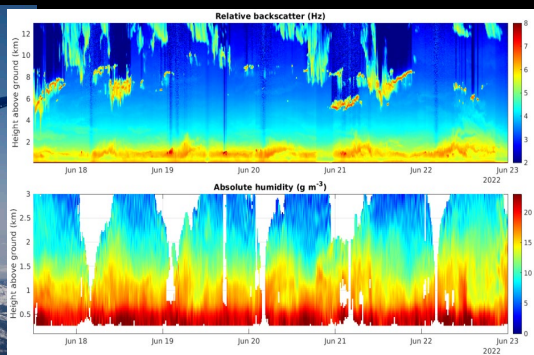
FARE Future: meeting agenda and expectations

Bart Geerts, University of Wyoming
Workshop Co-Chair



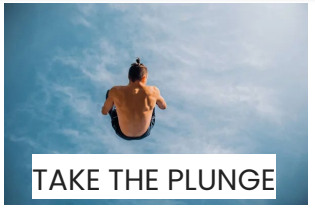
FARE Future Workshop Overview

The FARE Users' Workshop is funded by NSF to bring together new and experienced users of **Lower Atmosphere Observing Facilities** (LAOF) and **Community Instruments and Facilities** (CIF) to *network, collaborate, and explore observational needs to advance atmospheric science*.

The main goals of the workshop are :

- To increase community awareness of the expanded NSF FARE Program;
- To facilitate and engage in important discussions related to science drivers, emerging technologies, and community needs in the atmospheric sciences that will guide NSF's investment in future observing capabilities;
- To form / strengthen partnerships and sustain innovative collaboration.

Part I: FARE Process (Monday/Tuesday)



Audience:

- Researchers who are unfamiliar with NSF's FARE program, as well as "veterans"
- 122 participants

Program:

- Comprehensive overview of the NSF FARE Program (LAOF, CIF, FIRP, Track 1, 2, 3)
- Overview of field project support services offered by NCAR and other facility providers (e.g., data mgmt)

Highlights:

- Stories by recent FARE asset users
- Instrument Circuit - get to know facility providers/staff
- Facilities and Instrument Exhibit in UCAR Center Green parking lot – *Open TODAY during poster session and lunch*
- Breakout sessions to discuss challenges
- Ideas on how to train of next generation of airborne observationalists

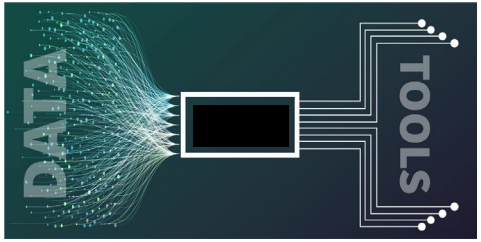
Ultimate Goal:

Walk away with a better understanding of what facilities and services are available; how to request those facilities, how to build a successful experiment design plan, and who to reach out to for further questions.

FARE Tours and Data FAIR (yesterday)

Target audience:

- Novice and seasoned users of FARE assets



Program:

- RAF Tour (morning)
- Foothills Lab Tour (afternoon, 2 tours / 1 hour each)
- Data FAIR (afternoon, 1-3 pm)

Highlights:

- NSF aircraft, the new NCAR RAF building, DFS shop
- MicroPulse DIAL, NCAR dropsonde display
- Delve into the world of data at the Data FAIR (***Findable, Accessible, Interoperable, Reusable***)
- Tools available to support field deployments

Ultimate Goal:

Don't make data an afterthought

FARE Future (today / tomorrow)

Our audience:

- Experienced and new users interested in new technologies, instrumentation development, and collaboration
- 113 registered participants, some virtual
- 43 distinct institutions, 34 of which are universities incl 12 MSIs [overall workshop]
- many FARE instrument providers (NCAR, UWyo, CIFs)

Objectives:

- Learn about **emerging technologies** in atmospheric measurements
- Learn about key **science drivers**
- **Facilitate discussions** about community needs in observational atmospheric research
- **Synthesize community input** in the form of a final report to NSF/AGS to set the stage for future instrumentation developments

FARE Future: **emerging technologies** enabling novel observations

- Mobile Phased Array Weather Radars - Developments from the ARRC at the University of Oklahoma

Robert Palmer
Exec Director, Assoc VPR, Professor
U. of Oklahoma ARRC
Speaker's Page

- Network of portable S-band radars (SOW) and bistatic array of radars network (BARN)

Joshua Wurman
Executive Director
University of Illinois
Speaker's Page

- Airborne Phased Array Radar (APAR)

Jothiram Vivekanandan
Senior Scientist
NCAR EOL
Speaker's Page

- Micropulse DIAL for Thermodynamic Profiling of the Lower Troposphere

Kevin Repasky
Professor
Montana State Univers
Speaker's Page

- Ground-based Spectral IR Thermodynamic Profiling

Dave Turner
Senior Scientist
NOAA Global Systems Lab
Speaker's Page

- LOTOS: A comprehensive lower-tropospheric observing network

Tammy Weckwerth
Senior Scientist
NCAR EOL
Speaker's Page

- Airborne Raman Lidar (MARLi) and 5-Beam Airborne Doppler Radar (ADL)

Zhien Wang
Professor
Stony Brook University
Speaker's Page

- Network of Atmospheric Composition and Aerosol Sensors

Gavin McMeeking
Scientist
Colorado State Univers
Speaker's Page

- From State to Process: What Airborne Isotopic Measurements tell us about Moisture Transport, Convective Mixing, and Precipitation Efficiency

Adriana Bailey
Assistant Professor
University of Michigan
Speaker's Page

- Small Uncrewed Aircraft for Weather and Climate Research: Insights from Decades of Research at the University of Colorado

Gijs de Boer
Senior Research Scient
University of Colorado Boulder
Speaker's Page

We need to leave any Q&A to the coffee break & poster session

FARE Future: **science drivers**: what measurements can be transformative?

