

Challenges, Needs, and Opportunities to Get Your Foot (back) in the Door

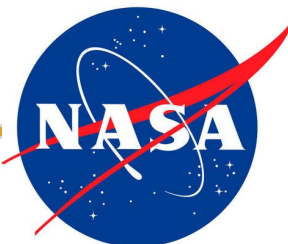
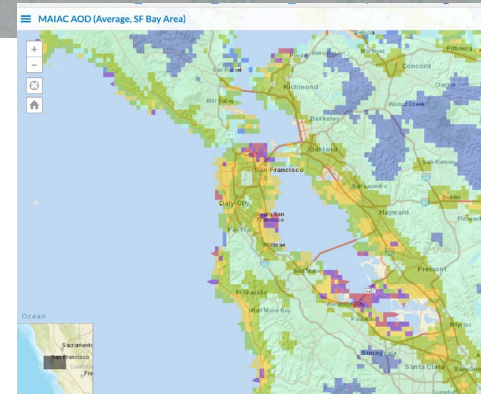


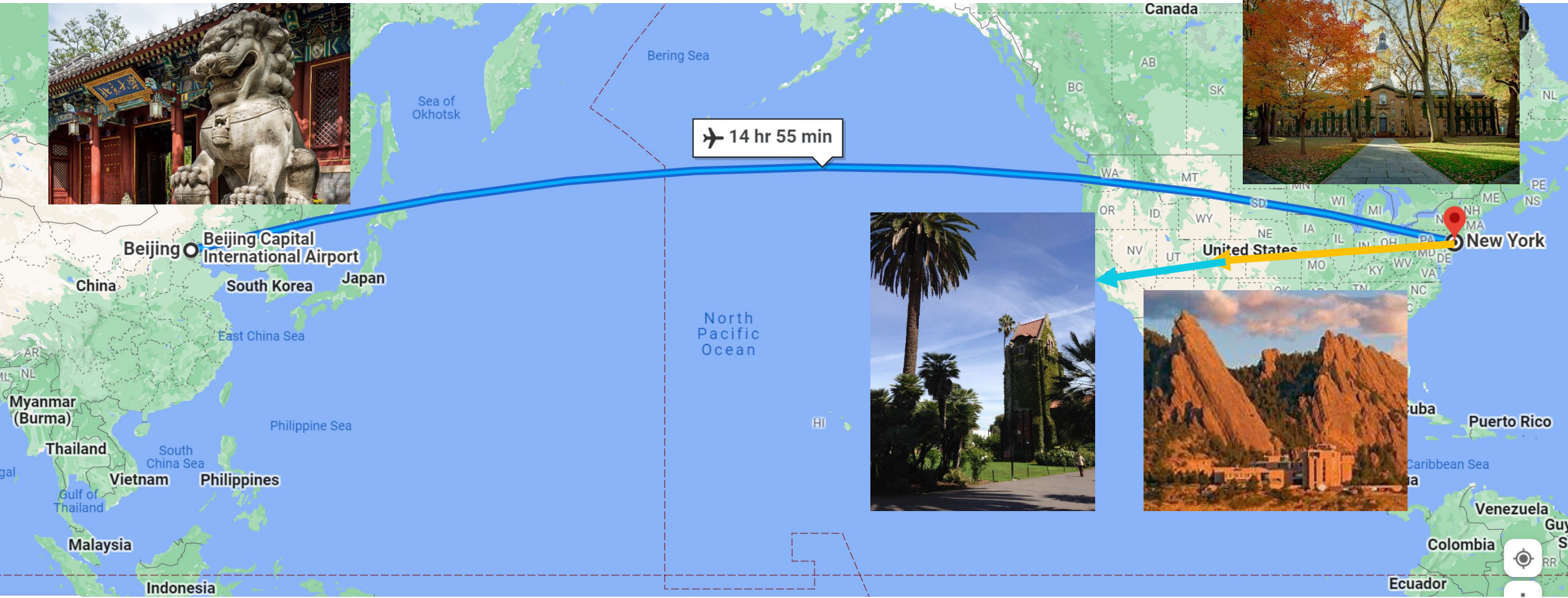
