

UNITED STATES ANTARCTIC PROGRAM
Science Planning Summary

2026–2027



United States Antarctic Program

SCIENCE SUPPORT

2026–2027

SCIENCE PLANNING SUMMARY

This publication is for use by United States Antarctic Program (USAP) grantees and participants. Others interested in knowing more about U.S. Antarctic activities are encouraged to visit the [USAP web site](#)  or the U.S. National Science Foundation's [Office of Polar Programs](#)  page.

Cover Photo: The Super Dual Auroral Radar Network (SuperDARN) Array in front of the very phenomena it helps research: Aurora Australis; Photo by Ted Lee.

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Table of Contents

2026-2027 FIELD SEASON

Front Matter

USAP Station Schedules	4
Air Operations	5
Staffed Field Camps	7
Event Numbering System	10

Projects By Discipline

Astrophysics and Geospace Sciences	12
Organisms and Ecosystems	47
Integrated System Science	61
Earth Sciences, Geodesy and Geophysics	82
Glaciology, Ice Core Science and Geomorphology	96
Oceans and Atmospheric Sciences	105
Technical Event - Science	124
Artists and Writers	137
Instrumentation and Technology Development	140

USAP Station Schedules

2026-2027 FIELD SEASON

The United States Antarctic Program operates three permanent research stations on the continent.

Opening Dates

	Austral Summer		Austral Winter
	Operational	Science	
McMurdo (Early Season)	21 Aug 2026	Continuing through Winter/WinFly 26 Aug 2026	16 Mar 2027
McMurdo (Mainbody)	6 Oct 2026	6 Oct 2026	
South Pole	23 Oct 2026	27 Oct 2026	15 Feb 2027
Palmer	20 Nov 2026	12 Nov 2026	18 April 2027

Estimated Population

	Summer	Winter
McMurdo	859 (weekly average)	196 (winter total)
South Pole	154 (weekly average)	52 (winter total)
Palmer	44 (weekly average)	21 (winter total)

Air Operations

2026-2027 FIELD SEASON

McMurdo Station

McMurdo-based aircraft, including helicopters, fixed wing aircraft, and uncrewed aircraft systems (UAS) will continue to support USAP researchers and program logistical functions.

Helicopters

Pathfinder Aviation, LLC

[Pathfinder Aviation, LLC \(PAA\)](#) [↗](#) is contracted by the U.S. National Science Foundation (NSF) to operate up to three helicopters during day shift and up to two helicopters during night shift this season in support of approved research and operational efforts in the vicinity of McMurdo Station.



A Bell 212 Helicopter, Operated by Pathfinder Aviation

Missions typically take place in McMurdo Sound, McMurdo Dry Valleys, Royal Society Range, Ross Ice Shelf and Ross Island regions, and will be supported by light (Astar B3s) and/or medium (Bell 212) airframes.

Southern Lakes Helicopters (SLH)

Antarctica New Zealand (ANZ) will be contracting an Astar B3 from [Southern Lakes Helicopters \(SLH\)](#) [↗](#) this season. U.S. Antarctic Program aircraft are available to provide NSF-approved quid pro quo missions in support of ANZ's 2026-2027 field science program as supportable throughout the season.

Fixed Wing Support

New York Air National Guard (ANG)

[The New York Air National Guard 109th](#)

[Airwing](#)  LC-130 Hercules aircraft will provide research and operational support to South Pole Station, West Antarctic Ice Sheet Divide (WAIS), Byrd Surface Camp, and Siple Dome Camp.

These workhorse aircraft, the largest ski-equipped planes in the world, are essential for transporting personnel, fuel, and equipment across the Antarctic; enabling research, construction, and waste disposal by landing on ice and snow runways.



*New York Air National Guard (ANG) LC-130
Airplane*

Kenn Borek Air

[Kenn Borek Air \(KBA\)](#)  will provide three DHC-6 Twin Otter and one DC-3T Basler aircraft to support a number of USAP operations on continent. The Twin Otters will be based out of McMurdo Station, South Pole Station, WAIS Divide, Byrd Surface Camp, and Siple Dome Camp at different times throughout the season, while the Basler will be based out of McMurdo Station for the full season.



Twin Otter Aircraft, Operated by Kenn Borek Air

Uncrewed Aerial Systems (UAS)

There will be several UAS operating in the McMurdo Station area this season, as well as some field camps. Naval Information Warfare Center (NIWC) Air Traffic Control and ASC Aviation Operations will advise aircraft of all UAS activities and deconflict airspace, as required.

Staffed Field Camps

2026-2027 FIELD SEASON

During the 2026-2027 summer season, ASC will operate five staffed field sites providing science support.

Taylor Valley Camps

~50 Nautical Miles From McMurdo Station

77° 38.000' S, 162° 52.000' E (LAKE HOARE)

The Taylor Valley camps will open to provide support to ongoing science projects in the McMurdo Dry Valleys. All camps are supported by helicopter operations based at McMurdo Station. This year, two resident staff based at Lake Hoare will facilitate operations at Lake Hoare, Lake Fryxell, Lake Bonney, F6, and New Harbor camps. Supported groups in the Taylor Valley this season include MCM-LTER and G-051.



Tents near the foot of the Canada Glacier, at the Lake Hoare field camp"

WAIS Divide Camp (WSD)

891 Nautical Miles From McMurdo Station

79° 29.000' S 112° 5.000' W

The WAIS Divide camp, with eight resident staff, will be completing decommission this coming season. The West Antarctic Support Traverse, along with Heavy Science Traverse and Intermediate Science Traverse, will traverse between WAIS Divide and Byrd Surface Camp to deliver remaining infrastructure to Byrd Camp. WAIS Divide is supported by fixed wing aircraft and LC-130 operations.



Portable Shelters at the West Antarctic Ice Sheet (WAIS) Divide Field Camp"

Marble Point

44 Nautical Miles From McMurdo Station

77° 26.000' S 163° 50.000' E

Marble Point will open with two residential staff to provide fuel services and weather observation support for helicopter operations between McMurdo Station, Taylor Valley, and Wright Valley. Marble Point is supported by helicopter operations based at McMurdo Station.

Siple Dome (SDM)

507 Nautical Miles From McMurdo Station

81° 39.840' S 149° 1.050' W

Siple Dome will open to provide fuel services and weather observation support for aircraft travelling between McMurdo Station and WAIS Divide Camp. Siple Dome has three residential staff to support aviation operations, POLENET recovery and retro, and O-283. Siple Dome is supported by fixed wing aircraft and LC-130 operations.



The Siple Dome field camp in West Antarctica, located about 500 miles from McMurdo Station"

Byrd Camp (NBY)

800 Nautical Miles From McMurdo Station

80° 01.000' S 119° 64.000' W

Byrd Camp will open to support the WAIS Divide decommission project, POLENET recovery and retro, and O-283. There will be eight

residential staff based at Byrd Camp. Byrd Camp is supported by fixed wing aircraft and LC-130 operations.

Event Numbering System

2026-2027 FIELD SEASON

Every USAP project is assigned a unique event number consisting of three parts: A prefix indicating the USAP program funding the effort, a project number, and a suffix denoting the location where field work will take place. If field work takes place at more than one location the event number will indicate this with multiple suffixes separated by a slash.



Sample Event Number

A - **100** - **M**

In the example above, the project would be funded by the *Astrophysics and Geospace Sciences program*, have a project number of *100*, and would consist of field work to be performed at or near *McMurdo Station*.

Program Prefixes

A

Astrophysics and Geospace Sciences

Dr. Marion Dierickx, Program Director

B

Organisms and Ecosystems

Dr. William Ambrose, Program Director

C

Integrated System Science

Dr. William Ambrose, Program Director

G

Earth Sciences, Geodesy and Geophysics

Dr. Kelly Brunt, Dr. David Porter, Dr. William Ambrose, Program Directors

I**Glaciology, Ice Core Science and Geomorphology**

Dr. Kelly Brunt, Dr. David Porter, Program Directors

O**Oceans and Atmospheric Sciences**

Dr. David Porter, Dr. William Ambrose, Program Directors

T**Technical Event - Science**

Dr. Kelly Brunt, Dr. Marion Dierickx, Jessie Crain, Program Directors

W**Artists and Writers**

Dr. Lauren Culler, Program Director

X**Instrumentation and Technology Development**

Dr. Deepankar Medhi, Program Director

Location Suffixes

M**NSF McMurdo Station****P****NSF Palmer Station****S****NSF South Pole Station****E****Special Projects Supported by the USAP**

(e.g., Investigators working with other national Antarctic programs)

2026–2027

USAP FIELD SEASON PROJECTS

ASTROPHYSICS AND GEOSPACE SCIENCES

Dr. Marion Dierickx, Program Director

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Small Multi-GNSS Data Collection Array for Ionosphere and Space Weather Monitoring

Event Number:

A-104-M/P/S

NSF / OPP Award 2332508

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Jamee Johnson /

Randolph Jones / Sheryl Seagraves

Principal Investigator(s):

Dr. Jade T Morton

jade.morton@colorado.edu 

University of Colorado Boulder

Department of Aerospace Engineering
Sciences

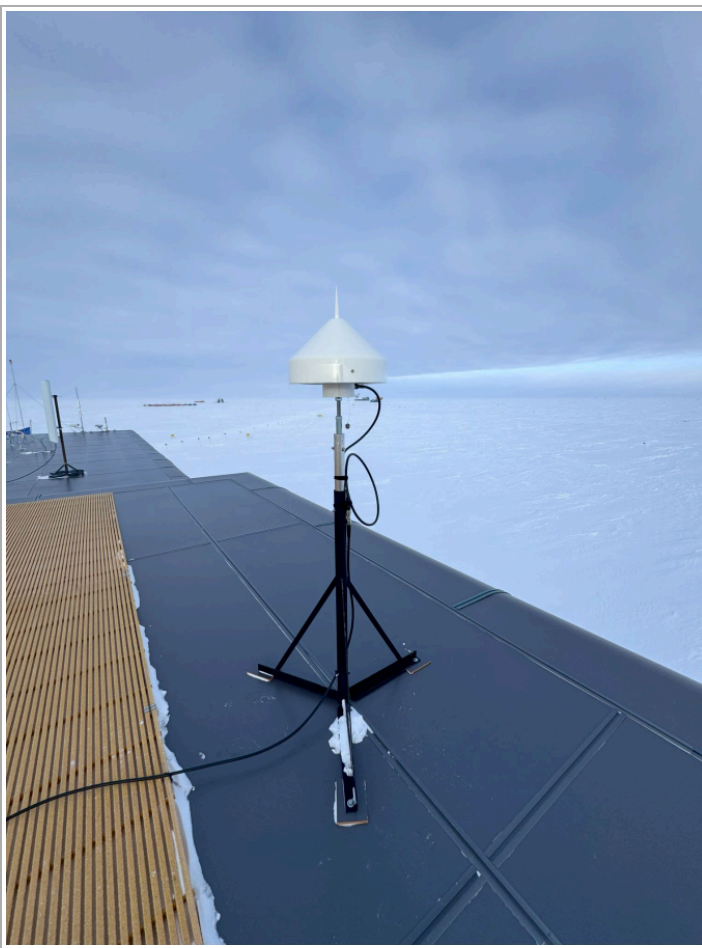
Boulder, Colorado

Location(s):

- **Supporting Stations:** McMurdo Station, Palmer Station, South Pole Station
- **Research Locations:** McMurdo Station, South Pole Station, Palmer Station

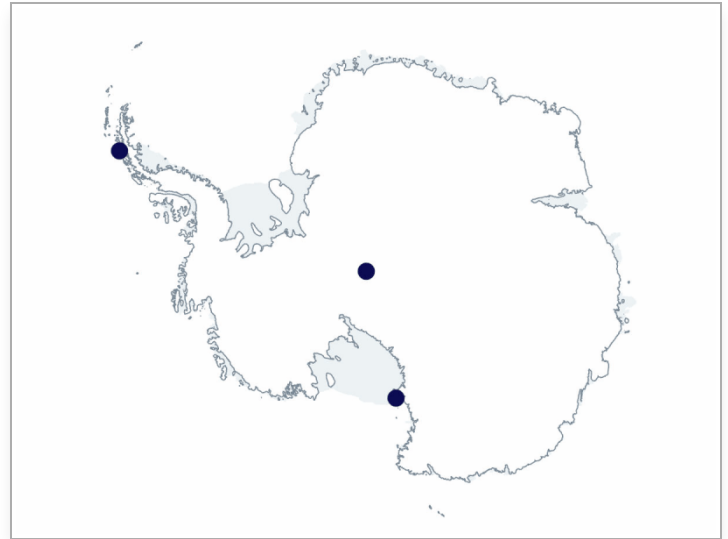
Project Description:

The polar ionosphere is home to complex processes that reflect dynamic coupling between the solar wind, magnetosphere, and upper atmosphere. As the Sun approaches its solar maximum, the polar ionosphere increasingly experiences intense space weather events. Global navigation satellite system



Antenna installed at South Pole. Photo courtesy of Jade Morton.

(GNSS) signals propagating through the polar ionosphere offer a unique opportunity to observe and study multiscale ionosphere irregularities, which are more intense, frequent, and complex in the southern than northern hemisphere. Current models do not adequately capture certain observed phenomena and irregularity formation and propagation mechanisms. Better spatial coverage, continuity, and resolution of ionospheric structures are needed to observe ionospheric plasma irregularities and their dynamics over Antarctica and to compare northern and southern hemisphere ionospheric responses to space weather events.



A-104 -M/P/S Research Location(s): McMurdo Station, South Pole Station, Palmer Station

This project aims to integrate data from new and existing GNSS stations with satellite measurements and data from multi-instrument sites that the science team and collaborators operate in Antarctica and the Arctic, to perform long-term monitoring of patterns of ionospheric irregularities over the southern polar regions and their dependence on solar-geomagnetic activities. Dedicated case studies will also be conducted to investigate the physics behind ionospheric irregularity formation and evolution in relation to geomagnetic activity and associated ionospheric dynamics at high latitudes.

Field Season Overview

The team will not deploy to Antarctica during the 2026-27 season. A GNSS experiment was installed in 2024-25 at McMurdo Station (Arrival Heights Lab) and South Pole Station (B2 Lab) with the help of principal investigators Dr. Hyomin Kim (2332427) and Dr. Allan Weatherwax (2332429). At Palmer Station (Terra Lab), a GNSS experiment was installed during 2025-26. Each installed GNSS experiment uses 28" x 28" x 17" of lab or tabletop space, and the GNSS equipment requires no data transfers. Removable hard drives will be shipped back to the home institution twice per year or as logistics can accommodate. Research associate support will be provided weekly for general maintenance and troubleshooting and annually for data-media shipping and receiving.

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Next Generation of Geospace Research Facilities at USAP Stations

Event Number:

A-111-M/P/S

NSF / OPP 2332427

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Jamee Johnson /
Randolph Jones / Sheryl Seagraves

Principal Investigator(s):

Dr. Hyomin Kim

Hyomin.kim@njit.edu 

New Jersey Institute of Technology
Department of Physics
Newark, New Jersey

Location(s):

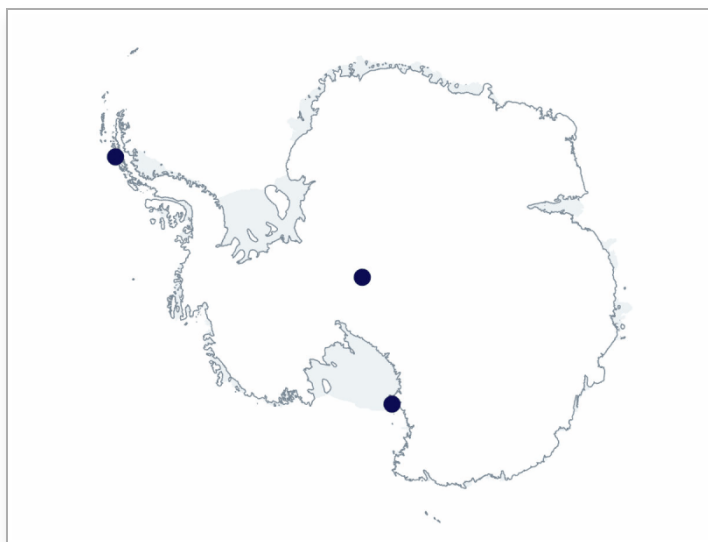
- **Supporting Stations:** McMurdo Station, Palmer Station, South Pole Station
- **Research Locations:** McMurdo Station (Arrival Heights), South Pole Station (B2 Laboratory), Palmer Station (Terra Lab)

Project Description:

Earth's space environment (geospace) is important to understanding the planet's functions within the solar system and the Sun's influence via space weather on technological systems on Earth and in space. Space weather impacts a wide range of technologies, including spacecraft operations and orbits, global positioning systems (GPSs), global



Auroras over the radome at South Pole Station. Photo by John-Michael Watson, courtesy of the NSF/USAP Photo Library.



A-111-M/P/S Research Location(s): McMurdo Station (Arrival Heights), South Pole Station (B2 Laboratory), Palmer Station (Terra Lab)

navigation satellite systems, high-frequency radio communications, and power grids. Earth's polar caps are specific areas around the geomagnetic poles where geomagnetic field lines are open to and directly interact with the interplanetary magnetic field. Consequently, Antarctica is an ideal location for geospace research, as its land mass provides superior siting to observe the Earth's high geomagnetic latitude magnetic field lines, thereby facilitating studies of the polar cap, cusp, auroral zone, and geosynchronous altitude where communications satellites orbit and allowing for extended and continuous observations of the Sun. As such, Antarctic stations have long been outfitted with a variety of instrumentation for observational studies of the geospace environment.

This project integrates clustered instrumentation at McMurdo Station, South Pole Station, and Palmer Station to examine the entire geospace system. Instruments include ground-based fluxgate and search-coil magnetometers, extremely low, very low, and high frequency receivers, imaging and broadband riometers, sky-looking optical systems, GPS scintillation-rated receivers, and more. The project expects to modernize the geospace science instruments at both stations.

The fieldwork will (1) assess the current geospace instrumentation at McMurdo Station, South Pole Station, and Palmer Station; (2) overhaul and/or replace existing instruments; (3) continue operation, collection, and dissemination of a host of data types; and (4) continue the coordinated logistical support approach of managing a diverse network of instruments at a single point of contact: the New Jersey Institute of Technology - Polar Engineering Development Center.

Field Season Overview

During the 2026-27 season, a science team of four will deploy to McMurdo Station, and a team of two will deploy to South Pole Station. The teams will service equipment; perform calibrations, repairs, and replacements; and decommission obsolete and non-functioning equipment. No on-site fieldwork will be performed at Palmer Station. The instruments will continue operating autonomously year-round via remote monitoring and control, aided by on-site support from Antarctic Support Contract staff and other station infrastructure (e.g., information technology network, station services) as needed. Research associates (RAs) will carry out a prescribed set of support tasks as described in standard operating procedures that the principal investigators (PIs) will provide. Typical RA services include swap-outs and shipping of data devices,

rebooting systems as needed, and, to a limited extent, assisting PIs with troubleshooting as needed.

Deploying Team Members

- Henri Chretien
- Hyomin Kim (PI)
- Richard McCoy
- Gerard Piccini

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Collaborative Research: The Simpson Neutron Monitor Network

Event Number:

A-118-S

NSF / OPP Award 2112437

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Sheryl Seagraves

Principal Investigator(s):

Dr. Surujhdeo Seunarine

surujhdeo.seunarine@uwrf.edu ✉

University of Wisconsin River Falls

Department of Physics

River Falls, Wisconsin

Project Web Site:

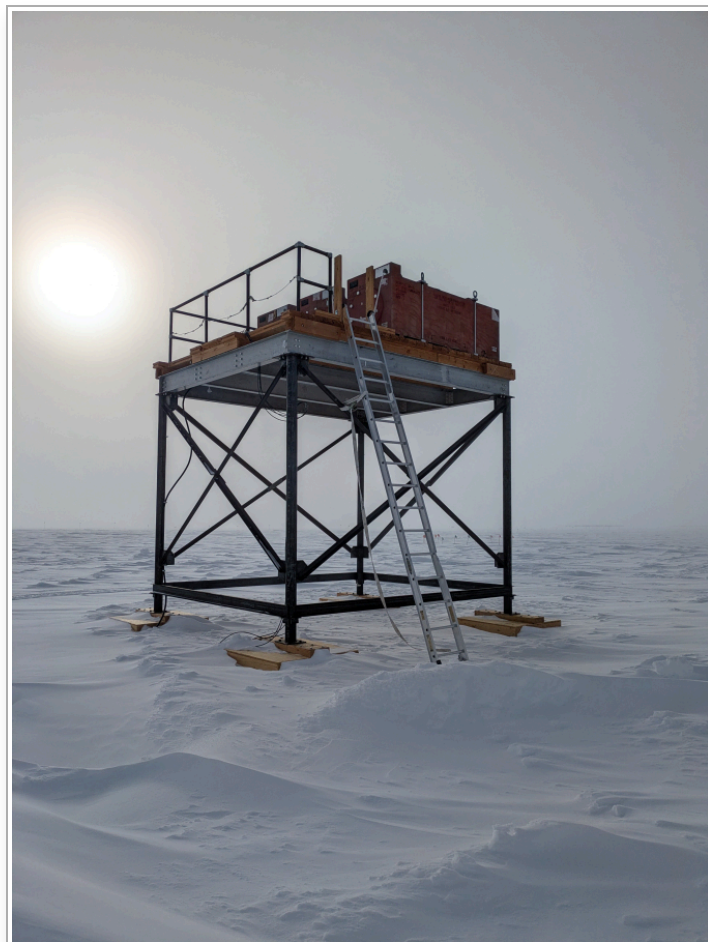
https://neutronm.bartol.udel.edu/~pyle/jsn/SSE_10min.html 🔗

Location(s):

- **Supporting Stations:** South Pole Station
- **Research Locations:** South Pole Station, B2 Laboratory

Project Description:

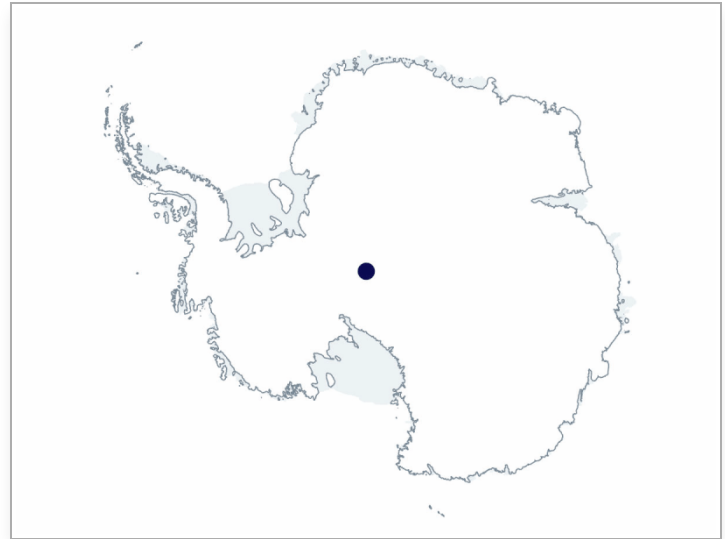
A neutron monitor is a ground-based instrument that measures the intensity of cosmic rays striking Earth's atmosphere. Cosmic rays carry information about large-scale heliospheric structure, the local space environment, and solar activity. Neutron monitors use the Earth's magnetic field as a directional



CosRay platform between the station and ARO. Photo by Marissa Goerke.

magnetic spectrometer and are unique tools for measuring the most energetic primary galactic cosmic radiation. Because the intensity with which cosmic rays strike Earth's atmosphere varies not only temporally but also geographically, neutron monitors must be installed at many locations to attain a complete image of cosmic rays.

The Simpson Neutron Monitor Network comprises 11 stations, with four institutions responsible for a subset of stations within the network. Neutron monitors cover the full sky 24/7, operating stably over many solar cycles, and are used to investigate how radiation from multiple sources and transport effects (e.g., solar emissions, inhomogeneities in the heliosphere, solar magnetic field reversals, transient coronal mass ejections, neutrons directly from solar flares) vary across timescales. Data accumulated by the Simpson Neutron Monitor Network are quickly fed to the international Neutron Monitor Database and are available in near real time.



A-118-S Research Location(s): South Pole Station, B2 Laboratory

Field Season Overview

One science team member will deploy to South Pole Station for 10 days in 2026-27 to focus on hardware installation, system validation, and calibration data acquisition activities. Tasks will include installing static wicks on the outdoor platform to mitigate static buildup on exposed components and surfaces, checking voltage stability at each counter's electronic remote boards, directly collecting complete waveform data at the counters to verify signal integrity, and inspecting heater systems to confirm proper functionality. Where applicable, firmware upgrades will be performed on the data rack and remote boards to improve performance or add new features in the data stream.

