Date: May 2022

I. PERSONAL

Alden C. Adolph
St. Olaf College
Department of Physics
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II. EDUCATION

Ph.D. in Engineering Sciences, Dartmouth College *June 2017*
Advisor: Dr. Mary Albert, Thesis: *Snow and Firn: Impacts of Microscale Properties on Macroscale Climate Indicators*
B.E. in Engineering Sciences, Dartmouth College *June 2012*
Concentration in Mechanical Engineering
B.A. in Engineering Sciences, Dartmouth College *June 2011*

Areas of Expertise: snow physics, field and laboratory measurements, remote sensing of surface temperature, cyrospheric sciences

III. EMPLOYMENT AND TEACHING EXPERIENCE

Employment

Asisstant Professor, Physics Department, St. Olaf College *2017 - Present*
Director, Engineering Studies Concentration, St. Olaf College *2020 - Present*
Graduate Research Assistant, Dartmouth College *2012 - 2017*
National Science Foundation Graduate Research Fellow *2014 - 2017*
Joint Science Education Project Fellow *2015 - 2016*
Integrative Graduate Education and Research Trainee Fellow *2013 - 2014*
Marc G. Fragge Thayer School of Engineering Fellow *2012 - 2013*

Courses Taught at St. Olaf College

- Engineering Thermodynamics — *Fall 2020, Spring 2022*
- Introduction to Engineering Design — *Interim 2019-2022*
- Materials Engineering — *Fall 2017-2021*
- Principles of Physics I — *Fall 2017-2021*
- Principles of Physics I Laboratory — *Fall 2017, 2019*
- Principles of Physics II Laboratory — *Spring 2021*
- Analytical Physics II — *Spring 2018-2021*
- Analytical Physics II Laboratory — *Spring 2019-2020*
- Directed Undergraduate Research — *Spring 2018, 2019*

· Modern Physics Laboratory *Spring 2018*

IV. SCHOLARLY WORK

Peer-reviewed Publications

***Italics indicate undergradute co-author.*

9. Beall, E., **A.C. Adolph**, C. Hinnerichs, M. Schmidt *L. Askegaard*, *J. Berkesch*. "Principles and test methods of non-contact body thermometry" *Journal of Biomedical Optics* (in prep.)
8. *Zikan, K.*, **A.C. Adolph**, *W. Brown*, and R. Fausto. "Comparison of MODIS Surface Temperatures to In-situ Measurements on the Greenland Ice Sheet from 2014-2017." *Jounral of Glaciology* (accepted pending minor revisions)
7. Schneider, A., M. Flanner, R.D. Roo, **A.C. Adolph**. "Monitoring of Snow Surface Near-Infrared Bidirectional Reflectance Factors with Added Light Absorbing Impurities." The Cyrosphere. The Cyrosphere, 13, 1753-1766 (2019): doi:10.5194/tc-13-1753-2019
6. **Adolph, A.C.**, Albert, M.R., and Hall, D.K. "Near-surface temperature inversion during summer at Summit, Greenland, and its relation to MODIS-derived surface temperatures." The Cryosphere, 12, 907-920 (2018): doi: 10.5194/tc-12-907-2018
5. **Adolph, A.C.**, M.R. Albert, J. Lazarcik, J. Dibb, J. Amante, and *A. Price*. "Dominance of grain size impacts on seasonal snow albedo at deforested sites in New Hampshire." Journal of Geophysical Research: Atmospheres 122 (2017): 121-139, doi:10.1002/2016JD025362
4. Lazarcik, J., J.E. Dibb, **A.C. Adolph**, J.M. Amante, C.P. Wake, E. Scheuer, M.M. Mineau, and M.R. Albert. "Major fraction of black carbon is flushed from the melting New Hampshire snowpack nearly as quickly as soluble impurities." Journal of Geophysical Research: Atmospheres 122 (2017): 537-553, doi:10.1002/2016JD025351
3. Contosta, A., **A.C. Adolph**, D. Burchsted, E. Burakowski, M. Green, D. Guerra, M. Albert, J. Dibb, M. Martin, W. H. McDowell, M. Routhier, C. Wake, R. Whitaker, and W. Wollheim. "A longer vernal window: the role of winter coldness and snowpack in driving spring transitions and lags." Global Change Biology 23 (2017): 1610-1625, doi:10.1111/gcb.13517
2. **Adolph, A.C.**, and M.R. Albert. "Gas diffusivity and permeability through the firn column at Summit, Greenland: measurements and comparison to microstructural properties." The Cryosphere 8.1 (2014): 319-328, doi:10.5194/tc-8-319-2014
1. **Adolph, A.C.**, and M.R. Albert. "An improved technique to measure firn diffusivity." International Journal of Heat and Mass Transfer 61 (2013): 598-604