Minghui Diao

Department of Meteorology and Climate Science

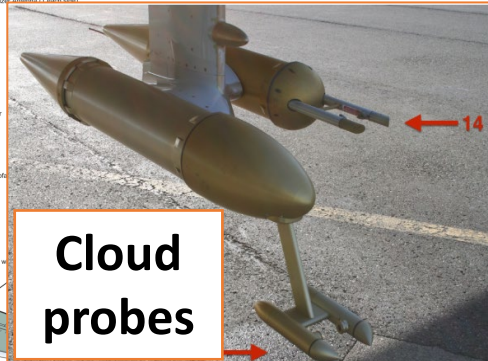
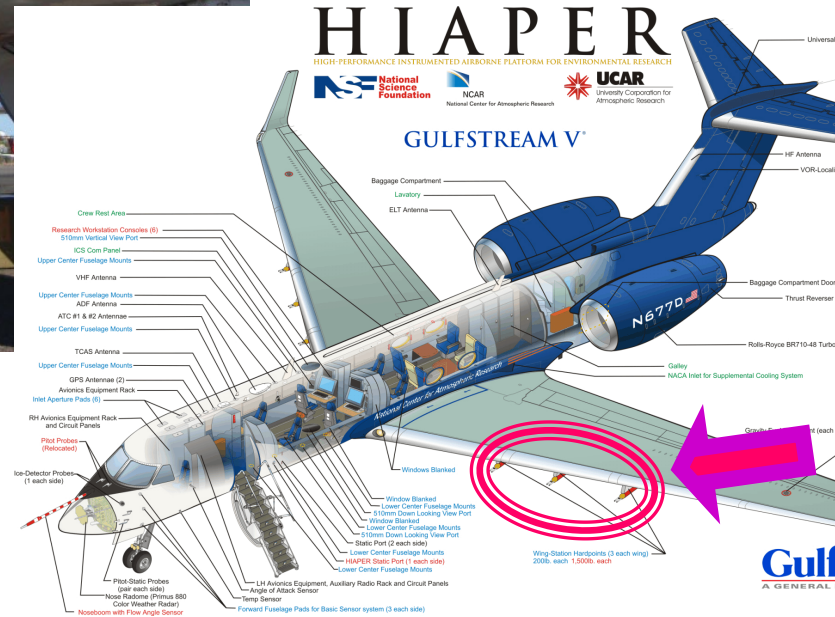
San Jose State University

