



Atmospheric System Research Program Update

Shaima L. Nasiri & Jeff Stehr
ASR Program Managers

June 23, 2020

ARM-ASR Joint User Facility & PI Meeting



U.S. DEPARTMENT OF
ENERGY

Office
of Science

Office of Biological
and Environmental Research

2020 Challenges

- We know that COVID-related closures, postponements, and work situations are impacting your research
 - Continue to let us know. The more information we have, the more we can work with you to find solutions.
- We know COVID affects more than your ASR-related research and that ASR is only a small part of your life.
- Thank you for taking the time to join the ARM and ASR communities this week.

Outline

- General updates
- Personnel updates: ASR and AACT
- ASR Funding: Reviews and Selections
 - DOE FOA 0002034 selections (FY19)
 - DOE FOA 0002198 updates (FY20)
 - Other Prospective FOAs and timelines
- Communications updates
- Meeting details

Atmospheric System Research (ASR) program

ASR utilizes the long-term cloud, aerosol, precipitation, and meteorological datasets from the Atmospheric Radiation Measurement (ARM) user facility, targeted field campaigns, laboratory studies, and process models to address key uncertainties in processes associated with clouds and aerosols that affect the Earth's radiative balance and hydrological cycle and limit the predictive ability of regional and global models.

Priority research areas are aerosol processes, warm boundary-layer processes, convective processes, and high-latitude processes.

ASR supports research at the national labs as well as through grants to universities and other research institutions.

DOE, BER, EESSD, and ASR

- The Climate and Environmental Sciences Division (CESD) changed its name to the Earth and Environmental Systems Sciences Division (EESSD).
 - The new name matches the congressional budget line
 - Division priorities have not changed and the divisional strategic plan has been updated with the new name.
- DOE's FY20 Appropriations bill was passed on 19 Dec. 2019
 - We were able to plan towards the budget based on Senate and House report language
 - BER was charged with spending \$15M to support cloud-aerosol research and computing. DOE tasked ASR with this charge.
 - ASR budget was \$35M (\$7M over FY19, and a large increase over Administration's FY20 request)
- FY21 budget is still up in the air
 - As in past 3 years, planning is difficult

ASR has two program managers again

- Dr. Jeff Stehr joined DOE in November 2019
- Six years at NASA HQ working across Earth Science and Heliophysics Divisions
- Research scientist and first director of the undergraduate program in the Department of Atmospheric & Oceanic Science at U. of Maryland for 17 years
 - Measurements from aircraft, surface, ships of trace gases and particles; modeling of same
- Joys of the new job!
 - Hearing new science ideas from some of the best in the world
 - Mentoring, listening, making things work better.
 - Working on important problems



- Ph.D. in Physics U. of Minnesota
- B.S. in Physics U. of Michigan
- Hiking, skiing, biking, gardening, photography
- Improv

ASR Working Group updates

- Hugh Morrison (NCAR) joined Adam Varble as co-chair of the Convective Processes working group in July 2019
- All 4 ASR working groups each have co-chairs
- Working group list serves are seeing more action
- Opportunities for virtual working group meetings later this fall. Bring us your ideas.



ARM-ASR Coordination Team (AACT) - updates

- Allison Aiken (LANL), ARM User Executive Committee Vice-Chair
- Sebastien Biraud (LBNL), ARM User Executive Committee Chair
- Jim Mather (PNNL), ARM Technical Director
- Nicki Hickmon (ANL), ARM Associate Deputy for Operations
- Jennifer Comstock (PNNL), ARM Engineering and Process Manager
- Adam Theisen (ANL), ARM Instrument Operations Manager
- Giri Prakash (ORNL), ARM Data Services Manager
- Shaocheng Xie (LLNL), ARM Lead Translator
- Jerome Fast (PNNL), PNNL SFA Lead
- Michael Jensen (BNL), BNL-ANL SFA Lead
- Greg McFarquhar (Univ. of Oklahoma), High Latitude Processes WG
- Gijs de Boer (Univ. of Colorado), High Latitude Processes WG
- Nicole Riemer (Univ. of Illinois), Aerosol Processes WG
- Jim Smith (Univ. of California-Irvine), Aerosol Processes WG
- Adam Varble (PNNL), Convective Processes WG
- Hugh Morrison (NCAR), Convective Processes WG
- Rob Wood (Univ. of Washington), Warm Boundary-Layer Processes WG
- Yunyan Zhang (LLNL), Warm Boundary Layer Processes WG

ASR FY2019 research call FOA 0002034

- ASR issued a targeted research call on 12/26/2018 covering four topic areas:
 - **Aerosol processes at ARM sites**
 - **Warm boundary-layer atmospheric processes**
 - **Convective cloud processes**
 - **Southern Ocean cloud and aerosol processes**
- 110 Pre-applications by 1/28/2019
- 94 applications received by 3/14/2019 due date
- 3 review panels met in May 2019
- Decision process is on-going.
 - Approval to spend \$13.2M
 - Expect to make 20 to 24 awards
 - End of the fiscal year paperwork crunch means that formal declination letters may not arrive until late summer