Conference Proceedings

· *Cameron, J., J. Rebollar, M. Krieg, P. Larson, E. Haisa*, and **A. Adolph**. "Impacts of Snow Grain Size and Liquid Water Content on Albedo: Field Studies in Minnesota." Western Snow Conference (in prep.)

· *Krieg, M., P. Larson, Cameron, J., J. Rebollar, K. Devgun*, and **A. Adolph**. "Investigations of Light Absorbing Impurities in a Rural Minnesota Snowpack." Western Snow

Conference (in prep.)

- Ray, L.E., **A.C. Adolph**, A. Morlock, B. Walker, M.R. Albert, J. H. Lever, and J. Dibb. "Autonomous rover for polar science support and remote sensing." IGARSS (2014): 4101-4104

Oral Conference Presentations

- *Zikan, K., W. Brown*, **A. Adolph**, and R. Fausto. December 2020. Comparison of MODIS Surface Temperatures to In-situ Measurements across the Ablation Zone of the Greenland Ice Sheet. AGU Fall Meeting, Virtual.
- **Adolph, A.**, M.R. Albert, J. Dibb, J. Amante, J. Lazarcik, and A. Price. August 24, 2016. Seasonal snow albedo in the northeastern United States: measurement uncertainty and controls on albedo evolution. Workshop on in-situ snow albedo measurements. Finnish Meteorological Institute, Helsinki, Finland.
- **Adolph, A.**, M.R. Albert, J. Amante, and J. Dibb. March 12, 2015. Impacts of sources and paths of snow events on snow structure, chemical impurities, and albedo in New Hampshire. NH EPSCoR Ecosystems and Society All Hands Meeting. University of New Hampshire, Durham, NH.
- **Adolph, A.** and M.R. Albert. 2013. Gas Diffusivity and Permeability of Polar Firn at Summit, Greenland. PIRE Workshop on Firn Processes, La Jolla, CA.
- **Adolph, A.** and M.R. Albert. 2012. Physical properties of firn and their relationship to gas transport. PIRE Workshop on Firn Processes, Giens, France. 2012.

Poster Conference Presentations

- *Cameron, J., J. Rebollar, M. Krieg, P. Larson, E. Haisa*, and **A. Adolph**. April 2022. Impacts of Snow Grain Size and Liquid Water Content on Albedo: Laboratory and Field Studies in Minnesota. Western Snow Conference, Salt Lake City, UT.
- *Krieg, M., P. Larson, Cameron, J., J. Rebollar, K. Devgun*, and **A. Adolph**. April 2022. Investigations of Light Absorbing Impurities in a Rural Minnesota Snowpack. Western Snow Conference, Salt Lake City, UT.
- **Adolph, A.**, M. Albert, J. Dibb, *A. Raduege*, J. Lazarcik, J. Amante, and T. Aoki. July 2019. Comparison of Physically Based Snow Albedo Models to In-Situ Measurements in New Hampshire, USA. IUGG General Assembly, Montreal, Canada.
- *Brown, W., K. Zikan*, **A. Adolph**, and R. Fausto. December 2018. Quantifying Near-Surface Inversions at Sites across the Greenland Ice Sheet. AGU Fall Meeting, Washington, D.C.
- *Zikan, K., W. Brown*, **A. Adolph**, and R. Fausto. December 2018. Validating MODIS Land Surface Temperatures Using In-situ Skin Temperature Data across Greenland. AGU Fall Meeting, Washington, D.C.
- **Adolph, A.**, M.R. Albert, and D.K. Hall. December 2017. Near surface thermal stratification at Summit, Greenland and its relation to MODIS-derived surface temperatures. AGU Fall Meeting, New Orleans, LA.
- **Adolph, A.**, M.R. Albert, J. Lazarcik, J. Dibb, and J. Amante. December 2016. A comparison of the SNICAR model to in-situ snow characterization measurements at sites

in New England, USA. AGU Fall Meeting, San Francisco, CA.

