Energy and Climate Change Session</i>	Spring 2009
Freescall Semiconductor University Relations	<i>Program Lead</i>	2007 - 2008
Journal of Geophysical Research	<i>Reviewer</i>	

Outreach

Aurora Australis, AAD Voyage: Casey to Hobart	<i>Onboard Science Lecture Speaker</i>	January 2011
Bucknell University Physics Department	<i>Weekly Colloquium</i>	September 2010
University Methodist Church, Austin, TX	<i>Guest Speaker</i>	February 2010
Solon High School, Solon, OH	<i>Guest Speaker</i>	February 2010
Tejas Club, Austin, TX	<i>Life Raft Debate Winner</i>	March 2010
University of Texas Institute for Geophysics	<i>Brownbag Speaker</i>	March 2009
Science Olympiad Coaches Clinic, Dearborn, MI	<i>Astronomy Session Speaker</i>	December 2008
Tufts University, Wright Center for Science Education	<i>Space Science Workshop Speaker</i>	Summer 2004

Professional Affiliations

American Geophysical Union
 IEEE Geoscience and Remote Sensing Society
 IEEE Antennas and Propagation Society
 International Glaciological Society

Mentoring

Undergraduate Students

Arami Rosales	<i>Physics</i>	<i>University of Texas, Austin</i>	2011 - Present
Evelyn Powell	<i>Physics, Plan II Honors</i>	<i>University of Texas at Austin</i>	2010 - Present
John Desantos	<i>Physics, Plan II Honors</i>	<i>University of Texas at Austin</i>	2008 - Present
Tad Komack	<i>Geophysical Sciences</i>	<i>University of Chicago</i>	2008 - Present
Leo Breston	<i>Engineering</i>	<i>University of Illinois at Urbana Champaign</i>	Summer 2012
Harris Davidson	<i>Engineering</i>	<i>University of Illinois at Urbana Champaign</i>	Summer 2012

High School Students

Marc Sands	<i>Now Studying Physics at the University of Chicago</i>	2010 - 2012
Daniel Wang	<i>Now Studying Mathematics at the Massachusetts Institute of Technology</i>	2010 - 2012
Chris Wang	<i>Now Studying at the Columbia University</i>	2010 - 2012
Calvin Ling	<i>Now Studying Business at the Stanford University</i>	2010 - 2012
Casey Edgerton	<i>Now Studying Engineering at the Georgia Institute of Technology</i>	2010 - 2011
Jason Pan	<i>Now Studying at the University of California, Los Angeles</i>	2010 - 2011
Victoria Cui	<i>Now Studying Neuroscience at Columbia University</i>	2009 - 2011
Jeffery Holzgrafe	<i>Now Studying Chemical Engineering at Olin College</i>	2009 - 2011
Chloe Ling	<i>Now Studying Chemistry at the California Institute of Technology</i>	2009 - 2011
Angela Liu	<i>Now Studying at Yale University</i>	2009 - 2011
Eliza McDonald	<i>Now Studying Astrophysics at the University of California, Berkeley</i>	2008 - 2010
Rose Kent McGlew	<i>Now Studying Forensic Science at the University of Oregon</i>	2008 - 2010
Travis Owens	<i>Now Studying Finance at New York University</i>	2008 - 2010
Zane Rankin	<i>Now at the University of California, Berkeley</i>	2008 - 2010

Emily Liljestrand	<i>Now Studying Cell Biology at Rice University</i>	2008 - 2009
Frasier Liljestrand	<i>Now Studying Geoscience at Rice University</i>	2008 - 2009
Ryan Doubrava	<i>Now Studying Classics at the University of Texas, Austin</i>	2008 - 2009
Andrew Vanderberg	<i>Now Studying Physics at the University of California, Berkeley</i>	2008 - 2009
Jonathan Hillis	<i>Now Studying Environmental Studies at Carleton College</i>	2008 - 2009

Publications

Refereed Articles

A.P. Wright, D.A. Young, J.L. Roberts, **D.M. Schroeder**, J.L. Bamber, J.A. Dowdeswell, N.W. Young, A.M. Le Brocq, R.C. Warner, A.J. Payne, D.D. Blankenship, T.D. van Ommen, M.J. Siegert. *Evidence for a Hydrological Connection Between the Ice Divide and Ice Sheet Margin in the Aurora Subglacial Basin Sector of East Antarctica*, JGR Earth Surface, 117, March 2012

