

Research Associate Professor  
 Dept. of Atmospheric Sciences  
 University of Washington  
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## EDUCATION

- Ph.D. Atmospheric Sciences, University of Washington, 1989, Title: Interpretation of integrated water vapor patterns in oceanic midlatitude cyclones derived from the Scanning Multichannel Microwave Radiometer. Advisor: Prof. Kristina Katsaros  
 M.S. Atmospheric Sciences, University of Washington, 1983  
 B.S. Atmospheric Sciences, University of California, Davis, 1978, High Honors

## EMPLOYMENT

- 2017—present      Research Associate Professor, Department of Atmospheric Sciences, University of Washington  
 1994 – 2017      Research Meteorologist III and Senior Lecturer, University of Washington  
 1991 – 1994      Research Meteorologist II, University of Washington  
 1989 – 1991      Postdoctoral Scientist, Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin  
 1980 – 1988      Research Assistant, University of Washington  
 1978 – 1979      Forecaster, River Forecast Center, National Weather Service, Portland OR

## RESEARCH GRANTS SINCE 2017

- 2016—2017      PI for NASA grant, *Analysis of OLYMPEX radar and ground data*, with Co-PI R. A. Houze, Jr., \$116,966  
 2017—2020      PI for NSF grant, *West Coast precipitation processes as modulated by storm structure and terrain* with Co-PI Angela Rowe. \$619,785  
 2017—2018      PI for NASA grant, *Orographic Precipitation as Measured by OLYMPEX Radar, Ground, and Aircraft Data*, \$101,747  
 2017—2018      PI for NASA grant, *Climatology of Eastern United States Snowstorms*, \$9475  
 2017—2022      Co-PI for NSF grant, *Radar observations of convective lifecycle near Argentina's Sierras de Cordoba*, with PI Angela Rowe and co-PI Kristen Rasmussen, \$784,756  
 2019—2020      PI for NASA grant, *GPM and TRMM Data Refinement*, \$18,209  
 2019—2024      PI for NASA grant, *Investigation of Microphysics and Precipitation for Atlantic Coast-threatening Snowstorms (IMPACTS)*. \$1,761,819  
 2020—2023      PI for NASA grant, *GPM and TRMM Data Products*. \$58,677  
 2022—2025      co-PI for collaborative NSF grant, *Convective upscale growth processes during RELAMPAGO* with PI Prof. Angela Rowe of University of Wisconsin

and co-PI Prof. Kristen Rasmussen of Colorado State University, UW award \$479,495

#### AWARDS

1999, 2004, 2011, 2015, 2017, 2019  
2016 Atmospheric Sciences Department Teaching Award.  
NASA Precipitation Measurement Mission (PMM) Science Team Award

#### FIELD EXPERIMENTS

2015-2016 *The Olympic Mountains Experiment, OLYMPEX*. Served as Project Manager in preparation for OLYMPEX 2012 – 2015, as Operations Director during field operations, November 2015 – January 2016, and as a Lead Science Principal Investigator. As Operations Director, oversaw student forecasters and helped make operational decisions for the operations of aircraft, radars and ground instrumentation.

2017 – 2018 *The Remote sensing of Electrification, Lightning, And Mesoscale/microscale Processes with Adaptive Ground Observations, RELAMPAGO*. Served as Forecast coordinator, lead forecaster and assist with radar operations during RELAMPAGO. Overseeing science analysis on projects in coordination with University of Wisconsin and Colorado State University.

