

## **Dustin M. Schroeder**

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### **EDUCATION**

- Ph.D. Geophysics, Jackson School of Geosciences, University of Texas at Austin, 2014
- B.S. Electrical Engineering (honors), Bucknell University, 2007
- B.A. Physics with minors in Mathematics and Philosophy, Bucknell University, 2007

### **PROFESSIONAL EXPERIENCE**

- 2008 – 2014 University of Texas Institute for Geophysics, Advisor: D.D. Blankenship  
Ice penetrating radar study of water beneath Thwaites Glacier, West Antarctica
- 2012 Johns Hopkins University, Applied Physics Lab, Advisor: R.K. Raney  
Theoretical study of subglacial scattering functions in focused radar sounding
- 2007 – 2008 Platform Hardware Engineer, Freescale Semiconductor, Austin, TX  
Developed interface for debugging board and created university hiring strategy
- 2006 – 2007 Bucknell University, Electrical Engineering, Advisor: D.F. Kelley  
Optimized design of a dielectric rod antenna for ground penetrating radar
- 2005 Cleveland Clinic Lerner Research Institute, Advisor: S. Roy  
Observed and modeled adult stem-cell kinetics on MEMS-fabricated surfaces
- 2004 Harvard-Smithsonian Center for Astrophysics, Advisor: P.B. Reid  
Produced the first profile of grazing-incidence optics for the IXO X-ray telescope
- 2002 Case Western Reserve University, Physics Department, Advisor: D.S. Akerib  
Experimental setup and improvement for Cryogenic Dark Matter Search II

### **AWARDS AND FELLOWSHIPS**

- 2013 Best Ph.D. Student Speaker Award, Jackson School of Geosciences
- 2013 Jackson School of Geosciences Research Symposium, 1<sup>st</sup> Place Late-Career Ph.D.
- 2012 NASA Group Achievement Award: Operation Ice Bridge
- 2012 Gale White Fellowship, University of Texas Institute for Geophysics
- 2012 David Brunton Jr. Fellowship, University of Texas Graduate School
- 2010 The Friar Society, The University of Texas
- 2009 – 2014 NSF Graduate Research Fellowship
- 2008 University of Texas Graduate School Recruiting Fellowship
- 2007 Thelma Johnson Showalter Prize, Bucknell University
- 2007 Phi Beta Kappa, Bucknell University
- 2006 Tau Beta Pi, Bucknell University
- 2006 Sigma Pi Sigma, Bucknell University
- 2005 COMAP Mathematical Contest in Modeling, Meritorious Winner

## PUBLICATIONS

### Refereed Papers

- 2013 **D.M. Schroeder**, D.D. Blankenship, D.A. Young. Evidence for a Water System Transition Beneath Thwaites Glacier, West Antarctica, *Proceedings of the National Academy of Sciences*
- 2013 J.A. MacGregor, G.A. Catania, H.B. Conway, **D.M. Schroeder**, I.R. Joughin, D.A. Young, S.D. Kempf, D.D. Blankenship. Weak Bed Control of the Eastern Shear Margin of Thwaites Glacier. *Journal of Glaciology*
- 2012 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, *Journal of Geophysical Research Earth Surface*
- 2011 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*

### Papers in Preparation and Review

- D.M. Schroeder**, D.D. Blankenship, D.A. Young, A.E. Krishner, J.B. Anderson. Radar Sounding Evidence for Deformable Sediments and Exposed Bedrock Beneath Thwaites Glacier, West Antarctica, *Geophysical Research Letters*
- D.M. Schroeder**, R.K. Raney, D.D. Blankenship. Detecting Subglacial Water Bodies from the Specularity of Radar Bed Echoes. *IEEE Geoscience and Remote Sensing Letters*
- D.M. Schroeder**, D.D. Blankenship, D.A. Young. Radar Sounding Evidence for Heterogeneous Basal Melt Beneath Thwaites Glacier, *Journal of Geophysical, Research Earth Surface*
- C. Grima, **D.M. Schroeder**, D.D. Blankenship, D.A. Young. Planetary Landing Zone Assessment by Radar Sounder: Demonstration in Antarctica, *Planetary and Space Science* (in review)
- A.E. Kirshner, C.M. Branecky, J.B. Anderson, W. Szczucinski, **D.M. Schroeder**, D.D. Blankenship, M. Jakobsson. Meltwater Intensive Glacial Retreat in Polar Environments and Investigation of Associated Sediments: Example from Pine Island Bay, West Antarctica, *Quaternary Science Reviews* (in review)
- M.G.P. Cavitte, D.D. Blankenship, D.A. Young, **D.M. Schroeder**, M.J. Siegert, E. Le Meur. Radar Stratigraphy Connecting Lake Vostok and Dome C, East Antarctica, Across the Last Two Glacial Cycles, *The Cryosphere* (in review)

