

Facilities for Atmospheric Research & Education (FARE)



Division of Atmospheric and
Geospace Sciences
Geosciences Directorate

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NSF Program Directors at FARE Workshop



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FARE Workshop Objectives

FARE Process

- Increase community awareness about the expanded FARE Program and associated FIRP Solicitation.
- Encourage and train (especially new users) in the submission of scientific proposals that plan to use one or more of the available FARE assets for research and education.

FARE Future

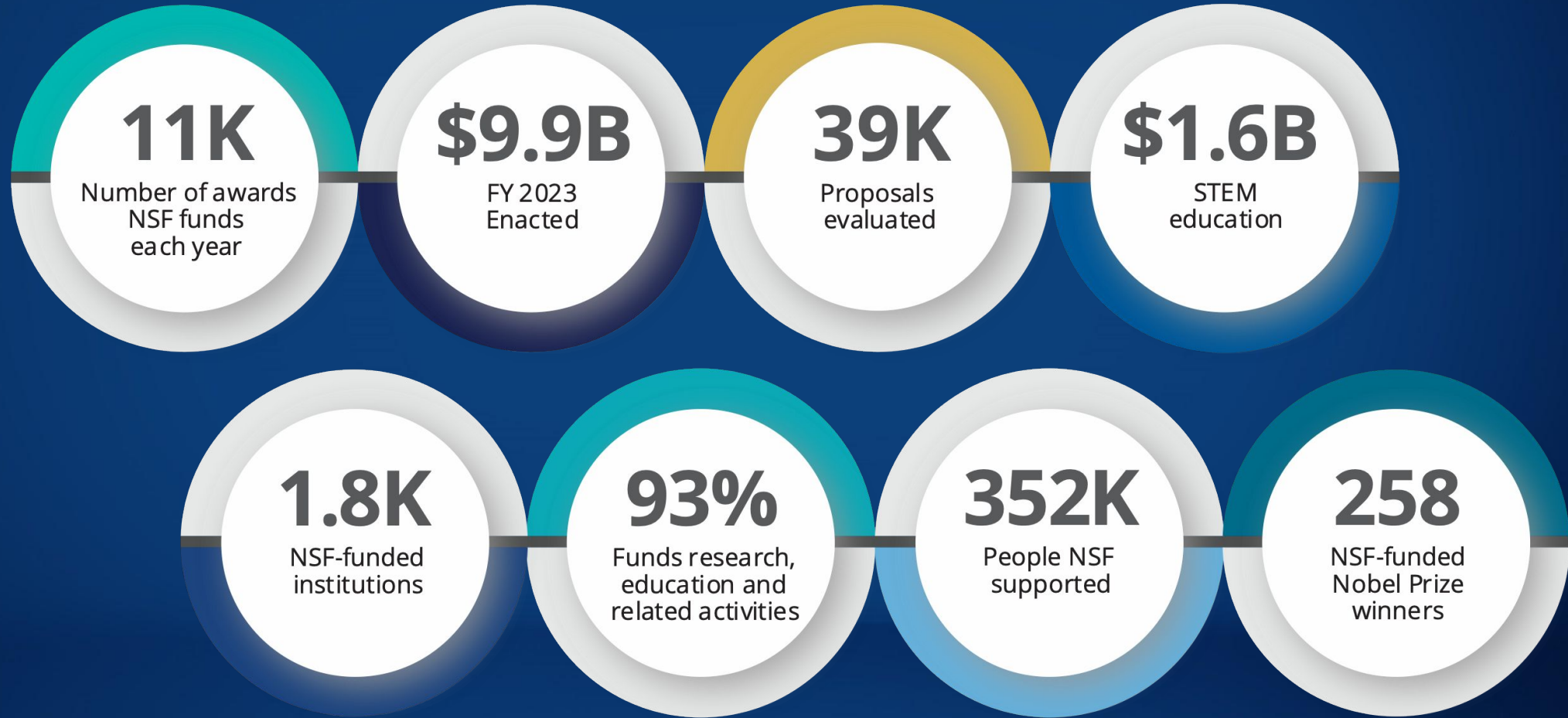
- To provide a venue for the community that facilitates continued discussions related to science drivers, emerging technologies, and community needs as they relate to observational atmospheric research.
- To understand community needs so NSF can plan ahead on future investments related to development of new instruments, observational facilities, & infrastructure.