NCAR FARE User Workshop, September 19, 2023



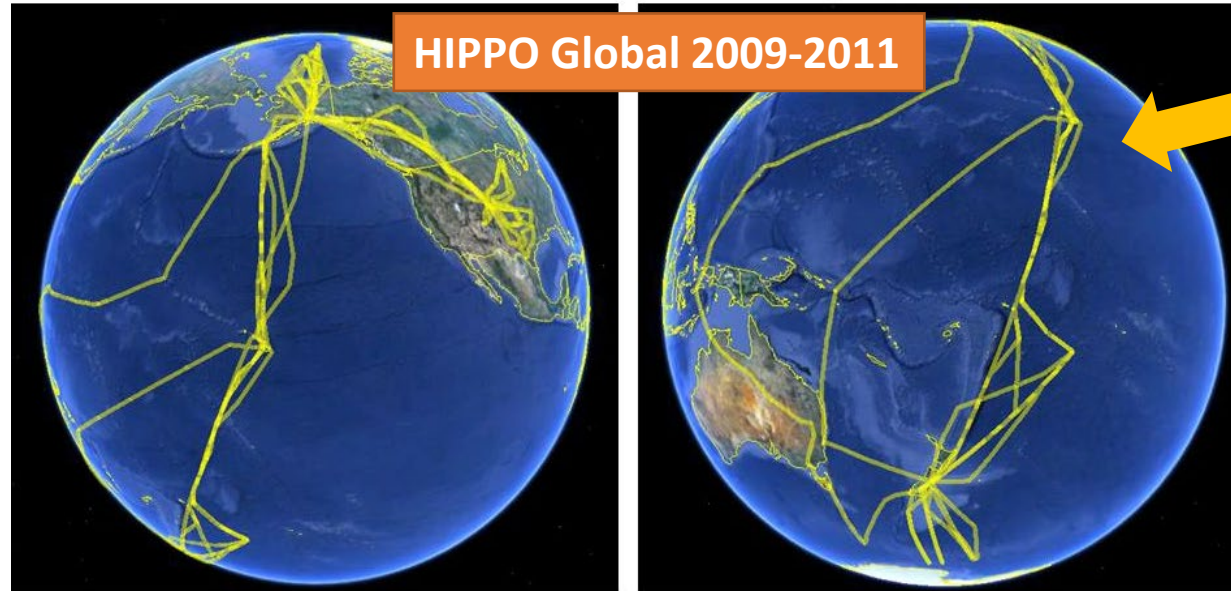


NSF Gulfstream-V Research Aircraft

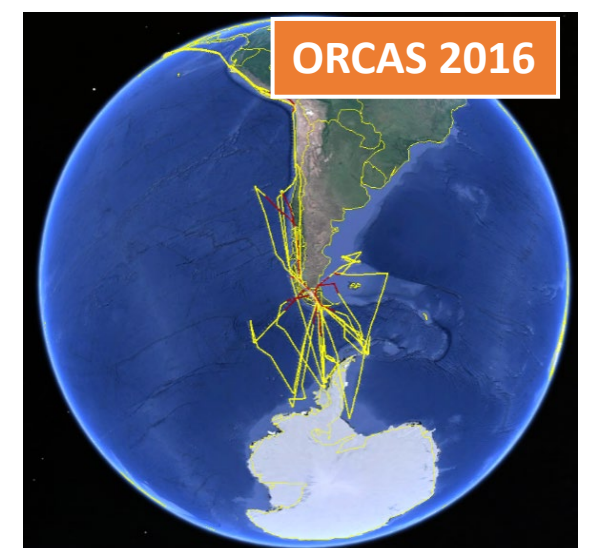
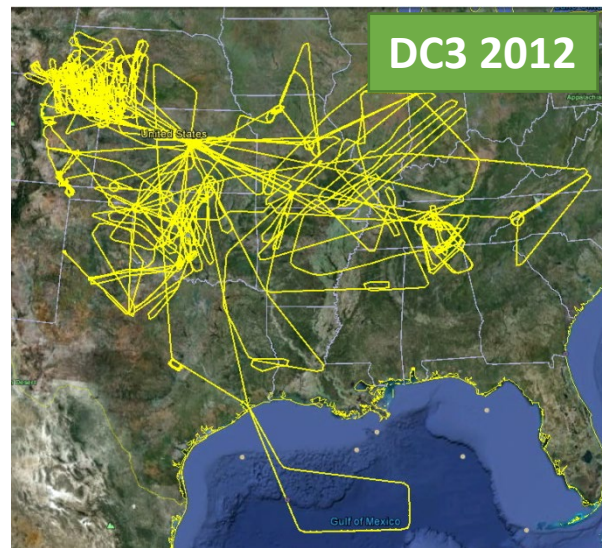
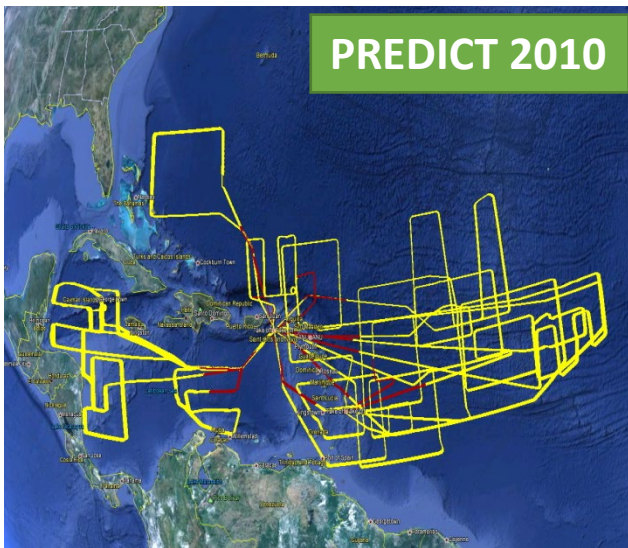


