

Todd Keith Dupont

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Earth System Science
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Education

PhD, The Pennsylvania State University, 2004.

Geosciences

Dissertation Title: Abrupt Changes in Ice Shelves and Ice Streams: Model Studies

Advisor: Alley, R. B.

MS, University of Maine (Orono), 1996.

Major: Quaternary Studies

Dissertation Title: Millennial Scale Climate Variability in the Sea-Ice/Ocean System: A Low-Order Dynamical Model

Advisor: Maasch, K. A.

BS, University of Maine (Orono), 1994.

Major: Geological Sciences

HS, University of Chicago Laboratory Schools, 1989.

Professional Positions

Assistant Professor, Earth System Science, UC Irvine (2007-2009).

Assistant Professor, University of Illinois at Chicago. (2006 - 2007).

Fall 2006 – Spring 2007

Research Assistant/Associate, Penn State University. (2004 - 2006).

Summer 2004 – Summer 2006

Graduate Research Assistant, Penn State University. (1997 - 2003).

1997; Fall 1998–Fall 2003

Participant, Siple Dome Ice Core Project. (1998 - 1999).

Antarctic Field Season

Teaching Assistant, Penn State University. (1996 - 1998).

Fall 1996; Spring 1998

Research Assistant, University of Maine. (1994 - 1996).

Fall 1994 – Spring 1996

Summer Research Assistant, University of Chicago. (1993 - 1994).

Summer 1993 & 1994

Field Assistant, Illinois Till Sheets Project, University of Chicago. (1992).

Summer 1992

Research Interests

I am interested cryospheric dynamics within the context of the larger Earth system. My research focuses on the evolution of the large ice sheets in Greenland and Antarctica.

Professional Memberships

American Association for the Advancement of Science.

American Geophysical Union.

International Glaciological Society.

RESEARCH

Publications

Journal Articles, Other

Alley, R. B., Horgan, H. J., Joughin, I., Cuffey, K. M., Dupont, T., Parizek, B. R., Anandakrishnan, S., Bassis, J. (2008). A Simple Law for Ice-Shelf Calving. *Science*, 322(5906), 1344-1344.

Journal Articles, Peer-Reviewed

Parizek, B. R., Alley, R. B., Dupont, T., Walker, R., Anandakrishnan, S. (2010). Effect of orbital-scale climate cycling and meltwater drainage on ice sheet grounding line migration. *Journal of Geophysical Research-Earth Surface*, 115(F01011), doi:10.1029/2009JF001325.

Walker, R. T., Dupont, T., Holland, D. M., Parizek, B. R., Alley, R. B. (2009). Initial effects of oceanic warming on a coupled ocean–ice shelf–ice stream system. *Earth and Planetary Science Letters*, 287, 483-487, doi:10.1016/j.epsl.2009.08.032.

Walker, R. T., Dupont, T., Parizek, B. R., Alley, R. B. (2008). Effects of basal-melting distribution on the retreat of ice-shelf grounding lines. *Geophysical Research Letters*, 35(L17503), doi:10.1029/2008GL034947.

Alley, R. B., Anandakrishnan, S., Dupont, T., Parizek, B. R., Pollard, D. (2007). Effect of Sedimentation on Ice-Sheet Grounding-Line Stability. *Science*, 315, 1838.

Alley, R. B., Dupont, T., Parizek, B. R., Anandakrishnan, S., Lawson, D. E., Larson, G. J., Evenson, E. B. (2006). Outburst flooding and surge initiation in response to climatic cooling: An hypothesis. *Geomorphology*, 75, 76-89.

Dupont, T., Alley, R. B. (2006). Role of small ice shelves in sea-level rise. *Geophysical Research Letters*, 33(L09503).

Alley, R. B., Dupont, T., Parizek, B. R., Anandakrishnan, S. (2005). Access of surface meltwater to beds of subfreezing glaciers: Preliminary insights. *Annals of Glaciology*, 40(8-14).

Dupont, T., Alley, R. B. (2005). Assessment of the importance of ice-shelf buttressing to ice-sheet flow. *Geophysical Research Letters*, 32(L04503).

Dupont, T., Alley, R. B. (2005). Conditions for the reversal of ice/air surface slope on ice streams and shelves: a model study. *Annals of Glaciology*, 40, 139-144.