Deploying Team Members

- Surujhdeo Seunarine (PI)

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Pan-Antarctic Investigations of Mesospheric Wave Dynamics and Influences Using the ANGWIN Network

Event Number:

A-119-M/S

NSF / OPP Award 2029318

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones / Sheryl Seagraves

Principal Investigator(s):

Dr. Pierre-Dominique Pautet

dominiquepautet@gmail.com 

Utah State University

Center for Atmospheric and Space Sciences

Logan, Utah

Project Web Site:

<https://digitalcommons.usu.edu/ail/> 



Utah State Camera Domes. Photo by Sheryl Seagraves.

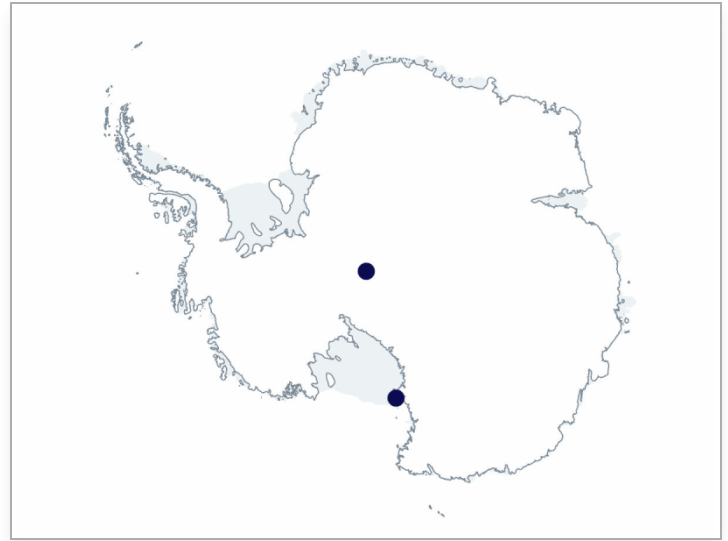
Location(s):

- **Supporting Stations:** McMurdo Station, South Pole Station
- **Research Locations:** Arrival Heights, B2 Laboratory

Project Description:

This project broadly aims to quantify the properties, variability, momentum fluxes, and dominant sources of mesospheric gravity waves (GWs) and their continental-scale effects on the upper atmosphere over Antarctica. GWs of

various scales and large amplitudes are now understood to provide most of the mean and variable forcing in the mesosphere, making their measurement critical to understanding many weather-related processes. The project is part of the Antarctic Gravity Wave Instrument Network (ANGWIN), an international collaboration of scientists and students with interests in Antarctic research. ANGWIN measurements over several austral winters have revealed a wealth of mesospheric wave activity, ranging from GWs with horizontal scales of tens of kilometers to planetary waves (PWs). The overall impact of GWs and PWs on the mesospheric dynamics over the vast Antarctic continent remains unknown. This project extends measurement capabilities with the installation and operation of a Rayleigh lidar at South Pole Station (provided by Deutsches Zentrum für Luft- und Raumfahrt, Germany), greatly enhancing capabilities for high-quality, in-depth mesospheric wave studies.



A-119-M/S Research Location(s): Arrival Heights, B2 Laboratory

Field Season Overview

No on-site fieldwork will be performed in 2026-27. Instruments operated as expected during winter 2025 and restarted normal image data collection in April 2026. End-of-winter observations are expected in September 2026.

Research associate support will be provided throughout the year for routine monitoring and maintenance of equipment, including observation of the cameras and lidar to ensure they are in normal operating mode; shutdown and restart of software and hardware; data transfer; and communication with the project's principal investigator and other personnel as needed.

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Collaborative Research: Fe and Na Lidar Investigations of Geospace-Atmosphere Temperature, Composition, Chemistry, and Dynamics at McMurdo, Antarctica

Event Number:

A-123-M

NSF / OPP Award 2110428

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones

Principal Investigator(s):

Dr. Xinzhao Chu

xinzhao.chu@colorado.edu 

University of Colorado Boulder

CIRES

Boulder, Colorado

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Arrival Heights

Project Description:

Researchers on this project operate two narrow-band, multifrequency lidars at McMurdo Station that can make high-resolution observations of winds and temperatures as well as meteoric metal species in the middle and upper atmosphere. Simultaneous observations by



This image captures both the LiDAR systems in action, as well as polar cap auroral arcs overhead and the glow of the auroral oval near horizon. Photo by Danny Hampton, Ian Geraghty, and Zimu Li.



A-123-M Research Location(s): Arrival Heights

the two instruments — a sodium (Na) Doppler lidar and an iron (Fe) Boltzmann lidar — provide unprecedented levels of detail to characterize atmospheric and space conditions. The instruments have been hosted by Antarctica New Zealand in their Arrival Heights laboratory since late 2010. The observations provide critical data to address key science challenges associated with the space-atmosphere interaction region and, in particular, the sparsely observed high-latitude southern hemisphere.

Field Season Overview

Five participants (including two winter-over participants) will deploy to McMurdo Station in 2026-27 to conduct observations with the Na Doppler and Fe Boltzmann lidars. They will upgrade, refurbish, and perform routine maintenance on the instruments and train students who will analyze data and progress toward their graduate degrees.

Deploying Team Members

- James Brague
- Rebecca Charno
- Xing Chen
- Zhou Chi
- Xinzhao Chu (PI)

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Payload Antarctic Demonstrator for the Advanced Particle-astrophysics Telescope (ADAPT)

Event Number:

A-126-M

NSF / NASA Agreement

Program Director:

Dr. Marion Dierickx

Science Support POC / Implementer(s):

Marissa Goerke / Kaija Webster / Chad Naughton

Principal Investigator(s):

Dr. James Henry Buckley

buckley@wustl.edu 

Physics

St. Louis, Missouri

Project Web Site:

<https://adapt.physics.wustl.edu> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Long Duration Balloon Facility (LDBF)

Project Description:

The Antarctic Demonstrator for the Advanced Particle-astrophysics Telescope (ADAPT) is primarily a technical



'ADAPT instrument after compatibility test at CSBF. Dana Braun, Marion Sudvar, Brian Rauch, Jim Buckley, Malee Alway, Blake Bal, Richard Bose and Ashtar Aggelopoulos. Photo courtesy of CSBF staff.'



A-126-M Research Location(s): McMurdo Long Duration Balloon Facility (LDBF)

demonstrator for a future space-based gamma ray experiment, the Advanced Particle-astrophysics Telescope (APT). APT will provide the most sensitive measurements of the MeV to 100 MeV gamma ray sky for any astrophysical transients during its flight. The APT's long-term goals include (1) detecting or ruling out weakly interacting massive particle (WIMP) dark matter; (2) providing electromagnetic counterparts of gravitational wave or other multi-messenger sources, and (3) understanding the origin of the heavy elements. ADAPT will carry two piggyback payloads: Air Shower Extended Simulations (AIRES), designed to analyze the radio pulses emitted by cosmic rays interacting with Earth's atmosphere; and Integrating Miniature Piggyback for Impulsive Solar Hard X-rays (IMPISH), a solar X-ray spectrometer measuring energy fluctuations during solar flares.

The ADAPT experiment will fly the ADAPT gondola on a 39 million cubic foot (mcf) balloon at the Long Duration Balloon Facility (LDBF) in Antarctica. ADAPT is a 0.5-by-0.5-meter active area telescope for mega-electronvolt (MeV) and giga-electronvolt (GeV) gamma ray detection and cosmic ray measurements. The instrument makes use of scintillating fibers, cesium iodide scintillators, and custom electronics to detect and reconstruct gamma rays through Compton imaging (in the MeV regime) and pair tracking and calorimetry (in the GeV regime). Real-time onboard computation will be used to localize gamma ray bursts and promptly transmit alerts to the ground.

Field Season Overview

Field support required for ADAPT in 2026-27 includes hosting scientists at McMurdo Station (with an office in Albert P. Crary Science and Engineering Center), transportation to the LDBF, and space in one of the two LDBF hangars. Crane operations will also be required to install the detector, solar panel, and antenna boom on the instrument. To satisfy science requirements, ADAPT is aiming for a long (30-day) flight at high altitude to maximize chances for detecting and localizing several gamma ray bursts. The plan is to deploy nine science team members to Antarctica for the flight and approve two to recover the flight computer, data, and piggyback experiments in 2027. The science team is slated to arrive in McMurdo around 3 November 2026 and anticipates no more than 23 days (and possibly many fewer) to prepare for a 30 November launch. The target float altitude is approximately 135 kilofeet, the maximum for a 39 mcf balloon. The minimum flight duration for success is 10 days, while the maximum flight duration would be 50 days, subject to prospects for payload recovery and operational status during the flight. Same-season payload recovery via aircraft, Arctic Trucks, or traverse is requested.

Deploying Team Members

- Malee Alway
- Richard Bose
- James Buckley (PI)
- Leonardo Di Venere (Co-PI)
- Jennifer Ott (Co-PI)
- Daniel Radomski
- Brian Rauch
- Davide Serini
- Marion Sudvarg
- Wolfgang Zober

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

First Conjugate-Station Studies and Continued Satellite-Conjunction Studies of LF/MF/HF Auroral Radio Emissions at South Pole

Event Number:

A-128-S

NSF / OPP Award 2205753

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Sheryl Seagraves

Principal Investigator(s):

Dr. James LaBelle

James.W.LaBelle@dartmouth.edu 

Dartmouth College

Department of Physics & Astronomy

Hanover, New Hampshire

Location(s):

- **Supporting Stations:** South Pole Station
- **Research Locations:** South Pole Station, B2 Laboratory

Project Description:

This project studies the relationship between auroral kilometric radiation (AKR) observed by distant satellites and ground-level AKR-like signals and tests current theories on how these phenomena are connected. These phenomena are best (and often can only be) observed from Antarctica because AKR-like signals cannot be regularly observed in the

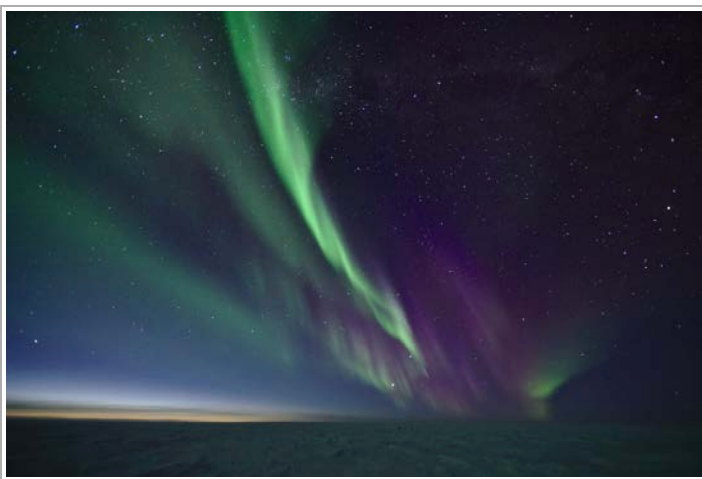
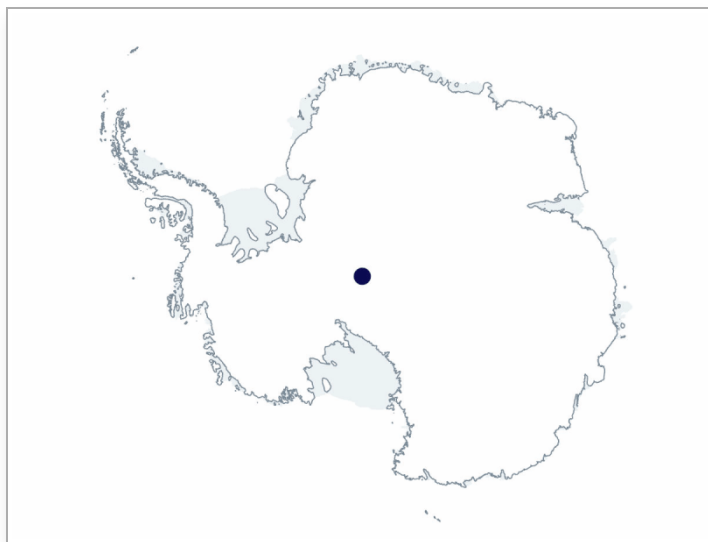


Photo courtesy of the NSF/USAP Photo Library. Photo by Dr. Daniel Michalik.



A-128-S Research Location(s): South Pole Station, B2 Laboratory

northern hemisphere due to human-made radio frequency interference. Radio receivers will operate at South Pole Station during anticipated conjunctions with the Cluster satellite high-resolution wave instrument, enabling simultaneous measurements of AKR fine structure at both locations.

While this project will end in 2026-27, continued operation of some instruments by other long-term observational programs is under discussion. Any equipment not passed to another project will be retrograded in the coming seasons.

Field Season Overview

The current level of technician support to maintain computers in the science lab and vault will continue through December 2026, after which the A-128 project will cease. The A-111 project will assess and may incorporate components of A-128. Any remaining components will be removed and retrograded. Research associate and cargo support will be required to dismantle the outside and inside components of the experiment, dispose of components, and ship components back to Port Hueneme, California, for onward transport to Dartmouth College.

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Exoplanet Climate Infrared Telescope (EXCITE)

Event Number:

A-130-M

NSF / NASA Agreement

Program Director:

Dr. Marion Dierickx

Science Support POC / Implementer(s):

Marissa Goerke / Kaija Webster / Chad Naughton

Principal Investigator(s):

Dr. Peter Campbell Nagler

peter.c.nagler@nasa.gov 

National Aeronautics and Space
Administration

Silver Spring, Maryland

Project Web Site:

<https://science.nasa.gov/mission/excite/>

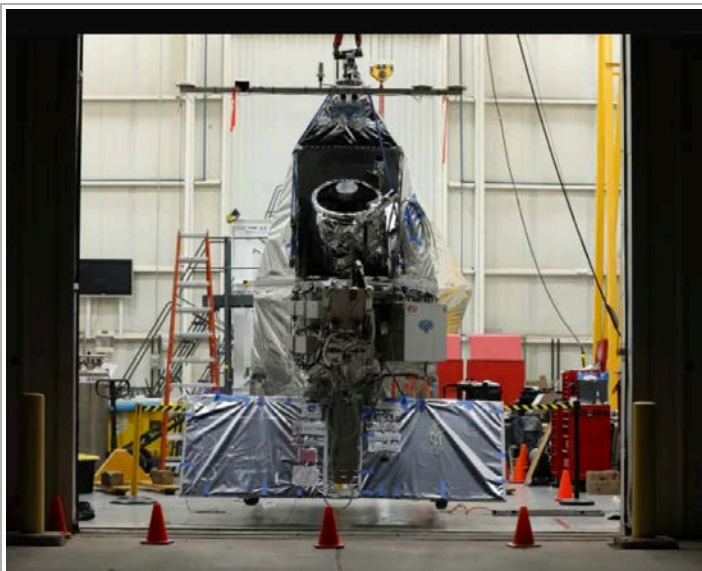


Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Long Duration Balloon Facility (LDBF)

Project Description:

The Exoplanet Climate Infrared Telescope (EXCITE) is a National Aeronautics and Space Administration (NASA) long duration balloon payload designed to



EXCITE Payload. Photo by Jeanette Kazmierczak (NASA).



A-130-M Research Location(s): McMurdo Long Duration Balloon Facility (LDBF)

characterize the atmospheres of transiting exoplanets (i.e., worlds beyond this solar system). EXCITE flies a telescope that is 0.5 meters in diameter and coupled to a cryogenic infrared spectrograph with sensitivity from 0.8 to 3.5 microns, which covers the spectral signatures of many carbon- and hydrogen-containing molecules (e.g., water, carbon dioxide). Besides measuring the compositions of exoplanet atmospheres, EXCITE will determine the temperatures of the planets' atmospheres and probe how they recirculate energy. This is accomplished via phase resolved spectroscopy, a technique involving continuous spectroscopic observations of a planet's entire orbit around its host star. Many advanced technologies also fly for the first time on EXCITE, including the detector readout electronics that will fly on NASA's Roman Space Telescope. Ultimately, the data collected by EXCITE will significantly advance understanding of exoplanet atmospheres and refine observational and analysis techniques for future space missions. EXCITE will carry the Sparrow piggyback payload in 2026-27, which will gather wind data during flight.

Field Season Overview

In 2026-27, a science team of eight to nine people will assemble and test EXCITE at the Long Duration Balloon Facility at McMurdo Station. Team members will deploy on a staggered schedule, with the first arriving shortly before camp opening on 31 October 2026 and the last arriving by mid-November. EXCITE assembly and testing is expected to take 2 to 3 weeks, before flight readiness is declared for a planned launch on 1 December. For scientific purposes, a flight of at least 7 days at a float altitude of more than 124,700 feet is required. The longest flight possible will be sought — the science payload has no expendables and can fly indefinitely. Post-launch, most of the science team will leave in staggered departures to ensure continuous capability coverage, with three members remaining to monitor the payload and support same-season recovery by aircraft, Arctic Trucks, or traverse. After termination and landing of the payload, the three team members will travel to it to recover the experiment's hard drives (required) and the science instrument (preferred).

Deploying Team Members

- Caitlyn Altermatt
- Lee Bernard
- Kyle Helson
- Peter Nagler (PI)
- Timothy Rehm
- Javier Romualdez

- Kanchita Klangboonkrong
- Stephen Maher
- Gregory Tucker

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

NASA Long Duration Balloon (LDB) Support Program

Event Number:

A-145-M

NSF / NASA Agreement

Program Director:

Dr. Marion Dierickx

Science Support POC / Implementer(s):

Marissa Goerke / Kaija Webster / Chad Naughton

Principal Investigator(s):

Hugo Franco

hugo.franco@nasa.gov 

Columbia Scientific Balloon Facility
Palestine, Texas

Project Web Site:

<https://www.csbf.nasa.gov> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Long Duration Balloon Facility (LDBF)

Project Description:

The National Aeronautics and Space Administration (NASA) and Columbia Scientific Balloon Facility (CSBF) provide the balloon platform and project oversight for balloon launches from McMurdo Station in Antarctica. In the 2026-27 season, up to two full-size payloads are being planned for launch: the



Launch at Long Duration Balloon Facility. Photo by by Brian Duffy, courtesy of the NSF/USAP Photo Library.



A-145-M Research Location(s): McMurdo Long Duration Balloon Facility (LDBF)

Antarctic Demonstrator for the Advanced Particle-astrophysics Telescope (ADAPT; project A-126); and the Exoplanet Climate Infrared Telescope (EXCITE; project A-130). These consist of science instruments, command/control systems, and solar/battery power units. Most data collected are stored on onboard hard drives, with a small amount of data transmitted to ground-based receiving stations via radio telemetry. After the flights are complete, recovery support is required to disassemble instruments and return data and equipment from the field to McMurdo Station.

Field Season Overview

NASA and CSBF will launch the balloons in 2026-27 from the Long Duration Balloon Facility on the Ross Ice Shelf. On-site planning and preparation will begin mid-October 2026, during which CSBF will unpack cargo, dewinterize and test equipment, assemble flight systems, and support science teams with instrument construction. The science teams' launch ready date is 1 December, which typically coincides with the establishment and stabilization of circumpolar stratospheric winds. The balloons will travel counterclockwise around the Antarctic continent between 70 and 80 degrees south latitude, at an approximate altitude of 115,000 to 160,000 feet. Flight duration for one revolution is typically 8 to 15 days though overall flight time can be longer. At the end of the flight, the balloons will be terminated over a suitable location and payloads will be recovered from the field.

Payload recovery support is requested by aircraft, traverse, or Arctic Trucks. South Pole support is requested in the event of Arctic Truck payload recovery, including on-site support for up to three LDB personnel at the South Pole Amundsen-Scott Station.

Deploying Team Members

- Jayden Allen
- Tyler Barnard
- Scott Battaion (Co-PI)
- Alexander Beange
- John Boyd
- Wayne Deacon
- Juan DeLuna
- Kevin Dillon
- Jose Marcelino
- Matthew Mullin
- Brian Parker
- Mitchell Richard
- Robert Salter (Co-PI)
- Michael Sellers
- Nathan Sparks
- Samantha Taylor

- Joseph Flowers
- Larry Fox
- Randall Henderson
- Joseph Jones
- Todd Lankford
- Bethany MacQueen
- Zachary Turner
- Jared Vaughan
- Jonathan Walling
- Christian Ward-Bourdeaux
- Curtis Wooten

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Imaging the Beginning of Time From the South Pole: Completing the BICEP Array Survey

Event Number:

A-149-S

NSF / OPP Award 2220444

Program Director:

Dr. Marion Dierickx

Science Support POC / Implementer(s):

Marissa Goerke / Sheryl Seagraves

Principal Investigator(s):

Dr. Clement Pryke

pryke@physics.umn.edu 

University of Minnesota

Minneapolis, Minnesota

Project Web Site:

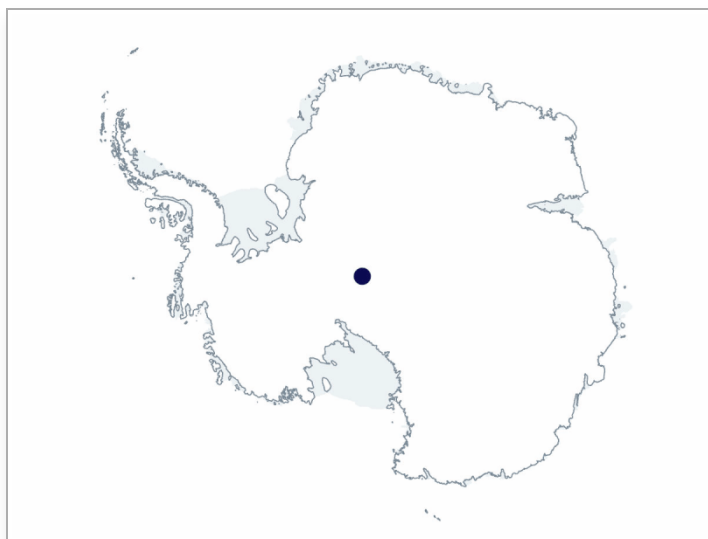
<http://bicepkeck.org> 

Location(s):

- **Supporting Stations:** South Pole Station
- **Research Locations:** South Pole (Dark Sector)



The Dark Sector Lab. Photo by Mike Lucibella, courtesy of the NSF/USAP Photo Library.



A-149-S Research Location(s): South Pole (Dark Sector)

Project Description:

This project continues the Background Imaging of Cosmic Extragalactic Polarization (BICEP) research program measuring polarization of the cosmic microwave background (CMB). These observations include operation of the BICEP3 stand-alone telescope, as well as the phased installation of the new

BICEP Array receivers. The sustained campaign at 95 gigahertz (GHz) enables the project's dataset to build sensitivity at frequencies where the contribution from galactic dust is lower and the signal from the CMB is strongest.

In October 2021 the science team published its analysis of all data taken by the BICEP2, Keck array, and BICEP3 experiments, up to and including the 2018 observing season. This result remains the best in the field, reaching a sensitivity to inflationary gravitational waves of $\sigma(r) = 0.009$. Currently, BICEP3 and the BICEP array are measuring the sky in five frequency bands to enable the removal of galactic foreground contamination. Extrapolating from achieved performance, and after conservatively accounting for the galactic dust, galactic synchrotron, and gravitational lensing foregrounds, the BICEP array is expected to reach a sensitivity of $\sigma(r) < 0.003$. This measurement will be a critical test of slow-roll models of inflation, many of which predict a gravitational wave signal at or above this level.

This project also provides training for undergraduate and graduate students and postdoctoral fellows. It represents an intersection of cosmology and Antarctic research that continues to stimulate the public imagination and interest in science.

Field Season Overview

Primary tasking for 2026-27 will be deploying the fourth BICEP array receiver (BA4-90/150), including assembly and in-lab characterization, installation, and in-mount characterization checkouts. The science team will also perform (1) detector module upgrades to the third BICEP array receiver (BA3-220/270), operating at 220-270 GHz; (2) maintenance and minor upgrades to the BICEP3, BA1-30/40, and BA2-150 receivers; (3) removal of the Keck 270 receiver from the BICEP array mount, disassembly, and retrograde of receiver hardware and accessories; (4) winter-over training to allow continued observations with BICEP3 and the BICEP array during the 2027 austral winter season; and (5) standard on-mount calibration activities with the BICEP3 and BICEP array receivers.