### Technical Reports

- 2012 **D.M. Schroeder**, C. Grima, D.D. Blankenship. Assessing the Utility of the Europa Clipper Radar Sounder to Identify Potential Landing Sites, Europa Science Definition Team, NASA

**INVITED PAPERS**

- 2011 **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, San Francisco, CA, December 5<sup>th</sup> – 9<sup>th</sup>

**INVITED TALKS**

- 2013 Bromery Seminar, Earth and Planetary Sciences Department, Johns Hopkins University November 7<sup>th</sup>
- 2013 Radar Science and Engineering Section, The Jet Propulsion Laboratory, California Institute of Technology, September 19<sup>th</sup>
- 2012 Space Research Group Seminar, The Applied Physics Lab, Johns Hopkins University, May 3rd

**CONFERENCE PARTICIPATION (Selected Abstracts)**

- 2013 **D.M. Schroeder**, D.D. Blankenship, D.A. Young. Quantifying Bedform Geometry, Water Configuration, and Melt Rate Beneath Thwaites Glacier from Radar Scattering Functions. AGU Fall Meeting, San Francisco, CA, December 9<sup>th</sup> – 13<sup>th</sup>
- 2013 C. Grima, **D.M. Schroeder**, D.D. Blankenship, D.A. Young. Planetary Surface Roughness Derived from Ice Penetrating Radar Data: Method and Concept Validation in Antarctica. AGU Fall Meeting, San Francisco, CA, December 9<sup>th</sup> – 13<sup>th</sup>
- 2013 C. Cura, E. Arnold, B. Karwoski, C. Grima, **D.M. Schroeder**, D.A. Young, D.D. Blankenship. Enhancing Europa Surface Characterization with Ice Penetrating Radar: A Comparative Study in Antarctica. AGU Fall Meeting, San Francisco, December 9<sup>th</sup> – 13<sup>th</sup>
- 2013 **D.M. Schroeder**, D.D. Blankenship, D.A. Young. What Can Radar Scattering Tell Us About Past and Future Retreats in the Amundsen Sea Embayment? WAIS Workshop, Sterling, VA, September 29<sup>th</sup> – October 2<sup>nd</sup>
- 2013 **D.M. Schroeder**, D.D. Blankenship, R.K. Raney, D.A. Young. Buried Information: Constraining Bed Geometry and Material from the Doppler-Dependent Radar-Scattering Function. International Symposium on Radioglaciology, Lawrence, September 9<sup>th</sup> – 13<sup>th</sup>
- 2013 D.D. Blankenship, B.E. Schmidt, **D.M. Schroeder**, K.M. Soderlund, C. Grima. Flyby Sounding of Europa's Icy Shell: Radar Investigations, Analogs, and Instruments for the Europa Clipper Mission. IGS International Symposium on Radioglaciology, Lawrence, KS, September 9<sup>th</sup> – 13<sup>th</sup>
- 2013 M.G.P. Cavitte, D.D. Blankenship, D.A. Young, **D.M. Schroeder**, M.J. Siegert, E. LeMeur. Extending East Antarctic Ice-Core Chronology with Radar Layer Stratigraphy. IGS International Symposium on Radioglaciology, Lawrence, KS, September 9<sup>th</sup> – 13<sup>th</sup>
- 2012 **D.M. Schroeder**, D.D. Blankenship, D.A. Young, E.M. Powell. Configuration of Subglacial Water and Sediments Beneath Thwaites Glacier, West Antarctica: Context for a Potential Basal-Water-Triggered Grounding-Line-Retreat. AGU Fall Meeting, San Francisco, CA, December 3<sup>rd</sup> – 9<sup>th</sup>
- 2012 **D.M. Schroeder**, D.D. Blankenship, D.A. Young. Evidence for Ice-Flow-Coupled Subglacial Water Systems Beneath West Antarctica's Potentially Unstable Thwaites