Alley, R. B., Anandakrishnan, S., Dupont, T., Parizek, B. R. (2004). Ice streams – fast, and faster?. *Comptes Rendus Physique*, 5(7), 723-734.

Rignot, E. J., Vaughan, D. G., Schmelz, M., Dupont, T., MacAyeal, D. (2002). Acceleration of Pine Island and Thwaites Glaciers, West Antarctica. *Annals of Glaciology*, 34, 189-194.

Schmelz, M., Rignot, E., Dupont, T., MacAyeal, D. R. (2002). Sensitivity of Pine Island Glacier, West Antarctica, to changes in ice-shelf and basal conditions: a model study. *Journal of Glaciology*, 48(163), 552-558.

Presentations Given

- Dupont, T. (Author), Chaney, N. (Presenter & Author), 2009 Fall American Geophysical Union Meeting, "Relationship between Fracture Mechanics and Heat Transfer in Moulin Formation," San Francisco. (December 15, 2009).
- Dupont, T. (Author), Lindsey, D. S. (Presenter & Author), 2009 Fall American Geophysical Union Meeting, "Using the level set method to track ice sheet boundaries," San Francisco. (December 15, 2009).
- Dupont, T. (Author), Parizek, B. R. (Presenter & Author), Alley, R. B. (Author), Walker, R. T. (Author), Anandakrishnan, S. (Author), 2009 Community Climate System Model Workshop, "Ice-Sheet Grounding-Line Migration: Effect of Climate Cycling and Meltwater Plumbing," Breckenridge, CO, USA. (June 18, 2009).
- Dupont, T., 2009 Midwest Glaciologist Meeting, "Testing Side-Stress Parameterization - along overdue experiment," Chicago, IL, USA. (March 27, 2009).
- Dupont, T. (Presenter & Author), Alley, R. B. (Author), Parizek, B. R. (Author), 2008 Fall American Geophysical Union Meeting, "Comparison of Side Drag and Buttressing Generated by Flow-Line and Plan-View Models of Ice Shelves," San Francisco, CA, USA. (December 2008).
- Dupont, T. (Author), Parizek, B. R. (Presenter & Author), Alley, R. B. (Author), Walker, R. T. (Author), Anandakrishnan, S. (Author), 2008 Fall American Geophysical Union Meeting, "Effect of Climate Cycling and Meltwater Plumbing on Ice-Sheet Grounding-Line Migration," San Francisco, CA, USA. (December 2008).
- Dupont, T. (Author), Walker, R. T. (Presenter & Author), Alley, R. B. (Author), Parizek, B. R. (Author), 2008 Fall American Geophysical Union Meeting, "Effects of Basal-Melting Distribution on the Retreat of Ice-Shelf Grounding Lines," San Francisco, CA, USA. (December 2008).
- Dupont, T., Building a Next-Generation Community Ice Sheet Model, "Dynamic Ice Fronts: Implementing an empirical ice-shelf calving law," Los Alamos, NM. (August 18, 2008 - August 20, 2008).
- Dupont, T., American Geophysical Union Fall Meeting (2007), "Calving Dynamics in an Ice-Stream/Ice-Shelf Model: Are Basal and Lateral Drag Stabilizing," San Francisco, CA. (December 10, 2007 - December 14, 2007).
- Dupont, T., Northwest Glaciology Meeting (2007), "Calving Dynamics and Buttressing - In Search of Stability," Portland, OR. (October 26, 2007 - October 27, 2007).
- Dupont, T., 14th Annual West Antarctic Ice Sheet initiative meeting (2007), "When the Bough Breaks: Implementing an Empirical Calving Rule in a Dynamic Stream/Shelf Model," Sterling, VA. (September 5, 2007 - September 6, 2007).

Contracts, Grants and Sponsored Research

Grant

- Dupont, Todd (Principal Investigator), "Regional-Scale Sea Rise: Reconnaissance-Level Experiments on Short-term Ice Dynamics for Sea-Level Projection," NASA - National Aeronautics & Space Administration, \$256,485.00. (September 3, 2009 - September 2, 2012).

Dupont, Todd (Principal Investigator), "Diagnosis and Prognosis of a Greenland Outlet Glacier: Inverse and Forward Modeling Constrained by Remote Sensing," NASA - National Aeronautics & Space Administration, \$446,235.00. (July 1, 2008 - June 30, 2011).