- **Adolph, A.**, M.R. Albert, J. Lazarcik, J. Dibb, J. Amante, and A. Price. December 2015. Impacts of Synoptic Weather Patterns on Snow Albedo at Sites in New England. AGU Fall Meeting, San Francisco, CA.
- Lazarcik, J., J. Dibb, C. Wake, **A. Adolph**, M. Mineau, E. Scheuer, and J. Amante. December 2015. Quantifying Snowpack Properties and Snow Impurity Dynamics Over Three Consecutive Winters in New Hampshire. AGU Fall Meeting, San Francisco, CA.
- Contosta, A.R., **A. Adolph**, D. Burchstead, M. Green, W.H. McDowell and the NH EPSCoR Sensors Team. December 2015. The vernal window flow path: a cascade of ecological transitions delineated at scales from points to pixels. AGU Fall Meeting, San Francisco, CA.
- Kopec, B., X. Feng, **A. Adolph**, R. Virginia, and E. Posmentier. December 2015. From precipitation to ice cores: an isotopic comparison at Summit, Greenland. AGU Fall Meeting, San Francisco, CA.
- **Adolph, A.**, M.R. Albert, J. Lazarcik, J. Dibb, J. Amante, and A. Price. November 2015. Impacts of Synoptic Weather Patterns on Snow Albedo at Sites in New England. NSF EPSCoR National Meeting. Portsmouth, NH.
- **Adolph, A.**, M.R. Albert, K. Outen, Z. Courville, and K. Miles. September 2015. Validation of an optical technique to measure the specific surface area of firn. PIRE Workshop. Grenoble, France.
- Tietjen, J., M.R. Albert and **A. Adolph**. August 2015. Composition changes in snowpack during the melt season near Hanover, NH. UNH Summer STEM Research Symposium. Durham, NH.
- **Adolph, A.**, M.R. Albert, J. Dibb and J. Amante. December 2014. Physical and chemical properties of seasonal snow and the impacts on Albedo in New Hampshire. AGU Fall Meeting, San Francisco, CA.
- **Adolph, A.**, M.R. Albert, J. Dibb and J. Amante. November 2014. Physical and chemical properties of seasonal snow and the impacts on Albedo in New Hampshire. NH EPSCoR Ecosystems and Society All Hands Meeting, Concord, NH.
- Miles, K, **A. Adolph**, and M.R. Albert. August 2014. A new technique for measuring specific surface on firn cores. PIRE Workshop on Ice Core Interpretation. Helsingor, Denmark.
- **Adolph, A.** and M.R. Albert. December 2013. Gas diffusion and physical property investigations for polar firn. AGU Fall Meeting. San Francisco, CA.
- **Adolph, A.** and M.R. Albert. December 2012. Gas diffusion, permeability and microsctrucutral relationships for polar firn. AGU Fall Meeting. San Francisco, CA.
- **Adolph, A**. and M.R. Albert. October 2012. Physical and microsctructural properties of firn and their effects on interstitial gas diffusion. International Partnerships in Ice Core Sciences, Open Science Conference. Giens, France.
- **Adolph, A.** and M.R. Albert. 2012. Gas diffusivity of Polar Firn. Polar Technology Conference. Fairlee, VT.
- **Adolph, A.** and M.R. Albert. December 2011. Gas diffusivity of polar firn. AGU Fall Meeting. San Francisco, CA.

Invited Lectures and Presentations

- **Midwest Interdisciplinary Symposium for Scientific Thought** *April 2021*
  Keynote Speaker, Snow in the Climate System, Snow in the Ecosystem
- **Women in Astronomy and Physics Lecture Series** *September 2020*
  The Role of Snow in Our Changing Climate
- **Grinnell College Physics Seminar Series** *February 2020*
  The Role of Snow in Our Changing Climate
- **Cyrosphere Group, NASA Goddard** *June 2019*
  Use of PROMICE Weather Station Data to Study Near Surface Temperature Inversions and MODIS LST Comparison in Greenland
- **Ice and Climate Course, Middlebury College** *January 2017*
  Guest Lecture: Introduction to Ice Cores and Climate
- **Snow Hydrology Course, University of New Hampshire** *Winter 2014, 2016*
  Guest Lecture: Snow Albedo and Snow Grain Size