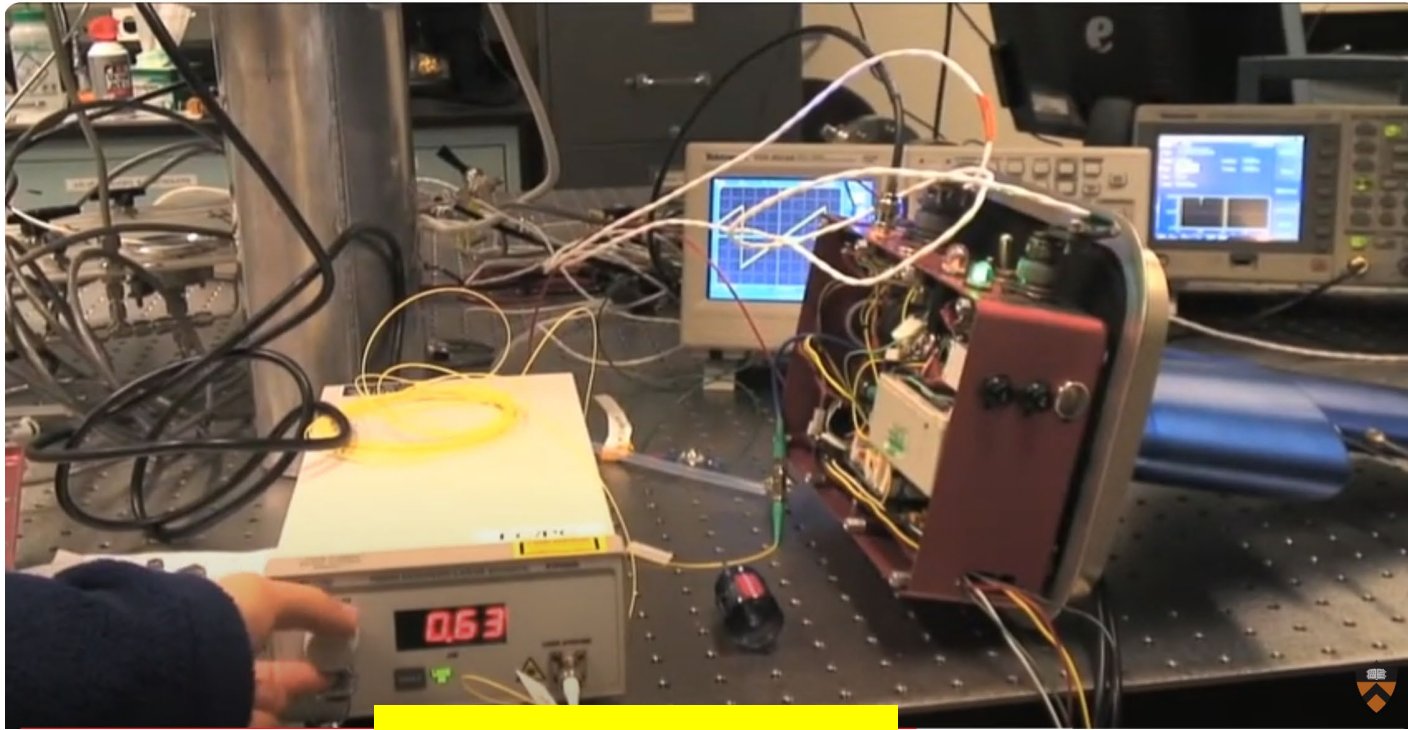
Vertical Cavity Surface Emitting Laser (VCSEL) Hygrometer

National Science Foundation (NSF) Flight Campaigns



HIPPO: The first field campaign I participated. The GV research aircraft sampled from 87N to 67S.





In the LAB



In the FIELD

Challenges for an Early Career Scientist at a Non-R1 Minority Serving Institution