2019 Slide

ASR FY2019 research call FOA 0002034

- ASR issued a targeted research call on 12/26/2018 covering four topic areas:
 - **Aerosol processes at ARM sites**
 - **Warm boundary-layer atmospheric processes**
 - **Convective cloud processes**
 - **Southern Ocean cloud and aerosol processes**
- 110 Pre-applications by 1/28/2019
- 94 applications received by 3/14/2019 due date
- 3 review panels met in May 2019
- \$13.2M for 24 awards
- 49 reviewers (panels and mail-in)

ASR FY2019 research call FOA-0002034 Projects

PI	Proposal Title
Bretherton, Christopher	Are marine low cloud droplet concentrations buffered by entrained Aitken-mode aerosol
Browne, Eleanor	Constraining the Chemistry of Particle Formation and Growth in the Southern Great Plains
Cappa, Christopher	Characterizing the impact of water uptake on light absorption by aerosol particles
Farmer, Delphine	Size-resolved particle and black carbon deposition over the cryosphere
Fu, Qiang	Direct Radiative Effects of Aerosols at the ARM SGP and TWP Sites
Gettelman, Andrew	Freezing Processes in Southern Ocean Mixed Phased Clouds
Goldstein, Allen	Advancing Molecular Level Understanding of Aerosol Processes in the Amazon and Integration with Modeling
Grabowski, Wojciech	From clouds to precipitation: multiscale dynamics-microphysics interactions in cumulus clouds

PI	Proposal Title
Kirshbaum, Daniel	Shallow cumulus entrainment: observational retrieval, physical interpretation, and climate impacts
Krueger, Steven	Using ARM Data to Retrieve Entrainment Rates in Stratocumulus Cloud Systems
Larson, Vincent	Turbulent processes that influence boundary-layer cloud structure
Prein, Andreas	Using ARM Observations to Evaluate Process-Interactions in MCS Simulations Across Scales
Sakaeda, Naoko	Assessment of Cloud Development and Organization Processes within the Madden-Julian Oscillation using ARM Observations and Lagrangian Modeling
Schumacher, Courtney	Organized convection and parameterized versus large-scale physics in global earth system models
Segal Rozenhaimer, Michal	Assessing the link between aerosol mixing state, structure and composition and their optical properties: Ascension Island as a testbed for the South-East Atlantic aerosol regimes
Shaw, Raymond	Entrainment and aerosol effects on marine boundary-layer clouds: An investigation using ACE-ENA data from HOLODEC, G1, Pico and ACTOS

PI	Proposal Title
Wang, Jian	Properties and controlling processes of aerosol and cloud condensation nuclei in marine boundary layer over Eastern North Atlantic
Wang, Zhien	Understanding Processes Controlling the Temporal and Spatial Variations of PBL Structures Over the ARM SGP Site
Witte, Mikael	Evaluation of boundary layer cloud processes in an advanced parameterization for global models
Zhang, Zhibo	Characterizing the Variation and Covariation of Cloud Microphysical Properties and Implications for Simulation of Subgrid-scale Warm-Rain Processes in Earth System Models
Zipser, Edward	Interactions Between Aerosols, Meteorology, and Early Convective Cloud Lifecycle as Measured During CACTI
Turner, David and Wagner, Timothy	Characterizing Land-Atmosphere Interactions During the Afternoon-to-Evening Transition Using ARM SGP Observations
Morrison, Hugh and Peters, John	Improving Understanding of the Internal Structure and Dynamics of Deep Convection Using ARM Observations and Large Eddy Simulations
Elsaesser, Gregory and Tao, Wei-Kuo	Advancing Understanding of Deep Convective Anvil Clouds

ASR FY2020 research call FOA-0002198

- ASR issued a targeted research call on 11/20/2019 covering four topic areas:
 - **Aerosol-cloud interactions**
 - **High-latitude atmospheric processes**
 - **Aerosol and/or cloud research associated with ARM's TRACER campaign**
 - **New data products**
- 116 Pre-applications by 1/21/2020
- 87 applications received (3/10/2020 due date)
- 5 virtual review panels met in May
- Decision process is on-going
 - FOA anticipated \$13.5 for awards* (released before final appropriation)
 - Goal is to have all decisions finalized by late July

Prospective new FOAs in 2020 (for 2021 funding)

- For FY21 we plan another ASR topical research call later in calendar 2020 (trying, again, for early fall).
 - We anticipate it will be targeted topically to complement research areas funded in FY 2020, priorities in working group areas, DOE priorities, and ongoing and upcoming ARM field campaigns

ASR FOA	fiscal year of funding	# proposals submitted	# proposals selected	total funding	selection rate
1174	2015	96	19	\$9.2 M	20%
1431	2016	26	6	\$2.2 M	23%
1430	2016	101	19	\$12.0 M	19%
1638	2017	74	15	\$9.3 M	20%
1845	2018	70	19	\$10.7 M	27%
2034	2019	94	24	\$13.2 M	26%

ASR communications updates

- Updated ASR website rolled out over the past year
- Better search features
- More integration between project pages and article
- Plans for 2020
 - Mobile friendly page
- Looking for suggestions/volunteers for ASR scientist profiles and story topics

A few meeting announcements and reminders

- Once again, there are no formal evening sessions.
- The virtual meeting format has its challenges, but we are focusing on the opportunities it present
 - More people are able to attend this year
 - Q&A feature makes it easy to ask questions
- Don't forget to share your presentations the day before your session

Ask the program manager