

Dr. George A. S. Duffy

• Remote Sensing of Falling Snow • *in-situ* Analysis of Frozen Clouds • Air-Sea Interactions Under Snowstorms •

🏠 Professional Experience

NASA-Caltech Jet Propulsion Laboratory (JPL), Pasadena CA 03/2020 —
 Postdoctoral Researcher
 Mentored by [Derek Posselt](#)
 Developing parameterizations for frozen clouds and precipitation in satellite radar simulations
 Conducting research on extra-tropical cyclones using CloudSat and GPM

🎓 Education

Vanderbilt University, Nashville, TN 2016 — 2020
 Ph.D. in Earth and Environmental Science
[Satellite Measurements of Falling Snow: Methods and Applications](#)
 Advised by [Ralf Bennartz](#)

University of Illinois, Urbana-Champaign, IL 2013 — 2015
 M.S. in Earth and Environmental Science
[Evaluations of microphysical parameterizations in retrieval algorithms for snowfall particle size distributions from dual frequency radar measurements.](#)
 Advised by [Stephen Nesbitt](#), [Greg McFarquhar](#)

University of Tennessee, Knoxville, TN 2007 — 2012
 B.S. in Physics

📄 Publications

Duffy, G. & Posselt, D. A particle size distribution function for falling snow aggregates. (Submitted to the Journal of Applied Meteorology and Climatology)

Duffy, G., King, F., Bennartz, R. & Fletcher, C. G. [Quantifying uncertainty in seasonal estimates of snow accumulation using CloudSat-CPR retrievals.](#) *Atmosphere* **12**, 363 (2021).

Duffy, G. Bennartz, R., McFarquhar, G., Nesbitt, S. An Empirical Relationship Between Ku/Ka Dual Wavelength Radar and Mass Weighted Mean Diameter Derived from Collocated Radar and in-situ Measurements of Diverse Snow Clouds, *Journal of Applied Meteorology and Climatology* (in typesetting for publication, 2021)

Posselt D., Wilson B., Storer R., Tropf D., **Duffy G.**, Lebsock M., Lall V., Niamsuwan N., Tanelli S., A Science-Focused, Scalable, Flexible, Observing System Simulation Experiment (SSE) Toolkit. *International Geoscience and Remote Sensing Symposium* (2021)

Duffy, G. & Bennartz, R. [The Role of Melting Snow in the Ocean Surface Heat Budget.](#) *Geophys Res Lett* **45**, 9782–9789 (2018).

King, F, **Duffy, G.**, and Fletcher, C: A Centimeter Wavelength Snowfall Retrieval Model Using Random Forest Regression (In Preparation)