- **1 – Access expensive laboratory equipment**

Resources

- **2 – Maintain collaboration with science teams**

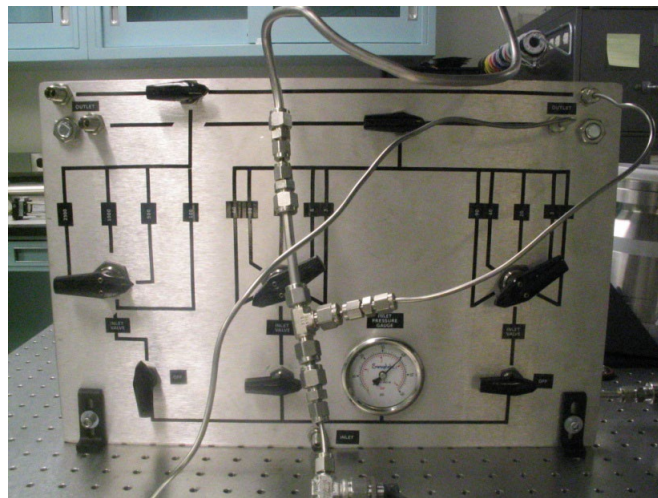
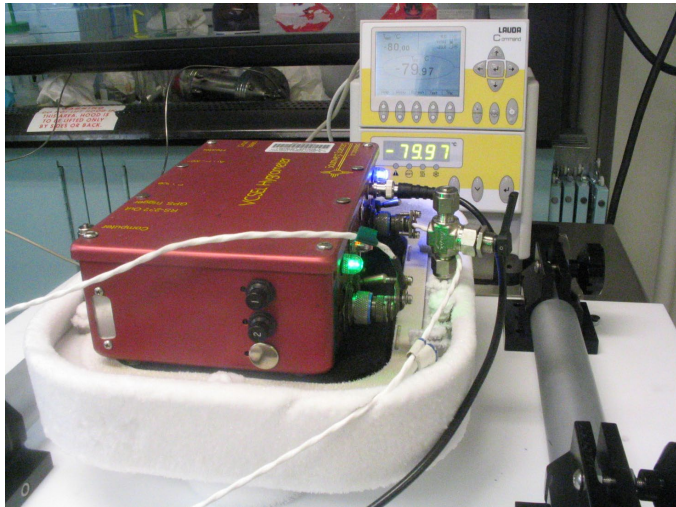
People

- **3 – Get back to the field with heavy teaching loads**

Time

- **4 – Get funding to get started**

Money





Sponsored By



SCIENTIFIC + PROFESSIONAL VISITS

FOSTERING COLLABORATION

Visitors invigorate our science, stimulate our research, and strengthen our community.

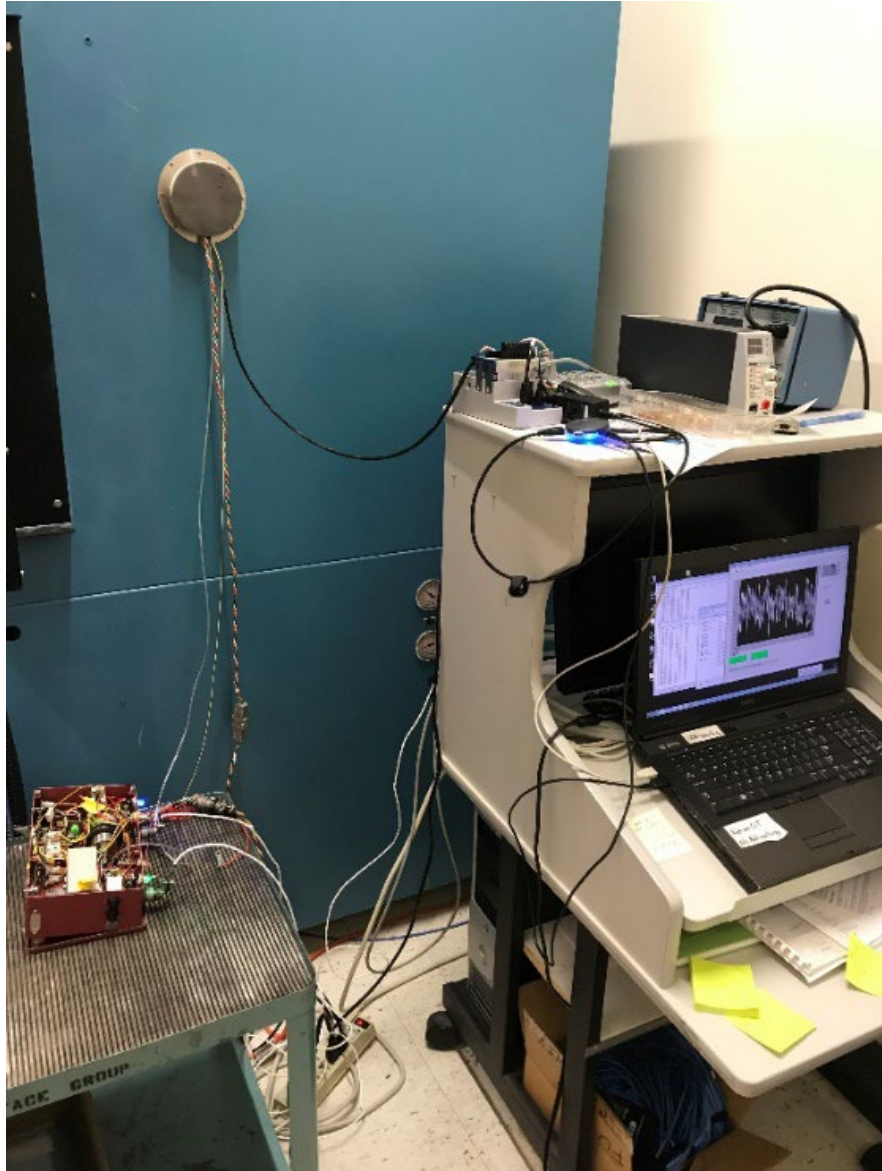
Partnerships with the wider scientific community are at the heart of the NCAR mission, and scientific and professional visits help form strong, productive collaborations. Visits range from a few days to a sabbatical.