- Glacier, WAIS Workshop, Eatonville, WA, September 19<sup>th</sup> – 22<sup>nd</sup>
- 2012 **D.M. Schroeder**, D.D. Blankenship, D.A. Young. Remote Sensing of Subglacial Water Networks with Ice Penetrating Radar, Chapman Conference on Remote Sensing of Terrestrial Water Cycle, Kona, HI, February 19<sup>th</sup> – 22<sup>nd</sup>
- 2011 D.A. Young, **D.M. Schroeder**, D.D. Blankenship, C.S. Jackson, M.J. Siegert, A.P. Wright, J.L. Roberts, R.C. Warner, T. van Ommen, N.W. Young. Under the Antarctic Ice: New Data in the East, New Approaches in the West, WAIS Workshop, Loveland, CO, September 21<sup>st</sup> – 23<sup>rd</sup>
- 2011 **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 10<sup>th</sup> – 16<sup>th</sup>
- 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 3<sup>rd</sup> – 6<sup>th</sup>
- 2009 **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 7<sup>th</sup> – 11<sup>th</sup>

## DEPARTMENTAL TALKS

- 2013 Characterizing the Subglacial Hydrology of Thwaites Glacier, West Antarctica Using Focused Airborne Radar Sounding, Technical Sessions, Jackson School of Geoscience, University of Texas at Austin, April 16<sup>th</sup>
- 2013 Configuration of Subglacial Water and Sediments Beneath Thwaites Glacier, West Antarctica: Context for a Potential Basal-Water-Triggered Grounding-Line-Retreat, 2<sup>nd</sup> Annual Jackson School Research Symposium, February 2<sup>nd</sup>

## TEACHING EXPERIENCE

- 2013 Guest Lecturer, The Cryosphere, Rice University
- 2013 Geophysical Glaciology: Ice Penetrating Radar, UT Institute for Geophysics
- 2010 Radar Principles Short Course, UT Institute for Geophysics

## FIELD WORK

- 2010 – 2011 The ICECAP Project and Operation Ice Bridge, East Antarctica (2 Months)
- 2009 – 2010 The ICECAP Project, East Antarctica (3 Months)
- 2008 – 2009 The ICECAP Project, East Antarctica (3 Months)
- Agencies: NSF (US), NASA (US), NERC (UK), AAD (AUS), IPEV (FR), PNRA (IT)
- Bases: McMurdo (US), Casey (AUS), Terra Nova (IT), Cap Prud'homme (FR)
- Targets: Aurora Subglacial Basin, Astrolabe, Byrd, Totten, and Wilkes Glaciers
- Instruments: VHF Radar, HF Radar, GPS, Gravimeter, Magnetometer, Lidar
- Role: Lead RF Engineer and Radar Operator

## **INSTRUMENT DEVELOPMENT**

- 2010 – 2011 University of Texas Dual Frequency Ice Penetrating Radar, Lead RF Engineer  
2008 – 2011 University of Texas HiCARS II Ice Penetrating Radar, Lead RF Engineer

## **GRANTS**

- 2013 Key Personnel, **Ice Penetrating Radar (IPR) for Europa Exploration** (NASA Instrument Concepts for Europa Exploration. PI: A. Mousseian) \$1,546,860  
2013 Collaborator, **Investigating Cryospheric Evolution by Constraining Antarctic geothermal Flux Estimates (ICECAFE)** (NASA Sea Level Rise, PI: D.A. Young) \$1,072,227 (in review)  
2008 NSF GRFP Fellow, **Quantifying Sources of Uncertainty in Predicted Contributions of the West Antarctic Ice Sheet to Sea Level Rise** (NSF Graduate Research Fellowship Program. PI: D.M. Schroeder) \$90,000

## **PROFESSIONAL SERVICE**

- 2013 External Reviewer, NASA Funding Panel  
2013 Technical Assistant, Europa Assessment Group, NASA  
2013 Technical Assistant, RIME (Radar for Icy Moon Exploration), JUICE mission, ESA  
2011 – 2012 Member, Working Group for Europa and Ganymede Radar Sounding  
2010 – 2012 Technical Assistant, Europa Science Definition Team, NASA  
2012 Reviewer, Geophysical Research Letters  
2012 Reviewer, Journal of Geophysical Research

## **OUTREACH**

- 2003 – 2013 Astronomy National Event Supervisor, National Science Olympiad  
2004 – 2013 Earth and Space Science Committee, National Science Olympiad  
2007 – 2013 Science Olympiad Coach, Liberal Arts and Sciences Academy, Austin, TX  
2011 Onboard Science Lecture, Aurora Australis AAD Voyage: Casey to Hobart  
2010 Guest Speaker, University Methodist Church, Austin, TX  
2010 Guest Speaker, Solon High School, Solon, OH  
2010 Tejas Club Life Raft Debate, Austin, TX  
2009 Energy and Climate Facilitator, Clinton Global Initiative University, Austin, TX  
2008 Science Olympiad Coaches Clinic, Dearborn, MI  
2004 Space Science Workshop, Wright Center for Science Education, Tufts University

## **PROFESSIONAL AFFILIATIONS**

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