

**Claire Pettersen**  
2455 Hayward Street  
Ann Arbor, Michigan 48103, USA  
608.772.6270  
pettersc@umich.edu

## Education

<b>PhD Atmospheric and Oceanic Sciences</b> University of Wisconsin, Madison <i>Dissertation: Snowfall over the Central Greenland Ice Sheet</i>	<i>June 2014 – Dec 2017</i>
<b>MS Atmospheric and Oceanic Sciences</b> University of Wisconsin, Madison	<i>Sept 2011 – May 2014</i>
<b>MS Materials Science and Engineering</b> University of Wisconsin, Madison	<i>Sept 2001 – May 2004</i>
<b>BA Physics and Astronomy</b> Carleton College	<i>Sept 1996 – June 2000</i>

## Experience

**University of Michigan (Ann Arbor, Michigan, USA):**

**Climate and Space Sciences and Engineering**

**Assistant Professor** *2022 – Present*

- \* Examine cloud and precipitation processes using radar and radiometer (ground-based, satellite)
- \* Principal Investigator for NASA, NOAA, and NSF agency grants
- \* Instrument Mentor of the Precipitation Imaging Package instrument for NASA Ground Validation

**University of Cologne (Cologne, Germany):**

**Arctic Amplification (AC)<sup>3</sup> Project**

**Mercator Fellow** *2023 – Present*

**University of Wisconsin-Madison (Madison, Wisconsin, USA):**

**Atmospheric and Oceanic Sciences**

**Adjunct Assistant Professor** *2022 – Present*

**Space Science and Engineering Center**

**Honorary Fellow** *2022 – Present*

**University of Wisconsin-Madison (Madison, Wisconsin, USA):**

**Space Science and Engineering Center**

**Instrumentation Innovator** *2018 – 2022*

**Associate Instrumentation Innovator** *2013 – 2018*

**Assistant Instrumentation Innovator** *2009 – 2013*

- \* Co-Investigator of the CIMSS Lake Effect Snow study for NOAA GOES-16
- \* Significant involvement in instrumentation and science for NSF ICECAPS project in Greenland
- \* Instrument lead and scientist for NSF high-latitude snowfall study in Norway and Sweden
- \* Integral part of the initial testing team for the climate-observing system CLARREO
- \* Field and science support for the Scanning High-Resolution Interferometer Sounder

**Project IceCube**

**Engineer and Winterover Experiments Researcher** *2004 – 2009*

- \* Managed, performed analysis of, and oversaw testing of all optical modules at UW site
- \* Operated and maintained the IceCube and AMANDA detectors at the South Pole Station
- \* Participated in drilling and deployment activities during the Antarctic Summer season

## Research

### Active Awarded Grants

- \* **NASA Future Investigators in Earth Science (PI Pettersen, FI Richter)** – Leveraging Global Precipitation Measurement Mission Assets to Evaluate Atmospheric River Snowfall Properties, \$150,000, 2024-2027
- \* **NSF AGS FIRP (PI Pettersen, Lead)** – Collaborative Research: AGS-FIRP Track 3: Snow Sensitivity to Clouds in a Mountain Environment (S<sup>2</sup>noCliME), \$4.8M (\$1.8M to UM), 2024-2027
- \* **NASA Earth-Venture Instrument (PI Bennartz, Co-I Pettersen, UM Lead)** – Polarized Submillimeter Ice-cloud Radiometer, \$33M (\$1.1M to UM), 2023-2030
- \* **NOAA CPO (PI Pettersen)** – A Pacific-North American blocking database: Assessment of precipitation, synoptic, and tropical precursor properties, \$517,832 (\$213,000 to UM), 2023-2026
- \* **NSF ICECAPS-MELT (PI Pettersen)** – Collaborative Research: NSFGE0-NERC: The Integrated Characterization of Energy, Clouds, Atmospheric State, and Precipitation at Summit: Measurements along Lagrangian Transects, \$1,009,000 (\$415,951 to UM), 2022-2024
- \* **NASA PMM Science Team 2021 (PI Pettersen)** – High-latitude precipitation characteristics during atmospheric river events utilizing GPM and ground-based observations, \$432,947, 2022-2025
- \* **NASA New (Early Career) Investigator Program (PI Pettersen)** – Leveraging enhanced imaging with ground validation observations to aid global snow remote sensing, \$379,529, 2022-2025
- \* **NOAA WPO Observations (PI Pettersen)** – High-impact Observations for Enhancing Great Lakes Snowfall Forecasting, \$557,260 (\$225,000 to UM), 2021-2025