Deploying Team Members

- Brianna Cantrall
- Michael Echter
- John Kovac (Co-PI)
- Nolan Maher
- Colt Pauley
- Matthew Petroff
- Anna Rose Polish
- Jonathan Pond

- Anika Patel

- Clement Pryke (PI)

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Management and Operations of the IceCube Neutrino Observatory, 2021-2026

Event Number:

A-333-M/S

NSF / OPP Award 2534830

Program Director:

Dr. Marion Dierickx

Science Support POC / Implementer(s):

Marissa Goerke / Jenny Cunningham /
Randolph Jones / Sheryl Seagraves / Leah
Street

Principal Investigator(s):

Dr. Francis Halzen

halzen@icecube.wisc.edu 

University of Wisconsin Madison
Department of Physics
Madison, Wisconsin

Project Web Site:

<https://icecube.wisc.edu/> 

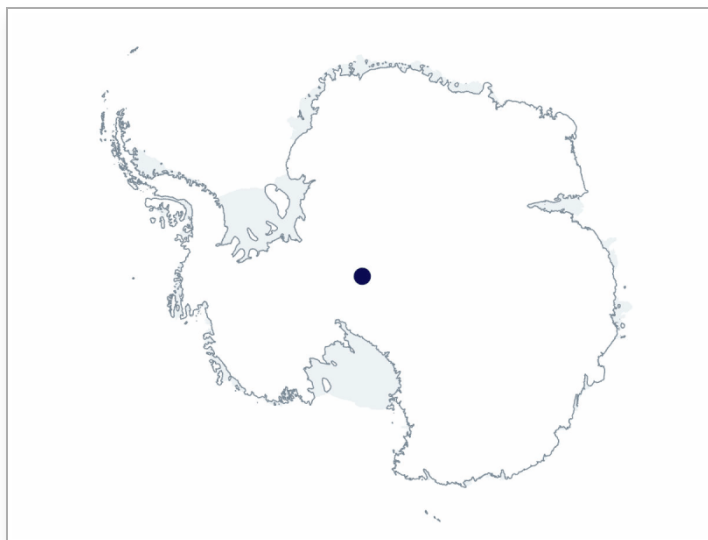
Location(s):

- **Supporting Stations:** McMurdo Station, South Pole Station
- **Research Locations:** South Pole (Dark Sector)

Project Description:



An mDOM is lowered into a borehole. Photo by Yuya Makino, IceCube/NSF



A-333-M/S Research Location(s): South Pole (Dark Sector)

The IceCube Neutrino Observatory (ICNO) operations and maintenance (O&M) team of researchers and engineers maintains the neutrino detector infrastructure at South Pole Station and at the project's home institution. This guarantees an uninterrupted stream of scientifically unique, high-quality data. The O&M team and IceCube Collaboration have worked together to produce significant performance increases over time in the cubic-kilometer, deep ice detector that is ICNO. After several seasons of preparatory work and project rebaselining in response to the COVID-19 pandemic, the IceCube Upgrade project was fielded in 2025-26.

ICNO/O&M activities have broad impacts, involving postdocs and students in the daily operation and calibration of the neutrino detector and public outreach. Components of this experiment are installed in various locations within the detector boundaries at South Pole and on the roof of the IceCube Laboratory (ICL). They include IceACT telescopes, prototype scintillator panels, all-sky cameras, cosmic-ray shower radio antennae, and upgrades to FieldHubs.

Field Season Overview

Tasking for the 2026-27 season includes core O&M, operating system security patches, restock of spare uninterruptible power supply batteries, archival data disk exchange, DOMHub hard-drive life-cycle replacements and other maintenance, the annual IceTop survey, a calibration campaign (e.g., device response, timing, ice properties), complementary science - surface array maintenance, IceACT and Askaryan Radio Array maintenance and upgrade, renewable energy evaluation, ICL rooftop mini-wind turbine upgrade, redeployment of the temporary solar test setup, IceCube Upgrade retrograde, and identifying cargo to retrograde to Madison, Wisconsin (Physical Sciences Laboratory), or remain at South Pole.

Deploying Team Members

- Ilya Bodo
- Michael DuVernois
- Hannah Erpenbeck
- Spencer Griswold
- Lars Heuermann
- Justin Hiemstra
- Daniel Hooper
- Matt Kauer
- Dane Kleiner
- Arun Vaidyanathan

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Local-scale Drivers and Responses of Thermospheric Weather Above Antarctica

Event Number:

A-343-M/S

NSF / OPP Award 2029459

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones / Sheryl Seagraves

Principal Investigator(s):

Dr. Mark Gerard Conde

mgconde@alaska.edu 

University of Alaska Fairbanks

Physics Department

Fairbanks, Alaska

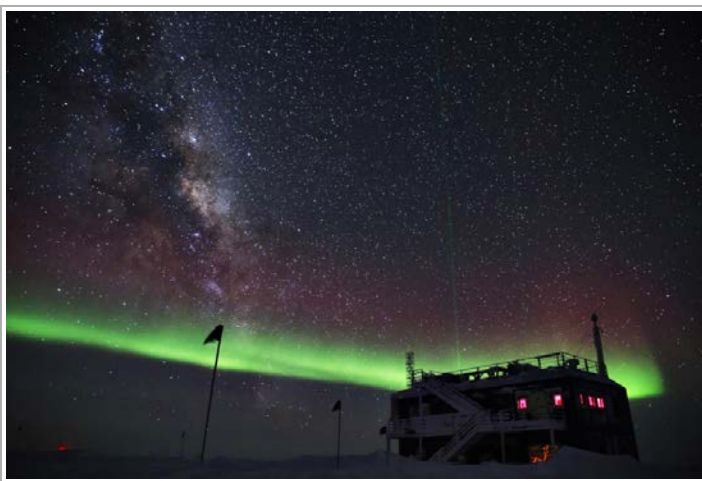
Project Web Site:

http://sdi_server.gi.alaska.edu/sdiweb/index.asp 

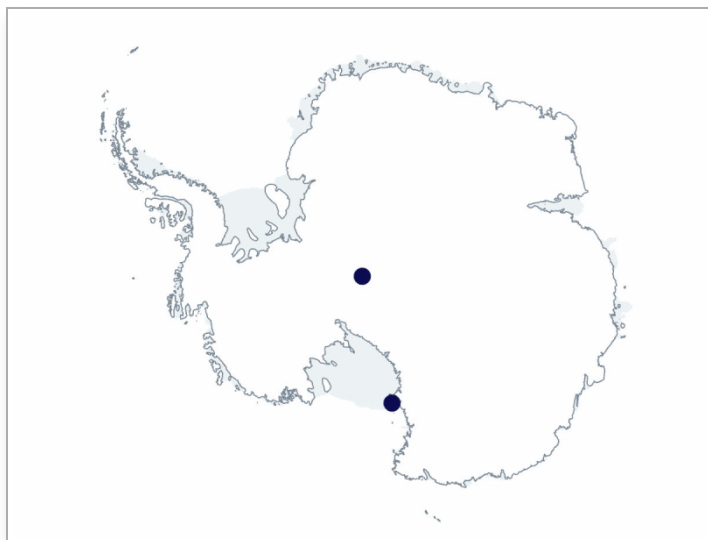
Location(s):

- **Supporting Stations:** McMurdo Station, South Pole Station
- **Research Locations:** Arrival Heights, B2 Laboratory, ARO

Project Description:



ARO building where the A-343 is housed at South Pole Station. Photo by Marissa Goerke.



A-343-M/S Research Location(s): Arrival Heights, B2 Laboratory, ARO

This project will use existing ground-based Fabry-Pérot spectrometers at McMurdo Station and South Pole Station to measure mesospheric and thermospheric neutral winds and temperatures, at heights of approximately 87, 120, and 240 kilometers. The project investigates coupling mechanisms that drive the morphology of small-scale thermospheric perturbations and large-scale thermospheric weather. The study will address both large-scale changes in mean flow and small-scale local perturbations and independently resolve impacts due to forcing from above versus below. Existing instruments will be upgraded by adding a capability to measure winds and temperatures at mesopause heights. The study will be supported by collaborative data from existing mesospheric temperature mapper and Super Dual Auroral Radar Network (SuperDARN) radar instruments in Antarctica, in turn providing neutral wind and temperature data for use by collaborators.

Field Season Overview

One participant will deploy to McMurdo Station and South Pole Station to perform routine calibration and alignment procedures, back up the computer systems, hand-carry full-resolution data files that are too large for reliable transmission over the United States Antarctic Program network, repair any faults that may occur during the 2026-27 observing season, and restock spare parts.

At McMurdo, the aging filter wheel and view-switch mechanisms will be replaced with a new 3-D-printed fore-optics assembly. At South Pole, the team will install a modified optical coupling section to rectify a problem that prevents optimum focus on the sky. This will require disassembly and reassembly of the instrument fore-optics. In addition, instrumentation will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support from Antarctic Support Contract staff and other station infrastructure (e.g., information technology network, station services) as needed. Research associate support will be provided throughout the year for routine monitoring and operation, logging observations, and responding to minor maintenance or diagnostic requests.

Deploying Team Members

- Kylee Branning (Co-PI)

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

Antarctic SuperDARN Research, Operations, and System Enhancements

Event Number:

A-369-M/S

NSF / OPP Award 2035105

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones / Sheryl Seagraves

Principal Investigator(s):

Dr. William Bristow

wab5217@psu.edu 

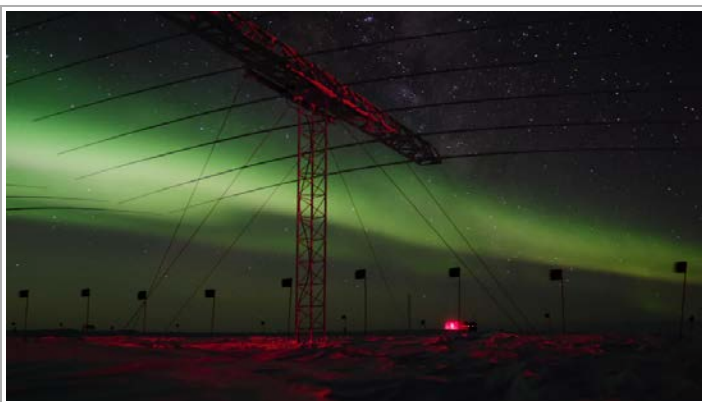
Pennsylvania State University
University Park, Pennsylvania

Location(s):

- **Supporting Stations:** McMurdo Station, South Pole Station
- **Research Locations:** Arrival Heights, South Pole

Project Description:

The Super Dual Auroral Radar Network (SuperDARN) is an international collaborative experiment for observations of plasma motions in Earth's upper atmosphere. By observing ionospheric plasma motions, a multitude of geophysical processes can be studied. These processes range from E-region plasma instabilities, to the relationships between auroral luminosity and electric fields, to the global-scale convective response to changes in the solar wind and interplanetary magnetic field (IMF). Each of these areas of study contributes to the overall goals of space physics:



SuperDARN array with auroras in the background. Photo by Ted Lee.



A-369-M/S Research Location(s): Arrival Heights, South Pole

developing an understanding of the coupling of solar wind energy into Earth's upper atmosphere and its effects on human-made systems.

This project supports the operation of, and research using data from, the SuperDARN radars at McMurdo Station and South Pole Station. The project supports a major enhancement of the South Pole radar to enable polarimetric observations. No other SuperDARN radar has the ability to characterize the polarization of its received signals. Providing this capability will open up entirely new research areas for SuperDARN. Data from these radars will be used in conjunction with data from the rest of the SuperDARN network and the wealth of other space physics instruments in Antarctica to study a variety of topics, including (1) convection responses to solar wind and IMF changes; (2) the relationship of central polar cap convection to that of the cusp and midnight regions and to the state of the coupled magnetosphere-ionosphere system; (3) the relationship between the wave structure observed in solar wind and responses in the polar cap; (4) the motions of density structures such as plasma patches through the polar cap; (5) ion-neutral coupling; and (6) thermospheric winds.

Field Season Overview

Two participants will deploy to South Pole Station and McMurdo Station for equipment maintenance and upgrades. At McMurdo, the team will replace the existing transmitters with a refurbished set and upgrade the radar operating software. At both stations, minor modifications will be completed on the transmitters, and other minor annual maintenance will be undertaken within the limits of deployment time. Any necessary repairs from winter damage will be repaired through the assistance of Antarctic Support Contract (ASC) staff.

The systems will otherwise continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (e.g., information technology network, station services) as needed. Research associate support will be provided throughout the year for routine monitoring and operation, responding to minor maintenance or diagnostic requests, and direct grantee assistance while the team is on site.

Deploying Team Members

- William Bristow (PI)
- Matthew Wilcox

Project Detail

ASTROPHYSICS AND GEOSPACE SCIENCES

South Pole Telescope Operations and Data Products

Event Number:

A-379-S

NSF / OPP 2332483

Program Director:

Dr. Marion Dierickx

Science Support POC / Implementer(s):

Marissa Goerke / Sheryl Seagraves

Principal Investigator(s):

Dr. Thomas M Crawford

tcrawfor@kicp.uchicago.edu 

University of Chicago

Astronomy and Astrophysics, Enrico Fermi
Institute

Chicago, Illinois

Project Web Site:

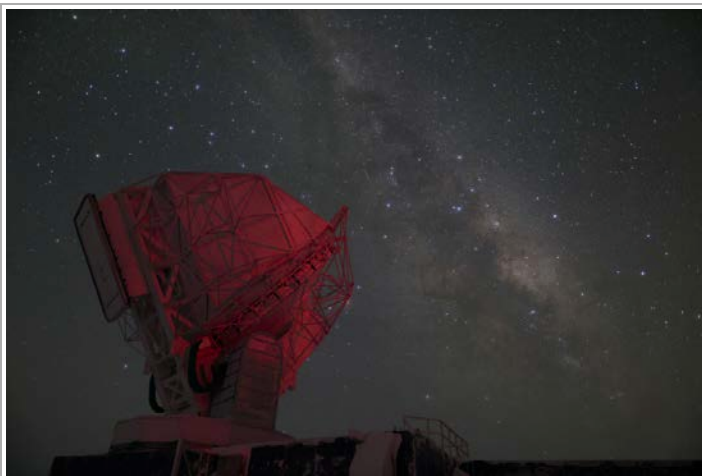
<https://pole.uchicago.edu/public/Home.html> 

Location(s):

- **Supporting Stations:** South Pole Station
- **Research Locations:** South Pole (Dark Sector)

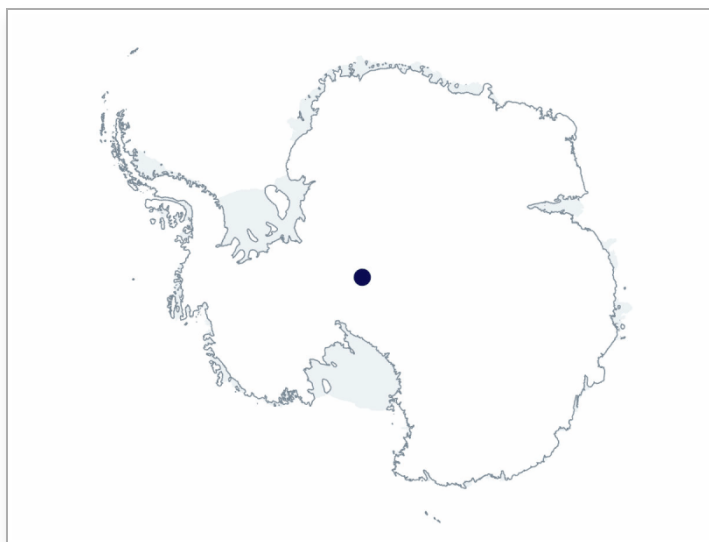
Project Description:

This project will continue maintenance and operations of the 10-meter South Pole Telescope (SPT), which is equipped with the current third-generation



The South Pole Telescope observing during the 2026 Austral winter season with the Milky Way Galaxy in the background.

Photo by Anjali Sehrawat



A-379-S Research Location(s): South Pole (Dark Sector)

instrument, SPT-3G. Survey observations will be made with SPT-3G to obtain ultra-deep, three-band millimeter-wave measurements of the 1,500 square-degree SPT-3G Main field. This SPT-3G survey region had been chosen to overlap with the Background Imaging of Cosmic Extragalactic Polarization (BICEP; aka BICEP/Keck) survey, with the coordinated observations used for a joint analysis to search for gravitational waves from the early universe. In addition, SPT-3G data will place new constraints on the cosmic neutrino density, possibly making the first-ever detection of the sum of the neutrino masses, constrain the properties of dark energy, and discover new astronomical objects (e.g., clusters of galaxies, proto-clusters, dusty star forming galaxies, transient sources).

The project will also support SPT's critical role in the Event Horizon Telescope (EHT), as well as the operation of the South Pole Telescope Summertime Line Intensity Mapper (SPT-SLIM). The EHT is a global array of telescopes to image the event horizon of nearby supermassive black holes. It made worldwide headlines with its first detections of the event horizon shadow from the black holes at the center of the Messier 87 (M87) and Milky Way (or Sagittarius A* [Sgr A*]) galaxies.

Field Season Overview

The primary maintenance activity for the 2026-27 season is repair of the SPT's azimuth cable wrap, which contains essential wiring and hoses to maintain telescope operation. The support structure for the cables in the azimuth wrap suffered significant damage during the 2024 austral winter season and was temporarily repaired during the 2024-25 and 2025-26 austral summer seasons. However, a more substantial rebuild is required.

In addition, a new Advanced South Pole Integrated Receiver for EHT (ASPIRE) will be installed, enabling SPT's participation in the 2027 EHT observing run. SPT-SLIM will be reinstalled and conduct observations for a couple of weeks during 2026-27. Routine yearly SPT tasks include service and maintenance of the telescope components and computer systems, computer upgrades and servicing, cryogenic maintenance of the SPT and optics cryostats, and winter-over training.

Deploying Team Members

- Adam Anderson
- Karia Dibert
- David Pernic
- Alexandra Rahlin

- William Holzapfel
- Nicholas Huang
- Amy Lowitz
- Bryce Schaefer
- Zachary Wilson

2026–2027

USAP FIELD SEASON PROJECTS

ORGANISMS AND ECOSYSTEMS

Dr. William Ambrose, Program Director

Project Detail

ORGANISMS AND ECOSYSTEMS

Collaborative Research: The Drivers and Role of Immigration in the Dynamics of the Largest Population of Weddell Seals in Antarctica Under Changing Conditions

Event Number:

B-009-M

NSF / OPP Award 2147553

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Randolph Jones

Principal Investigator(s):

Dr. Jay Rotella

rotella@montana.edu 

Montana State University Bozeman

Department of Ecology

Bozeman, Montana

Project Web Site:

<https://www.montana.edu/weddellseals/index.html> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Erebus Bay

Project Description:

The Weddell seal population in the Ross Sea is the most southerly mammal population in the world and has been intensively monitored since 1978. Over



A female Weddell Seal with her soon-to-be-weaned pup in Erebus Bay, Antarctica. Photo by Sophia Rotella.



B-009-M Research Location(s): Erebus Bay

the past 15 years, the team has focused on monitoring both the number of pups produced annually and new immigrants. While continuing the long-term monitoring of the study of the Erebus Bay Weddell seal population, this project will add population modeling and genomic analyses to learn about the environmental factors that influence population dynamics, the geographic origin of immigrants, and immigrants' role in the local population. The team also has a robust plan for early-career science training and education and outreach activities related to this project. One artist from the Polar STEAM (science, technology, engineering, arts, and math) project will join the science team in the field.

Field Season Overview

For the 2026-27 season, eight McMurdo Station-based participants will deploy from early October to mid-December, focusing on all pupping colonies and haul-outs across Erebus Bay from Cape Evans to Pram Point, at White Island, and at select sites outside of Erebus Bay. These sites include Lewis Bay, Marble Point, and several others to be determined based on seal numbers. The team will visit each Weddell seal colony within Erebus Bay every other day to find and tag newborn pups and associate them with their mothers. Any untagged mothers will be tagged. The team will also conduct six surveys per season throughout the Erebus Bay study area to record the identity of previously tagged individuals, tag unmarked animals, and replace broken or missing tags. They will continue to collect a tissue sample from each of up to 150 locally born mothers and immigrant mothers throughout the study area for subsequent genetic comparisons. The team will not have a field camp in 2026-27. Emergency, portable structures will be placed at Turtle Rock and at Big Razorback Island for safety. One artist from Polar STEAM will join the team in the field.

Deploying Team Members

- Nathanael Jourdonnais
- Parker Levinson
- Madison Pfau
- Jay Rotella (PI)
- Brandon Rubalcaba
- Megan Swart
- Collette Webb
- Elizabeth Widen
- Erica Xin

Project Detail

ORGANISMS AND ECOSYSTEMS

Antarctica as a Model System for Responses of Terrestrial Carbon Balance to Warming

Event Number:

B-086-P

NSF / OPP Award 1947562

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Allison Barden / Jamee Johnson

Principal Investigator(s):

Dr. Natasja Carla van Gestel

natasja.van-gestel@ttu.edu 

Texas Tech University

Lubbock, Texas

Project Web Site:

<https://www.nvangestel.com/antarctica> 

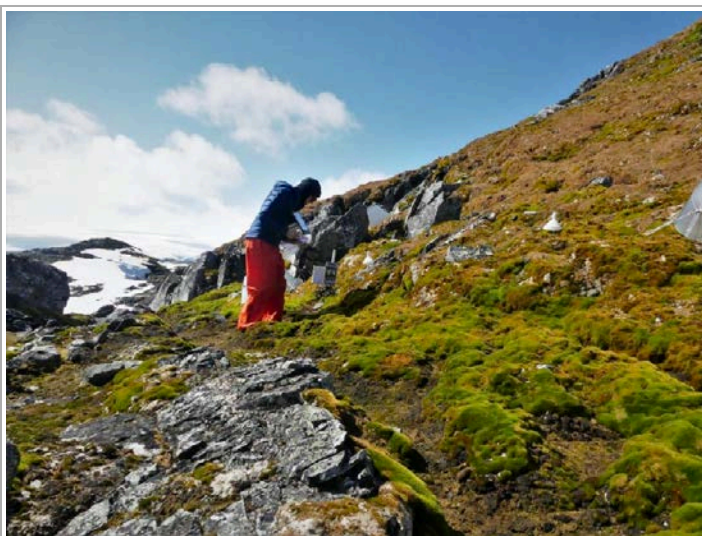
Location(s):

- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Backyard and Litchfield Island

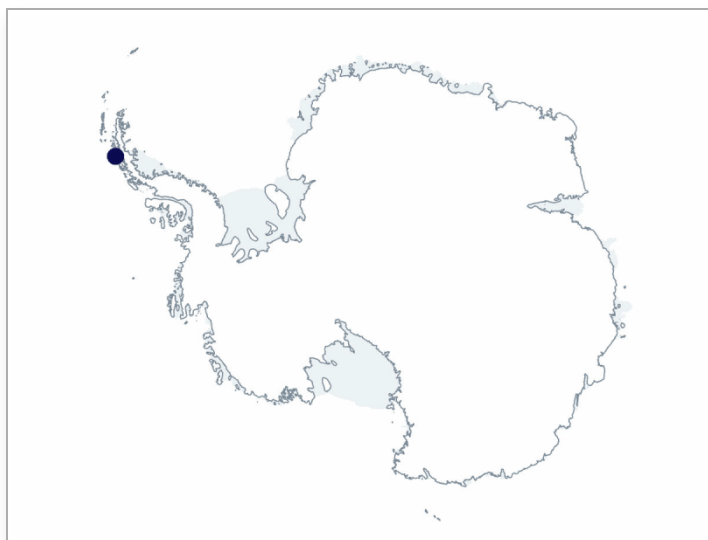
Project Description:

This 5-year Antarctic Peninsula project is evaluating the magnitude feedback response of soil microbes and plant physiology to environmental parameters.

The science team will use experimental field deployed chambers to evaluate



Grantee checks moss data collection site on Litchfield Island (Permit ACA 2023-007). Photo by Keri Nelson, courtesy of the USAP Photo Library.



B-086-P Research Location(s): Palmer Backyard and Litchfield Island

the effects of warming on microbial mediated carbon losses from soil on a deglaciated sere gradient at sites in the western Antarctic Peninsula. The team will evaluate the differential warming responses of individual taxa of bacteria, fungi, and archaea and their potential roles in carbon cycling. The project will further assess the role of warming on photosynthetic uptake of carbon by the vegetation. Results will advance research in plant and soil microbial ecology and ecosystem modeling.