2020 – 2023 *Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms, IMPACTS*. Lead PI for the project. Overseeing entire project that includes 3 deployment years and overseeing all activities including research conducted. Other participating institutions include NASA Goddard, NASA Langley, NASA Marshall, NASA Aimes, University of Colorado, University of Illinois, University of North Carolina, University of North Dakota, University of Oklahoma, SUNY Stonybrook, SUNY Albany, Pennsylvania State University, and the National Center for Atmospheric Research. Project selected 25 September 2018

#### COMMITTEES

2012–2018 UNIDATA Strategic Advisory Committee.  
2016–present Member of the Global Precipitation Measurement Particle Size Distribution working group (GPM-PSD Working Group).  
2016–present Member of the AMS committee on Mountain Meteorology  
2017, 2019 Co-Convenor of the GPM sessions of the Fall AGU meeting  
2020 Co-Chairperson of the 19<sup>th</sup> AMS Conference on Mountain Meteorology

#### EDITORIAL DUTIES

2016-present Editor Weather and Forecasting  
2010-2015 Associate Editor for Weather and Forecasting

#### ADVISING

Post-doctoral Supervision  
Dr. Joe Finlon, August 2019 – present  
Dr. Robert Conrick, June 2021 – present (co-advised with Prof. Cliff Mass and Dr. Yolande Serra)

Graduate Students as Chair of committee  
Garret Wedam, 2005 – 2008 Masters Thesis advisor, chair. Title: Measuring Skill of Numerical Weather Prediction.

Joe Zagrodnik, 2013—2019. PhD granted March, 2019, Title: Modification of Precipitation in Mid-Latitude Cyclones Passing over a Coastal Mountain Range

Andrew DeLaFrance, September 2018 – present, Masters awarded June 2021, continuing on with PhD

Clayton Sasaki, September 2018 – present, Masters awarded June 2021, continuing on with PhD

Victoria McDonald, September 2019 – August 2022, Masters, title: Measuring Kinematic forcing associated with snowbands in midlatitude winter cyclones. Will start job at government lab, Jet Propulsion Laboratory, NASA.

Piero Rivas, 2021 – present (co-advised with Prof. Alex Anderson-Frey)

Valeria Gallegos Garcia – Will start at UW in Fall 2022.

Undergraduate Students: mentored the following students on research projects: Steven Brey 2013—2014, Parker Malek 2014—2015, Thomas Schuldt 2016—2017, Kenneth Wohl 2016—2017, Kyle Anderson 2017—2018, Jamin Rader 2017—2019, Thomas Lamb 2018, Eliza Dawson (2017-2018), Jordan Rendon, 2019 – 2021, Anthony Edwards, 2021, Alex Hewett 2021—2022, Sarah Phillips 2022

## TEACHING EXPERIENCE

At the University of Washington:

Summer 1983	Taught the “Weather” course (ATMS 101).
Spring 1985	Taught a University of Washington Extension Program course titled “Weather and the Atmosphere”.
1991 - present (except 1996)	Laboratory instructor for the “Atmospheric Structure and Analysis” course for juniors in atmospheric sciences (ATMS 370). Responsible for the instruction and grading of the laboratory portion of the course. Coordinated with the lecture instructor concerning the content of the laboratory. The laboratory consists of map analysis and computer-based laboratory assignments.
1992 - present	Laboratory instructor for the “Atmospheric Motions II” course for seniors in atmospheric sciences (ATMS 442). Responsible for the content, instruction and grading of the laboratory portion of the course. The laboratory consists of computer-based assignments.
1991 - 1998	Laboratory instructor for the “Atmospheric Structure and Analysis I: Synoptic Scale Systems” course for graduate students in atmospheric sciences (ATMS 551). Responsible for the content, instruction and grading of the laboratory portion of the course. The laboratory included both map analysis and computer-based assignments. Currently, this course is not taught every year.
Spring 1997, 2000 and 2002	Laboratory instructor for “Introduction to Synoptic Meteorology” (ATMS 502). Coordinated with the lecture instructor concerning the content of the laboratory assignments, responsible for the instruction and grading of the laboratory portion of course. The laboratory consisted of map analysis, computer-based assignments and a student project.