- The NOAA/CSL Airborne Research Program - Measurements, Capabilities, Emerging Technologies, and Needs for Air Quality and Climate Research

- Advancing the Understanding of the Atmospheric Boundary Layer - Instrument Synergies and Challenges

- Requisite Measurements to Close Critical Gaps in our Understanding of Deep Convective Processes

- Measurements Needed to Advance Understanding of Aerosol-Cloud-Precipitation-Climate Interactions

Steven Brown
Program Leader
NOAA CSL
Speaker's Page

Bianca Adler
Research Scientist
CIRES, University of Colorado, NOAA PSL

Dr. Adam Varble
Earth Scientist
PNNL
Speaker's Page

Greg McFarquhar
Director
U. of Oklahoma CIWRO
Speaker's Page

20 min presentations, 5 min Q&A for each

Breakout session 1: What capabilities are needed to answer key science questions?

1:30 - 2:45 pm

Room	Code	(5 parallel sessions)	***Moderator***	***Co-chair***	***Rapporteur***
2603	1A	Aerosol, cloud, precipitation, and climate	Greg McFarquhar	Gannet Hallar (virtual)	Masa Saito
2607	1B	Trace gases, biogeochemical cycles, and climate	Britt Stephens	John Mak (virtual)	Steve Brown
2503	1C	Atmospheric thermodynamics and radiation	Bianca Adler	David Turner	David Turner
3131	1D	Boundary layer processes and air quality	Julie Lundquist	John Lin (virtual)	Patrick Veres
2126	1E	Extreme events: deep convection and tropical cyclones	Adam Varble	Wen- Chau Lee	Mani Rajagopal

1:50 - 3:15 pm: each group to report (plenary)

reporting portal →

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Breakout session 2: What are the new frontiers of measurement capabilities: Instruments

3:45 – 5:00 pm

Room	Code	(5 parallel sessions)	***Moderator***	***Co-chair***	***Rapporteur***
3131	2A	Radars (phased array, solid state and passive radar systems, radar hardware …)	Bob Palmer	Vivek	Coltin Grasmick
2503	2B	Lidars (Doppler, Raman, DIAL, ...)	Kevin Repasky	Zhien Wang	Tammy Weckwerth
2126	2C	Passive remote sensing (microwave radiometers, IR spectrometers, ...)	David Turner	Bianca Adler	Julie Haggerty
2603	2D	In situ (trace) gas instruments	Adriana Bailey	John Mak (virtual)	Britt Stephens
2607	2E	In situ aerosol, cloud, and precip probes	Jeff French	Sarah Woods	Minghui Diao

5:05 – 5:30 pm: each group to report (plenary)

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Breakout session 3: What are the new frontiers of measurement capabilities: Platforms

Friday 8:30 - 10:00 am

Room	Code	(5 parallel sessions)	***Moderator***	***Co-chair***	***Rapporteur***
3131	3A	Instrument Networks (surface fluxes/SEB networks, LT profiling networks, mobile ground arrays)	Gavin McMeeking	Kim Nitschke	Loren White
2126	3B	Crewed aircraft measurement opportunities and challenges	Matt Burkhart	Cory Wolff	Jason St. Clair
2503	3C	UAS / Drone measurement opportunities and challenges	Gijs de Boer	Brian Argrow	Chris Roden
2607	3D	Lab systems (cloud chambers, ice nucleation, aerosol/gas spectrometry)	Andrew Metcalf	Vacant	Neel Desai
2603	3E	Interface between models and experimental data (retrievals, simulators, data assimilation, OSSEs ...)	Steve Koch	Minghui Diao	Bart Geerts

Friday 10:00 - 10:30 am: each group to report (plenary)

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Our Pledge to Participants & Code of Conducts

UCAR/NCAR are committed to providing a safe, productive, and welcoming environment for all workshop participants, no matter what role they play or their background. This includes respectful treatment of everyone regardless of gender, gender identity or expression, sexual orientation, disability, physical appearance, age, body size, race, religion, national origin, ethnicity, level of experience, political affiliation, veteran status, pregnancy, genetic information, as well as any other characteristic protected under state or federal law.

- All participants are treated with respect and consideration, valuing a diversity of views and opinions
- Be considerate, respectful, and collaborative
- Communicate openly with respect for others, critiquing ideas rather than individuals
- Avoid personal attacks directed toward other participants
- Be mindful of your surroundings and of your fellow participants
- Alert NCAR conference staff if you notice a dangerous situation or someone in distress
- Respect the rules and policies of the workshop and UCAR/NCAR facilities

Housekeeping

- **Daily Agenda** poster located in CG Lobby, Whova browser and App
- **“Sticky Wall for Questions”** in CG Lobby
- **Guest Wifi** instructions located at registration table
- Doors & Emergency Exits & Bathrooms
- **Cell phones:** Remember to put phones in silent mode during meeting
- **Facilitate virtual participation:** Use microphones for all questions