### Completed Awarded Grants

- \* **NOAA WPO Observations (PI Wood, Co-I Pettersen)** – Particle Imaging and Ceilometer Observations for Snowfall Properties and Blizzard Parameters, \$457,635, 2021-2024
- \* **SSEC 2022 (PI Pettersen)** – Precipitation Imaging Package (PIP) Instrument Development, \$95,792, 2019-2024
- \* **SSEC 2022 (PI Pettersen)** – Augmenting Microphysical Remote Sensing Mixed-phase Capabilities for Precipitation Process Studies, \$89,000, 2021-2023
- \* **NASA Future Investigators in Earth Science (PI L'Ecuyer, Science Co-PI Pettersen, FI Shates)** – Characterizing Precipitation Structure and Processes in the Satellite Radar Blind Zone, \$135,000, 2021-2023
- \* **NASA PMM Science Team 2018 (PI Pettersen)** – Leveraging GPM and Ground-Based Measurements to Examine High-Latitude Extreme Precipitation, \$323,850, 2019-2023
- \* **NASA GPM Ground Validation (PI Pettersen)** – Marquette, Michigan Instrument Suite: Deployment, Maintenance, and Analysis, \$146,200, 2018-2023
- \* **NASA Michigan Technological University Subaward (PI Pettersen)** – Snowfall in the GPM Era: Assessing GPM Snowfall and Ice Microphysical Retrievals Using Independent Spaceborne and Ground-Based Observations, \$44,192, 2019-2020
- \* **NOAA CIMSS (PI L'Ecuyer, Co-I Pettersen)** – An Enhanced Lake-Effect Snow Nowcasting Tool Using Synergistic GOES-R, NEXRAD, and Ground-Based Snowfall Microphysics Observations, \$281,852, 2017-2021
- \* **NASA PMM Science Team 2015 (PI Wood, Co-I Pettersen)** – Assessing precipitation microphysical structure aloft using cold-season ground validation observations, \$286,932, 2016-2019

### Pending Competitive Grants

- \* *None at this time*

### Field Work – Ground-based and Airborne Campaigns

- \* **NSF S<sup>2</sup>noCliME Field Campaign, Steamboat Springs, CO** – Lead PI 2024 – 2025
- \* **NASA Lake Effect Snow Suite, Marquette, MI** – PI, Co-I, and Instrument Lead 2014 – present
- \* **NOAA Enhanced snow suite deployments, Gaylord, MI; Buffalo, NY** – PI 2021 – 2024
- \* **NASA Pluvio Deployment, Marquette, MI** – PI and Instrument Lead (Nov, April) 2017 – 2020
- \* **NSF High-Latitude Snow Suite, Norway** – Instrument Lead (Oct, June) 2016 – 2018

* NOAA GOES16 CalVal ER2, Armstrong – SHIS Science Support (March)	2017
* NASA SNPP CalVal ER2, Iceland – SHIS Science Support (March)	2015
* NASA HS3 Global Hawk, Wallops – SHIS Science Support (July – Sep)	2012 – 2014
* NASA SNPP CalVal ER2, Armstrong – SHIS Science Support (May)	2013
* NSF ICECAPS Winter Over – Instrument Technician (Feb – May)	2012
* NSF IceCube DOM Deployment – Instrument Lead (Nov – Dec)	2005 – 2009
* NSF IceCube Winter Over – Instrument Technician (Feb – Nov)	2006 – 2007

## Teaching and Mentoring

* <b>Instructor</b> – University of Michigan, Climate and Space Sciences and Engineering (CLaSP)	
* <b>CLIMATE/SPACE/EARTH 321: Earth and Space System Dynamics</b>	
* Winter 2024, Winter 2026 (planned)	
* <b>CLIMATE/SPACE/EARTH 380/381: Radiative Transfer</b>	
* Fall 2023, Fall 2025 (planned)	
* <b>CLIMATE/EARTH 411: Cloud and Precipitation Processes</b>	
* Winter 2022, Winter 2023, Fall 2024,	
* <b>CLIMATE/SPACE 749: Seminar Series</b>	
* Fall 2022, Winter 2023	
* <b>Instructor</b> – University of Wisconsin, Department of Atmospheric and Oceanic Sciences (AOS)	
* <b>AOS 340: Physics of the Atmosphere and Ocean II</b>	
* Spring 2021	
* <b>Guest Lecturer</b> – University of Wisconsin, Department of Atmospheric and Oceanic Sciences	
* AOS 453: <i>Synoptic Lab II: Mesoscale Meteorology</i>	2021
* AOS 660: <i>Introduction to Physical Oceanography</i>	2020
* AOS 640: <i>Radiation in the Atmosphere and Ocean</i>	2018
* AOS 425: <i>Global Climate Processes</i>	2017, 2018
* AOS 340: <i>Physics of the Atmosphere and Ocean II</i>	2015, 2016, 2017
* <b>MS Advisees</b>	
* Julia Shates (UW, Department of Atmospheric and Ocean Sciences)	2017 – 2019
* Jon Delpizzo (UM, Climate and Space Sciences and Engineering)	2022 – 2023
* McKenzie Peters (UI, Department of Atmospheric Science)	2022 – 2024
* <b>PhD Advisees</b>	
* Julia Shates (UW, Department of Atmospheric and Ocean Sciences)	2019 – 2023
* NASA FINESST Recipient: 2021 – 2023	
* Tristan Rendfrey (UM, Climate and Space Sciences and Engineering)	2021 – present
* Yan Xie (UM, Climate and Space Sciences and Engineering)	2022 – present
* Rackham Pre-Doctoral Fellow: 2024 – 2025	
* Jack Richter (UM, Climate and Space Sciences and Engineering)	2022 – present
* NASA FINESST Recipient: 2024 – 2027	
* Alanna Wedum (UM, Climate and Space Sciences and Engineering)	2022 – present
* Rackham Merit Fellow: 2022 – 2023	
* <b>PhD Committees</b>	
* Yingxiao Zhang (UM, Climate and Space Sciences and Engineering)	2023 – present
* Chloe Wicker (UM, Climate and Space Sciences and Engineering)	2022 – 2023
* Samantha Hartke (UW, Water Resources Engineering and Science)	2021 – 2022