[HOME](#)[Opportunities](#)[SCIENTIFIC + PROFESSIONAL VISITS](#)

RELATED LINKS

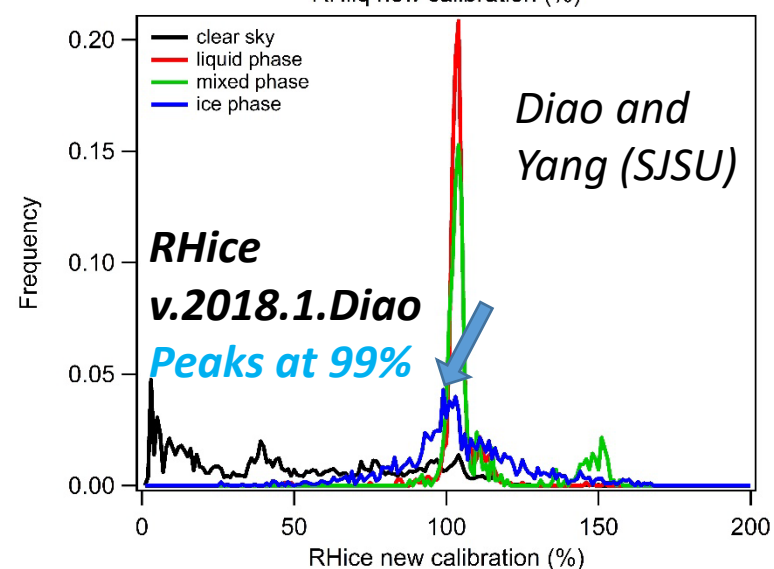
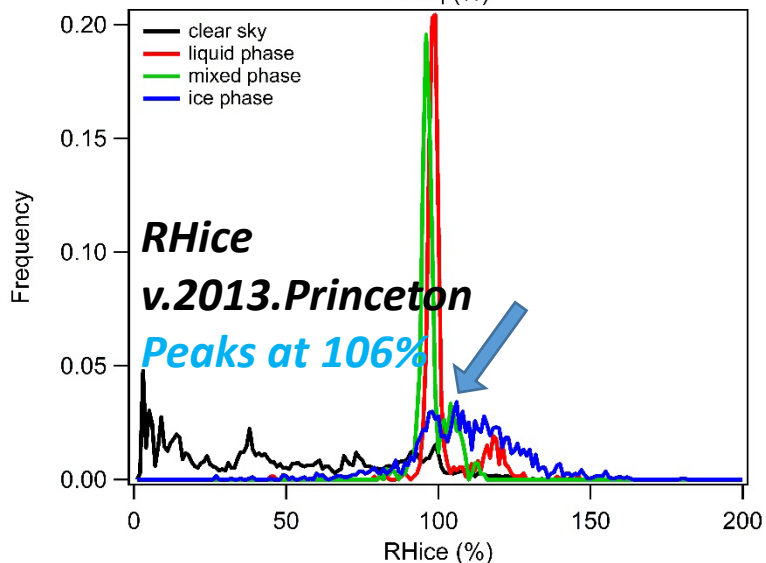
