



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# Atmospheric Radiation Measurement (ARM) User Facility

---

**Sally McFarlane**  
ARM Program Manager

October 25, 2022

*2022 ARM-ASR Joint User Facility & PI Meeting*

# COVID-19 Updates

- ❑ All ARM sites are open to ARM staff and users for visits; masking/other requirements tied to local community transmission levels
- ❑ Many deferred campaigns and deferred instrument/site maintenance were conducted in FY22 – site staff & mentors have been busy
- ❑ Thanks to all ARM staff and users for your hard work, patience, and understanding over the past few years

# FY23 Budget

- ❑ FY22 budget saw many new initiatives for BER, as well as increased funding for ARM to support the AMF3 Southeastern US site and instrument refresh
- ❑ FY23 President's budget requested flat budget for ARM operations relative to FY22
- ❑ FY23 House and Senate appropriation bills express support for SC user facilities
- ❑ Currently in a continuing resolution until Dec 16

# ARM new capability updates

- ❑ New or upgraded instrumentation in process or planned:
  - ❑ Refresh of instrumentation including broadband radiometers, sun photometers, sky imagers, Doppler lidars, microwave radiometers
  - ❑ New lidar capabilities for NSA; new mobile C-band radar; upgrade KAZR antennas/electronics
- ❑ Arctic Shark UAS
  - ❑ First science mission at SGP in July – data in archive; Planning series of SGP missions in FY23
  - ❑ Breakout session this afternoon
- ❑ Challenger 850 – new ARM research aircraft
  - ❑ Aircraft modifications have been delayed due to FAA ruling of “significant” modifications, requiring subcontractor to respond to multiple FAA amendments since date of aircraft manufacture
  - ❑ FAA has recently accepted the “issue” papers; expect updated timeline for completing modifications by end of the year
- ❑ AMF3 site – update later this session

# Field campaign updates – fixed sites

- ❑ **SGP** – multiple small campaigns including studies on:
  - ❑ Agricultural ice nucleating particles
  - ❑ Hydroxyl radicals in cloud droplets
  - ❑ New particle formation
  - ❑ Boundary layer – wind farm interactions
- ❑ **NSA** – campaigns on:
  - ❑ Biological volatile organic compounds
  - ❑ Snow albedo evolution
- ❑ **ENA**
  - ❑ Aerosol growth in the Eastern North Atlantic

# Field campaign updates – Mobile Facilities

- ❑ TRACER (PI: Mike Jensen, BNL)
  - ❑ AMF campaign in Houston concluded after 1 year of operations & 4-month IOP
  - ❑ AMS special collection recently approved
- ❑ SAIL (PI: Dan Feldman, LBNL)
  - ❑ Over 1 year of data obtained; campaign continues through June 2023
  - ❑ Strong collaborations with BER Watershed project & NOAA SPLASH project
  - ❑ Breakout session tomorrow
- ❑ EPCAPE (PI: Lynn Russell, UCSD)
  - ❑ Site prep & installation of AMF beginning Nov
  - ❑ Campaign start Feb 15, 2023
  - ❑ Aircraft flights supported by ONR w/ aerosol instrumentation supported by ASR in June 2023



NEWS & EVENTS > FEATURES

## SAIL AT 1 YEAR: A MOUNTAIN HYDROLOGY CAMPAIGN SWEEPS UP RICH DATA

Published: 27 September 2022



WITH 9 MONTHS OF OBSERVATION TO GO, RESEARCHERS AWAIT ADDITIONAL SURPRISES IN THE ROCKIES



Photo: UC San Diego

# New activities - FICUS Proposal Selections

- ❑ FICUS – joint call with EMSL user facility for analysis of ARM TBS samples with EMSL instrumentation
- ❑ 4 proposals selected – projects will analyze data from SGP, SAIL, and TRACER

## FY23 FICUS Awardee



**Allison Aiken**

Los Alamos National Laboratory

### Seasonal Vertical Aerosol Profiling for Aerosol-cloud-precipitation interactions to Advance Mountainous Hydrological Process Science

Aerosols are critical for understanding the water cycle of mountainous regions, but a complete understanding cannot be provided without vertically resolved observations. The project aims to provide a greater understanding of aerosols and associated meteorological conditions for complex mountainous terrain in the East River Watershed of the Upper Colorado River.



## FY23 FICUS Awardee



**Allison Steiner**

University of Michigan

### Characterizing Primary Biological Aerosol Particles During TRACER

Atmospheric organic aerosols represent a large portion of total aerosols in the atmosphere. Among poorly constrained contributions are primary biological aerosol particle emissions from the terrestrial biosphere. The project aims to investigate vertical gradients of biological particles and their fragments by analyzing samples from the tethered balloon system during the TRACER campaign.