Field Season Overview

Each field season, the team sets up 40 plots in the glacier forefield behind Palmer Station and on Litchfield Island, which include 20 plots containing open-top chambers (OTC) that elevate temperatures and 20 control plots without chambers. These are positioned in four different sites along a productivity gradient (five plots per treatment at each productivity level). OTCs are deployed as soon as possible after snowmelt (early December) and removed at the end of the growing season (late March). The environmental probes and steel collars have been in place in the field throughout the project to collect year-round continuous data on soil temperature and moisture. The 2026-27 field season is the final one for this project.

Field measurements: During each field season the science team takes weekly carbon flux weather-permitting and photographs for vegetative cover analyses in all 40 plots. In those plots, the research team will examine longer-term warming effects with 2- and 4-week stable isotope field incubation using microcosms containing intact soil cores.

Lab measurements: The science team will collect and incubate representative plant and soil specimens in lighted growth chambers to measure their photosynthetic rates in response to warming. They will include a “wind x warming” experiment to examine whether reduced wind speeds also enhance vegetative growth at the earliest successional site that has only recently shown moss growth. This earliest successional site has high organic matter content, and remnants of black, ancient moss are present, presumably having been a peat-bank during glacier advance thousands of years ago.

Deploying Team Members

- Alicia Purcell
- Natasja van Gestel (PI)

Project Detail

ORGANISMS AND ECOSYSTEMS

From Air Sacs to Tissues: Oxygen Transfer and Utilization in Diving Emperor Penguins

Event Number:

B-197-M

NSF / OPP Award 1643532

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Randolph Jones

Principal Investigator(s):

Dr. Paul John Ponganis

pponganis@ucsd.edu 

Scripps Institution of Oceanography
Center Marine Biotechnology/Biomedicine
La Jolla, California

Location(s):

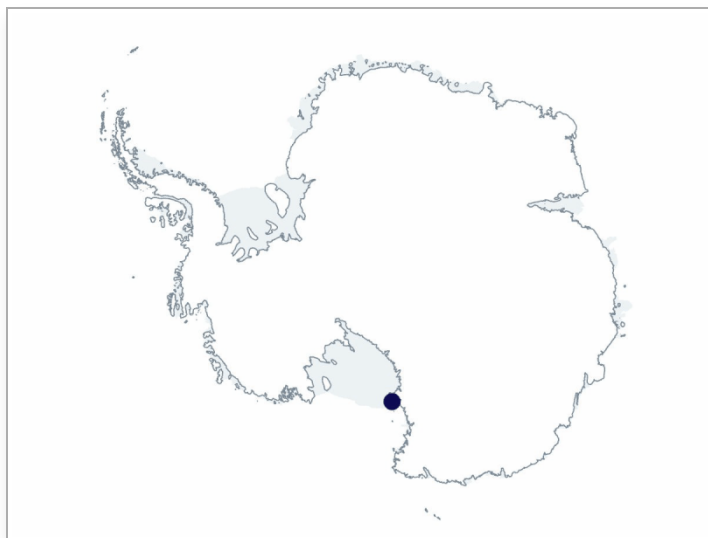
- **Supporting Stations:** McMurdo Station
- **Research Locations:** Erebus Bay

Project Description:

During exercise, oxygen must be efficiently delivered from the lungs to the working tissues. Birds have a unique respiratory system that includes both air sacs and lungs (called parabronchi) and has a one-way, rather than bidirectional, airflow pattern. This allows a high proportion of the oxygen in inhaled air to be transferred into the blood so that the oxygen can be circulated by the cardiovascular system to the tissues.



Emperor penguin exits dive hole at research camp in McMurdo Sound. Photo by Paul Ponganis.



B-197-M Research Location(s): Erebus Bay

In diving birds such as the Emperor penguin, air-sac-to-tissue oxygen delivery is essential to dive capacity and is one of the adaptations that allows Emperor penguins to dive deeper than 500 meters. However, the physiological mechanisms underlying the transfer of oxygen from air sacs to blood and the subsequent distribution of oxygen to tissues are poorly understood. The Emperor penguin is ideal for investigating this oxygen cascade because of its body size, its dive capacity, and the physiological database and established research techniques and protocols for this species. This study should provide insight into (1) mechanisms underlying the efficiency of the bird oxygen transport system; (2) the physiological basis of penguins' dive behavior and ability to adapt to environmental change; and (3) perhaps even the design of better therapeutic strategies and tools for treatment of human respiratory disease.

Field Season Overview

Six participants will deploy to McMurdo Station from early October to mid-December 2026. They will set up a field camp on the sea ice of McMurdo Sound to work with temporarily captive Emperor penguins. Isolated holes will be drilled in the ice at the camp and encircled by snow and corral fencing. Participants will capture Emperor penguins and bring them to the camp, where they will be outfitted with internal sensors. Birds will be allowed to dive and forage freely for 3 days at the hole before the instruments are recovered. The birds will be released from the camp (if the ice edge is near) or returned to their original capture site at the end of the season.

The sea ice camp will consist of three to four huts with electrical power and wireless connectivity, a hybrid power sled, a Weatherhaven tent with heating for anesthesia, and personal tents for the participants.

Deploying Team Members

- Evelyn Conley
- Angela Jackson
- Jessica Kendall-Bar
- Birgitte McDonald
- Paul Ponganis (PI)
- Cassondra Williams

Project Detail

ORGANISMS AND ECOSYSTEMS

Beyond the Black-and-White: Uncovering Hidden Keys to Success in Adelie Penguins

Event Number:

B-200-M

NSF / OPP Award 2535120

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Grant Ballard

gballard@pointblue.org 

Point Reyes Bird Observatory

San Francisco, California

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Cape Crozier, Cape Royds

Project Description:

In the contrasting environments of the relatively stable Ross Sea and the rapidly warming western Antarctic Peninsula, Adélie penguin populations are exhibiting divergent demographic trajectories. This project will formally integrate two of the longest-running US penguin research programs to uncover the behavioral, phenotypic, and genetic "hidden keys" that determine the species' capacity to adapt to accelerating



Adélie Penguins. Photo by Mika Lucibella, courtesy of the NSF/USAP Photo Library.



B-200-M Research Location(s): Cape Crozier, Cape Royds

environmental change. By deploying state-of-the-art biologging tools and combining multidecadal demographic datasets with cutting-edge genomics, the team will evaluate how rarely observed traits (e.g., juvenile dispersal, winter foraging, molt characteristics) influence individual fitness and population resilience. These data will be utilized to build integrated models that forecast future population dynamics under projected climate scenarios. Results from this study will directly inform adaptive management strategies for Antarctic marine ecosystems through collaboration with international bodies like the Commission for the Conservation of Antarctic Marine Living Resources, while the team also leads an extensive science, technology, engineering, and mathematics (STEM) education and public outreach program featuring multimedia storytelling and a new Antarctic science adventure comic series.

Field Season Overview

Nine participants will deploy in 2026-27 from late October to mid-February to continue the long-term study of Adélie penguin demographics and response to environmental change in the Ross Sea. Deployments will be staggered throughout the field season, with participants occupying helicopter-supported camps at Cape Royds and Cape Crozier. Field activities include identifying marked penguins at each location, collecting breeding behavior data, recovering loggers that were attached to penguins in prior seasons, and conducting uncrewed aerial system (UAS) surveys of the penguin colonies. The team will also make 1- to 2-day trips to Cape Bird to conduct a census and UAS flights.

Deploying Team Members

- Grant Ballard (PI)
- Megan Elrod (Team Leader)
- Dennis Jongsomjit
- Amelie Lescroel (Co-PI)
- Anne Schmidt (Co-PI)
- Alexandra Strang
- Arvind Varsani (Co-PI)
- John Weller
- Suzanne Winkvist

Project Detail

ORGANISMS AND ECOSYSTEMS

Career: Ecosystem Impacts of Microbial Succession and Production at Antarctic Methane Seeps

Event Number:

B-249-M

NSF / OPP Award 2535603

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Randolph Jones

Principal Investigator(s):

Dr. Andrew Reichmann Thurber

athurber@ucsb.edu 

University of California Santa Barbara

Department of Ecology, Evolution, Marine

Biology

Santa Barbara, California

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Intake Jetty, Cape Armitage/Dayton's Wall, Cinder Cones, Turtle Rock

Project Description:

This project involves the genomic and transcriptomic study of microbial communities developed and still developing after seepage of methane through the seafloor into the ocean — the cold seeps. The first methane



The white patches at the Cinder Cones Seep indicates where microbes consume the greenhouse-gas methane.

Photograph by Andrew Thurber.



B-249-M Research Location(s): Intake Jetty, Cape Armitage/Dayton's Wall, Cinder Cones, Turtle Rock

seepage in the high Antarctic was discovered in McMurdo Sound in 2012 and 5 years later still had an underdeveloped microbial community that was consuming methane. This project will elucidate the microbial community composition in relation to the presence of methane and their function in oxidizing methane in Antarctic coastal waters. The project aims to answer three scientific questions on microbes associated with methane seeps: (1) What is their relation to species present and their evolution over time, (2) what metabolic processes do they support, and (3) what role do they play in providing food for benthic food webs.

Sampling must occur in the late winter / early spring, before high light levels support growth of diatom mats over the benthos. When at McMurdo Station, the science team, with United States Antarctic Program (USAP) dive support, will sample to characterize the community in sediment cores and collect other animals to assess the carbon flow through the food web supported by methane. Geochemical analysis of methane released in the sediment will be measured on samples collected in situ and analyzed on an instrument provided by the team. Additional experiments will be run in the aquarium. A Polar STEAM (science, technology, engineering, arts, and math) artist will be included as part of the team.

Field Season Overview

Four participants will deploy for approximately 3 months, from mid-August to mid-November 2026, to collect sediment cores and animals with the aid of USAP dive support. A significant component of the research will focus on experimentation using either the seawater system or incubators within the Albert P. Crary Science and Engineering Center. A Polar STEAM artist will be included as part of the team.

In the field, the team will focus on sampling areas of known methane seepage around eastern McMurdo Sound, with the goal of sampling as far north as ice conditions allow, as early as possible during Winter Flight. If feasible, these areas will include cinder cones shortly after landing or access to the jetty and more southerly sites while it is still mostly dark. Most of the work involves diving out of fish huts, as well as dive “tomatoes” or “apples.” The team will again collaborate with Dr. Sarah Seabrook's team through Antarctica New Zealand (AntNZ) to co-study the methane seep sites at Cape Evans, staying at the AntNZ camp up to 3 nights to minimize fuel and drive time between McMurdo Station and Cape Evans.

Deploying Team Members

- Sarai Alvarez Zepeda
- Paola Santiago Padua
- Andrew Thurber (PI)
- Margeaux Walter
- Jacob Wynne

Project Detail

ORGANISMS AND ECOSYSTEMS

CAREER: Coastal Antarctic Snow Algae and Light Absorbing Particles: Snowmelt, Climate, and Ecosystem Impacts

Event Number:

B-466-P

NSF / OPP Award 2046240

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Marissa Goerke / Diane Hutt

Principal Investigator(s):

Dr. Alia Lauren Khan

alia.khan@Colorado.EDU 

University of Colorado Boulder
Boulder, Colorado

Project Web Site:

<https://www.colorado.edu/faculty/khan-cryobiogeosensing> 

Location(s):

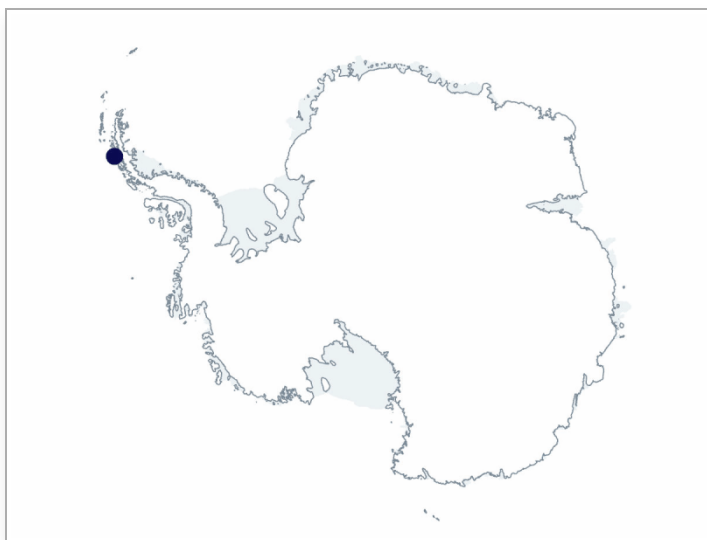
- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Station and surrounding islands

Project Description:

This 5-year, time series project will assess the effects of changing cryosphere-albedo feedback in the Antarctic Peninsula and the Pacific Northwest. A variety of in situ and remote sensing data collected



A rainbow over Bonaparte Point at NSF Palmer Station, located on Anvers Island in the Antarctica Peninsula. Photo by Katie Harrison, courtesy of the USAP Photo Library.



B-466-P Research Location(s): Palmer Station and surrounding islands

across multiple spatial scales will be used to evaluate the role of temperature, radiative forcing effects, and light absorbing particles (LAPs) on snow algae growth. The project is expected to advance knowledge of factors that affect the snow algae growing season.

Ground measurements will inform development and application of novel algorithms to map algal bloom extent through time using multispectral satellite imagery at 0.5- to 3.0-meter spatial resolution. These results will be used to improve snow algae parameterization in a new version of the Snow Ice Aerosol Radiation (SNICARv3) model that includes bio-albedo feedbacks, eventually informing models of ice-free area expansion through incorporation of SNICARv3 in the Community Earth System Model. Local Pacific Northwest sites will be used to develop educational case studies in classroom and field courses and for URM-targeted graduate student education and for middle school snow camp.

Field Season Overview

Two field team members will deploy to Palmer Station in 2026-27. Sampling sites at Palmer will be identified at the start of the season, with sampling variously taking place weekly (at areas easily accessed from Palmer), every other week (at areas further afield accessed via Zodiac inflatable boat) and every ~3 weeks (at areas accessed via longer Zodiac trips). Sampling at all locations will include taking snow samples and physical and spectral reflective measurements to determine the spatial and temporal distribution of snow algae. Additional physical properties will be measured (e.g., snow depth, density, grain size). The science team's principal investigator (PI) will take spectral reflectance measurements with an Analytical Spectral Devices FieldSpec 4 hyperspectral spectroradiometer. At certain identified sample sites, the PI will install a time-lapse camera, snow depth sensor, and air temperature sensors. The team will also deploy an uncrewed aerial system, which will require a separate PI-generated concept of operations when flown at Palmer Station. Samples will either be analyzed at Palmer Station or fixed and shipped to the PI's home university.

Deploying Team Members

- Jacob Dana
- Edison Twyman

2026–2027

USAP FIELD SEASON PROJECTS

INTEGRATED SYSTEM SCIENCE

Dr. William Ambrose, Program Director

Project Detail

INTEGRATED SYSTEM SCIENCE

PAL-LTER: Ecological Response to "Press Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula

Event Number:

C-013-P

NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Diane Hutt

Principal Investigator(s):

Dr. Megan A Cimino

megan.cimino@noaa.gov 

University of California Santa Cruz

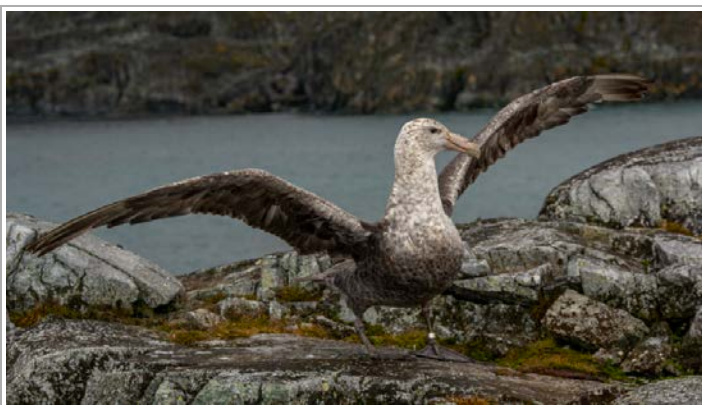
Monterey, California

Location(s):

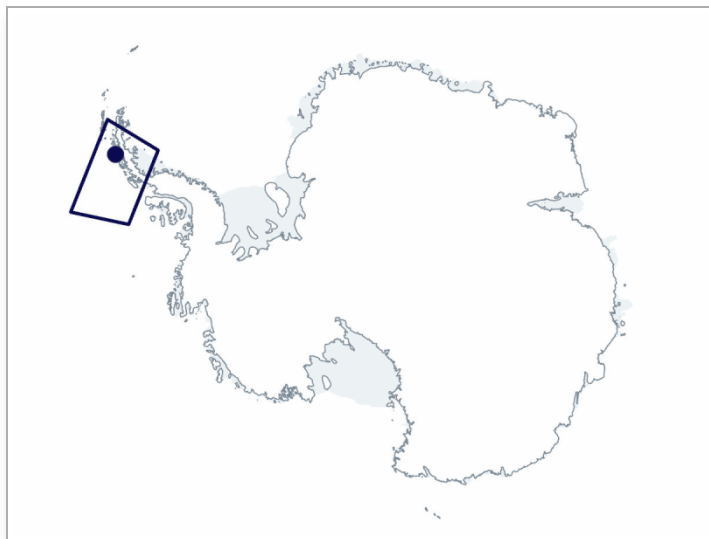
- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Station and surrounding environs

Project Description:

Seasonal sea ice-influenced marine ecosystems at both poles are characterized by high productivity concentrated in space and time by local, regional, and remote physical forcing. These polar ecosystems are among the most rapidly changing on Earth. The Palmer Long-Term Ecological Research (PAL-LTER) seeks to build on three decades of research along the West Antarctic Peninsula to gain new mechanistic and predictive understanding of ecosystem changes in response



A southern giant petrel. Photo by Mike Lucibella, courtesy of the USAP Photo Library.



C-013-P Research Location(s): Palmer Station and surrounding environs

to disturbances spanning long-term, subdecadal, and higher frequency “pulses” driven by a range of processes, including long-term natural variability and storms. These disturbances alter food web composition and ecological interactions across temporal and spatial scales that are not well understood. Researchers will contribute fundamental understanding of how population dynamics and biogeochemical processes are responding within a polar marine ecosystem undergoing profound change.

Field Season Overview

During the 2026-27 season, the Palmer Station-based science team will deploy from roughly mid-November to mid-April. Team members will live at Palmer while conducting their field research, using small boats to access local islands in the Palmer vicinity and making frequent day trips to seabird colonies in the local, distant, and extended boating areas (e.g., Dream Island, Biscoe Point, Joubin Islands, Wauwermans Islands, Rosenthal Islands). The team will conduct population censuses and sampling from local seabird colonies and collaborate with other Long-Term Ecological Research (LTER) groups on biweekly acoustic surveys in the area. The C-013 project will support the C-024 project by documenting whale sightings when on the water and collecting biopsy samples when possible.

Deploying Team Members

- Megan Cimino (PI)
- Richard Robbins

Project Detail

INTEGRATED SYSTEM SCIENCE

PAL-LTER: Ecological Response to "Press Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula

Event Number:

C-019-P

NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jamee Johnson

Principal Investigator(s):

Dr. Oscar Schofield

oscar@marine.rutgers.edu 

Rutgers University

Institute for Marine & Coastal Sciences

New Brunswick, New Jersey

Project Web Site:

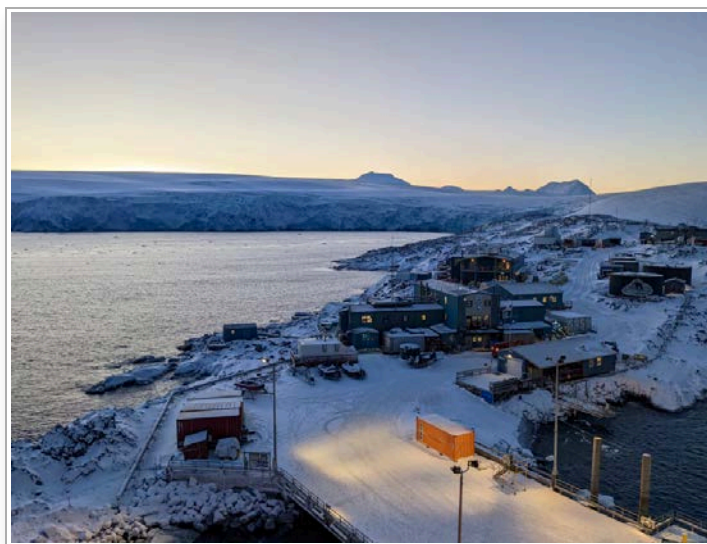
<https://pallter.marine.rutgers.edu/> 

Location(s):

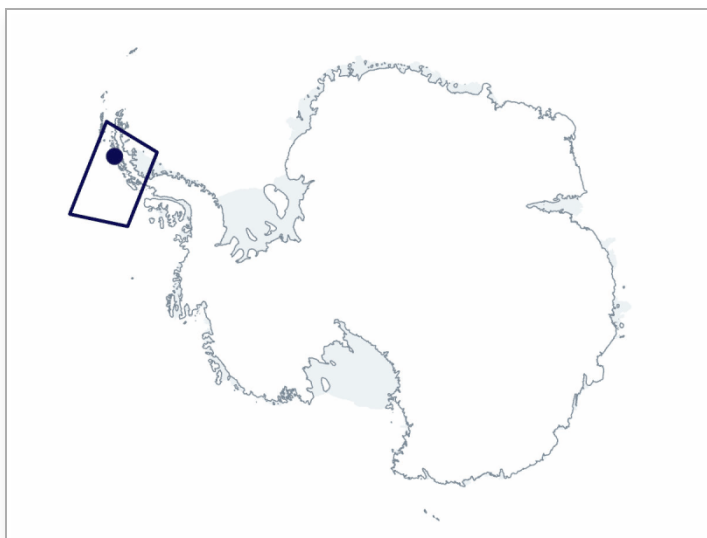
- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Station

Project Description:

Seasonal sea ice-influenced marine ecosystems at both poles are characterized by high productivity concentrated in space and time by local, regional, and remote physical forcing. These polar ecosystems are among the most rapidly changing on Earth. The Palmer Long-Term Ecological Research



Palmer Station. Photo by Ben Rosen-Filardo, courtesy of the USAP Photo Library.



C-019-P Research Location(s): Palmer Station

(PAL-LTER) seeks to build on three decades of research along the West Antarctic Peninsula to gain new mechanistic and predictive understanding of ecosystem changes in response to disturbances spanning long-term, subdecadal, and higher frequency “pulses” driven by a range of processes, including long-term natural variability and storms. These disturbances alter food web composition and ecological interactions across temporal and spatial scales that are not well understood. Researchers will contribute fundamental understanding of how population dynamics and biogeochemical processes are responding within a polar marine ecosystem undergoing profound change.

Field Season Overview

During 2026-27, the three-member science team will continue to study seasonal and local-scale processes at Palmer Station, conducting water sampling and optical surveys twice per week, EK80 echo sounder surveys in collaboration with other Long-Term Ecological Research (LTER) groups, and incubation experiments. The Palmer lab manager will assist with year-round weekly sampling for chlorophyll at the station's seawater intake in the pump house. The team will periodically deploy up to two Slocum gliders via Zodiac or other rigid hull inflatable boats. A conductivity, temperature, depth (CTD) cast with no water sampling will be required during the deployment and recovery. The C-019 project's Schofield group will conduct research for the C-020 project's Steinberg and C-045 project's Van Mooy groups, which will not deploy participants this season.

Deploying Team Members

- Elliot Brown
- Abby Tomita
- Jessica Defeo

Project Detail

INTEGRATED SYSTEM SCIENCE

PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula

Event Number:

C-024-P

NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jamee Johnson

Principal Investigator(s):

Dr. Ari Seth Friedlaender

ari.friedlaender@ucsc.edu 

University of California Santa Cruz

Institute of Marine Sciences

Santa Cruz, California

Project Web Site:

<https://pallter.marine.rutgers.edu/> 

Location(s):

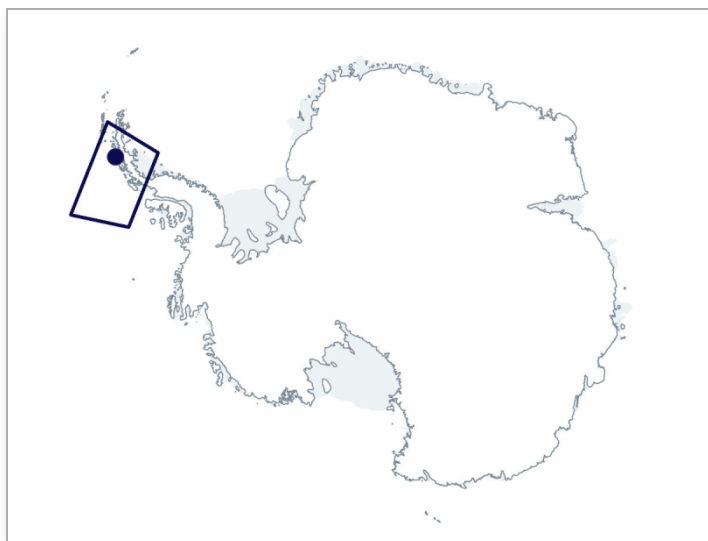
- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Station

Project Description:

Seasonal sea ice-influenced marine ecosystems at both poles are characterized by high productivity concentrated in space and time by local, regional, and remote physical forcing. These polar ecosystems are among the most rapidly changing on Earth. The Palmer Long-Term Ecological Research (PAL-LTER) seeks to build on three decades of research along the West



Humpback whale. Photo by Ari Friedlaender, courtesy of the USAP Photo Library.