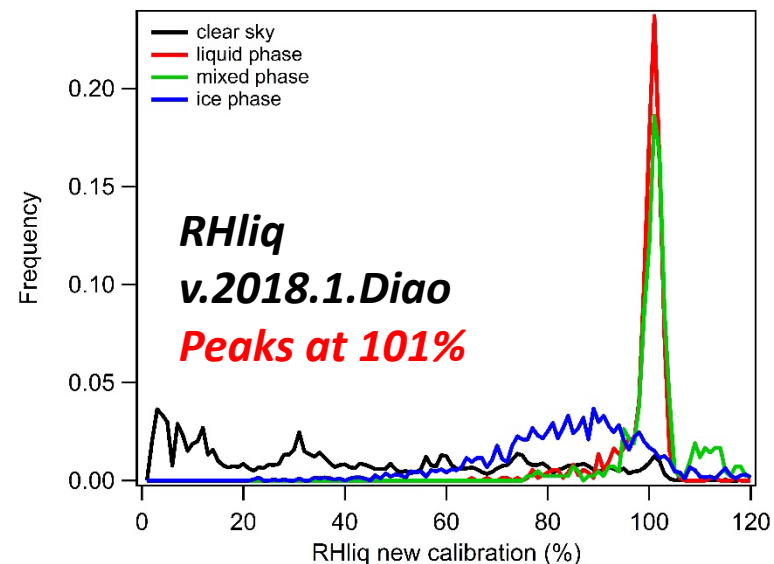
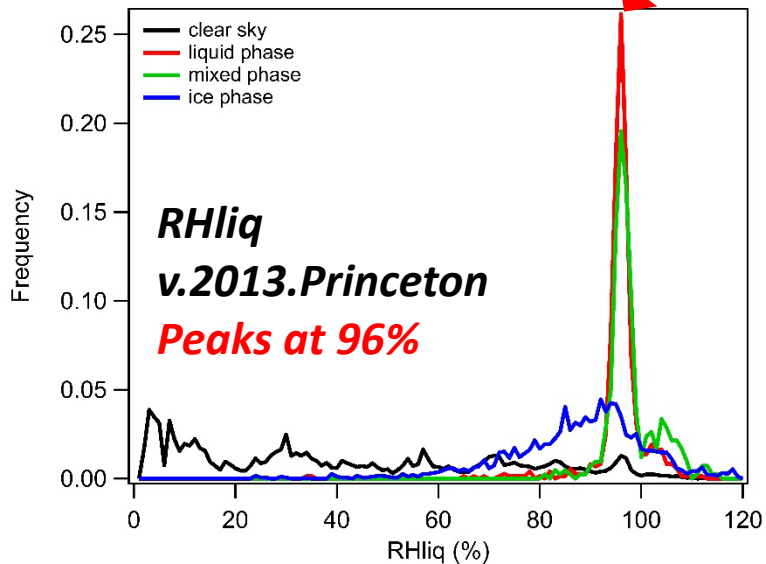
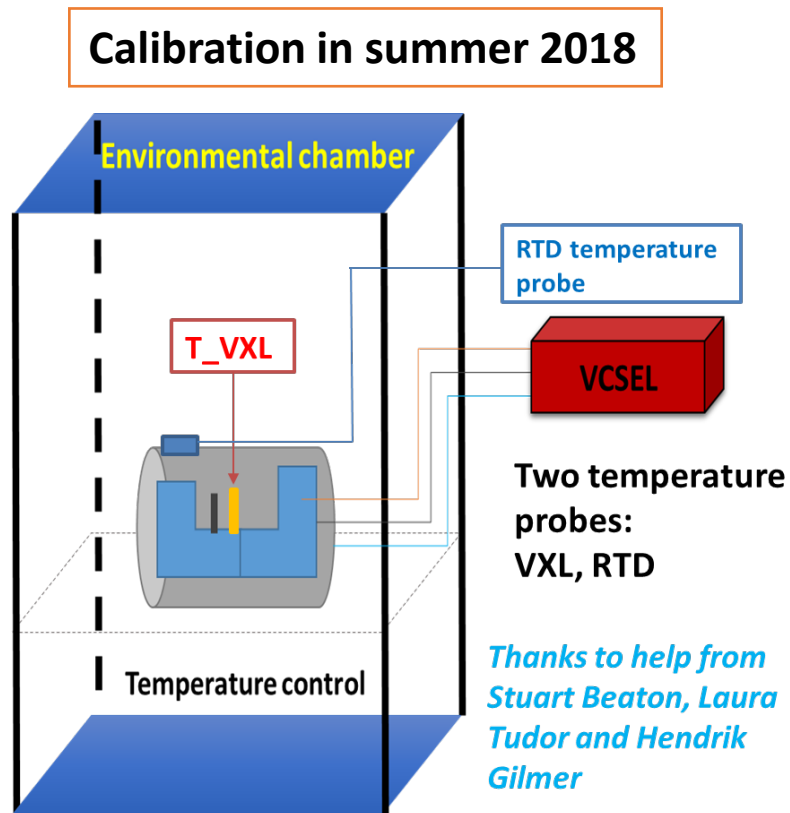
[Public visits to NCAR](#)