Mission History



NSF By the Numbers





DIRECTORATE FOR GEOSCIENCES (GEO)

For a full list of GEO programs and opportunities scan the code below.



**Division of
Atmospheric and
Geospace Science
(AGS)**

**Division of Earth
Sciences (EAR)**

**Division of Ocean
Sciences (OCE)**

**Office of Polar
Programs (OPP)**

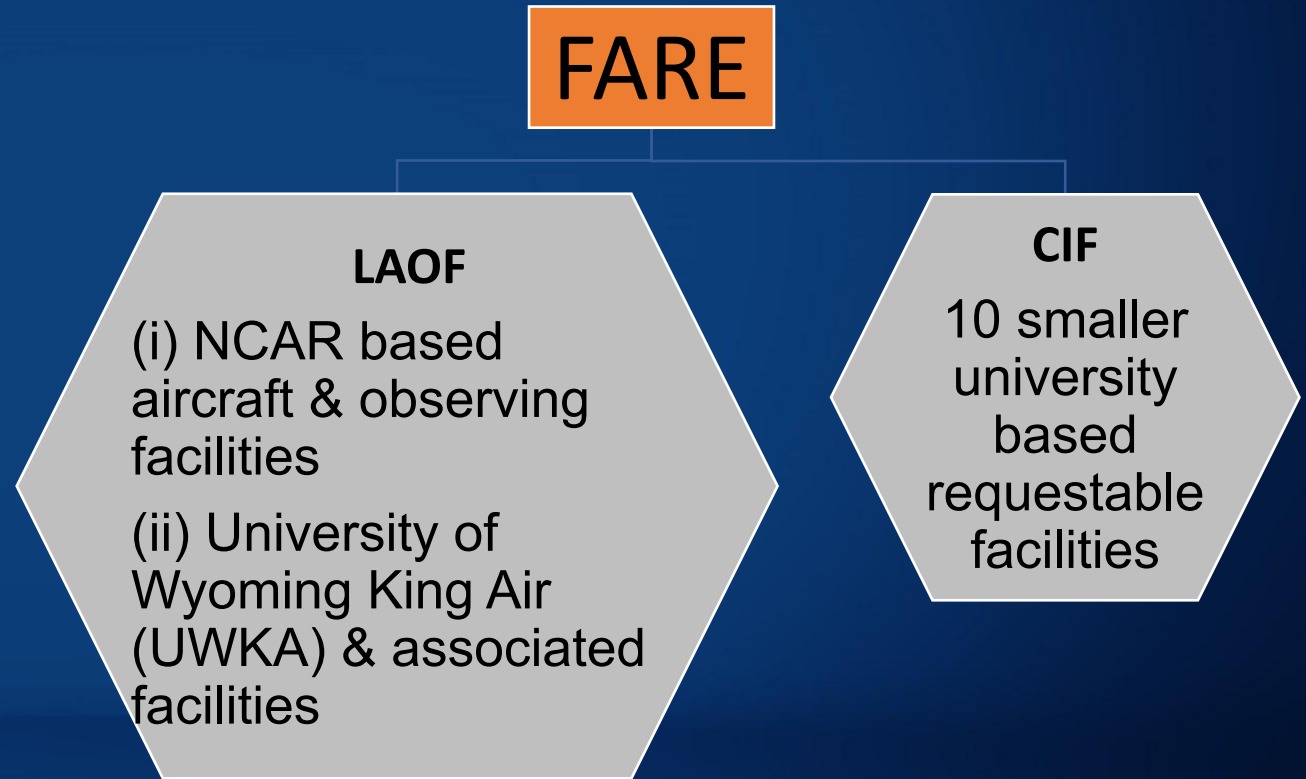
**Division of Research,
Innovation,
Synergies, and
Education (RISE)**



AGS Facilities for Atmospheric Research & Education (FARE)

fare@nsf.gov


- The new Community Instruments & Facilities program and the larger facilities supported via LAOF fall within FARE.
- A new solicitation with guidelines for requesting FARE supported facilities & instruments named FIRP was released in 2021 (NSF 21-611)
- All requests requesting use of FARE facilities must follow the FIRP solicitation.