C-024-P Research Location(s): Palmer Station

Antarctic Peninsula to gain new mechanistic and predictive understanding of ecosystem changes in response to disturbances spanning long-term, subdecadal, and higher frequency “pulses” driven by a range of processes, including long-term natural variability and storms. These disturbances alter food web composition and ecological interactions across temporal and spatial scales that are not well understood. Researchers will contribute fundamental understanding of how population dynamics and biogeochemical processes are responding within a polar marine ecosystem undergoing profound change.

Field Season Overview

The science team will deploy two participants to Palmer Station for the 2026-27 austral summer. Field operations will focus on multidisciplinary research to study the behavior, ecology, distribution, and abundance of marine mammals in the waters around the station. Researchers will routinely conduct visual surveys, collect photogrammetric images of whales, collect remote biopsy samples using crossbows, and deploy motion-sensing and video-recording suction cup tags to whales. Additionally, the science team will be working collaboratively with other Long-Term Ecological Research (LTER) groups to accomplish shared goals.

Deploying Team Members

- Mason Cole

Project Detail

INTEGRATED SYSTEM SCIENCE

LTER: MCM6: The Roles of Legacy and Ecological Connectivity in a Polar Desert Ecosystem

Event Number:

C-504-M

NSF / OPP Award 2224760

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Melisa Antonia Diaz

diaz.237@osu.edu 

Ohio State University

Byrd Polar and Climate Research Center

Columbus, Ohio

Project Web Site:

<https://mcm.lternet.edu/> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Lake Fryxell, Lake Bonney, New Harbor, McMurdo Dry Valleys

Project Description:

In this iteration of the McMurdo Long-Term Ecological Research (MCM-LTER) project (MCM6), the science team will test ecological connectivity and stability



Water quality experimentation on Crescent Stream in Taylor Valley. Photo by Melisa Diaz.



C-504-M Research Location(s): Lake Fryxell, Lake Bonney, New Harbor, McMurdo Dry Valleys

theory in a system subject to strong physical drivers (e.g., geological legacies, extreme seasonality) and driven by microbial organisms. Since microorganisms regulate most of the world's critical biogeochemical functions, these insights can be relevant beyond polar ecosystems and can inform understanding and expectations of how natural and managed ecosystems respond to ongoing environmental variation. MCM6 builds on foundational research both in Antarctica and within the Long-Term Ecological Research (LTER) network, to consider the temporal aspects of connectivity and how it relates to ecosystem stability. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine (1) the stability of these ecosystems as reflected by sentinel taxa; (2) the relationship between ecological legacies and ecosystem resilience; (3) the importance of material carryover during periods of low connectivity to maintaining biological activity and community stability; and (4) how changes in disturbance dynamics disrupt ecological cycles through the polar night.

Field Season Overview

Four participants will deploy on the LTER surface processes team from early-December 2026 to late January 2027, based primarily out of F6 camp in Taylor Valley, with occasional stays at Lake Bonney and New Harbor and trips back to Albert P. Crary Science and Engineering Center to process samples. The science team will collect aeolian, stream, and other sediments and shallow ice cores from Taylor Valley glaciers. It will also measure nutrient concentrations in streams and lakes and use an uncrewed aerial system to map and characterize hydrologically active areas at several locations in the Dry Valleys. Following field work, one participant will remain on station into mid-February to process samples.

Deploying Team Members

- Melisa Diaz (PI)
- Nolan Magner
- Denise Mondragon
- Isabella Ulate

Project Detail

INTEGRATED SYSTEM SCIENCE

MCM-LTER: MCM6: The Roles of Legacy and Ecological Connectivity in a Polar Desert Ecosystem

Event Number:

C-505-M

NSF / OPP Award 2224760

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Cristina Danielle Takacs-Vesbach

cvesbach@gmail.com 

University of New Mexico

Department of Biology

Albuquerque, New Mexico

Project Web Site:

<https://mcm.lternet.edu/> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Lake Bonney, Lake Fryxell, Lake Hoare, McMurdo Dry Valleys

Project Description:

In this iteration of the McMurdo Long-Term Ecological Research (MCM-LTER) project (MCM6), the science team will test ecological connectivity and stability



Limno team drills a hole in Lake Bonney. Photo by Emily Reynebeau.



C-505-M Research Location(s): Lake Bonney, Lake Fryxell, Lake Hoare, McMurdo Dry Valleys

theory in a system subject to strong physical drivers (e.g., geological legacies, extreme seasonality) and driven by microbial organisms. The team hypothesizes that the structure and functioning of the McMurdo Dry Valleys ecosystem depends on legacies and the contemporary frequency, duration, and magnitude of ecological connectivity. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine (1) the stability of these ecosystems as reflected by sentinel taxa; (2) the relationship between ecological legacies and ecosystem resilience; (3) the importance of material carryover during periods of low connectivity to maintaining biological activity and community stability; and (4) how changes in disturbance dynamics disrupt ecological cycles through the polar night. One artist from the Polar STEAM (science, technology, engineering, arts, and math) project will join the team in the field.

Field Season Overview

Five participants will deploy on the Long-Term Ecological Research (LTER) limno team between mid-October 2026 and mid-February 2027. The team will rotate among Lake Fryxell, Lake Hoare, and Lake Bonney camps, conducting two to three rounds of "limno runs" in which they complete biological and chemical sampling throughout the water column. The team will also retrieve and redeploy a large sediment trap.

Antarctic Support Contract carpentry staff will set up Polarhavens on the ice of Lake Fryxell, Lake Bonney, and Lake Hoare for the team to work from. The team will melt holes in the ice to access the water column. The team will also make day trips to other lakes in the Dry Valleys (e.g., lakes Miers, Vanda, Joyce, Trough, and Vida) to collect samples. Between each limno run, the team will return to the Albert P. Crary Science and Engineering Center to process samples. One Polar STEAM artist will deploy with the C-505-M project team and work with it and the C-508-M project team in the field.

Deploying Team Members

- Natalia Chavez
- Maisy Frederick
- Bradley Johnson
- Jade Lawrence (Team Leader)
- Rachael Morgan-Kiss
- Emily Reynebeau (Team Leader)

Project Detail

INTEGRATED SYSTEM SCIENCE

LTER: MCM6: The Roles of Legacy and Ecological Connectivity in a Polar Desert Ecosystem

Event Number:

C-506-M

NSF / OPP Award 2224760

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Michael N Gooseff

michael.gooseff@colorado.edu 

University of Colorado Boulder

Institute of Arctic and Alpine Research

Boulder, Colorado

Project Web Site:

<https://mcm.lternet.edu/> 

Location(s):

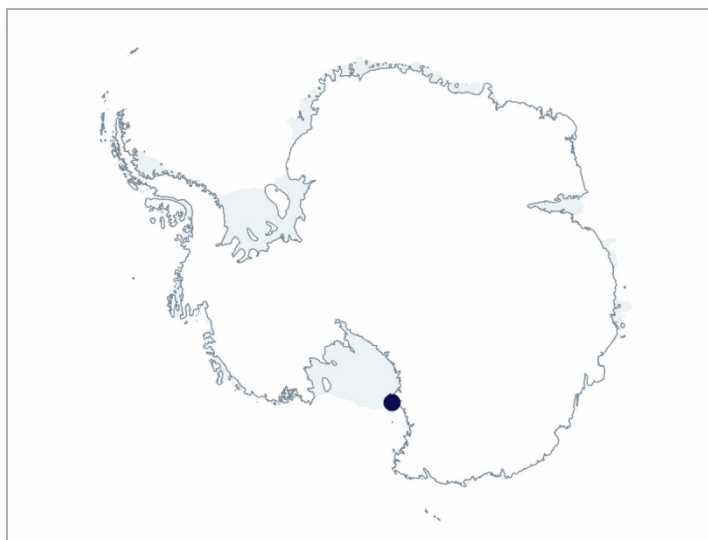
- **Supporting Stations:** McMurdo Station
- **Research Locations:** Lake Hoare, Lake Fryxell, New Harbor, McMurdo Dry Valleys

Project Description:

In this iteration of the McMurdo Long-Term Ecological Research (MCM-LTER) project (MCM6), the science team will



MCM LTER stream team member measures discharge in the Onyx River above Lake Vanda, Wright Valley. Photo by Michael Gooseff.



C-506-M Research Location(s): Lake Hoare, Lake Fryxell, New Harbor, McMurdo Dry Valleys

test ecological connectivity and stability theory in a system subject to strong physical drivers (e.g., geological legacies, extreme seasonality) and driven by microbial organisms. The team hypothesizes that the structure and functioning of the McMurdo Dry Valleys ecosystem depends on legacies and the contemporary frequency, duration, and magnitude of ecological connectivity. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine (1) the stability of these ecosystems as reflected by sentinel taxa; (2) the relationship between ecological legacies and ecosystem resilience; (3) the importance of material carryover during periods of low connectivity to maintaining biological activity and community stability; and (4) how changes in disturbance dynamics disrupt ecological cycles through the polar night.

Field Season Overview

Four participants will deploy on the Long-Term Ecological Research (LTER) streams and glaciers team from early November 2026 to early-February 2027. The team will primarily base out of F6 camp in Taylor Valley, with occasional stays at New Harbor camp and day trips to streams and glaciers throughout Taylor, Wright, Garwood, Victoria, and Miers valleys. The team will also spend some time at Lake Hoare early in their season. Activities will include maintaining the network of 17 stream gauges, surveying lake levels, collecting water samples, monitoring microbial mats in abandoned channels, collecting shallow glacier ice cores, deploying and recovering sensors, and maintaining various sensor and data collection systems deployed throughout the region.

Deploying Team Members

- Jared Collins (Team Leader)
- Charles Dougherty
- Michael Gooseff (PI)
- Owen Sedej

Project Detail

INTEGRATED SYSTEM SCIENCE

LTER: MCM6: The Roles of Legacy and Ecological Connectivity in a Polar Desert Ecosystem

Event Number:

C-507-M

NSF / OPP Award 2224760

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Byron J Adams

bjadams@byu.edu 

Brigham Young University

College of Life Sciences

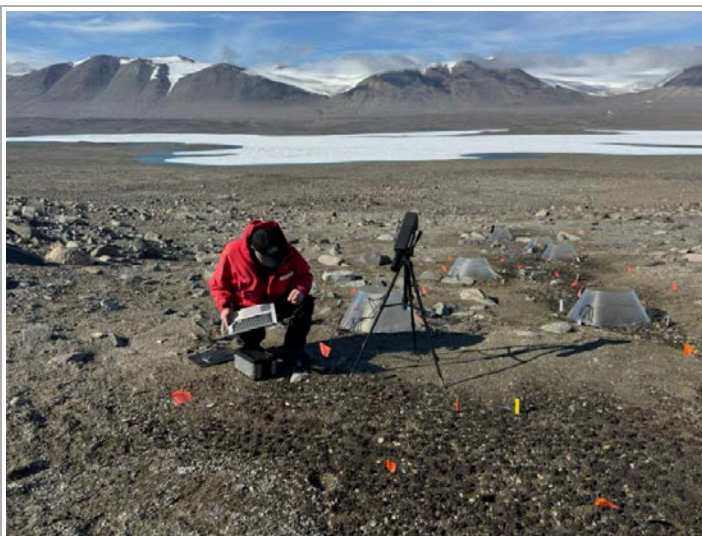
Provo, Utah

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Dry Valleys, Lake Fryxell

Project Description:

In this iteration of the McMurdo Long-Term Ecological Research (MCM-LTER) project (MCM6), the science team will test ecological connectivity and stability theory in a system subject to strong physical drivers (e.g., geological legacies, extreme seasonality) and driven by microbial organisms. The team



Measuring microbial mat responses to experimental wetting and warming. Photo by Byron Adams.



C-507-M Research Location(s): McMurdo Dry Valleys, Lake Fryxell

hypothesizes that the structure and functioning of the McMurdo Dry Valleys ecosystem depends on legacies and the contemporary frequency, duration, and magnitude of ecological connectivity. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine (1) the stability of these ecosystems as reflected by sentinel taxa; (2) the relationship between ecological legacies and ecosystem resilience; (3) the importance of material carryover during periods of low connectivity to maintaining biological activity and community stability; and (4) how changes in disturbance dynamics disrupt ecological cycles through the polar night.

Field Season Overview

Eight participants will deploy on the Long-Term Ecological Research (LTER) soils team from mid-December 2026 to early February 2027. The team will primarily base out of McMurdo Station and make helicopter-supported day trips to locations throughout the Dry Valleys. It will also spend a week based out of Fryxell Camp. Activities will include sampling soils, conducting various in situ soil experiments, and monitoring and maintaining soil meteorological stations. The team will analyze and prepare collected soil samples at the Albert P. Crary Science and Engineering Center. One team member will use an uncrewed aerial system and microscope photography to produce outreach materials.

Deploying Team Members

- Byron Adams (PI)
- Marcella Adams
- John Barrett (Co-PI)
- Rayna Palkewicz
- Kepler Ridge
- Nicholas Smithson
- Ryan Snow
- Ariel Waldman

Project Detail

INTEGRATED SYSTEM SCIENCE

LTER: MCM6 - The Roles of Legacy and Ecological Connectivity in a Polar Desert Ecosystem

Event Number:

C-508-M

NSF / OPP Award 2224760

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Rachael Morgan-Kiss

morganr2@miamioh.edu 

Miami University

Oxford, Ohio

Project Web Site:

<https://mcm.lternet.edu/> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Lake Fryxell, Bonney Narrows

Project Description:

In this iteration of the McMurdo Long-Term Ecological Research (MCM-LTER) project (MCM6), the science team will test ecological connectivity and stability theory in a system subject to strong physical drivers (e.g., geological legacies, extreme seasonality) and driven by



Lake Fryxell field camp in Taylor Valley, Victoria Land. Photo by Chris Kannen, courtesy of the USAP Photo Library.



C-508-M Research Location(s): Lake Fryxell, Bonney Narrows

microbial organisms. The team hypothesizes that the structure and functioning of the McMurdo Dry Valleys ecosystem depends on legacies and the contemporary frequency, duration, and magnitude of ecological connectivity. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine (1) the stability of these ecosystems as reflected by sentinel taxa; (2) the relationship between ecological legacies and ecosystem resilience; (3) the importance of material carryover during periods of low connectivity to maintaining biological activity and community stability; and (4) how changes in disturbance dynamics disrupt ecological cycles through the polar night.

Field Season Overview

Five participants will work on C-508-M project activities this season from mid-November to mid-December 2026. The team will primarily focus on dives and remotely operated underwater-vehicle operations in Lake Fryxell. Three participants will make 20-30 dives under the lake ice to carry out repeated observations of microbial mat distribution and activity, collect samples, and retrieve or redeploy instrumentation. The team will also spend a short amount of time at Lake Bonney camp to dive and recover instrumentation and sample sediments at the Bonney Narrows in collaboration with the C-511 project. Upon completing C-508-M work, two participants will transition to work with the G-080-M project.

Deploying Team Members

- Abbey Dias
- Tyler Mackey (Team Leader)
- Marisol Juarez Rivera
- Elisa Merz

Project Detail

INTEGRATED SYSTEM SCIENCE

LTER: MCM6: The Roles of Legacy and Ecological Connectivity in a Polar Desert Ecosystem

Event Number:

C-509-M

NSF / OPP Award 2224760

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Lydia Helen Zeglin

lzeglin@ksu.edu 

Manhattan, Kansas

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Dry Valleys, Lake Fryxell, Lake Hoare

Project Description:

In this iteration of the McMurdo Long-Term Ecological Research (MCM-LTER) project (MCM6), the science team will test ecological connectivity and stability theory in a system subject to strong physical drivers (e.g., geological legacies, extreme seasonality) and driven by microbial organisms. The team hypothesizes that the structure and functioning of the McMurdo Dry Valleys ecosystem depends on legacies and the contemporary



*Researchers sampling stream algal mats in Taylor Valley.
Photo by Lydia Zeglin.*



C-509-M Research Location(s): McMurdo Dry Valleys, Lake Fryxell, Lake Hoare

frequency, duration, and magnitude of ecological connectivity. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine (1) the stability of these ecosystems as reflected by sentinel taxa; (2) the relationship between ecological legacies and ecosystem resilience; (3) the importance of material carryover during periods of low connectivity to maintaining biological activity and community stability; and (4) how changes in disturbance dynamics disrupt ecological cycles through the polar night.

Field Season Overview

Three participants will deploy from the latter half of December 2026 to early February 2027. The team will primarily base out of F6 camp to sample long-term established algal transects, sample newer transects, deploy temporary nutrient releasing substrate experiments, and maintain a modified stream flow experiment at various locations in the McMurdo Dry Valleys. As many sites as possible will be accessed on foot, with others accessed by helicopter day trip. The team may make occasional stays at New Harbor camp to complete Wales Stream sampling in collaboration with the C-506-M project. Following field work, participants will work at the Albert P. Crary Science and Engineering Center to process and analyze samples.

Deploying Team Members

- Michaela Halsey
- Lydia Zeglin (PI)
- Claire Utzman (Team Leader)

Project Detail

INTEGRATED SYSTEM SCIENCE

LTER: MCM6: The Roles of Legacy and Ecological Connectivity in a Polar Desert Ecosystem

Event Number:

C-511-M

NSF / OPP Award 2224760

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Hilary Anne Bawden Dugan

hdugan@wisc.edu 

University of Wisconsin Madison

Madison, Wisconsin

Project Web Site:

<https://mcm.lternet.edu/> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Lake Hoare, Lake Bonney, McMurdo Dry Valleys

Project Description:

In this iteration of the McMurdo Long-Term Ecological Research (MCM-LTER)

project (MCM6), the science team will test ecological connectivity and stability theory in a system subject to strong physical drivers (e.g., geological legacies,



Annual maintenance on the Canada Glacier meteorological station. Photo by Kayla Hubbard.



C-511-M Research Location(s): Lake Hoare, Lake Bonney, McMurdo Dry Valleys

extreme seasonality) and driven by microbial organisms. The team hypothesizes that the structure and functioning of the McMurdo Dry Valleys ecosystem depends on legacies and the contemporary frequency, duration, and magnitude of ecological connectivity. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine (1) the stability of these ecosystems as reflected by sentinel taxa; (2) the relationship between ecological legacies and ecosystem resilience; (3) the importance of material carryover during periods of low connectivity to maintaining biological activity and community stability; and (4) how changes in disturbance dynamics disrupt ecological cycles through the polar night.

Field Season Overview

Three participants will deploy between early November 2026 and mid-January 2027, basing out of Lake Bonney and Lake Hoare camps to maintain long-term automated lake monitoring equipment and meteorological stations in the McMurdo Dry Valleys. The team will also carry out manual measurements of lake properties and perform seismic surveys near Explorer's Cove and (with assistance from an Antarctic Support Contract mountaineer) Taylor Glacier. Helicopters will support access to field sites. In early December, C-508-M team members will help the C-511-M project retrieve and redeploy under-ice instrumentation in the Bonney Narrows.

Deploying Team Members

- Hilary Dugan (PI)
- Kayla Hubbard
- Daniel Szydlowski

2026–2027

USAP FIELD SEASON PROJECTS

EARTH SCIENCES, GEODESY AND GEOPHYSICS

Dr. Kelly Brunt, Dr. David Porter, Dr. William Ambrose, Program Directors

Project Detail

EARTH SCIENCES, GEODESY AND GEOPHYSICS

Collaborative Research: RAPID: Antarctic Groundwater-Ecosystem Connectivity Across Ice-Ocean-Land Critical Zones

Event Number:

G-051-M

NSF / OPP Award 2602802

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Jill Mikucki

jmikucki@utk.edu 

University of Tennessee

Microbiology

Knoxville, Tennessee

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Cape Evans, New Harbor, Lake Bonney, Lake Fryxell

Project Description:

Antarctica holds vast, hidden reservoirs of salty groundwater beneath its ice and frozen soils; an extensive network that may influence ocean ecosystems and ice sheet stability. This project will directly measure groundwater discharge and potential associated gas seeps along the Antarctic coast, revealing how these subsurface waters transport



*Helicopter flying into New Harbor, Victoria Land, Antarctica.
Photo by Peter Rejcek, courtesy of the USAP Photo Library.*



*G-051-M Research Location(s): Cape Evans, New Harbor,
Lake Bonney, Lake Fryxell*

nutrients, trace metals, microorganisms, and gases to the Southern Ocean. Understanding these exchanges is vital because they can shape marine productivity, influence carbon cycling, and control the release or storage of gases. The project strengthens US and New Zealand scientific collaboration in alignment with the “Antarctica InSync” initiative, supporting coordinated, sustainable research in one of the world’s most logistically challenging environments. Insights from this work will help improve predictions of how Antarctica both responds to and influences global environmental change.

This collaborative RAPID project investigates how Antarctic groundwater drives ecosystem connectivity across the McMurdo Sound coastal zone. The science team will identify groundwater discharge using in situ gamma radiation sensors, deploy seepage meters and OsmoSamplers for fluid and gas flux measurements, and collect water and sediment samples for detailed geochemical and microbial analyses. Data from this project will quantify groundwater pathways, flux rates, and biogeochemical properties. The project tests the hypothesis that Antarctic groundwater significantly affects coastal geochemistry, microbial diversity, and glacial flow, influencing the sensitivity of Antarctic coastal margins to dynamics. The findings will provide foundational data for future multinational monitoring, modeling, and management of Antarctic critical zones.

Field Season Overview

This is a collaborative event between the United States Antarctic Program (USAP) and Antarctica New Zealand (AntNZ), with the majority of on-continent support provided by AntNZ. Three USAP and six AntNZ participants will deploy in mid-October 2026 to Scott Base, where they will conduct preparations before putting into their field sites.

Field work will involve measuring and sampling Antarctic groundwater discharge and gas-rich seeps along the McMurdo Sound coast at Cape Evans and in the New Harbor area. Groundwater presence will be assessed by measuring gamma radiation tracers of groundwater flux via an in situ radionuclide detector. The team will work out of the AntNZ camp at Cape Evans for approximately 2 weeks then the USAP New Harbor fixed camp for about 2 weeks (with a backup site at Cinder Cones). Visits to the USAP Lake Bonney fixed camp (four participants for about 1 week) and USAP Lake Fryxell fixed camp as secondary groundwater flux sites are also planned. Seepage meters will be deployed at Cape Evans and New Harbor, which will require diving to install and retrieve. Antarctic Support Contract dive staff will assist

with diving work. Deployment of instruments, water column profiling with a multimeter sonde and gamma radiation sensor, and sample collection will require access holes in the sea ice and the potential use of USAP resources. Lab space in Albert P. Crary Science and Engineering Center will be required for field preparation and sample processing. Participants will return to Scott Base in early December 2026 and redeploy by mid-December 2026.