Grants

- **NSF CAREER Award**, Arctic Natural Sciences Program *2022-2027*
  CAREER: Quantifying the Effects of Liquid Water Content on the Spectral Albedo of Snow
- **St. Olaf Magnus the Good Collaborative Fellowship** *2020-2021*
  Determining Controls on Snow Albedo Evolution in Minnesota
  Co-authored proposal with students Kavya Devgun and Elvis Haisa
- **St. Olaf Professional Development Grant** *2019-2020*
  Analysis of Surface Temperature of the Greenland Ice Sheet
- **St. Olaf To Include is To Excel Grant**, co-authored with Jay Demas *2019-2021*
  Promoting Inclusion in the Physics Classroom: Developing a Streamlined Process for Creation of Web-Based Video Content

Honors and Awards

- **Cassling Award for Faculty Innovation** *August 2020*
  Awarded for innovative teaching, especially in rapid transition to remote learning.
- **Charles F. and Ruth D. Goodrich Prize** *Jun. 2017*
  Awarded in recognition of outstanding achievement with special emphasis on academic achievement.
- **John C. Woodhouse Environmental Engineering Prize** *Jun. 2017*
  Awarded annually to a student in recognition of outstanding work in the field of environmental study or research at Thayer School.
- **Thayer School Dean's Service Award** *Jun. 2016*
  Awarded to a student who has made an exceptional contribution to Thayer School, Dartmouth College, or the broader world

Professional Memberships and Activities

- **American Geophysical Union**, Member *2012 - Present*

- **European Geophysical Union**, Member *2018 - Present*
- **American Society for Engineering Education**, Member *2020 - Present*
- **Journal Reviewer**, *The Cryosphere, Journal of Glaciology, Cold Regions Science and Technology, Remote Sensing*
- **Proposal Reviewer**, *National Science Foundation, NASA Review Panel, Swiss National Science Foundation, U.S. Army Engineer Research and Development Center (ERDC)*

Workshop Attendance and Professional Development

- **Online Learning Community for New Physics Faculty** *Fall 2019 - Spring 2020*
  Organizer: American Association of Physics Teachers
- **New Faculty Workshop** *June 2019*
  Organizer: American Association of Physics Teachers, College Park, MD
- **Facilitating increased engagement between the research communities of Greenland and the U.S.** *August 2018*
  Organizer: National Science Foundation, Nuuk, Greenland
- **Early Career Faculty Workshop** *July 2018*
  Organizer: Midstates Consortium for Math and Science, St. Peter, MN

Student Research Supervision, St. Olaf College

- Jazline Rebollar, McNair Scholars Program *2021 - Present*
- Meghan Krieg, CURI and Thomas Environmental Research Scholar *2021 - Present*
- Josh Cameron, CURI and Thomas Environmental Research Scholar *2021 - Present*
- Peter Larson, CURI and Thomas Environmental Research Scholar *2020 - Present*
- Jiayi Wang, CURI *2020-2021*
- Samip Karki, McNair Scholars Program *2020-2021*
- Kavya Devgun, CURI and Directed Undergraduate Research *2019 - 2021*
- Elvis Haisa, CURI and Directed Undergraduate Research *2019 - 2021*
- Karina Zikan, CURI and Thomas Environmental Research Scholar *2018 - 2020*
- Hannah Chapman-Dutton, Independent Research *Fall 2020*
- Wesley Brown, CURI and Thomas Environmental Research Scholar *2018 - 2019*
- Isaiah Scharen, Directed Undergraduate Research *Spring 2019*
- Ian Roback, Independent Research *Fall 2018*
- Andreas Raduege, Directed Undergraduate Research *Spring 2018*
- Skylar Whitcomb, Directed Undergraduate Research *Spring 2018*
- Trevor Stewart, Directed Undergraduate Research *Spring 2018*
- Caitlin Glennon, Directed Undergraduate Research *Spring 2018*
- William Gustafson, Directed Undergraduate Research *Spring 2018*
- Hannah Tomlinson, Directed Undergraduate Research *Spring 2018*

Student Research Assistant Supervision, Dartmouth College

- Amanda Zhou, Women in Science Program *Winter and Spring 2016*
- Kiana Outen, Sophomore Scholars Program *Summer 2015*