## Computer and Instrumentation Expertise

- \* Operating Systems: Windows, Apple, Unix, Linux
- \* Programming: python (*primary*), IDL, Fortran, MatLab, LabView (*limited experience*)
- \* Applications: LabView, Sigma Plot, Mathematica, Microsoft Office Suite (Word, Excel, PPT)
- \* Instrumentation: radars, passive microwave, passive infrared, lidar, radiosonde, in-situ snow cameras, optical and video disdrometers, snow accumulation, meteorological equipment

- \* Analytical Equipment: Electron Microprobe with Wavelength Dispersive Spectroscopy, Transmission Electron Microscope with Energy Dispersive Spectroscopy, Scanning Electron Microscope
- \* Hardware: Soldering, cable repair, analogue systems, NIM logic, waveguide systems, and basic mechanical, electrical, and thermal system experience/knowledge

## **Professional Service**

### **Journals**

- \* JGR: Atmospheres **Associate Editor** 2022 – present
- \* MPDI journal article reviewer 2020 – present
- \* AGU journal article reviewer 2019 – present
- \* Elsevier journal article reviewer 2018 – present
- \* EGU journal article reviewer 2018 – present
- \* IEEE journal article reviewer 2018 – present
- \* AMS journal article reviewer 2017 – present

### **Proposals Panels**

- \* NASA grant proposal panelist 2017 – present
- \* DOE grant proposal panelist 2020 – present
- \* NSF grant proposal panelist / reviewer 2021 – present
- \* NOAA grant proposal panelist / reviewer 2023 – present

### **Conference Session Convener**

- \* AMS Polar Meteorology and Climatology 2019 – present
- \* GPM Ground Validation Conference 2020, 2023
- \* AMS Cloud Physics and Radiation 2018, 2022
- \* AMS Annual Meeting 2017 – present
- \* AGU Annual Meeting 2016 – present
- \* AMS Radars 2015, 2017

### **Committees**

- \* CLaSP Curriculum Committee 2024 – present
- \* CLaSP Graduate Admissions Committee 2023 – present
- \* AMS Polar Meteorology and Climatology Conference Organizing Committee *co-Chair* 2020 – present
- \* AMS Polar Meteorology and Climatology Conference Organizing Committee *co-Chair* 2023 – present
- \* NASA GPM Particle Size Distribution Working Group (*co-Chair*) 2019 – present
- \* CLaSP JEDI (Justice Equity Diversity Inclusion) Committee 2022 – 2024
- \* AMS Radars 2021 Conference PSD Subcommittee 2020 – 2021
- \* NASA GPM Ground Validation Conference Organizer (*co-Chair*) 2020, 2023
- \* AOS Polar Faculty Hiring Committee 2019 – 2020
- \* AOSS Poster Reception, Instigator and Organizer 2011 – 2019
- \* SSEC Equity and Diversity Committee 2010 – 2019
- \* *Chair* 2012 – 2016
- \* UW AOS Colloquium Committee 2014 – 2018

## **Awards**

- \* German Mercator Fellow – University of Cologne for (AC)<sup>3</sup> 2023
- \* NASA New (Early Career) Investigator Award 2021
- \* NASA PMM Annual Science Team Award (*co-recipient*) 2019
- \* UW Atmospheric and Oceanic Sciences: Recognition of Contributions 2018
- \* Women in Science and Engineering Leadership Institute Grants 2015, 2016
- \* NASA Group Achievement Award: HS3 Campaign 2015
- \* AOS Excellence Award: Colloquium Student Service Award 2015
- \* IceCube Neutrino Observatory: Service Award 2009
- \* Antarctic Service Medal, Wintered Over Distinction 2007
- \* Sigma Xi Scientific Honor Society 2000