## FY23 FICUS Awardee



**Allen Goldstein**

University of California, Berkeley

### Vertically and Size-Resolved Chemical Speciation of Aqueously Processed Organic Aerosols

A gap in aerosol chemical composition between laboratory oxidation and ambient atmospheric data sets may result from challenges in simulating aerosol-cloud interactions. This project aims to improve process-level understanding and model representation of aerosol-cloud interactions and aerosol processes affecting cloud life cycles, properties, and related processes during ARM deployments.



## FY23 FICUS Awardee



**Maria Zawadowicz**

Brookhaven National Laboratory

### Characterization of the Aerobiome during ARM Surface-Atmosphere Integrated Laboratory (SAIL) Campaign

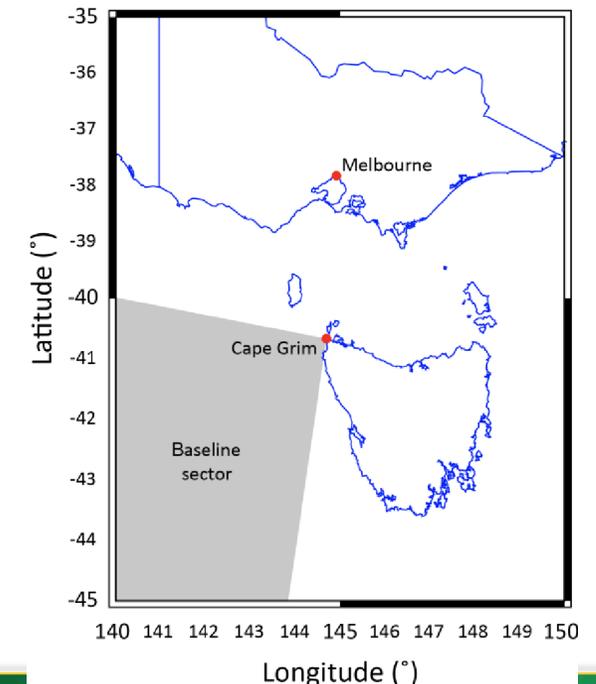
Atmospheric bioaerosols are bacteria, viruses, spores, or pollen and their fragments suspended in ambient air. They can have large impacts on air quality, climate, and public health. Atmospheric bioaerosols are difficult to measure, especially in real time. This project aims to investigate the vertical profile of bioaerosols as part of the SAIL campaign.



# New activities - AMF Proposal Selection

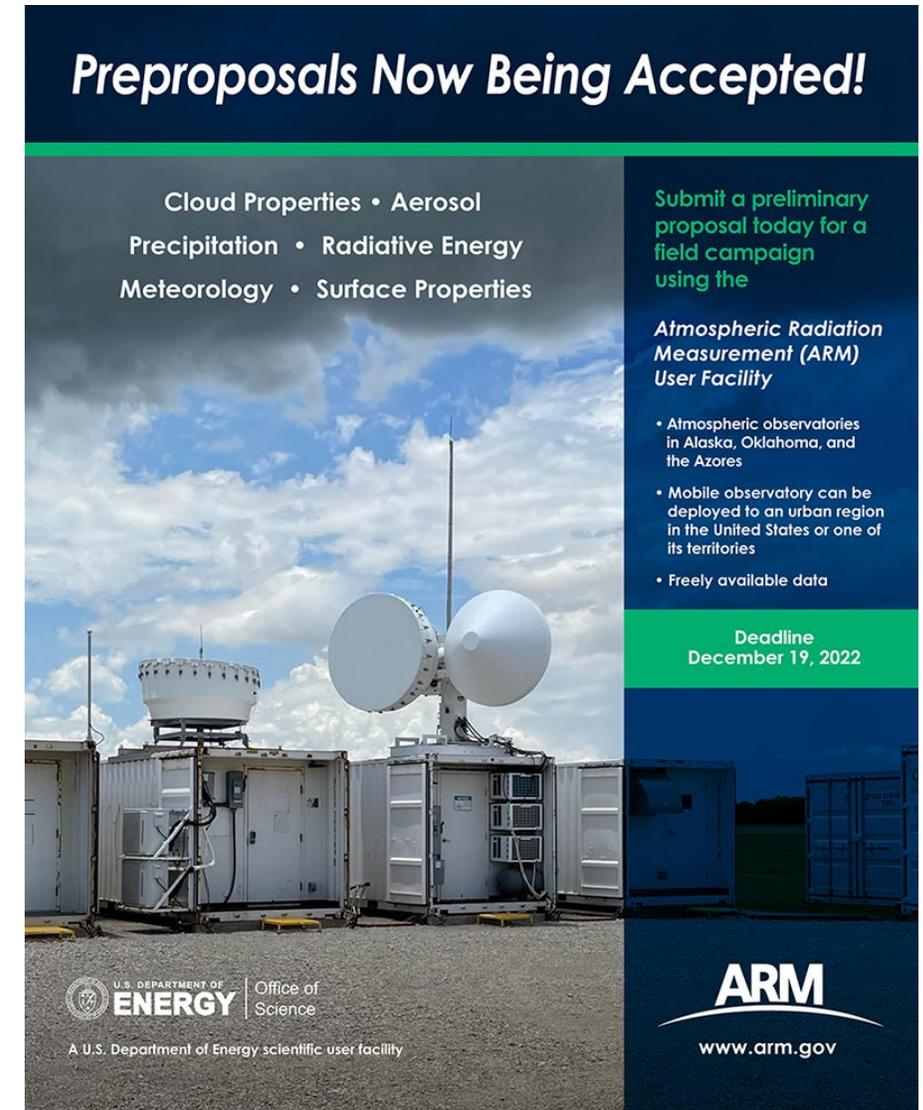
## Cloud And Precipitation Experiment at Kennaook (Cape-K)