1998, 1999,2001, 2003-present	Taught "Introduction to Synoptic Meteorology" (ATMS 502). Fully responsible for the course including course content, lectures, laboratory assignments, and grading.
2013 - present	Designed and taught a 1 credit, pass/no pass class called Weather Challenge offered in Autumn and Winter Quarters. It's a course open to all University students who have taken Atmos Sci. 101 or who are undergraduate majors. Students must enter the National Weather Challenge Forecast contest and learn about current weather at select cities around the country.
Summers 2017, 2022	PNNL Instrumentation Class. Short course taught at PNNL, Richland Washington. Responsible for grading student projects and presentations.

#### SEMINARS AND CONFERENCE PRESENTATIONS SINCE 2017

##### INVITED

18 July 2022	IEEE IGARRS, Kuala Lumpur, Malaysia, hybrid, <b>Invited</b> : Investigation of Microphysics and Precipitation for Atlantic Coast-threatening Snowstorms (IMPACTS): The 2022 Deployment.
26 April 2022	Presentation to the US CLIVAR Panel on Process Studies, <b>Invited</b> : IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms: Report to the US CLIVAR Process and Model Improvement Panel.
21 April 2022	Presentation to the AVAPS Users group, <b>Invited</b> : The Use of Dropsondes during Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms (IMPACTS)
29 March 2022	Presentation to the NOAA Winter Storms Working Group, <b>Invited</b> : IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms: Overview of the 2020 and 2022 Deployments
22 March 2022	University of Illinois Urbana-Champaign, <b>Invited</b> : IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms: The 2020 and 2022 Deployments
8 November 2021	McGill University, <b>Invited</b> : IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms: Results from the first deployment of 2020 and a look ahead to winter 2022.
24 May 2021	Presentation to the NASA THP Snow Group, <b>Invited</b> : IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms: Preliminary results from the first deployment in winter
15 April 2021	University of British Columbia, <b>Invited</b> : Modification of Precipitation Processes by Complex Terrain: The Olympic Mountains Experiment (OLYMPEX)
2 December 2020	Panelist, Regional Precipitation Session of the NOAA-DOE Precipitation Processes and Predictability Workshop, <b>Invited</b> .
23 October 2019	University of Utah, <b>Invited</b> : Precipitation Processes in Winter Cyclones: A Tale of two field campaigns. Salt Lake City, UT
10 January 2019	Precipitation Processes from Radars on Air- and Space-borne Platforms. <b>Invited</b> : India Radar Conference, Pune, India
9 January 2019	Aircraft Radar measurements of the Vertical Structure and Microphysical Characteristics of Precipitation across the Olympic Mountains. <b>Invited</b> : India Radar Conference, Pune, India

18 September 2018      Precipitation Processes in Cyclones Passing over a Coastal Mountain Range: Recent Results from the Olympic Mountains Experiment (OLYMPEX), Colorado State University, **Invited**, Fort Collins, CO.

## PRESENTATIONS

11 August 2022      AMS Conference on Cloud Physics, Madison, WI, Presentation: Microphysical and radar characteristics of snowbands sampled during the Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms (IMPACTS).

28 June 2022      20<sup>th</sup> AMS Conference on Mountain Meteorology, Park City, Presentation: Understanding and simulating warm rain during orographically enhanced windward precipitation.

14 December 2021      AGU, New Orleans, presentation: IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-Threatening Snowstorms: Results from the first deployment of 2020 and a look ahead to winter 2022.

14 December 2020      AGU, virtual, Presentation: Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS): Preliminary results from the first deployment in winter 2020.

5 October 2020      International Atmospheric River Conference, virtual, Presentation: The Role of Warm Rain Processes in Atmospheric River Events during the Olympic Mountains Experiment: OLYMPEX.

13 July 2020      19<sup>th</sup> AMS Conference on Mountain Meteorology, virtual, Presentation: Modification of precipitation processes by complex terrain: What are we learning from the Olympic Mountains Experiment (OLYMPEX).

15 April 2020      Dynamics Seminar UW, Seattle, WA, Presentation: IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast Threatening Snowstorms.

13 December 2019      AGU, San Francisco, CA, Presentation: IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast Threatening Snowstorms.