## **Publications and Datasets** (♦denotes student mentees; \*denotes researcher mentees)

### **Submitted or In Review**

- 42 Anderson, J., Connelly, R. and 10 others (including **Pettersen, C.**): Exploring the Seasonality of Lake Enhanced Snow Events Across Michigan's Upper Peninsula, **Weather and Forecasting**, *submitted*
- 41 Hallar, A.G., McCubbin, I.B., and 16 others (including **Pettersen, C.**): Storm Peak Laboratory: A Research and Training Facility for the Atmospheric Sciences, **Bulletin of the American Meteorological Society**, *in review*
- 40 Rendfrey, T.S.♦, Bassis, J.N., **Pettersen, C.**: Do events of enhanced atmospheric moisture transport trigger tabular iceberg calving?, **Journal of Glaciology**, *in revisions*
- 39 King, F.\*, **Pettersen, C.**, Dolan, B., Shates, J.A., and Posselt, D.: Primary Modes of Northern Hemisphere Snowfall Particle Size Distributions, **Journal of the Atmospheric Sciences**, *in revisions*
- 38 Shates, J.A.♦, **Pettersen, C.**, L'Ecuyer, T.S., and Kulie, M.S.: Ground-based radar perspectives on the satellite radar blind zone at the North Slope of Alaska, **JGR: Atmospheres**, *in revisions*

### **2024**

- 37 Xie, Y.♦, **Pettersen, C.**, Flanner, M., and Shates, J.A.: Ground-observed snow albedo changes during rain-on-snow events in northern Alaska, **JGR: Atmospheres**, *in revisions*
- 36 Mateling, M.E.\*, **Pettersen, C.**, Mattingly, K.S., and Ringerud, S.: Merged and Gridded GPM and Atmospheric River Data Product, **Earth and Space Science**, 2024, doi: 10.1029/2023EA003333
- 35 King, F.\*, **Pettersen, C.**, and 20 others: A Comprehensive Northern Hemisphere Particle Microphysics Dataset from the Precipitation Imaging Package, **Earth and Space Science**, 2024, doi: 10.1029/2024EA003538
- 34 King, F.\*, **Pettersen, C.**, Fletcher, C.G., and Geiss, A.: Development of a full-scale connected U-Net for reflectivity inpainting in spaceborne radar blind zones, **Artificial Intelligence for the Earth Systems**, 2024, doi: 10.1175/AIES-D-23-0063.1
- 33 Rendfrey, T.S.♦, **Pettersen, C.**, Bassis, J.N., and Mateling, M.E.: CloudSat observations reveal enhanced moisture transport events increase snowfall rate and frequency over Antarctic ice sheet basins, **JGR: Atmospheres**, 2024, doi: 10.1029/2023JD040556
- 32 Zhang, Y., Subba, T., Matthews, B.H., **Pettersen, C.**, Brooks, S.D., and Steiner, A.L.: Effects of pollen on hydrometeors and precipitation in a convective system, **JGR: Atmospheres**, 2024, doi: 10.1029/2023JD039891

### **2023**

- 31 Ward, J.L., Payne, A.E., and **Pettersen, C.**: Present-Day Regional Antarctic Sea Ice Response to Extratropical Cyclone Activity, **JGR: Atmospheres**, *accepted*
- 30 Mateling, M.E.\*, **Pettersen, C.**, Kulie, M.S., and L'Ecuyer, T.S.: Marine Cold-Air Outbreak Snowfall in the North Atlantic: A CloudSat Perspective, **JGR: Atmospheres**, 2023, doi: 10.1029/2022JD038053
- 29 Shates, J.A.♦, **Pettersen, C.**, L'Ecuyer, T.S., and Kulie, M.S.: Multi-year analysis of precipitation phase transition height at Marquette, Michigan, **JGR: Atmospheres**, 2023, doi: 10.1029/2022JD037132

### **2022**

- 28 Helms, C.N., Munchak, S.J., Tokay, A., and **Pettersen, C.**: A Comparative Evaluation of Snowflake Particle Size and Shape Estimation Techniques used by the Precipitation Imaging Package (PIP), Multi-Angle Snowflake Camera (MASC), and Two-Dimensional Video Disdrometer (2DVD), **Atmospheric Measurement Techniques**, 2022, doi: 10.5194/amt-15-6545-2022
- 27 King, F.\*, Duffy, G., Milani, L., Fletcher, C.G., **Pettersen, C.**, and Ebell, K.: DeepPrecip: A deep neural network for precipitation retrievals, **Atmospheric Measurement Techniques**, 2022, doi: 10.5194/amt-15-6035-2022
- 26 Cooper, S.J., L'Ecuyer, T.S. and 12 others (including **Pettersen, C.**): Exploring Snowfall Variability through the High-Latitude Measurement of Snowfall (HiLaMS) Field Campaign, **Bulletin of the American Meteorological Society**, 2022, doi: 10.1175/BAMS-D-21-0007.1