Thanks to NCAR Advanced Study Program (ASP) Faculty Fellowship, 2016, 2018 summers



Laboratory calibration of the VCSEL hygrometer – an airborne open-path laser hygrometer

Example of RF10 at $-40^{\circ}\text{C} < T \leq 0^{\circ}\text{C}$



(Diao, water vapor v2 data for the NSF SOCRATES campaign, 2021a, b)

Funded by NCAR ASP Faculty Fellowship 2016, 2018

Resources

Use NCAR EOL and RAF laboratory space and environmental chamber; Gain core hours on NCAR supercomputer

People

Build network with scientists at NCAR and other institutions

Time

Summer research trips with multiple undergraduate and graduate students, not colliding with teaching duties

Money

Seed money to get started. Small stipends and travel fund for faculty and students to get summer research done, and to attend science team meetings; Support from my college and university



Abril, Me, Ryan, and Katie at NCAR, Boulder in summer 2018

Cloud and Aerosol Group

A rippling effect to seek other funding

Better data quality, better science

- NCAR ASP Faculty Fellowship 2016, 2018
- NSF Atmosphere and Geoscience grant 1642291 (PI)
- NSF Office of Polar Program grant 1744965 (PI)
- NSF MRI grant 1727052 for a Cloud Radar (Co-I)
- DOE ASR grant DE-SC0021211 (PI)
- DOE RDPP grant DE-SC0023155 (PI)
- NASA ROSES-2020 80NSSC21K1457 (PI)
- NASA HAQAST2 NNX16AQ91G (PI)



A landscape photograph featuring a range of dark, silhouetted mountains in the foreground. The sky is filled with large, billowing white and grey clouds, with patches of blue sky visible. The lighting suggests a bright day, possibly late afternoon or early morning, as the clouds are illuminated from the side.

Changes needed for the
Future?

Funding structure

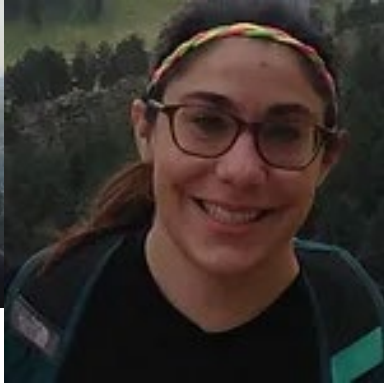
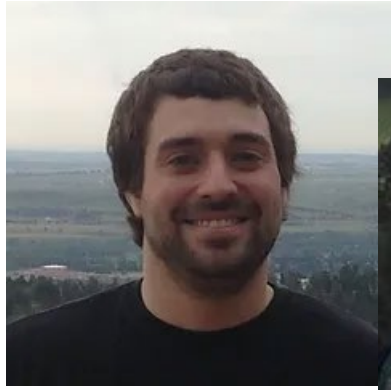
- small budgets designated to early-career, MSI, and first-time participants of field campaigns

Break barriers

- networking opportunities and collaboration between different universities/institutions

Investment/return

- Long-lasting impacts on students and faculty who greatly benefit from a jump start





Thank you!
Would Love to Hear Your Thoughts!