Dupont, Todd (Co-Principal Investigator), Alley, R B (Principal Investigator), "Modeling the dynamics of surface-slope reversals and their role in the formation and stability of subglacial lakes," NSF - National Science Foundation, \$149,748.00. (January 1, 2005 - December 31, 2010).

Dupont, Todd (Co-Principal Investigator), "Collaborative Research: Synthesis of Thwaites Glacier Dynamics: Diagnostic and Prognostic Sensitivity Studies of a West Antarctic Outlet System," NSF - National Science Foundation, \$168,000.00. (July 1, 2007 - March 31, 2010).

Professional Service

US Ice Core Working Group, Member, Elected. (2009 - Present).

Ice Sheet Assessment Group, Member, Appointed, Pro Bono, National, a new ice-sheet assessment group focused on improved model assessments for the next IPCC installment (R. Bindshadler, chair). (August 20, 2008 - Present).

Reviewed manuscripts for Geophysical Research Letters, Journal of Climate, Journal of Glaciology, Annals of Glaciology, and The Cryosphere, Journal Article Reviewer. (July 2007 - Present).

Fall AGU Sessions - Outlet Glacier and Ice Shelf Changes: Observations and Modeling, Co-Chair, San Francisco, CA, USA. (December 14, 2009 - December 15, 2009).

NASA review panel, Extramural Funding Reviewer. (September 2009).

NSF review panel, Extramural Funding Reviewer. (April 2008).

Attended annual UCAR meeting as a guest of Gudrun Magnusdottir. (October 2007).

IGS International Symposium on Ice and Water Interactions, Session chair. (July 2004).

Professional Development

Workshop, "Information Session - Academic Personnel Review Process," UCI, Irvine, CA. (May 20, 2010).

Workshop, "Faculty Teaching Academy," UCI Teaching, Learning & Technology Center, Irvine, CA. (September 11, 2007 - September 12, 2007).

TEACHING

Teaching Interests

I am interested in helping students gain perspective of the Earth system. A related interest is helping students acquire quantitative skills for investigating Earth system science problems.

Doctoral Committee

March 14, 2007, M Taber, Member

Doctoral Candidacy Committee

July 2008 - Present, Daniel "Seneca" Lindsey, Advisor
Incoming ESS graduate student who has started as a summer researcher (Summer, 2008), and enrolled officially in the ESS Ph.D. program in Fall, 2008.
June 14, 2010, Yun Xu, Member
October 22, 2009, Yi-Hui Wang, Member
April 27, 2008, Diane Livio, Member

Undergraduate Research Supervision

June 2009 - December 2009, Nathaniel Chaney, Advisor
I serve as Nathaniel's REU advisor in the summer of 2009; he presented his work at the 2009 Fall AGU meeting
June 2008 - March 2009, Katherine Davis, Advisor
I served as Katherine's REU advisor during the 2008 Summer REU program at UCI. I also served as her "remote" undergraduate thesis advisor. She defended her thesis in March, 2009.

SERVICE

Department Service

Member, Kathe Todd-Brown Advancement Committee. (January 2010 - Present).

Member, ESS "Greenplanet" Computer Committee. (September 2008 - Present).

Member, Graduate Comprehensive Exam Committee. (June 30, 2008 - Present).

Member, ESS Graduate Admissions Committee. (January 2008 - Present).

Member, Yun Xu Advancement Committee. (April 2, 2010 - June 14, 2010).

Gave a lecture on cryospheric research for ESS 191 "Research for Undergraduates" course. (November 2009).

Member, Yi-Hui Wang Advancement Committee. (September 4, 2009 - October 22, 2009).

Guest Lecturer, ESS 25. (November 13, 2008).

Gave a lecture on cryospheric research for ESS 191 "Research for Undergraduates" course. (October 2008).

Contributed >\$7k of Start-up Funds toward ESS video-conferencing equipment. (June 2008).

Guest Speaker, Presentation for NSF-sponsored UCI STEM Day. (April 2008).

Judge, ESS/IGPP Symposium. (December 2007).

Gave a lecture on cryospheric research for ESS 199 "Research for Undergraduates" course. (October 2007).

Guest Lecturer, US 13A. (October 30, 2007).

Public Service

Guest Speaker, UCI Summer Science Institute, Irvine, CA. (August 3, 2010).

Judge, Southern California Junior Science and Humanities Symposium, Irvine, CA. (March 2008).