- 25 Pettersen, C.**, Henderson, S.A., Mattingly, K.S., Bennartz, R., and Breeden, M.L.: The Critical Role of Euro-Atlantic Blocking in Promoting Precipitation in Central Greenland, **JGR: Atmospheres**, 2022, doi: 10.1029/2021JD035776
- 24 Tokay, A.**, von Lerber, A., **Pettersen, C.**, Kulie, M.S., Moisseev, D.N., and Wolff, D.B.: Retrieval of Snow Water Equivalent by Precipitation Imaging Package (PIP) over Northern Great Lakes, **Journal of Oceanic and Atmospheric Technology**, 2022, doi: 10.1175/JTECH-D-20-0216.1
- 2021**
- 23 Guy, H.**, Brooks I.M. and 10 others (including **Pettersen, C.**): Controls on surface aerosol number concentrations and aerosol limited cloud regimes over the central Greenland Ice Sheet, **The Cryosphere**, 2021, doi: 10.5194/acp-21-15351-2021
- 22 Mateling, M.E.\***, **Pettersen, C.**, Kulie, M.S., Mattingly, K.S., Henderson, S.A., and L'Ecuyer, T.S.: The influence of atmospheric rivers on cold-season precipitation in the upper Great Lakes region, **JGR: Atmospheres**, 2021, doi: 10.1029/2021JD034754
- 21 Shates, J.♦**, **Pettersen, C.**, L'Ecuyer, T.S., Cooper, S.J., Kulie, M.S., and Wood, N.B.: High-latitude precipitation: Snowfall regimes at two distinct sites in Scandinavia, **Journal of Applied Meteorology and Climatology**, 2021, doi: 10.1175/JAMC-D-20-0248.1
- 20 Pettersen, C.**, Bliven, L.F., Kulie, M.S., Wood, N.B., Shates, J., Mateling, M.E., Petersen, W.A., Ritzman, J., von Lerber, A., and Wolff, D.B.: The Precipitation Imaging Package: Phase partitioning capabilities, **Remote Sensing**, 2021, doi: 10.3390/rs13112183
- 19 Kulie, M.S.**, **Pettersen C.**, and 17 others: "Snowfall regimes in the Upper Great Lakes: Lessons learned from a multi-sensor snowfall observatory", **Bulletin of the American Meteorological Society**, 2021, doi: 10.1175/BAMS-D-19-0128.1
- 18 Butterworth, B.J.**, Desai, A.R. and 25 others (including **Pettersen, C.**): "Connecting Land-Atmosphere Interactions to Surface Heterogeneity in CHEESEHEAD 2019", **Bulletin of the American Meteorological Society**, 2021, doi: 10.1175/BAMS-D-19-0346.1
- 2020**
- 17 McIlhattan, E.A.♦**, **Pettersen, C.**, Wood, N.B., and L'Ecuyer, T.S.: Satellite Observations of Snowfall Regimes over the Greenland Ice Sheet, **The Cryosphere**, 2020, doi: 10.5194/tc-2019-223
- 16 Pettersen, C.**, Bliven, L.F., von Lerber, A., Wood, N.B., Kulie, M.S., Mateling, M.E., Moisseev, D.N., Munchak, S.J., Petersen, W.A., and Wolff, D.B.: The Precipitation Imaging Package: Assessment of microphysical and bulk characteristics of snow, **Atmosphere**, 2020, doi: 10.3390/atmos11080785
- 15 Mattingly, K.S.**, Mote, T.L., Fettweis, X., van As, D., Van Tricht, K., Lhermitte, S., **Pettersen, C.**, and Fausto, R.S.: Strong Summer Atmospheric Rivers Trigger Greenland Ice Sheet Melt through Spatially Varying Surface Energy Balance and Cloud Regimes, **Journal of Climate**, 2020, doi: 10.1175/JCLI-D-19-0835.1.
- 14 Pettersen, C.**, Kulie, M.S., Bliven, L.F., Merrelli, A.J., Petersen, W.A., Wagner, T.J., Wolff, D.B., and Wood, N.B.: A composite analysis of snowfall modes from four winter seasons in Marquette, Michigan, **Journal of Applied Meteorology and Climatology**, 2020, doi: 10.1175/JAMC-D-19-0099.1.
- 2019**
- 13 Bennartz, R.**, Fell, F., **Pettersen, C.**, Shupe, M.D., and Schuettmeyer, D.: Spatial and temporal variability of snowfall over Greenland from CloudSat observations, **Atmospheric Chemistry and Physics**, 2019, doi: 10.5194/acp-2018-1045.
- 12 Schirle, C.E.♦**, Cooper, S.J., Wolff, M.A., **Pettersen, C.**, Wood, N.B., L'Ecuyer, T.S., Ilmo, T., Nygård, K.: Estimation of Snowfall Properties at a Mountainous Site in Norway Using Combined Radar and In Situ Microphysical Observations, **Journal of Applied Meteorology and Climatology**, 2019, doi: 10.1175/jamc-d-18-0281.1.
- 2018 and earlier**
- 11 Pettersen, C.**, Bennartz, R., Merrelli, A.J., Shupe, M.D., Turner, D.D., and Walden, V.P.: Precipitation regimes over central Greenland inferred from 5 years of ICECAPS observations, **Atmospheric Chemistry and Physics**, 2018, doi: 10.5194/acp-18-4715-2018.
- 10 Aartsen, M.G.** and 100+ others (including **Pettersen, C.**): The IceCube Neutrino Observatory: instrumentation and online systems, **Journal of Instrumentation**, 2017, doi: 10.1088/1748-0221/12/03/P03012.