Deploying Team Members

- Peter Doran (Co-PI)
- Evan Solomon (Co-PI)
- Jill Mikucki (PI)

Project Detail

EARTH SCIENCES, GEODESY AND GEOPHYSICS

Antarctic Search for Meteorites (ANSMET)

Event Number:

G-058-M

NSF / NASA Agreement

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Allison Barden / Jenny Cunningham

Principal Investigator(s):

Dr. James Karner

jameskarner21@gmail.com 

University of Utah

Department of Geology & Geophysics

Salt Lake City, Utah

Project Web Site:

<https://caslabs.case.edu/ansmet/> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Dominion Range

Project Description:

Antarctic Search for Meteorites (ANSMET) is a field-based science project that recovers meteorite specimens from Antarctica. Since 1976, teams have recovered more than 23,000 specimens from surfaces along the Transantarctic Mountains. These specimens are a reliable, continuous source of new, non-microscopic extraterrestrial material and support thousands of



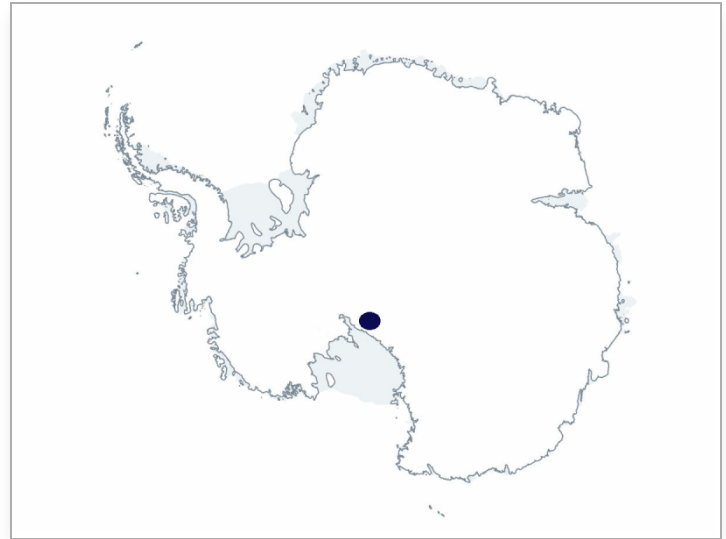
ANSMET PI Jim Karner takes notes on a meteorite find.

Photo by ANSMET/John Friedrich.

scientists from around the globe as they seek essential “ground truth” concerning the materials that make up the asteroids, planets, and other bodies of our solar system. The study of ANSMET meteorites has extended knowledge of the materials and conditions from which our solar system was born and has revealed the geologic nature of asteroids.

Field Season Overview

A science team of six will deploy from early December 2026 to late January 2027 to search for and recover meteorites in the blue ice area at the foot of the Dominion Range mountains, at the top of the Beardmore Glacier. The team will include one grantee-hired mountaineer, who will deploy in mid-November to conduct a Twin Otter reconnaissance flight to access the team's cache, deliver snowmobile fuel, and determine a suitable Basler landing site. The mountaineer and an Antarctic Support Contract field coordinator will then put-in a small camp to groom a Basler skiway, with the rest of the team following by Basler put-in in mid-December. Basler will take out the team and collected meteorites in mid-January. Meteorites will be shipped north via United States Antarctic Program resupply vessel.



G-058-M Research Location(s): Dominion Range

Deploying Team Members

- Melanie Gomez
- James Karner (PI)
- Forrest McCarthy
- Eric Parker
- Jani Radebaugh
- Patrick Shober

Project Detail

EARTH SCIENCES, GEODESY AND GEOPHYSICS

Collaborative Research: Holocene and Late Pleistocene Stream Deposition in the McMurdo Dry Valleys, Antarctica as a Proxy for Glacial Meltwater and Paleoclimate

Event Number:

G-064-M

NSF / OPP Award 2039419

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Kate Swanger

Kate_Swanger@uml.edu ✉

University of Massachusetts

Lowell, Massachusetts

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Dry Valleys, Victoria Valley, Wright Valley

Project Description:

The McMurdo Dry Valleys are the largest ice-free region in Antarctica and home to a seasonally active hydrologic system, with streams and saline lakes. Streams are fed by summer meltwater from local glaciers and snowbanks. Therefore, streamflow is tied to summer climatic conditions



A U.S. Antarctic Program helicopter sits on the ground near Lake Vanda, Wright Valley, McMurdo Dry Valleys. Photo by Elaine Hood, courtesy of the USAP Photo Library.



G-064-M Research Location(s): McMurdo Dry Valleys, Victoria Valley, Wright Valley

such as air temperatures, ground temperatures, winds, and incoming solar radiation. Based on 50 years of monitoring, summer stream activity has been observed to change, and it likely varied during the geologic past in response to regional dynamics and fluctuating glaciers. Thus, deposits from these streams can address questions about past environments, meltwater, and lake level changes in this region (e.g., how meltwater streamflow responded to past environments, how streamflow varied glacial advances and retreats, and when and to what extent large lakes filled certain valleys). The researchers plan to acquire a record of stream activity for the Dry Valleys that will span the three largest valleys and a period of about 100,000 years. This record will come from a series of active and ancient alluvial fans that streams deposited as they flowed from valley sidewalls onto valley floors. The study will provide a long-term context to assess recent observed changes to stream activity and lake levels. Two women, mid-career investigators will lead the investigation, which will contribute to graduate and undergraduate education by including students in both field and laboratory research and incorporating data and results into the classroom.

Field Season Overview

The 2026-27 field season will be the second of two for this project. Three participants will deploy from early December to late January to conduct helicopter-supported field work at two consecutive tent camps in Victoria Valley and Wright Valley. The team will be based at its tent camps for 3 weeks and take several day trips to other locations in Taylor and Wright valleys. Work will focus on collecting sediment and rock samples for dating, geochemical analyses, stratigraphy, and provenance studies. Upon return from the field, the team will organize samples for shipment to their home institution.

Deploying Team Members

- Mika Bighin
- Colten Rodriguez
- Cindy Lou Skipper

Project Detail

EARTH SCIENCES, GEODESY AND GEOPHYSICS

Collaborative Research: RAPID: Catalyzing a Joint US-NZ Spectral Repository of Antarctic Photoautotrophs in the Face of Ongoing Environmental Shifts

Event Number:

G-066-M

NSF OPP 2607496

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Mark Robert Salvatore

Mark.Salvatore@nau.edu ✉

Flagstaff, Arizona

Location(s):

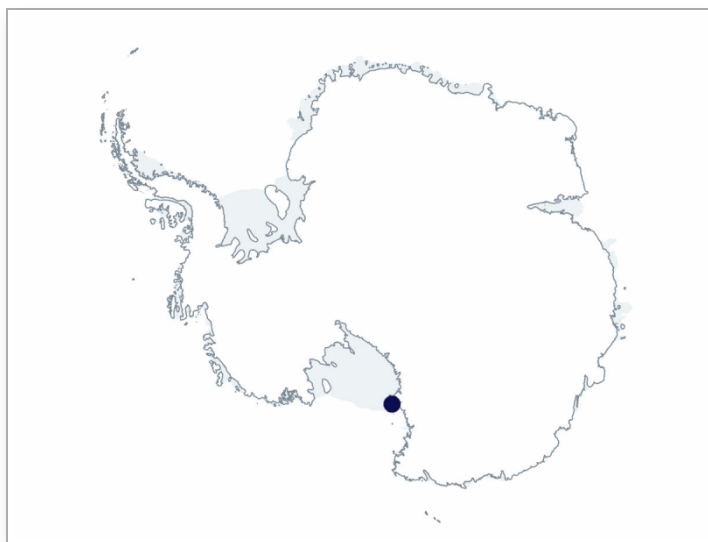
- **Supporting Stations:** McMurdo Station
- **Research Locations:** Pyramid Trough, Lake Fryxell

Project Description:

This project will generate a comprehensive database linking the biogeochemical properties of Antarctic land-based ecosystems in the McMurdo Dry Valleys to their spectroscopic properties that can be detected by drones, aircraft, and satellites. The multi-technique, multi-scale approach of this project will enable scaling



The Friis Hills rise above the Taylor Valley in Victoria Land, Antarctica. Photo by Elaine Hood, courtesy of the USAP Photo Library.



G-066-M Research Location(s): Pyramid Trough, Lake Fryxell

from local observations to landscape-level patterns and will create a standardized monitoring framework compatible with global observation networks such as the National Ecological Observatory Network (NEON), ensuring interoperability and long-term scientific value. The urgency of this work is driven by its alignment with the Catalyst Strategic New Zealand - United States Joint Antarctic Research Programme, which creates a unique and time-critical opportunity for collaboration between two nations at the forefront of Antarctic research. This opportunity addresses the immediate need to synchronize methodologies, share infrastructure, and initiate joint data collection. The Catalyst program is structured to accelerate integration of US and New Zealand capabilities, reduce duplication, and establish a foundation for sustained monitoring of terrestrial ecosystems. This project also contributes to the training of an undergraduate student in the development of cutting-edge drone operations and spectroscopy skills.

Field Season Overview

This is a collaborative event between the United States Antarctic Program (USAP) and Antarctica New Zealand (AntNZ), with AntNZ providing most on-continent support. The science team plans to develop the first integrated spectral, ecological, and biochemical database of Antarctic photoautotrophs in the McMurdo Dry Valleys and surrounding Ross Sea region. The team will consist of three USAP and one AntNZ participant and will deploy to Scott Base in mid-December 2026. Following field preparations, the team will put in to a tent camp at Pyramid Trough for approximately 17 days. Upon completion of work there, the team will move to USAP's fixed camp at Lake Fryxell for 11 days then return to Scott Base and redeploy in mid-January 2027. Field work will include simultaneous aerial hyperspectral surveys, field spectroscopy, and sampling for subsequent biogeochemical and genetic analysis and will include flying an uncrewed aerial system.

Deploying Team Members

- Joseph Levy (Co-PI)
- Emily Pfaff
- Eric Sokol (Co-PI)

Project Detail

EARTH SCIENCES, GEODESY AND GEOPHYSICS

Paleolake Deposits in Miers Valley, Antarctica: An Analog Depositional Record for Martian Lakes Through Late Noachian to Early Hesperian Climatic Transitions

Event Number:

G-080-M

NASA - 20-SSW20-0117

Program Director:

(Other)

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Frances Rivera-Hernandez

friverah@gatech.edu 

Georgia Institute of Technology

School of Earth and Atmospheric Science

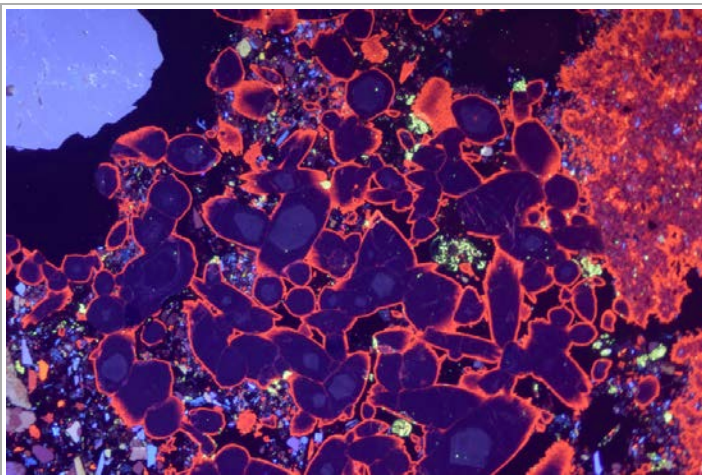
Atlanta, Georgia

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Miers Valley

Project Description:

This is a field-based Mars analogue study of Antarctic paleolake deposits in Miers Valley in the McMurdo Dry Valleys. The Miers Valley deposits offer a unique opportunity to calibrate models for perennially ice-covered lake (PICL) depositional characteristics (i.e., facies) in response to climatic changes, in a



Photomicrograph of Miers paleolake sediments capturing changes in water chemistry through time. Photo by David Giovannetti-Nazario



G-080-M Research Location(s): Miers Valley

location where detailed paleo-climate records exist. Such facies models are needed to assess if Martian paleolakes were similarly ice-covered and can help predict changes in lake properties of modern PICLs on Earth that may affect aquatic ecosystems in the future.

Field Season Overview

Four participants will deploy in mid-December 2026 to McMurdo Station then put in to a remote tent camp in the eastern basin of Miers Valley to conduct field work for 3 weeks. Work will include a 2- to 3-day reconnaissance of the study area, differential GPS surveys with EarthScope-provided instruments, sediment characterization using principal investigator-provided handheld instruments, imaging outcrop exposures for photogrammetry and geologic sampling, and acquisition of topographic data (with overlaid visible images) using a lidar-mounted backpack to help map the extent of paleolake deposits and paleoshorelines in the valley floor. The science team will also collect samples, including sediment samples from stream cuts, small excavations, and sediment peels, as well as water samples from glacial streams. If sediments are ice-cemented, the team will use a handheld drill provided by the National Science Foundation Ice Drilling Program to collect shallow cores within 1 meter of the surface. Excavations will be logged and back-filled. In total, about 350 pounds of samples will be collected. Upon completion of work, the team will return to McMurdo to prepare samples for vessel shipment then redeploy in late January.

Deploying Team Members

- Jordan Bretzfelder
- Tatiana Gibson
- David Giovannetti-Nazario
- Marisol Juarez Rivera

Project Detail

EARTH SCIENCES, GEODESY AND GEOPHYSICS

Global Seismographic Network (GSN) at South Pole Station, Palmer Station, and Scott Base

Event Number:

G-090-P/S

NSF / USGS Agreement

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Allison Barden / Jamee Johnson / Sheryl Seagraves

Principal Investigator(s):

David Wilson

dwilson@usgs.gov 

Albuquerque, New Mexico

Project Web Site:

<https://www.usgs.gov/centers/geologic-hazards-science-center/albuquerque-seismological-laboratory> 

Location(s):

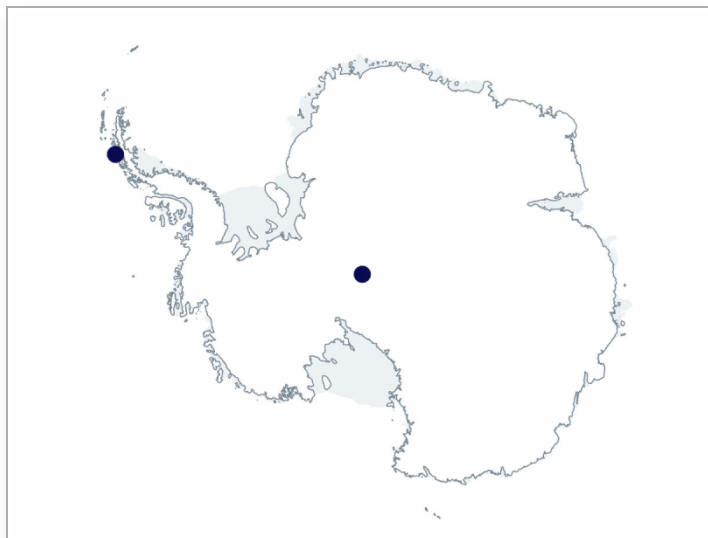
- **Supporting Stations:** Palmer Station, South Pole Station
- **Research Locations:** South Pole Station, Palmer Station

Project Description:

The Global Seismographic Network (GSN) is a worldwide network of about 150 modern seismograph stations. Each station consists of seismometers,



South Pole SPRESSO Vault. Photo courtesy of USGS.



G-090-P/S Research Location(s): South Pole Station, Palmer Station

recording and communications equipment, and facilities necessary for the operation and security of the equipment; some stations may include ancillary sensors. The GSN is a multi-use facility serving the interests of scientific research, earthquake monitoring and tsunami warning, nuclear explosion monitoring, assessment of earthquake hazards, and education. GSN is a partnership between U.S. Geological Survey (USGS) and U.S. National Science Foundation (NSF). Currently, the USGS supports about two-thirds of GSN stations operated by the USGS Albuquerque Seismological Laboratory (ASL); the NSF Division of Earth Sciences provides funding and oversight for a competitively solicited cooperative agreement that includes operations for about one-third of the GSN; and the NSF Office of Polar Programs provides in-kind support for USGS GSN station operations in Antarctica. The USGS ASL operates four GSN stations in Antarctica: CASY (Casey Antarctica), PMSA (Palmer Station, Antarctica), SBA (Scott Base, Antarctica), and QSPA (South Pole Remote Earth Science Observatory, in the Quiet Zone).

Field Season Overview

Research associates at South Pole and Palmer Station will support routine monitoring and maintenance of equipment. This will include ensuring equipment is operational, shutdown and restart of software and hardware as needed, and communication with the project's Principal Investigator and other personnel.

At South Pole, routine support also includes annual inspection and measurement of cabling and structures of the subsurface expansion vaults and the primary recording vault. In addition, a small amount of cargo will be sent to South Pole this summer to replace critical equipment in the recording vault.

2026–2027

USAP FIELD SEASON PROJECTS

GLACIOLOGY, ICE CORE SCIENCE AND GEOMORPHOLOGY

Dr. Kelly Brunt, Dr. David Porter, Program Directors

Project Detail

GLACIOLOGY, ICE CORE SCIENCE AND GEOMORPHOLOGY

Collaborative Research: A New Approach to Firn Evolution Using the Taylor Dome Natural Laboratory

Event Number:

I-162-M

NSF / OPP Award 2024163

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Allison Barden / Jenny Cunningham

Principal Investigator(s):

Kaitlin M Keegan

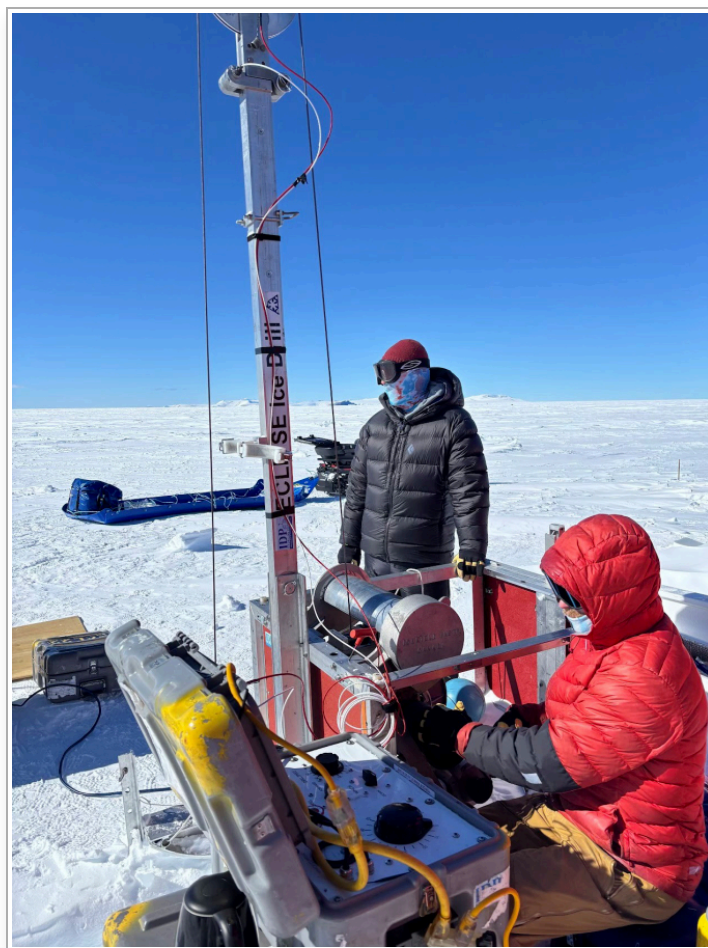
kkeegan@unr.edu 

University of Nevada Reno

Reno, Nevada

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Taylor Dome



Forest Harmon and Elliot Moravec (IDP) collect cores, Taylor Dome. Photo by Zoe Courville.

Project Description:

This project will introduce a new combination of firn datasets designed to facilitate development of next-generation, physics-based firn models. Advances in ice core science and satellite altimetry demand firn models that can reliably simulate firn evolution in a range of climatic conditions, in a environments, and on long and short timescales. Current firn compaction models are largely based on a steady state assumption and tuned to particular geographical locations. Advancing beyond these models requires (1) measuring current firn compaction rates; (2) measuring grain-scale

microstructures that play a crucial role in firn compaction; and (3) quantifying processes driving evolution of those microstructures. To decouple the firn's sensitivities to accumulation and temperature, the science team will measure in situ strain rates by two independent methods and observe trends in microstructure in cores from sites spanning the accumulation gradient at Taylor Dome in Antarctica while maintaining the same average temperature. The team will assess the ability of phase-sensitive radar to remotely measure firn compaction rates, potentially simplifying future in situ measurements. This work will create a road map for collecting future microstructural data spanning key areas of temperature accumulation space and simplify future collaborations through the availability of the open-source Community Firn Model.



I-162-M Research Location(s): Taylor Dome

Field Season Overview

The 2026-26 field season is the second of three for this project. Three participants will deploy from mid-December to late January. They and an Antarctic Support Contract field safety coordinator will put in to Taylor Dome and set up a small tent camp in late December. The participants will spend 2.5 weeks using snowmachines to traverse routes established in the 2025-26 season to sites with installed instrumentation, where they will download data and replace some of the instruments. They will also collect repeat phase-sensitive radar measurements at 10 sites and collect radar data along the transects. Instruments will be left in place for next season. Upon completion of field work, the team return to McMurdo then redeploy in late January.

Deploying Team Members

- Knut Christianson (Co-PI)
- Olivia Moehl

Project Detail

GLACIOLOGY, ICE CORE SCIENCE AND GEOMORPHOLOGY

Collaborative Research: Ice Shelf Rumples and Its Influence on Ice Shelf Buttressing Processes

Event Number:

I-169-M

NSF / OPP Award 2332479

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Allison Barden / Randolph Jones

Principal Investigator(s):

Dr. Alison Banwell

alison.banwell@colorado.edu 

University of Colorado Boulder

CIRES

Boulder, Colorado

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Ice Shelf

Project Description:

This project will investigate the complex interplay between factors that promote and factors that inhibit ice shelf damage at compressive margins. The overall goal is to determine how rumples affect ice shelf stability and hence ice shelf buttressing power, with a focus on the rumples at the compressive margin of the McMurdo Ice Shelf and Hut Point Peninsula, adjacent to New Zealand's



*The McMurdo Ice Shelf Rumples with Scott Base behind.
Photo by Ali Banwell.*



I-169-M Research Location(s): McMurdo Ice Shelf

Scott Base. The science team will acquire a comprehensive set of geophysical and glaciological observations through field-based surveys, deployed surface sensor networks, and remote sensing, with reference to the large body of available historical observations. All observations will be used to develop and validate an existing process-scale numerical model, which combines ice shelf flow with flexure and fracture in a framework that embodies the thin plate approximation. One artist from the Polar STEAM (science, technology, engineering, arts, and math) program will join this project.

Field Season Overview

To allow sufficient time for rumple amplitude changes and geometry to be locally observed, two seasons of ground-based field surveying will be conducted about 12 to 14 months apart, thereby increasing the likelihood of change detection. This season, four participants will deploy from mid-January to mid-February, and field activity will consist of survey and sensor network deployment. One artist from Polar STEAM will join this project.

Surveys will entail conducting measurements at positions along two transects that traverse the rumpled field area, and at locations above the field area. These measurements will utilize portable geophysical equipment towed by snowmobile and potentially roped travel on skis or foot within the study zone, including ground-penetrating radar, lidar, spot kinematic global navigation satellite system (GNSS) measurements, a terrestrial radar interferometer, and optical leveling/survey. Sensor network deployment will require setting up sensors to record data for extended periods. These sensors include up to six seismometers (one or two deployed through the austral winter), eight GNSS receivers (one set up with sufficient battery power to log through the austral winter), autonomous phase-sensitive radar, two automatic weather stations, and three time-lapse camera systems. All sensors will be collected at the end of the 2026-27 field season.

Deploying Team Members

- Alison Banwell (PI)
- Jui-Chun Chen
- Kamala Sankaram
- Michela Savignano
- Caroline Wexler

Project Detail

GLACIOLOGY, ICE CORE SCIENCE AND GEOMORPHOLOGY

COLDEX Phase 2 - Airborne Geophysics Survey - Victoria Land Blue Ice Areas

Event Number:

I-185-M

NSF / OPP Award 2521357

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Allison Barden / Jenny Cunningham /
Matthew Kippenhan

Principal Investigator(s):

Dr. Duncan A Young

duncan@ig.utexas.edu 

University of Texas Austin
Institute for Geophysics
Austin, Texas

Project Web Site:

<https://coldex.org/research> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Victoria Land Blue Ice Areas, Williams Field

Project Description:

The Center for Oldest Ice Exploration (COLDEX) explores Antarctica for the oldest possible ice core records of Earth's environmental history. These cores will help answer scientific questions regarding long-term (Plio-Pleistocene)



A helicopter lands near a field camp in the Allan Hills. Photo by Peter Rejcek, courtesy of the USAP Photo Library.



I-185-M Research Location(s): Victoria Land Blue Ice Areas, Williams Field

planetary cooling and Earth's natural Ice Age cycles, while investigating past natural warm periods that are an analogue for warming expected this century. COLDEX has now firmly established that ice-margin blue ice areas provide the best opportunity for obtaining Earth's oldest ice.