- PI: Gerald Mace, University of Utah
- Team: Roger Marchand, Melita Keywood, Sam Cleland, Alain Protat, Ruhi Humphries, Sonya Fiddes, Christina McCluskey, Steve Siems, Yi Huang, Peter May
- Deployment of the AMF at the Kennaook/Cape Grim Baseline Air Pollution Station in Tasmania, Australia to study the seasonal cycle of Southern Ocean cloud & precipitation properties and their co-variation with aerosol, dynamic, and thermodynamic factors
- April 15, 2024 – Sep 15, 2025 with two planned IOPs
- Collaboration with Australian Bureau of Meteorology and CSIRO including planned ship-borne campaign off Tasmania in Austral winter 2025



# ARM Facility Solicitations

- ❑ New call for AMF deployments open
- ❑ Deployments within US focusing on urban regions
- ❑ Webinar on Nov 9
- ❑ Pre-applications due Dec 19
- ❑ FICUS & TBS call – expected Dec
- ❑ Proposals for small campaigns & use of ARM high performance computing capabilities always open
- ❑ Proposals reviewed quarterly by IMB



**Preproposals Now Being Accepted!**

Cloud Properties • Aerosol  
Precipitation • Radiative Energy  
Meteorology • Surface Properties

Submit a preliminary proposal today for a field campaign using the

**Atmospheric Radiation Measurement (ARM) User Facility**

- Atmospheric observatories in Alaska, Oklahoma, and the Azores
- Mobile observatory can be deployed to an urban region in the United States or one of its territories
- Freely available data

**Deadline  
December 19, 2022**

U.S. DEPARTMENT OF **ENERGY** | Office of Science  
A U.S. Department of Energy scientific user facility

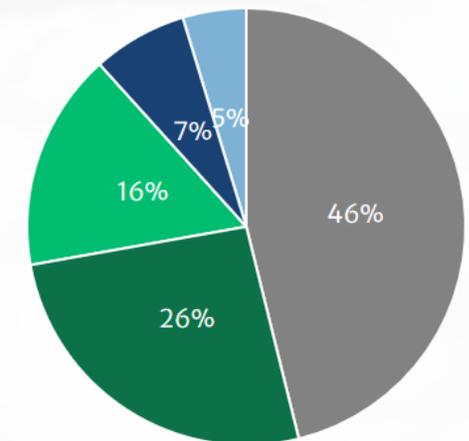
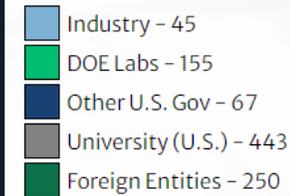
**ARM**  
www.arm.gov

# User registration form

- ❑ Office of Science requires ARM to report information on science users
- ❑ This information is important to continued funding/support for the facility!
- ❑ Office of Science has been adding required information the past few years & more rigorously checking input
- ❑ Please fill out/update your user registration information & project information



**USERS BY INSTITUTION**



# Acknowledging ARM

- ❑ <https://arm.gov/working-with-arm/acknowledging-arm>
- ❑ It is important to acknowledge ARM facility in your papers to show the research coming out of the facility
- ❑ Please submit research highlights on your papers using ARM data: <https://arm.gov/research/highlights>
- ❑ ARM data is not possible without the work of many people – to acknowledge their efforts:
  - ❑ Cite the data – use DOIs for datasets
  - ❑ Cite instrument handbooks or relevant papers on the instruments/data streams
  - ❑ If ARM mentors or other ARM staff are contributing significantly to your research, please consider including them as a co-author
  - ❑ See Adam Theisen’s poster – “Get to Know your ARM Instrument Mentors”