3 September 2019      International Conference on Alpine Meteorology (ICAM), Riva del Garda, Italy, Presentation: Modification of Precipitation in Cyclones Passing over a Coastal Mountain Range: Results from OLYMPEX.

29 July 2019      AMS Conference on Mesoscale Meteorology, Savannah, GA, Poster: Modification of Precipitation in Cyclones Passing over a Coastal Mountain Range: Results from OLYMPEX.

31 July 2019      AMS Conference on Mesoscale Meteorology, Savannah, GA, Presentation: IMPACTS: A NASA Earth Venture Suborbital Airborne Field Campaign to study US East Coast Snowstorms. Savannah, GA

21 June 2019      12<sup>th</sup> International Precipitation Conference, Irvine, CA, Presentation: IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast Threatening Snowstorms.

15 December 2018      AGU, Washington DC, Presentation: Three-Dimensional reflectivity structure from the Dual-Frequency Radar (DPR) on the Global Precipitation Measurement (GPM) Satellite over coastal mountain ranges.

9 October 2018      PMM Science Team Meeting, Phoenix, AZ, Poster: Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS),.

10 October 2018      PMM Science Team Meeting, Phoenix, AZ, Poster: Verification of the GPM Satellite by the Olympic Mountains Experiment (OLYMPEX).

26 June 2018      18<sup>th</sup> AMS Mountain Meteorology Conference, Santa Fe, NM, Presentation: Terrain-Enhanced Precipitation Processes above the Melting Layer: Results from the Olympic Mountains Experiment (OLYMPEX).

- 26 June 2018 18<sup>th</sup> AMS Mountain Meteorology Conference, Santa Fe, NM, Poster: Precipitation Processes in Cyclones Passing over a Coastal Mountain Range: Recent Results from OLYMPEX.
- 13 December 2017 AGU, New Orleans, Presentation: Verification of the Global Precipitation Measurement (GPM) satellite by the Olympic Mountains Experiment (OLYMPEX).
- 5 October 2017 Workshop on Extreme Precipitation, Stockholm, Sweden, Presentation: Observations of extreme precipitation events documented by the Olympic Mountains Experiment (OLYMPEX).
- 27 July 2017 AMS Mesoscale Conference, San Diego, Presentation: Orographic effects on precipitation as observed during the Olympic Mountains Experiment (OLYMPEX).

#### PRESENTATIONS – PUBLIC AND OUTREACH

- 10 February 2022 NASA Social Media Day, Virtual: IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-threatening Snowstorms. Presentation given to Media and the public.
- 31 January 2022 Virtual Teachers workshop: IMPACTS: Investigation of Microphysics and Precipitation in Atlantic Coast-threatening Snowstorms. Event organized by NASA outreach given to teachers around the country.
- 14 January 2020 NASA Social Media Day, Wallops, VA: Investigation of Microphysics and Precipitation in Atlantic Coast-threatening Snowstorms. Presentation given to Media and the public.

#### INTERVIEWS RESULTING IN NEWS ARTICLES IN PUBLIC MEDIA

- 3 February 2022 Popular Science, <https://www.popsci.com/science/nasa-planes-improve-snowstorm-forecasts/>
- 3 February 2022 NBC Universal, <https://www.nbcnews.com/science/weird-science/nasa-winter-storm-flight-research-rcna14249>
- 20 January 2020 All Things Considered, NPR, <https://www.npr.org/2020/01/20/797981409/nasa-taps-snowstorm-chasing-team-to-improve-forecasting>
- 15 January 2020 Washington Post, [https://www.washingtonpost.com/weather/2020/01/15/nasa-snow-hunters-fly-into-east-coast-snowstorms-improve-storm-forecasts/?utm\\_campaign](https://www.washingtonpost.com/weather/2020/01/15/nasa-snow-hunters-fly-into-east-coast-snowstorms-improve-storm-forecasts/?utm_campaign)

#### BIBLIOGRAPHY

(see separate document)