D.A. Young, A.P. Wright, J.L. Roberts, R.C. Warner, N.W. Young, J.S. Greenbaum, **D.M. Schroeder**, D.E. Sugden, J.W. Holt, D.D. Blankenship, T. Van Ommen, M.J. Siegert. *A Dynamic Early East Antarctic Ice Sheet Suggested by Ice Covered Fjord Landscapes*, **Nature**, 2, June 2011

Selected Abstracts: Invited Talks

D.M. Schroeder. *Interpretation of Subglacial Hydrologic Systems from Radar Echo Specularity: Application to Thwaites Glacier, West Antarctica*, Johns Hopkins University Applied Physics Lab, July 2012

D.M. Schroeder, D.D. Blankenship, D.A. Young. *Interpretation of Sub-resolution Bedform and Subglacial Hydrologic Network Geometries from Radar Echo Specularity: Application to Thwaites Glacier, West Antarctica*, AGU Fall Meeting, December 2011

Selected Abstracts: Oral Presentations

D.M. Schroeder, D.D. Blankenship, D.A. Young. *The Basal Boundary of the Thwaites Glacier Catchment: Characterizing and Anisotropic Hydrological Environment*, International Symposium on Antarctic Earth Science, Edinburgh, UK, July 2011

D.M. Schroeder, D.D. Blankenship, D.A. Young. *Basal Specularity of Thwaites Glacier, West Antarctica: Results from a New Tool for Evaluating Subglacial Hydrology*, West Antarctic Ice Sheet Workshop, Raystown, PA, September 2010

D.M. Schroeder, D.D. Blankenship, D.A. Young. *The Subglacial Hydrology of Thwaites Glacier: Characterization and Interpretation of a Basin-Scale Specularity Map*, SCAR Open Science Conference, Buenos Aires, Argentina, August 2010

D.A. Young, D.D. Blankenship, M.J. Siegert, T. Van Ommen, A.P. Wright, J.L. Roberts, J.S. Greenbaum, B.C. Frederick, **D.M. Schroeder**, J.W. Holt, R.C. Warner, N.W. Young. *Extent, geomorphology and geo-physics of the Aurora and Wilkes Subglacial Basins, East Antarctica: Influences on ice sheet architecture*, SCAR Open Science Conference, Buenos Aires, Argentina, August 2010

A.P. Wright, M.J. Siegert, D.A. Young, D.D. Blankenship, T. Van Ommen, J.L. Roberts, J.S. Greenbaum, B.C. Fredrick, **D.M. Schroeder**, J.W. Holt, R.C. Warner, N.W. Young. *Subglacial hydrology of the Aurora Basin, East Antarctica, from the geophysical investigations of the ICECAP project*, SCAR Open Science Conference, Buenos Aires, Argentina, August 2010

J.W. Holt, D.A. Young, D.D. Blankenship, J.S. Greenbaum, **D.M. Schroeder**, T.G. Richter, A.P. Wright, T. Van Ommen, M.J. Siegert, J.L. Roberts, R.C. Warner. *Bed topography of the Byrd Glacier trunk from radar soundings of the ICECAP project*, SCAR Open Science Conference, Buenos Aires, Argentina, August 2010

D.M. Schroeder, D.D. Blankenship, D.A. Young. *Improved Characterization of Subglacial Hydrology Using Multiple Radar Focusing Windows: Examples from Thwaites Glacier, West Antarctica*, First Antarctic Climate Evolution Symposium, Granada, Spain, September 2009

Selected Abstracts: Posters

D.M. Schroeder, D.D. Blankenship, D.A. Young. *Comparative Subglacial Hydrology of Thwaites Glacier, Using Basal Specularity*, Chapman Conference, Exploration and Study of Antarctic Subglacial Aquatic Systems, Baltimore, March 2010

D.M. Schroeder, D.D. Blankenship, D.A. Young. *Remote Sensing of Subglacial Water Networks with Ice Penetrating Radar*, Chapman on Remote Sensing of Terrestrial Water Cycle, Kona, February 2012