🏠 Conference Proceedings

- George Duffy**, Derek Posselt, Joe Finlon: The Shape of (Frozen) Water: Exponential, Log-Normal, Super-Exponential, and Power-Law Particle Size Distributions Observed in Frozen Precipitation. *International Snowfall Scattering Conference*, 2021. (Scheduled Virtual Oral presentation)
- George Duffy**, Shannon Mason, Derek Posselt: Investigating Multiple-Frequency Retrievals of Secondary Ice Production. *International Snowfall Scattering Conference*, 2021 (Scheduled Poster)
- Fraser King, **George Duffy**, Chris Fletcher: A Centimeter Wavelength Snowfall Retrieval Model Using Random Forest Regression. *International Snowfall Scattering Conference*, 2021. (Scheduled Poster)
- Posselt D., Wilson B., Storer R., Tropf D., **Duffy G.**, Lebsock M., Lall V., Niamsuwan N., Tanelli S., A Science-Focused, Scalable, Flexible, Observing System Simulation Experiment (SSE) Toolkit. *International Geoscience and Remote Sensing Symposium*, 2021. (Scheduled Virtual Oral Presentation).
- George Duffy**, Derek Posselt: Power Law Size Distributions in Frozen Precipitation. *American Meteorological Society Annual Meeting*, 2021 (Virtual Oral Presentation)
- George Duffy**, Ralf Bennartz: The Role of Melting Snow in the Ocean Surface Heat Budget, *American Geophysical Union Fall Conference*, 2020 (Virtual Oral Presentation)
- George Duffy**, Ralf Bennartz: The Role of Melting Snow in the Ocean Surface Heat Budget, *POLAR conference*, 2018 (Poster)
- George Duffy**, Ralf Bennartz, Greg McFarquhar, Steve Nesbitt: Evaluations of Snowflake Aggregate Scattering Models through Collocated Aircraft and Ku/Ka Radar Measurements, *International Snowfall Scattering Conference*, 2018 (Poster)
- George Duffy**, Ralf Bennartz, Greg McFarquhar, Steve Nesbitt: Improved measurements of Snowstorm Particle Size Distributions from Dual Frequency Radar measurements, *Space-based Snowfall Measurement Workshop*, 2016 (Oral Presentation)
- George Duffy**, Greg McFarquhar, Steve Nesbitt: Sensitivity of Simulated Snow Cloud Properties to Mass-Diameter Parameterizations, *American Geophysical Union Fall Conference* (Oral Presentation)
- George Duffy**, Greg McFarquhar, Steve Nesbitt: Evaluation of Algorithms to Retrieve Snowfall Size Distributions with Dual Frequency Reflectivity, *American Meteorological Society Radar Conference* (Poster)
- George Duffy**, Greg McFarquhar, Steve Nesbitt: Evaluations of Dual Frequency Satellite Retrievals in Falling Snow, *Precipitation Measurement Mission Summer Conference* (Poster)
- George Duffy**, Greg McFarquhar, Steve Nesbitt: In-situ microphysical and scattering properties of falling snow in GCPEX, *In-situ Microphysical and Scattering Properties of Falling Snow in GCPEX*, 2013 (Oral Presentation)

Funding and Awards

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| JPL New Researcher's Support Group Mission Incubation Contest | 2021 |
| Rapid Gravity Measurements from a Satellite Mega-Constellation | Lead Scientist |
| "A-team" mission incubation panel of expert scientists worth \$10,000 | |
| NASA ROSES Modeling Analysis and Prediction | 2020 |
| Observation and Modelling of Extratropical Cyclones | Contributing Author |
| Three years of salary, travel, and funding for Co-Is and P-Is | (Lead: Derek Posselt) |
| NASA Postdoctoral Program | 2020 |
| How Does the Water Cycle Energy Budget Change in Response to Climate Change in Polar Regions? | Lead Author |
| \$60,000 a year (won, but rejected, since I received the funding after accepting a job at JPL) | |

NASA Earth and Space Science Fellowship

Improving Spaceborne Falling Snow Retrievals Using in-situ Data, Particle Models, and Validation

\$90,000 a year

2014

Lead Author

☂ Workshops and Field Experience

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| Weather Research and Forecasting model (WRF) Winter Tutorial | 2019 |
| International Russian Youth Arctic Forum | 2017 |
| Doppler On Wheels (DOW) radar operator in the NASA Olympic Mountains Experiment (OLYMPEX) | 2015 |
| Atmospheric Radiation Measurement (ARM) Summer School | 2015 |

☂ Teaching Experience and Service

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| JPL Neurodiversity Laboratory Network (NPLN) Founder, interim president | 2021 — |
| JPL Volunteer Tutoring Program at Pasadena Community College Physics and geology tutor | 2020 —2021 |
| Skype-a-Scientist Guest lecturer | 2020 |
| Scientist in the Classroom Program. 8 th grade physical science co-teacher | 2018 – 2019 |
| Dynamic Earth 101 at Vanderbilt University. Teaching Assistant. | 2018 |
| School of Math and Science at Vanderbilt Guest lecturer, curriculum design | 2016 – 2018 |
| Introductory Matlab at the University of Illinois Teaching assistant | 2014 |
| University of Tennessee Physics Department, Athletic department Physics tutor | 2008-2012 |