<https://www.nsf.gov/geo/ags/programs/fare/>



Aircraft Facilities

NSF/NCAR C-130	NSF/NCAR Gulfstream G-V	New Univ. of Wyoming King Air
		
<ul style="list-style-type: none">□ Endurance – 10 hours□ Range - 2,900 nm/5,350 km□ Ceiling - 27,000 feet or 8,200 m	<ul style="list-style-type: none">□ Endurance – 10 hours□ Range - 6,000 nm/11,100 km□ Ceiling - 49,000 feet or 15,000 m	<ul style="list-style-type: none">□ Endurance – 5.4 hours with 1300 lbs; 3.1 hrs with 3100 lbs□ Range – 1125 nm avg.□ Ceiling - 33,000-35,000 ft depending on payload

New University of Wyoming King Air

- The Mid-scale Research Infrastructure-1 award to the University of Wyoming provided funding for a new King Air (UWKA-2).
- Modifications are underway. The new UWKA platform is expected to be available for research in early 2024.



Project Highlights

1. Newer aircraft – 2013 King Air 350i, higher ceiling, enhanced capabilities
2. Radar – next generation radars (WCR4 & KPR-2)
3. Lidar (MARLi-2, ADL)
4. New air chemistry inst. to improve trace gas and aerosol measurement capabilities
5. Enhanced communications (real time immersive flight experience) for education

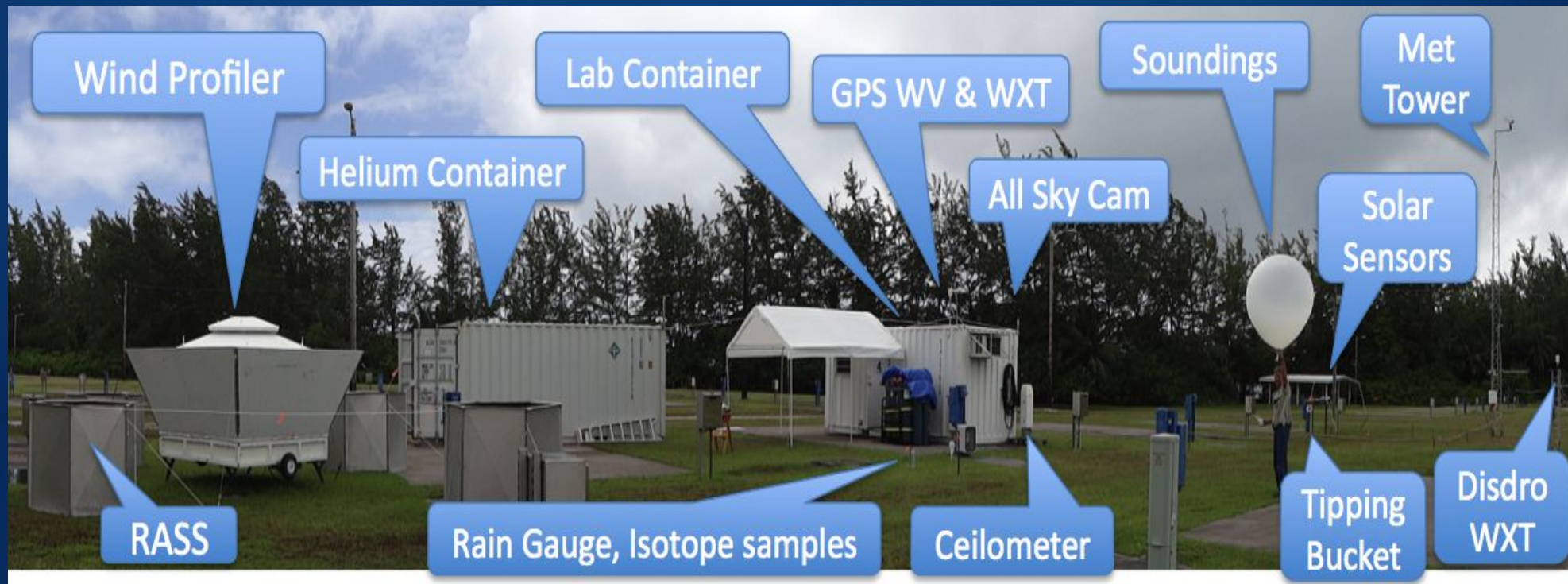
Facility Manager and POC for deployments
– Dr. Jeff French: jfrench@uwyo.edu
<http://www.uwyo.edu/atsc/uwka/>



Surface and Sounding Systems

Integrated Sounding System (ISS)

Radar wind profilers, sodar, ceilometer, disdrometer, lidar, rawinsonde system, etc.
Mobile system also available



Surface and Sounding Systems

Integrated Surface Flux System (ISFS)