This project aims to extensively map the ice thickness and internal layering of the Allan Hills and other Victoria Land blue ice areas, the eastern flank of Wilkes Subglacial Basin, and upstream accumulation areas. This will inform future drilling targets, enhance understanding of extremely old ice preservation and Wilkes Subglacial Basin stability, and inform interpretation of the intermediate and shallow ice cores. The team will expand the technical capabilities of the COLDEX ultra-high-frequency radar system to include polarimetric radar acquisition and use the system to map ice rheology and changes in ice flow. These data will be important for understanding the context for long-term ice sheet history in this region and may enable mapping of old ice deposits.

Field Season Overview

Nine participants will deploy from late November 2026 to late January 2027 this season: three from the University of Kansas and six from the University of Texas Institute for Geophysics. They will work out of a Rac-Tent at Williams Field to prepare and install instruments on a Basler aircraft. After test flights and adjustments, the Basler will complete survey flights for 3 weeks over a portion of Victoria Land and some of its blue ice areas, as well as Dome C. Following the surveys, instruments will be removed from the Basler and shipped north via resupply vessel.

Deploying Team Members

- Dillon Buhl
- Annabel Conger
- Gonzalo Echeverry
- Shravan Ramakrishna Kaundinya
- Megan Kerr
- John Paden (Co-PI)
- Bradley Schroeder
- Shivangini Singh
- Duncan Young (PI)

Project Detail

GLACIOLOGY, ICE CORE SCIENCE AND GEOMORPHOLOGY

NSFGEO-NERC: Investigating the Direct Influence of Meltwater on Antarctic Ice Sheet Dynamics

Event Number:

I-347-E

NSF / OPP Award 2053169

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Allison Barden / Diane Hutt

Principal Investigator(s):

Dr. Jonathan Kingslake

jonnyk@ldeo.columbia.edu 

Columbia University

Lamont-Doherty Earth Observatory

New York, New York

Project Web Site:

https://ldeo-glaciology.github.io/AntPen_NSF_NERC/ 

Location(s):

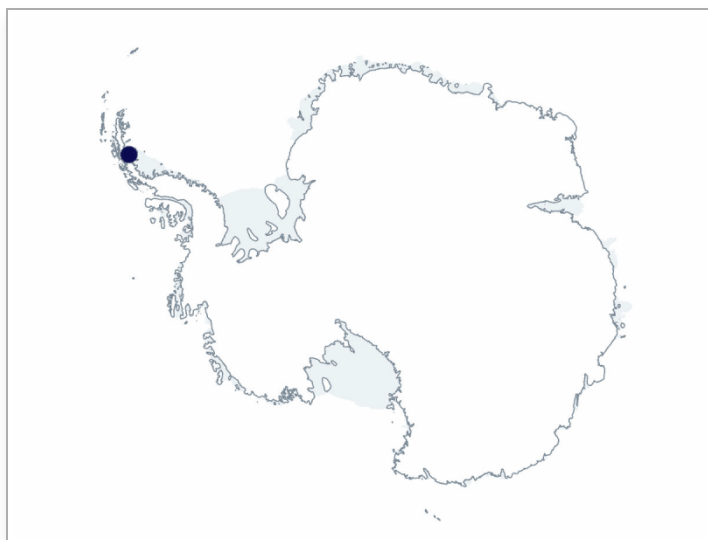
- **Supporting Stations:** Special Project
- **Research Locations:** Flask Glacier

Project Description:

Surface melting is widespread in Antarctica and predicted to increase significantly as the continent warms. This US-UK collaborative project will take steps toward understanding and predicting these changes. The science team will test three



*Glaciated mountains taken from Rothera Research Station.
Photo by Jonathan Kingslake, British Antarctic Survey,
Lamont-Doherty Earth Observatory.*



I-347-E Research Location(s): Flask Glacier

hypotheses: (1) Short-term changes in ice velocity indicated by satellite data result from surface meltwater reaching the bed of outlet glaciers in the Antarctic Peninsula; (2) this phenomenon is widespread in Antarctica today; and (3) this results in a measurable increase in mean annual ice discharge. The team will also conduct a continentwide remote sensing survey using synthetic aperture radar and multispectral imagery to comprehensively map meltwater on grounded ice and short-term velocity variations.

Field Season Overview

The 2026-27 season is the final one of this project and will entail recovery and demobilization of data and instruments from the Flask Glacier field site and a site slightly south of it. These two sites were installed and revisited in 2024-25 and 2025-26. The installed instrumentation includes a global navigation satellite system, passive seismometers, automatic weather stations, and ice-penetrating radar. Uncrewed-aerial-system survey work was conducted at the two sites in previous seasons.

For 2026-27, British Antarctic Survey members will deploy to the field sites to recover the instrumentation. No United States Antarctic Program (USAP) participants will deploy, but cargo and instruments will return to the continental United States via the USAP cargo system in Punta Arenas, Chile.

2026–2027

USAP FIELD SEASON PROJECTS

OCEANS AND ATMOSPHERIC SCIENCES

Dr. David Porter, Dr. William Ambrose, Program Directors

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

UV Measurements at McMurdo Station for the NOAA Global Monitoring Laboratory's Antarctic UV Network

Event Number:

O-257-M/S

NSF / NOAA Agreement

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones / Sheryl Seagraves

Principal Investigator(s):

Dr. Vanda Grubisic

vanda.grubisic@noaa.gov 

National Oceanic and Atmospheric
Administration

Global Monitoring Laboratory (GML)
Boulder, Colorado

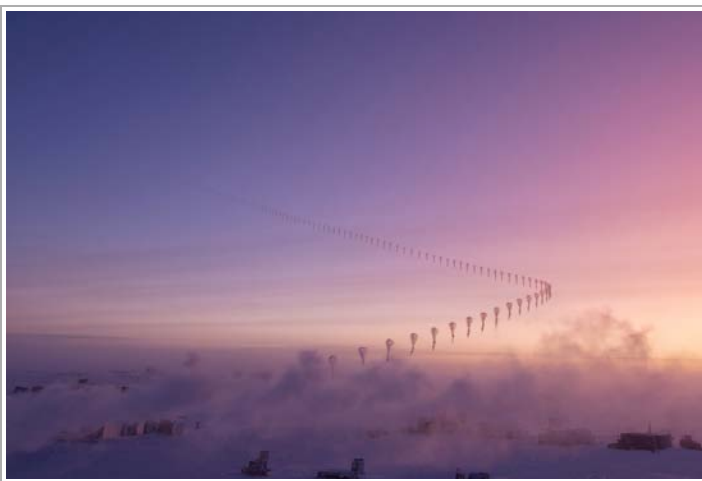
Project Web Site:

<https://gml.noaa.gov> 

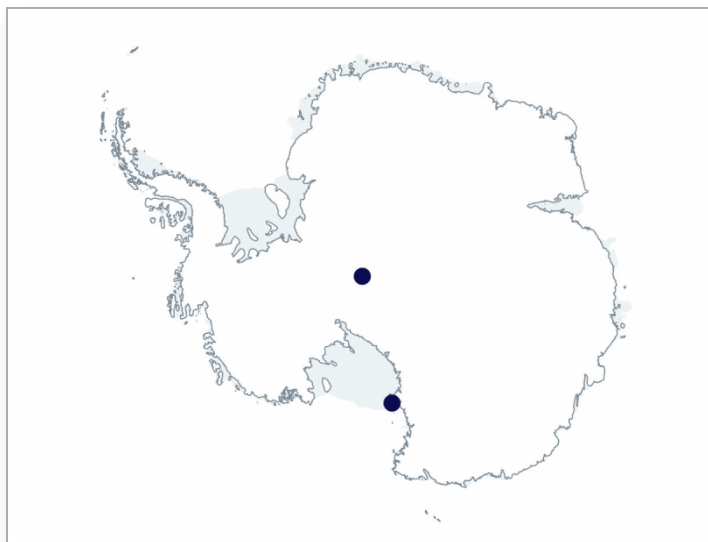
Location(s):

- **Supporting Stations:** McMurdo Station, South Pole Station
- **Research Locations:** McMurdo Station; South Pole Station

Project Description:



A time lapse of a NOAA balloon launch. Photo by Christian Krueger, courtesy of the USAP Photo Library.



O-257-M/S Research Location(s): McMurdo Station; South Pole Station

The National Oceanic and Atmospheric Administration (NOAA) Global Monitoring Laboratory (GML) team will continue long-term measurements of ultraviolet (UV) radiation and trace gas constituents that influence the atmosphere, including the ozone layer. The work done at McMurdo, Palmer, and South Pole stations is in conjunction with the ongoing long-term worldwide measurements of atmospheric composition, aerosols, solar radiation, and the ozone layer. At the South Pole, GML collects year-round, long-term measurements of trace atmospheric constituents. The measurements are used for time series analysis of multiyear data that focus on stratospheric ozone depletion, trans-Antarctic transport and deposition, the interplay of trace gases and aerosols with solar and terrestrial radiation fluxes on the polar plateau, the magnitude of seasonal and temporal variations in atmospheric constituents, and the development of polar stratospheric clouds over Antarctica. Other objectives of this research are to determine the rate at which concentrations of these atmospheric constituents change and to examine the sources, sinks, and budgets.

Field Season Overview

For the 2026-27 season, up to seven deploying participants will primarily focus on South Pole Station, including upgrades and routine maintenance for instruments in the Atmospheric Research Observatory (ARO), regularly launching atmospheric balloons, and shipping air samples to GML for analysis of carbon dioxide and other trace constituents. Two large structural projects at South Pole Station are scheduled: raising the ARO and replacing the existing 30-meter meteorology tower. These efforts have been planned and coordinated over several seasons and will require temporary workspace for National Oceanic and Atmospheric Administration (NOAA) personnel during the austral summer. At South Pole Station, two participants staff the ARO year-round. At McMurdo Station, a research associate provides year-round support for the instruments at Arrival Heights, including daily checks, routine calibrations, and troubleshooting as needed.

Deploying Team Members

- Roger Crocker
- Julianne Fernandez
- Alex Fritz
- Luca Grifo-Hahn
- Anna McAuliffe

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Collection of Atmospheric Air for the NOAA Global Monitoring Laboratory's Worldwide Flask-sampling Network

Event Number:

O-264-P

NSF / NOAA Agreement

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Jamee Johnson

Principal Investigator(s):

Dr. Vanda Grubisic

vanda.grubisic@noaa.gov 

National Oceanic and Atmospheric
Administration

Global Monitoring Laboratory (GML)
Boulder, Colorado

Project Web Site:

<https://gml.noaa.gov> 

Location(s):

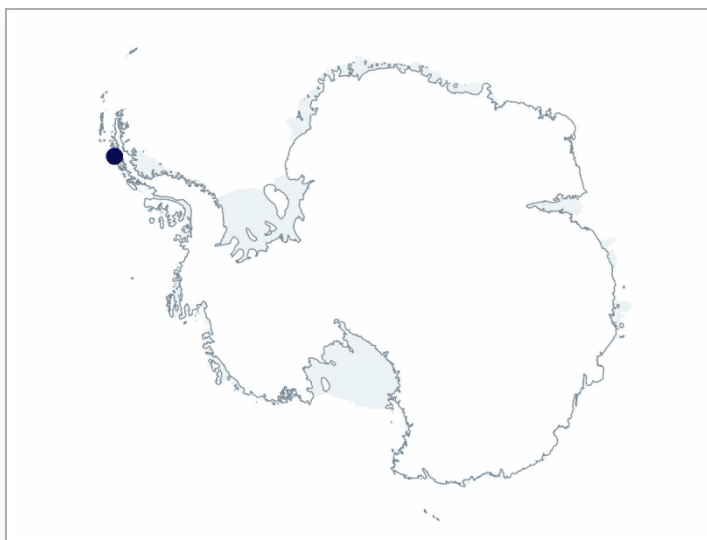
- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Station

Project Description:

The National Oceanic and Atmospheric Administration (NOAA) Global Monitoring Laboratory (GML) team will continue long-term measurements of ultraviolet (UV) radiation that influences weather and the ozone layer, and surface concentrations of ozone in the



Remote Air Sampling Unit for NOAA in use near Arthur Harbor, Palmer Station. Photo by Marissa Goerke.



O-264-P Research Location(s): Palmer Station

atmosphere. The work done at McMurdo, Palmer, and South Pole stations is in conjunction with the ongoing, long-term worldwide measurements of atmospheric composition, aerosols, solar radiation, and the ozone layer. The measurements will be used for time series analysis of multiyear data that focus on stratospheric ozone depletion, trans-Antarctic transport and deposition, the interplay of trace gases and aerosols with the solar and terrestrial radiation fluxes on the polar plateau, the magnitude of seasonal and temporal variations in atmospheric constituents, and the development of polar stratospheric clouds over Antarctica.

Field Season Overview

SUV, GUV, UVR, and PSP instruments to monitor UV radiation are on the roof of Terra Lab at Palmer Station. They run continuously year-round. NOAA's Long-term Observations of Greenhouse Gases and Ozone-depleting Substances (LOGOS) Division and Carbon Cycle Greenhouse Gases (CCGG) research area, as well as the Scripps Institution of Oceanography's Atmospheric Oxygen Research group, capture clean air samples upwind of station activities. Scripps air sampling takes place in Terra Lab, CCGG sampling is performed with a mobile sampling unit at various places around station based on wind conditions, and LOGOS sampling can be performed from Terra Lab or a mobile sampling unit.

The Palmer Station research associate (RA) provides year-round support for the UV monitoring instruments. Typically, site visits are needed every 2 years for one NOAA UV instrument participant. Additionally, the RA performs Scripps, CCGG, and LOGOS air sampling.

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Collaborative Research: Antarctic Automatic Weather Station Program

Event Number:

O-283-M/S

NSF / OPP Award 2301362

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Jenny Cunningham /
Sheryl Seagraves

Principal Investigator(s):

Dr. Matthew Lazzara

mattl@ssec.wisc.edu 

University of Wisconsin Madison
Space Science and Engineering
Center/AMRC
Madison, Wisconsin

Location(s):

- **Supporting Stations:** McMurdo Station, South Pole Station
- **Research Locations:** West Antarctica, South Pole, Near McMurdo Station

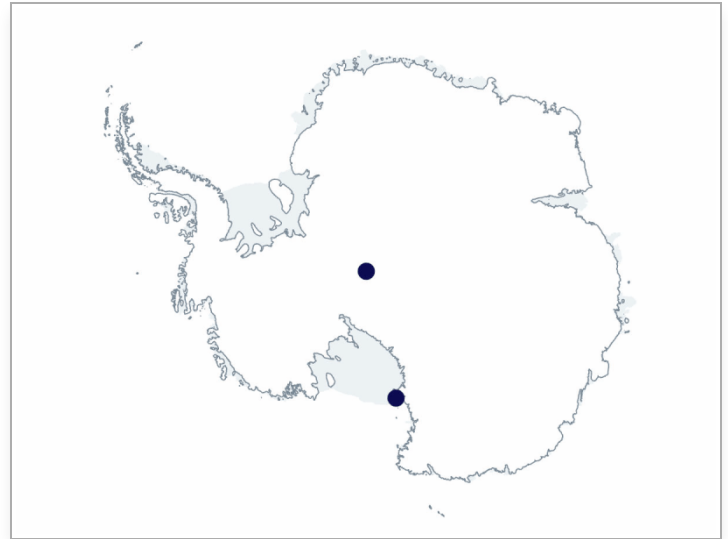
Project Description:

The Antarctic automated weather station (AWS) network has been making meteorological observations since the early 1980s. This continentwide network is positioned to observe significant meteorological events in real time and increase understanding of the climate of the Antarctic surface. Project activities will focus on maintaining and operating the AWS network, student engagement, and outreach activities. Goals include upgrading real-time AWS



White Island Automatic Weather Station (AWS) from November 2025. Photo by Matthew Lazzara.

processing, monitoring evolving communication methods, and facilitating wide distribution of AWS data. Prior National Science Foundation investments in the Madison Automated Weather Station will be leveraged with the development of a more robust station that can be reliably utilized year-round in Antarctica. The observations will be quality-controlled and placed into a database where the public can search and select observations. A test system of different radiation shields (with and without aspiration) will be deployed for 1 year at South Pole Station to resolve conflicting radiation-shield bias corrections of historical data and to inform optimal setup for temperature observations going forward.



O-283-M/S Research Location(s): West Antarctica, South Pole, Near McMurdo Station

Field Season Overview

Two participants will deploy in early November 2026 and focus on servicing AWS stations around McMurdo Station via helicopter, Twin Otter aircraft, and overland vehicles. In early December, they will spend several days at South Pole Station to install a weather observation system near the Atmospheric Research Laboratory and service two more AWS stations by Twin Otter. The team will return to McMurdo in mid-December, one participant will be replaced with a new team member, and the new team will focus on West Antarctica and put in to Siple Dome in late December to service three to four AWS stations by Twin Otter. The team will then move to Byrd surface camp to service another two to three stations by Twin Otter before returning to McMurdo in mid-January 2027. Servicing involves digging out, raising, and (if needed) repairing AWS stations and occasionally replacing power systems. The team will redeploy in late January. A research associate will assist with monitoring and troubleshooting AWS network equipment at McMurdo year-round.

Deploying Team Members

- Jonathan Chambers
- Justin Widen
- Forbes Filip (Team Leader)

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Collaborative Research: Snow Transport in Katabatic Winds and Implications for the Antarctic Surface Mass Balance: Observations, Theory, and Numerical Modeling

Event Number:

O-315-M

NSF / OPP Award 2034874

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones

Principal Investigator(s):

Dr. Scott Thomas Salesky

salesky@ou.edu 

University of Oklahoma

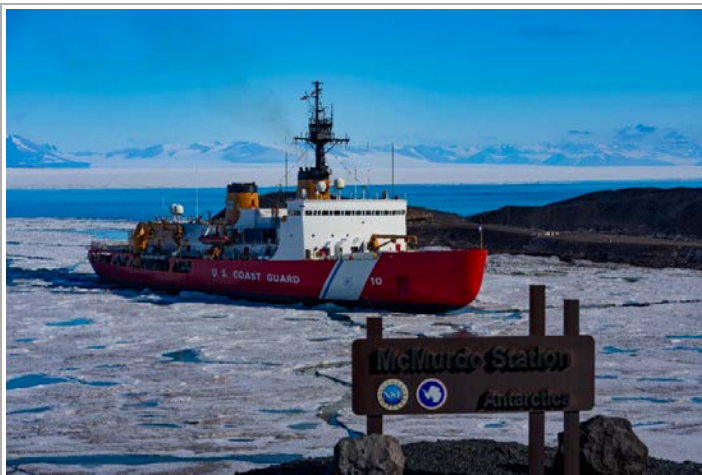
Norman, Oklahoma

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo/Ross Ice Shelf

Project Description:

This project aims to advance understanding of snow transport and redistribution by near-surface katabatic winds, which have critical implications for the surface mass balance of the Antarctic ice sheet. Its evolution through snow deposition, erosion, and transport in katabatic winds (which are



The U.S. Coast Guard heavy icebreaker Polar Star makes its way toward McMurdo Station. Photo by Heath McFarland, courtesy of the USAP Photo Library.



O-315-M Research Location(s): McMurdo/Ross Ice Shelf

persistent across much of the Antarctic) remains poorly understood due to the lack of an overarching theoretical framework, scarcity of in situ observational datasets, and absence of accurate numerical modeling tools. To achieve the main research objectives, the science team will conduct a field campaign to measure (1) the mean flow and turbulent structure of katabatic winds and snow transport using meteorological instruments on a tower; and (2) longer-term accumulation variability using radars. Observations will be used to develop a unique feature: resolving a numerical algorithm capable of representing the fine-scale physics of snow transport, long-term accumulation variability, redistribution, and sublimation in katabatic winds. The new model will produce insights at an unprecedented level of detail of katabatic transport processes, enabling an accurate quantification of snow transport in the Antarctic surface mass balance.

Field Season Overview

During the 2026-27 field season, a team of three will deploy to McMurdo Station to install instruments on a 10-meter micrometeorological tower, potentially installing one autonomous phase-sensitive radar collocated with the tower site, and will provide research assistant training and instructions. The tower instrumentation will operate autonomously for 12 months, monitoring winds, temperature, radiation, turbulence, and blowing snow. The tower/research site is on the Ross Ice Shelf near the snow road. Antarctic Support Contract rigger staff will erect the tower and provide all climbing support needed. In 2027-28, team members will return to decommission and retrograde their equipment.

Deploying Team Members

- Adrian Brügger (Co-PI)
- Marco Giometto (Co-PI)
- Logan Roy

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Collaborative Research: Antarctic Low Cloud Interaction With Natural Aerosol (ALCINA)

Event Number:

O-325-P

NSF / OPP Award 2130203

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Jamee Johnson

Principal Investigator(s):

Dr. Dan Lubin

dlubin@ucsd.edu 

Scripps Institution of Oceanography

Polar Research Program

La Jolla, California

Project Web Site:

<https://alcina.ucsd.edu> 

Location(s):

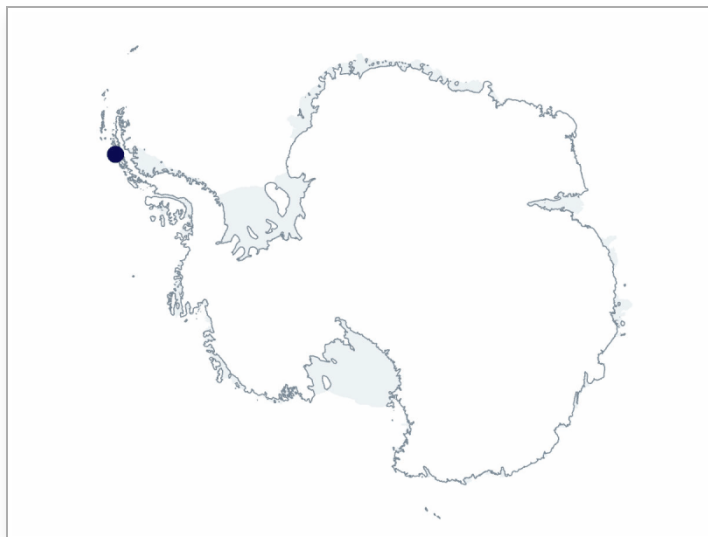
- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Station

Project Description:

This project focuses on advancing Earth system simulations over Antarctica and the Southern Ocean by improving physical representation of low-level clouds. These clouds significantly impact ice-surface melt events and inaccuracies in solar energy transmission, degrading weather models. As errors in cloud simulations have been linked to insufficient information about



Location of Lubin Instrumentation Installation Site. Photo by William Skorski.



O-325-P Research Location(s): Palmer Station

aerosols (ubiquitous microscopic particles that seed cloud droplet and cloud ice crystal formation), the science team will continuously collect data on ocean and continent aerosols, their chemical and microphysical properties, and cloud optical properties at Palmer Station for 18 months. These austral summer and winter observations will yield robust aerosol-cloud interaction statistics for Earth system model evaluation and improvement. Aerosol property measurements include size distributions; number concentrations of cloud condensation nuclei and ice nucleating particles (INPs); chemical compositions of minerals, sulfates, sea salt, and organics; and microbial community structure from DNA sequencing. The measurements will also differentiate algal bloom from continental dust influences on INPs, for which there is scarce data over Antarctica.

Field Season Overview

The team will deploy to Palmer Station in November 2026, when the transportable laboratory housing for the aerosol sampling equipment will already have been set up behind Terra Lab with heating, ventilation, and air conditioning. The team will install one set of five broadband radiometers and an automated weather station on a platform behind the aerosol structure. A spectroradiometer and an all-sky camera system will be installed on a truss tower adjoining the housing. Another suite of radiometers and an eddy covariance turbulent flux system will be set up nearby, as clear of other structures as possible. A multifilter radiometer and a cloud backscatter lidar will be installed at the Terra Lab. All of this equipment will operate continuously for 18 months. Throughout the austral summer, the team will fly uncrewed aerial systems to obtain vertical profiles of atmospheric thermodynamics.

Deploying Team Members

- Lintong Cai
- Samantha Greeney
- Thea Moellerstedt
- Gregory Roberts (Co-PI)
- Lynn Russell (Co-PI)

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Observing the Atmospheric Boundary Over the Antarctic Ice Sheet

Event Number:

O-400-M

NSF / OPP Award 1745097

Program Director:

Dr. William Ambrose

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones

Principal Investigator(s):

Dr. John Cassano

cassano@colorado.edu 

University of Colorado Boulder

CIRES

Louisville, Colorado

Project Web Site:

<https://amrdc.ssec.wisc.edu/projects/byrd-tall-tower> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo/Ross Ice Shelf

Project Description:

This project will investigate the atmospheric boundary layer linking the atmosphere and the underlying Antarctic ice sheet. Exchanges of heat, moisture, momentum, and other atmospheric constituents in the boundary



Elijah tall tower automatic weather station and hut near McMurdo. Photo by John Cassano.