- 9 Pettersen, C.**, Bennartz, R., Merrelli, A.J., Shupe, M.D., and Turner, D.D.: Microwave signatures of ice hydrometeors from ground-based observations above Summit, Greenland, **Atmospheric Chemistry and Physics**, 2016, doi: 10.5194/acp-16-4743-2016.
- 8 Best, F.A., Adler, D.P., Pettersen, C., Revercomb, H.E., Gero, P.J., Taylor, J.K., and Knuteson, R.O.:** Results from recent vacuum testing of an on-orbit absolute radiance standard (OARS) intended for the next generation of infrared remote sensing instruments, **SPIE Remote Sensing**, 2014, doi: 10.1117/12.2069338.
- 7 Bennartz, R.B., Shupe, M.D., Turner, D.D., Walden, V.P., Steffen, K., Cox, C.J., Miller, N.B., and Pettersen, C.:** July 2012 Greenland melt extent enhanced by low-level liquid clouds, **Nature**, 2013, doi: 10.1038/nature12002.
- 6 Best, F.A., Adler, D.P., Pettersen C., Revercomb, H.E., Gero, P.J., Taylor, J.K., and Knuteson R.O., Perepezko JH.:** On-orbit absolute radiance standard for the next generation of IR remote sensing instruments, **International Society for Optics and Photonics**, 2012, doi: 10.1364/FTS.2013.FW4D.5.
- 5 Pettersen, C., Best, F.A., Adler, D.P., Revercomb, H.E., Gero, P.J., Taylor, J.K., Knuteson, R.O. and Perepezko, J.H.:** “On-Orbit Absolute Radiance Standard for Future IR Remote Sensing Instruments – Overview of Recent Technology Advancements”, **Fourier Transform Spectroscopy**, 2011, doi: 10.1364/FTS.2011.JPDP3.
- 4 Best, F.A., Adler, D.P., Pettersen, C., Revercomb, H.E. and Perepezko, J.H.:** “On-orbit absolute temperature calibration using multiple phase change materials: overview of recent technology advancements”, **Multispectral, Hyperspectral, and Ultraspectral Remote Sensing Technology, Techniques, and Applications III** (Vol. 7857, p. 78570J), 2010, doi: 10.1117/12.869564.
- 3 Pettersen, C. and Cooper, R.F.:** “Float-reaction between liquid bronze and magnesium aluminosilicate and ZnO-doped magnesium aluminosilicate glass–ceramic-forming glassmelts”, **Journal of Non-Crystalline Solids**, 2008, doi: 10.1016/j.jnoncrysol.2008.01.007.
- 2 Achterberg, A. and 100+ others (including Pettersen, C.):** “First year performance of the IceCube neutrino telescope”, **Astroparticle Physics**, 2006, doi: 10.1016/j.astropartphys.2006.06.007.
- 1 Veum, M, Pettersen, C., Mach, P., Crowell, P.A., and Huang, C.C.:** “Studies of a Free-Standing Liquid Crystal Film Using a Vibrating Drumhead Tensiometer” **Physical Review E**, 2000, doi: 10.1103/PhysRevE.61.R2192.

### Data Sets

- 5 Mateling, M.E.\* and Pettersen, C.,** Merged and Gridded GPM and Atmospheric River Data Product, 2023, **University of Michigan – Deep Blue Data**, doi: 10.7302/7t62-s085
- 4 King, F.\* and Pettersen, C.,** A Comprehensive Northern Hemisphere Particle Microphysics Dataset from the Precipitation Imaging Package, 2023, **University of Michigan – Deep Blue Data**, doi: 10.7302/37yx-9q53
- 3 Pettersen, C. and Merrelli, A.J.:** “Microwave radiometer snow categorization tool for Summit, Greenland, 2010 – 2015”, 2018, **Arctic Data Center**, doi:10.18739/A2R28Q.
- 2 Hudak, D., Kulie, M.S., and Pettersen, C.:** “GPM Ground Validation Environment Canada (EC) Micro Rain Radar (MRR) GCPEX V2”, 2015, **NASA**, doi: 10.5067/GPMGV/GCPEX/MRR/DATA203.
- 1 Petersen, W.A., Pettersen, C., Kulie, M.S., Gatlin, P.N, and Wingo, M.T.:** “GPM Ground Validation NASA Micro Rain Radar (MRR) GCPEX V2”, 2015, **NASA**, doi: 10.5067/GPMGV/GCPEX/MRR/DATA204.