- Basic meteorology, turbulence, surface fluxes, surface energy balance
- Sensors include sonic anemometers, radiometers, hygrometers, etc.
- Highly configurable



Remote Sensing Facilities/Instruments

Instrument	Characteristics	Type
S-PolKa	Dual wavelength : S (10 cm) and K _a (0.8 cm) bands Dual polarimetric	Ground-based
Wyoming Cloud Radar	Dual polarimetric, W-band (95 GHz/3 mm) Multiple configurations, single or dual beam	Airborne, Wyoming King Air or NSF/NCAR C-130
Wyoming Cloud Lidar	Upward and/or downward-looking; 355 nm	Wyoming King Air or NSF/NCAR C-130
HIAPER Cloud Radar (HCR)	Doppler, polarimetric, W-band radar K _a band planned	Airborne
High Spectral Resolution Lidar (HSRL)	532 nm; zenith or nadir, can be rotated in flight	Airborne



Community Instruments & Facilities



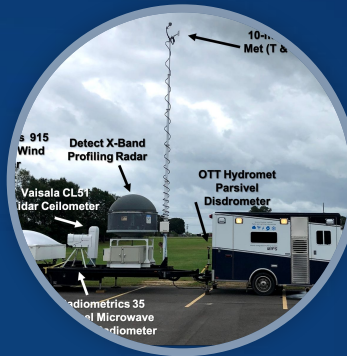
**CSU SEA-POL
Radar**



**Storm Peak Lab
University of Utah**



**SPARC
Univ. of Wisconsin**



**MAPNet
U. of Alabama Huntsville**



**Millimeter Wavelength
Radar Facility
SUNY Stony Brook**



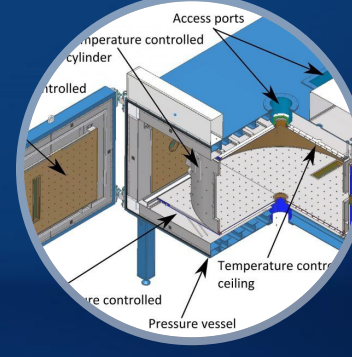
**FARM: Flexible Array of Radars
& Mesonets
U. Illinois, Urbana-Champaign**



**Clemson Single-Particle
Soot Photometer**



**NC State Ice
Nucleation Cold Stage**



**Michigan Tech
Pi Cloud Chamber**



**OU Rapid
X-Pol Radar**



CIF Objectives

- Expand the suite of instruments and facilities available to the atmospheric science community.
- Promote and enable research and education in areas currently supported by the NSF **Atmospheric Science** programs.
- Broaden participation of underrepresented groups in experiential learning by promoting innovative outreach efforts such as
 - partnerships with faculty at minority serving institutions and/or community colleges.
 - short courses or summer institutes focused on engaging members of underrepresented groups.
 - unique webcasting, social media or other activities to promote awareness of the facilities.



Questions?

Hope you have a productive week. Feel free to contact us: fare@nsf.gov



List of FARE supported Community Instruments & Facilities (CIF)

Request for research and education is highly encouraged.

PI/Last	Institute	Title
Bell	Colorado State University	CIF: A Sea-Going and Land Deployable Polarimetric (SEA-POL) Radar for the Science Community
Gero	U of Wisconsin Madison	CIF: Supporting the Space Science and Engineering Center (SSEC) Portable Atmospheric Research Center (SPARC)
Hallar	University of Utah	CIF: Storm Peak Laboratory: Facility for Research and Research Training in Atmospheric Sciences
Knupp	U of Alabama Huntsville	CIF: Mobile Atmospheric Profiling Network (MAPNet) Facility for Boundary Layer and Precipitation Investigations
Kollias	SUNY Stony Brook	CIF: Millimeter-wavelength Radar Facility for Cloud and Precipitation Research
Kosiba	U of Ill Urbana-Champaign	CIF: Community Instruments and Facilities: Mobile and Quickly Deployable Radars
Metcalf	Clemson University	CIF: Single-particle measurements of soot and incandescing aerosol
Petters	North Carolina State U	CIF: An Ice Nucleation Cold-Stage for Research and Teaching
Shaw	Mich Technological Univ	CIF: Making the Pi Convection-Cloud Chamber Available to the Community for Aerosol-Cloud-Turbulence Research
Yu	U of Oklahoma	CIF: Mobile Rapid Scanning Radar for Enhancing Weather Radar Research and Education