- John Tietjen, NH EPSCoR Research Experience for Teachers *Summer 2015*
- Krystyna Miles, Sophomore Scholars Program *2014*
- Andrea Price, Junior Scholars Program *Winter 2015*
- Beth Bloom, Women in Science Program *Winter and Spring 2015*
- Cecilia Robinson, Women in Science Program *2013-2014*

V. COLLEGE AND COMMUNITY

St. Olaf Physics Department Service

- Physics TEAM-UP Implementation Committee, *Member* *Fall 2020 - Present*
- Society of Women in Physics, *Faculty Advisor* *Fall 2019 - Present*
- Faculty Search Committees, *Member* *Fall 2019, Spring 2022*
- Society of Physics Students, *Faculty Advisor* *2017-2018*
- Physics Stockroom Technician Search Committee, *Member* *2018, 2020*

St. Olaf College Service

- **St. Olaf Diversity, Equity and Inclusion Symposium**, *Co-Presenter* *May 2022*
  Flippin' physics: how we stopped worrying about course coverage and learned to love community and quizzes
- **Chemistry Tenure-Track Search Committee**, *Member* *Fall 2021*
- **NetVUE Community of Practice**, *Participant* *2020*
  Exploring Vocation in CURI
- **CILA Workshop Series on Creativity Collaboration**, *Co-presenter* *March 2020*
  Implementing Prototyping and Design Thinking In the Classroom
- **Environmental Engineering Club**, *Faculty Advisor* *2018-2021*
- **St. Olaf Teaching and Technology Showcase**, *Co-Presenter with Student* *2018*
  Methodology for Detecting Snowmelt using UAV Structure from Motion Photogrammetry
- **Geospatial Instructional Technologist Search Committee**, *Member* *2018*
- **Admissions Events**
  Admitted Students Group Discussion Leader *2019, 2020, 2022*
  Spring Break Series Faculty Panel *March 2019*
  Admitted Student Days FNSM Panel *April 2019, 2020*

Polar Outreach Activities

- **Joint Science Education Project** *2013, 2015, 2020*
  Led a group of 15 high school students from Greenland, Denmark and the US in field course in Greenland to discover polar sciences. Note: Program was virtual in 2020.
- **Classroom and Community Lectures and Activities**
  Citizens Climate Lobby, Northfield, MN *October 2021*
  Conversations on the Wonders of Science, Northfield, MN *January 2020*
  The Expedition School, Hillsborough, NC *September 2019*
  St. Olaf OUTS Group, Northfield, MN *November 2017*
  Dartmouth Great Issues Scholars Lecture Series, Hanover, NH *2013-2017*

Rutland High School, Rutland, VT *June 2016, 2017*
Montshire Museum of Science, Norwich, VT *May, November 2016*
Design it! Build it! Dartmouth Engineering Camp, Hanover, NH *2014, 2016*
Lyme Elementary School, Lyme, NH *October 2016*
Richmond Middle School, Hanover, NH *April 2016*
Rivendell Academy, Orford, NH *March 2015*
Newport Middle School, Newport, NH *March 2015*
Marion Cross Elementary School, Norwich, VT *February 2015*
Dartmouth Science Pub, Lebanon, NH *October 2013*

· **Science Education Conference Presentations**

National Science Teachers Association Web Seminar, *Co-Presenter* *April 2015*
New Hampshire Science Teachers Association Meeting, *Co-Presenter* *December 2014*
USA Science and Engineering Festival, *Exhibit Co-Presenter* *April 2014*
National Science Teachers Association Meeting, *Exhibit Co-Presenter* *April 2012*

General STEM Enrichment

· **Women in Astronomy and Physics Lecture Series** *August 2020 - Present*
Work as co-coordinator with leadership team from University of Minnesota, SUNY Albany, and Rensslaer Polytechnic Institute to organize monthly virtual lecture series.

· **St. Olaf Hands-On Experiments in Physics and Engineering** *March-April 2022*
Work with Dr. Eric Hazlett to coordinate student particpants and lead physics demonstrates in K-12 classrooms at Greenvale Park Elementary School

· **After School Science and Engineering** *2011-2017*
Coordinate and conduct weekly hands-on science and engineering projects for elementary school students