### Research Presentations

#### 2024

- \* **Pettersen**, “Observing, Characterizing, and Quantifying Wintertime Precipitation Processes: Space and Ground-Based Perspective”, **University of Cologne**, 2024, *Oral (Invited)*
- \* **Pettersen**, “Observing, Characterizing, and Quantifying Wintertime Precipitation Processes: A 10 Year Retrospective from Marquette, Michigan”, **NOAA GLERL Seminar Series**, 2024, *Oral (Invited)*

#### 2023

- \* **Pettersen et al.**, “Merged and Gridded GPM and Atmospheric River Data Product”, **NASA PMM STM**, *Poster*
- \* **Pettersen et al.**, “The Influence of High-Latitude Atmospheric Rivers on Cold-Season Precipitation: A Satellite and Ground-based Perspective”, **4<sup>th</sup> Annual Summer Snowfall Workshop (ISSW4)**, 2023, *Oral (Invited – Keynote)*
- \* **Pettersen et al.**, “High-impact Observations for Enhancing Great Lakes Snowfall Forecasting”, **AMS Mesoscale Processes**, 2023, *Oral*
- \* **Pettersen**, “From neutrinos to ice sheets to atmospheric rivers: One physicist’s long journey to climate science”, **Carleton College Physics Seminar Series**, 2023, *Oral (Invited)*

**2022**

- \* **Pettersen et al.**, “The influence of atmospheric rivers on wintertime high-latitude precipitation”, **AGU**, 2022, *Oral*
- \* **Pettersen**, “Observing, Characterizing, and Quantifying Processes in Snowfall Regimes”, **University of Utah Seminar Series**, 2022, *Oral (Invited)*
- \* **Pettersen et al.**, “The influence of atmospheric rivers on wintertime high-latitude precipitation”, **NASA PMM STM**, 2022, *Oral*
- \* **Pettersen et al.**, “The influence of atmospheric rivers on high-latitude precipitation as seen by GPM”, **AMS PMO and Sat. Met.**, 2022, *Oral*
- \* **Pettersen et al.**, “The Critical Role of Euro-Atlantic Blocking in Promoting Snowfall in Central Greenland”, **AMS PMO**, 2022, *Poster*
- \* **Pettersen**, “Clouds and Blocking: Snowfall Processes over the Greenland Ice Sheet”, **Climate, People, and the Environment Program Seminar Series**, 2022, *Oral (Invited)*
- \* **Pettersen et al.**, “The Influence of Atmospheric Rivers on Cold-Season Precipitation in the Upper Great Lakes Region”, 2022, **AMS Annual Meeting**, *Poster*
- \* **Pettersen et al.**, “The Precipitation Imaging Package: Assessment of Microphysical and Bulk Characteristics of Snow and Phase Partitioning”, 2022, **AMS Annual Meeting**, *Oral (Invited)*

**2021**

- \* **Pettersen et al.**, “The influence of atmospheric rivers on high-latitude precipitation”, **NASA PMM STM**, 2021, *Oral*
- \* **Pettersen et al.**, “The Critical Role of Euro-Atlantic Blocking in Promoting Snowfall in Central Greenland”, **Atmospheric Blocking Workshop**, 2021, *Poster*
- \* **Pettersen et al.**, “The Precipitation Imaging Package: Assessment of Microphysical and Bulk Characteristics of Snow and Phase Partitioning”, **3<sup>rd</sup> International Summer Snowfall Workshop**, 2021, *Poster*
- \* **Pettersen**, “Clouds and Blocking: Snowfall Processes Over the Greenland Ice Sheet”, **NOAA Physical Sciences Laboratory Seminar**, 2021, *Oral (Invited)*
- \* **Pettersen et al.**, “The Critical Role of Euro-Atlantic Blocking in Promoting Snowfall in Central Greenland”, **AMS PMO**, 2021, *Poster*
- \* **Pettersen**, “Observing, Characterizing, and Quantifying Processes in Snowfall Regimes”, **Department of Climate and Space Sciences and Engineering, University of Michigan Seminar**, 2021, *Oral (Invited)*
- \* **Pettersen** and Kulie “Lake-effect snow in the U.P.”, **Michigan Sea Grant Speaker Series**, 2021, *Oral (Invited)*

**2020**

- \* **Pettersen et al.**, “Lake-Effect Snow Quantitative Precipitation Estimation Nowcasting through Blended GOES, NEXRAD, and PIP Observations”, **AGU**, 2020, *Poster*
- \* **Pettersen**, “From neutrinos to snowfall: A tale of two ice sheets”, **College of Idaho Natural Sciences and Mathematics Colloquium**, 2020, *Oral (Invited)*
- \* **Pettersen et al.**, “The influence of atmospheric rivers on cold season precipitation”, **NASA PMM STM**, 2020, *Poster*
- \* **Pettersen**, “Cloud, Seasonal, and Blocking Influences on Snowfall over the Greenland Ice Sheet”, **Department of Atmospheric Sciences, University of Illinois Seminar**, 2020, *Oral (Invited)*
- \* **Pettersen et al.**, “Upper Great Lakes Snowfall Characteristics: Perspectives from an Enhanced Instrument Suite”, **UW SSEC/ANL-CELS Joint Workshop**, 2020, *Oral*
- \* **Pettersen et al.**, “Long term dataset applications (including international partners and DOE)”, **PMM Cal/Val Symposium**, 2020, *Oral*



**2019**

- \* **Pettersen et al.**, “A Composite Analysis of Snowfall Modes from Four Winter Seasons in Marquette, Michigan”, **AGU**, 2019, *Poster*
- \* **Pettersen et al.**, “The Influence of Atmospheric Rivers on High-Latitude Wintertime Precipitation”, **NASA PMM STM**, 2019, *Oral*
- \* **Pettersen et al.**, “Cyclones, Blocks, and their Impact on Precipitation Processes over Central Greenland”, **AMS PMO**, 2019, *Oral*
- \* **Pettersen et al.**, “Analyses of Two Distinct Precipitation Regimes over Central Greenland Inferred from Ground-Based and Satellite Observations”, **AMS PMO**, 2019, *Poster*
- \* **Pettersen**, “From neutrinos to snow: A tale of two ice sheets”, **University of Wisconsin – Women in Tech**, 2019, *Oral (Invited)*

**2018 and earlier**

- \* **Pettersen and Wood**, “Snowfall Modes Diagnosed from GV Observations: Implications for Satellite Snowfall Retrievals”, **NASA PMM STM**, 2018, *Poster*
- \* **Pettersen et al.**, “Analyses of two distinct precipitation regimes over central Greenland inferred from 5 years of ICECAPS observations”, **AMS CPR**, 2018, *Oral*
- \* **Pettersen et al.**, “A Composite Analysis of Snowfall Modes from Four Winter Seasons in Marquette, Michigan”, **AMS CPR**, 2018, *Poster*
- \* **Pettersen et al.**, “Ground based remote sensing retrievals and observations of snowfall in the Telemark region of Norway”, **AGU**, 2017, *Poster*
- \* **Pettersen et al.**, “Enhancing our Understanding of Snowfall Modes with Ground-Based Observations”, **AMS Radars**, 2017, *Oral*
- \* **Pettersen et al.**, “Enhancing our Understanding of Snowfall Modes with Ground-Based Observations: From the Great Lakes to Norway”, **Norwegian Meteorologisk Institutt**, 2017, *Oral (Invited)*
- \* **Pettersen et al.**, “Enhancing our Understanding of Snowfall Modes with Ground-Based Observations: From the Great Lakes to Norway”, **UW AOS Department Seminar**, *Oral*
- \* **Pettersen et al.**, “Dry Precipitation on the Greenland Ice Sheet: A study of Properties and Characteristics”, **AMS**, 2017, *Oral*
- \* **Pettersen et al.**, “Enhancing our Observations of Snowfall Modes from Satellite with Ground-Based Instruments”, **AGU**, 2016, *Oral*
- \* **Pettersen and Wood**, “Constraints on precipitation microphysics from cold-season ground validation observations”, **NASA PMM STM**, 2016, *Poster*
- \* **Pettersen et al.**, “Dry Precipitation on the Greenland Ice Sheet: A study of Properties and Characteristics”, **ICCP**, 2016, *Poster*
- \* **Pettersen and Kulie**, “Snowfall Modes as observed from Ground-Based Observations: Large-Scale, Lake Effect, and Orographically Enhanced”, **NWS Duluth, MN**, 2016, *Oral (Invited)*
- \* **Pettersen et al.**, “Lake Effect Snow: A Combined Micro Rain Radar and Microphysical Analysis” **AMS Radars**, 2015, *Poster*
- \* **Pettersen et al.**, “Microwave signatures of ice hydrometeors from ground-based observations above Summit, Greenland”, **GRC/GRS**, 2015, *Poster*
- \* **Pettersen et al.**, “Identifying Ice Hydrometeor Signatures above Summit, Greenland Using a Multi-Instrument Approach”, **AGU**, 2014, *Poster*
- \* **Pettersen et al.**, “Case Study of Mixed-Phase to Ice Precipitation in the Arctic”, **AGU**, 2013, *Poster*
- \* **Pettersen et al.**, “Performance Demonstration of Miniature Phase Transition Cells in Microgravity as a Validation for their use in the Absolute Calibration of Temperature Sensors On-Orbit”, **AGU**, 2012, *Poster*
- \* **Pettersen et al.**, “Validation of an Absolute Temperature Calibration Scheme for use in an On-Orbit Absolute Radiance Standard (OARS)”, **IRS**, 2012, *Poster*
- \* **Pettersen et al.**, “Performance Demonstration of Miniature Phase Transition Cells in Microgravity as a Validation for their use in the Absolute Calibration of Temperature Sensors On-Orbit”, **AGU**, 2011, *Poster*
- \* **Pettersen et al.**, “On-Orbit Absolute Radiance Standard for Future IR Remote Sensing Instruments – Overview of Recent Technology Advancements”, **OSA FTS**, 2011, *Oral*
- \* **Best, Pettersen et al.**, “On-Orbit Absolute Radiance Standard for CLARREO”, **AGU**, 2010, *Poster*