O-400-M Research Location(s): McMurdo/Ross Ice Shelf

layer are critical to ice sheet melt and other climate processes. An observational campaign using a 30-meter (m) tall tower (TT) and a small uncrewed aerial system (UAS) had initially been planned for West Antarctica, but has now relocated near McMurdo Station in response to logistical constraints. The 30 m TT will provide year-round observations of the lower portion of the boundary layer, while its full depth will be profiled via small UAS.

Field Season Overview

Two science team members will deploy to McMurdo Station between mid-August and early October 2026 and conduct an observational campaign focused on the atmospheric boundary layer near McMurdo using an instrumented 30 m tower (automated weather station site "Elijah" installed during the 2024-25 season) and quadcopter UASs. The Antarctic Support Contract will provide the team a fish hut near the 30 m TT and rigger support to maintain the TT during McMurdo's October-November season opening.

Deploying Team Members

- John Cassano (PI)
- Kara Hartig

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Formation, Transformation, and Northward Spread of Dense Saline Water Derived From Terra Nova Bay, Ross Sea, Antarctica

Event Number:

O-401-E

NSF / OPP Award 2332418

Program Director:

Dr. Marion Dierickx

Science Support POC / Implementer(s):

Ryan Steiner / Randolph Jones

Principal Investigator(s):

Dr. Christopher J Zappa

zappa@ldeo.columbia.edu 

Columbia University

Lamont-Doherty Earth Observatory

Palisades, New York

Location(s):

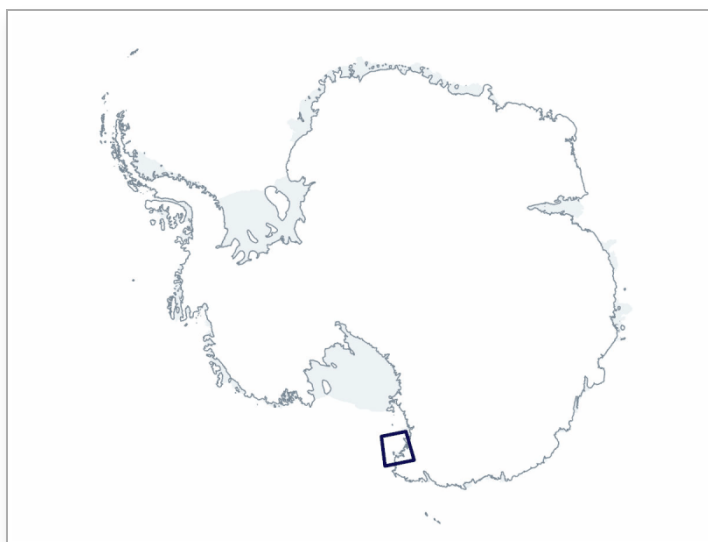
- **Supporting Stations:** Special Project
- **Research Locations:** RV Araon (KOPRI)
 - South Korean Vessel, Western Ross Sea

Project Description:

This project primarily aims to investigate the formation, transformation, and northward spread of dense saline water derived from Terra Nova Bay (TNB), along the Drygalski Trough into the western Ross Sea and off the ice shelf to the Southern Ocean, to form the Antarctic bottom water. The project will deploy a series of moorings: two



Sea ice near Cape Adare, Antarctica. Photo by Mike Usher, courtesy of the USAP Photo Library.



O-401-E Research Location(s): RV Araon (KOPRI) - South Korean Vessel, Western Ross Sea

heavily instrumented full-water-column moorings within TNB to capture high-salinity shelf water (HSSW) production; and a series of bottom-focused moorings to evaluate the transformation and northward spreading of the dense saline water. The broad science goals to be addressed by this program through a coordinated analysis of these mooring measurements include (1) how the water column profile and HSSW characteristics evolve on timescales ranging from hourly/daily through seasonal; and (2) what regulates the transformation and northward spread of the dense saline water derived in TNB. This project involves international cooperation between the US, South Korea, New Zealand (NZ), and Italy.

Field Season Overview

This project sees oceanographic moorings deployed and recovered across 3 years, including two heavy moorings (instrumented from the ocean floor to 50 meters [m] beneath the ocean surface in water depths of roughly 400-500 m and 800-1000 m) deployed in TNB and four deep bottom moorings (instrumented within the bottom 10-100 m of the seafloor). One deep bottom mooring will be deployed in the Drygalski Basin in TNB, one near Cape Washington in the northern extent of TNB, and two along the Drygalski Trough, further north in the Ross Sea toward Cape Adare.

In the 2026-27 season, the science team will recover the two heavy moorings and four deep bottom moorings with support from the Korean Polar Research Institute (KOPRI) aboard the research vessel (RV) *Araon*. The team will also deploy four low-profile moorings to be retrieved by Italian, NZ, and Korean Antarctic programs. The United States Antarctic Program will assist with moving cargo and personnel between the ports of departure and arrival of the RV *Araon* and storing equipment in NZ between seasons.

Deploying Team Members

- Mackenzie Blanus
- Lindsay Hogan
- Carson Witte
- Christopher Zappa (PI)

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Collaborative Research: Southern Ocean Carbon Gas Observatory (SCARGO)

Event Number:

O-404-M

NSF / OPP Award 1839218

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Marissa Goerke / Randolph Jones

Principal Investigator(s):

Dr. Britton Bruce Stephens

stephens@ucar.edu ✉

National Center for Atmospheric Research
(NCAR)

Boulder, Colorado

Project Web Site:

https://www.eol.ucar.edu/field_projects/scargo 🔗

Location(s):

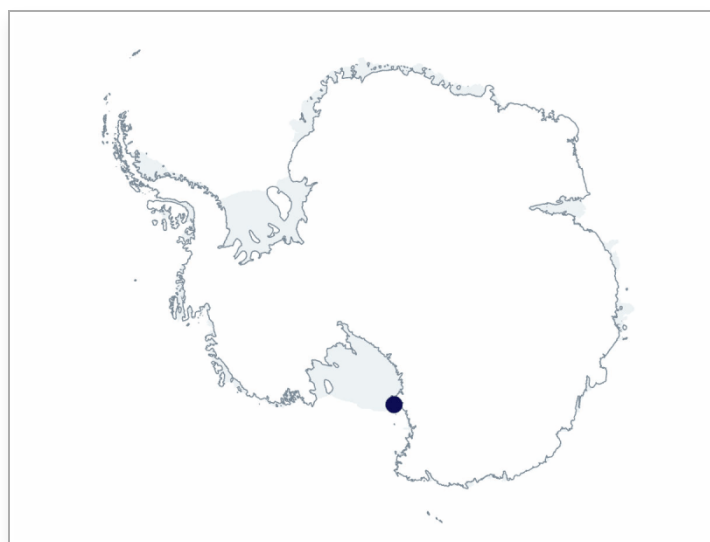
- **Supporting Stations:** McMurdo Station
- **Research Locations:** Christchurch, McMurdo Station, South Pole Station, and LC-130s

Project Description:

The Southern Ocean plays a fundamental role in the global carbon cycle, yet there is great uncertainty regarding air-sea fluxes of carbon dioxide in the



LC-130 aircraft taking off from Williams Field with the SCARGO sampling inlets above the cockpit. Photo by Mack Goodstein (NCAR).



O-404-M Research Location(s): Christchurch, McMurdo Station, South Pole Station, and LC-130s

region. This project will conduct novel airborne measurements called the Southern Ocean Carbon Gas Observatory (SCARGO), which will map distributions of carbon dioxide, methane, carbon monoxide, and water vapor in the polar troposphere and enable estimates of austral summer air-sea fluxes. SCARGO will leverage an observational platform of opportunity: the New York Air National Guard (NYANG) LC-130 aircraft operating each austral summer from McMurdo Station in support of the United States Antarctic Program. Measurements will be made across three field seasons. Analysis and modeling activities will quantify Southern Ocean air-sea carbon dioxide, methane, carbon monoxide, and water vapor exchange based on the observations, including the intraseasonal evolution and interannual variability of the fluxes.

Field Season Overview

During 2026-27, SCARGO will conduct sampling between Christchurch, New Zealand; McMurdo Station; and the South Pole. The SCARGO instrumentation rack and air sampling hatch will be installed on different LC-130 aircraft based on the mission. The rack is a roll-on/roll-off crate that straps down in the forward cabin. Each week, SCARGO will nominally join two National Science Foundation (NSF) South Pole flights plus one NYANG MXWash (Rotator) mission or a third South Pole flight per week.

Two participants at a time from the five-member science team will be based at McMurdo Station from mid-November 2026 through early February 2027, with additional support staff from Earth Sciences New Zealand in Christchurch. Instrument assembly and testing, flight crew training, and all support activities will take place at McMurdo, where SCARGO will operate out of a Rac-Tent at Williams Field shared with the I-185-M Center for Oldest Ice Exploration project.

Deploying Team Members

- Mack Goodstein
- Justin Jacquot
- Charles Martin
- Jeffrey Peischl
- Britton Stephens (PI)

Project Detail

OCEANS AND ATMOSPHERIC SCIENCES

Collaborative Research: RAPID: Drivers and Implications of Recent Rapid Sea Ice Decline in the Ross Sea

Event Number:

O-406-M

NSF / OPP Award 2610153

Program Director:

Dr. David Porter

Science Support POC / Implementer(s):

Matthew Erickson / Randolph Jones

Principal Investigator(s):

Dr. Edward Maksym

tmaksym@whoi.edu 

Woods Hole Oceanographic Institution

AOP&E

Woods Hole, Massachusetts

Location(s):

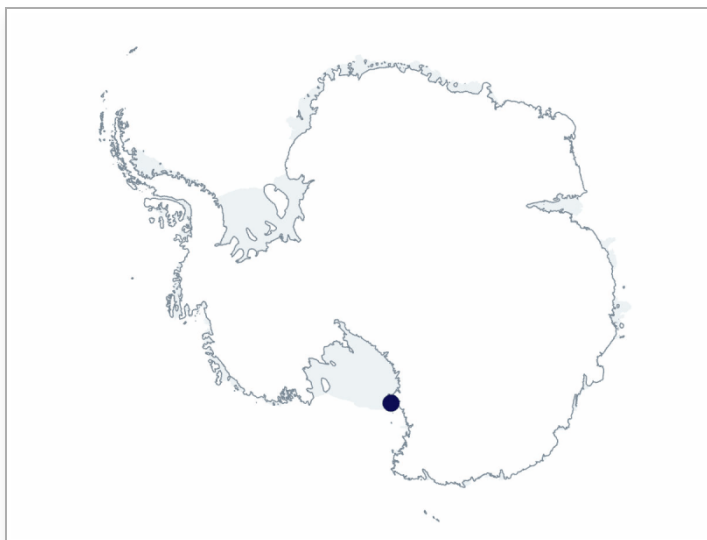
- **Supporting Stations:** McMurdo Station
- **Research Locations:**

Project Description:

Antarctic sea ice extent has exhibited extreme recent variability, with a modest long-term increase in extent until an abrupt decline in 2016, leading to record lows in 2023. These changes in sea ice extent are likely closely related to changes in ice thickness. The causes of this recent variability and its implications have been identified as a key theme for the international



Mt. Erebus in the background, with the buildings of Scott Base in the foreground. Photo by Phil Wannamaker, courtesy of the USAP Photo Library.



O-406-M Research Location(s):

research effort “Antarctica InSync.” This project will (1) evaluate advanced and emerging technology that could contribute to an observational network capable of capturing key processes across the Ross Sea; (2) improve and evaluate both satellite and model products with in situ observations; and (3) develop a combined modelling, satellite, and in situ observational strategy to understand these processes. This project is centered on capability development through an evaluation of techniques in the McMurdo Station region, leveraging existing programs and logistics to address the complex coupled role of various atmosphere-ice-ocean processes in driving sea ice variability. This work represents the US component of one project in the strategic collaboration between the National Science Foundation and Antarctica New Zealand (AntNZ).

Field Season Overview

In 2026-27, three US-based participants will deploy through the United States Antarctic Program, which will provide cargo support, samples movement, and extreme cold weather gear. All field work will be supported by AntNZ logistics at Scott Base (SB). SB staff will install and maintain a US automated weather station (shipped during Winter Flight) and recover and store it at McMurdo Station. Ice buoys will be tested and deployed alongside a New Zealand ice buoy on fast ice near SB (deployed over ice via Hägglunds vehicle or by helicopter). The buoys may be recovered, or one or more may be left for the ice season to drift out of the Ross Sea. LASSITOS-EM, an airborne electromagnetic sounder, will be tested by kite/aerostat. Daily trips will be made on the McMurdo Sound sea ice approximately from deployment day 9 to day 16, to test and service buoys and LASSITOS-EM. Ice-coring at test sites will take place the day before asset recovery. Field work is anticipated for up to 21 days, starting in mid to late October 2026.

Deploying Team Members

- Achille Capelli
- Edward Maksym (PI)
- Madeline Sowinski

2026–2027

USAP FIELD SEASON PROJECTS

TECHNICAL EVENT – SCIENCE

Dr. Kelly Brunt, Dr. Marion Dierickx, Jessie Crain, Program Directors

Project Detail

TECHNICAL EVENT - SCIENCE

National Science Foundation Ice Drilling Program (IDP)

Event Number:

T-150-M

NSF Agreement

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Matthew Erickson / Jenny Cunningham

Principal Investigator(s):

Dr. Mary R Albert

mary.r.albert@dartmouth.edu 

Dartmouth College

Thayer School of Engineering

Hanover, New Hampshire

Project Web Site:

<https://icedrill.org/> 

Location(s):

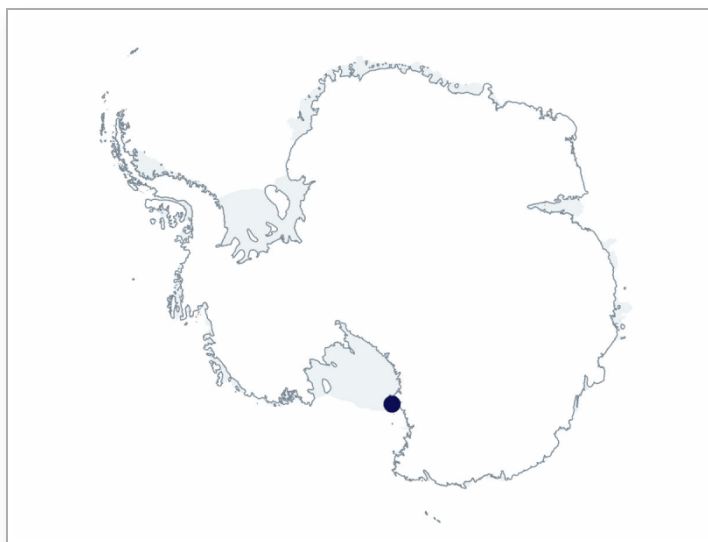
- **Supporting Stations:** McMurdo Station
- **Research Locations:**

Project Description:

The National Science Foundation (NSF) Ice Drilling Program (IDP) (1) provides community leadership in ice-drilling research and development; (2) identifies new technology needs and plans technology development and funding; (3) acquires new drilling technology to support science objectives for new discoveries; (4) provides the drills,



Drilling using the IDP ice-enabled Winkie drill for subglacial coring near Mt. Waesche during the 24/25 season. Photo by Nels Iverson.



T-150-M Research Location(s):

equipment, and drilling expertise needed by science groups; (5) enhances communication and information exchange related to ice-coring and -drilling science and technology; and (6) establishes activities in collaboration with the polar science and engineering community to contribute to NSF's strategic goals for desired societal outcomes.

Field Season Overview

IDP participants will not deploy during the 2026-27 season. The United States Antarctic Program (USAP) will support movement of IDP cargo items (i.e., hand augers) as requested by other science groups. USAP will also support northbound vessel shipment of the Foro 1650 drill system.

Project Detail

TECHNICAL EVENT - SCIENCE

EarthScope GAGE High-precision GPS and Ground-based Lidar Support

Event Number:

T-295-M

NSF Award 2614915

Program Director:

Dr. Kelly Brunt

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Rebecca Bendick

rebecca.bendick@earthscope.org 

EarthScope Consortium

Washington, District of Columbia

Project Web Site:

<https://www.earthscope.org/> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Mt. Erebus, Ross Island, McMurdo Dry Valleys, Ross Ice Shelf

Project Description:

The EarthScope Consortium is a geophysical science support organization formed on 1 January 2023, through the merger of two long-standing institutions: the Incorporated Research Institutions for Seismology (IRIS) and University NAVSTAR Consortium (UNAVCO). Both organizations, founded in



*Pecora Escarpment during POLENET site decommissioning.
Photo by Nicolas Bayou.*



*T-295-M Research Location(s): Mt. Erebus, Ross Island,
McMurdo Dry Valleys, Ross Ice Shelf*

1984, had been central pillars of the US geoscience community (IRIS in seismology and UNAVCO in geodesy), providing researchers with access to high-quality instrumentation, data, and educational resources. Until 2025, the EarthScope Consortium operated two National Science Foundation (NSF) facilities: the Geodetic Facility for the Advancement of Geoscience (GAGE) and the Seismological Facility for the Advancement of Geoscience (SAGE). These facilities supported global research by maintaining extensive networks of geophysical sensors.

In 2025, NSF made an award to the EarthScope Consortium to operate the National Geophysical Facility (NGF), a unified national resource that will support US geoscience research for the coming years. Through the NGF, EarthScope will provide essential infrastructure to the US geophysical community, including global and regional seismic networks, global positioning system (GPS) / global navigation satellite system (GNSS) geodetic arrays, portable instrumentation pools, and real-time data services. In 2026, NSF's Office of Polar Programs awarded the EarthScope Consortium a new 5-year cooperative support agreement to support seismic and geodetic research in the polar regions.

Field Season Overview

In 2026-27, the EarthScope support team will deploy a team of four core geodetic and seismic field engineers, who will work out of McMurdo Station for much of the field season. Up to four additional engineers will deploy to support peak activity and efforts further afield. T-295 project staff will continue to support the I-169-M Banwell project in the "rumple zone" near the Scott Base Transition. Work will peak in late October 2026 and late January 2027. Staff will service existing instruments and augment the previous year's instrument suite with additional sensors. Antarctic Support Contract field safety coordinators will assist with work in this area. Decommission of the G-079 project's Polar Earth Observing Network (POLENET) will continue under the R-795-M (POST) project. An EarthScope engineer will accompany the decommissioning team in West Antarctica in late November 2026.

Two EarthScope staff will service the X-498-M project's NASA-ISRO Synthetic Aperture Radar (NISAR) sites across the Ross Ice Shelf and along the Transantarctic Mountains. EarthScope staff will also use helicopter support from mid-November to mid-December 2026 to service Erebus Backbone Network and Erebus Perimeter Experiment sites via day trips. Additionally, the team will endeavor to service some of their network of continuously operating

GPS and seismic stations located in the vicinity of McMurdo, including at the airfields, Ross Ice Shelf, McMurdo Dry Valleys, Mount Erebus, and Alexander Tall Tower. Finally, the team will continue to conduct equipment preparation and testing of instrumentation at their test site near Castle Rock and on Observation Hill and will maintain their seismic equipment (nodes) at Albert P. Crary Science and Engineering Center.

Deploying Team Members

- Nicolas Bayou (Co-PI)
- Danue Bustos
- Samuel Jannke
- Ciera King
- Lia Lajoie
- Joseph Pettit (Co-PI)
- John Roberson
- Erika Schreiber

Project Detail

TECHNICAL EVENT - SCIENCE

Operation and Maintenance of a CTBT Class Infrasound Array at Windless Bight and Palmer Station

Event Number:

T-396-M/P

NSF / DTRA Agreement

Program Director:

Ms. Jessie Crain

Science Support POC / Implementer(s):

Allison Barden / Jenny Cunningham /

Jamee Johnson

Principal Investigator(s):

Mr. Lukas J Blom

ljblom@alaska.edu 

University of Alaska Fairbanks

Geophysics Institute

Fairbanks, Alaska

Project Web Site:

<https://watc.alaska.edu/> 

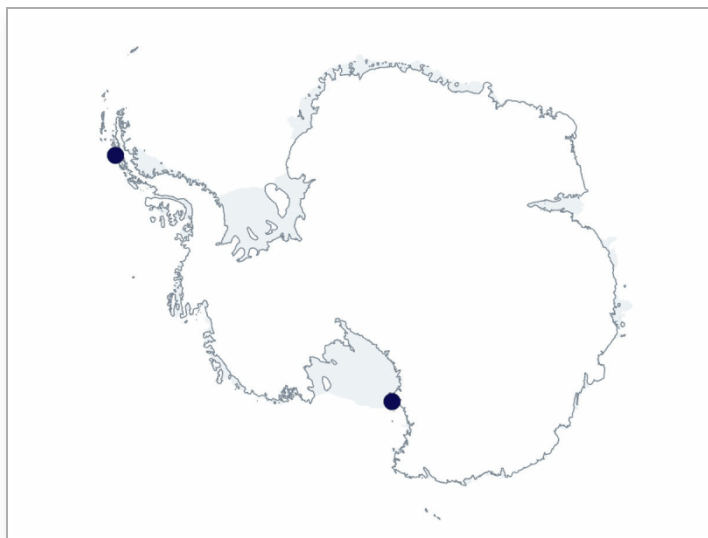
Location(s):

- **Supporting Stations:** McMurdo Station, Palmer Station
- **Research Locations:** Windless Bight, Palmer Backyard, Terra Lab, Bonaparte Point

Project Description:



Mount Erebus. Photo by Peter Rejcek. Image courtesy of NSF/USAP Photo Library.



T-396-M/P Research Location(s): Windless Bight, Palmer Backyard, Terra Lab, Bonaparte Point

This project operates, maintains, upgrades, calibrates, and services the joint US Comprehensive Nuclear-Test Ban Treaty (CTBT) infrasound array at Windless Bight and Palmer Station. Windless Bight's location on the Ross Ice Shelf is unique for its low wind levels, which makes infrasound detection possible. Maintenance will also be performed on an infrasound array at Palmer Station comprising four infrasound sensor sites (elements) distributed over approximately 2 square kilometers. The communication hub, known as the central recording facility, will be in Terra Lab at Palmer.

Infrasound can detect volcanic eruptions, winds over distant mountain ranges, large storms at sea, auroral and meteor events, earthquakes, and avalanches, as well as human-caused events such as large explosions, at great distances from the sound-producing events. Detection of events occurring worldwide are routinely made at the Windless Bight site.

Field Season Overview

Four participants will deploy from late October 2026 to mid-December 2027 to service the infrasound array and hybrid power system at Windless Bight. The science team will camp at the field site for 5 weeks, with occasional trips back to McMurdo Station for resupply. The field camp, consisting of two Polarhavens and an outhouse, will be set up by the Antarctic Support Contract (ASC) and accessed by ground vehicles. Service will include excavation and raising of system components, performance of power system service, and restoration of the power system snow berm. Connectivity equipment and servers for the system are located at McMurdo Station Building 159, and a mini-ISO container at the station is used for year-round cold storage of supplies and spare parts. ASC will provide year-round research associate support and deliver JP-8 fuel to the field site.

Two participants will service the Palmer infrasound array this season. Tasks will focus on troubleshooting and optimizing systems and finishing any tasks that were not completed during install. The United States Antarctic Program provides year-round support via the research associate, who may occasionally visit the site when conditions allow for maintenance and troubleshooting. Equipment and servers for the array are located in Terra Lab.

Deploying Team Members

- Riley Bickford
- Anthony D'Aoust
- Joanne Heslop
- Matthew VonLintig

- Samuel Delamere

- Andrew Winkelman (Team Leader)

Project Detail

TECHNICAL EVENT - SCIENCE

The Polar Geospatial Information Center: Joint Support

Event Number:

T-434-M

NSF / OPP Award 2434541

Program Director:

Dr. Colleen Strawhacker

Science Support POC / Implementer(s):

Ryan Steiner / Randolph Jones

Principal Investigator(s):

Dr. Jay Dickson

jdickson@umn.edu 

University of Minnesota

Polar Geospatial Center (PGC)

Saint Paul, Minnesota

Project Web Site:

<https://www.pgc.umn.edu/> 

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Crary Lab



*Aerial view of McMurdo Dry Valleys. Photo by Peter Rejcek.
Image courtesy of NSF/USAP Photo Library.*



T-434-M Research Location(s): Crary Lab

Project Description:

The Polar Geospatial Center (PGC; fka Antarctic Geospatial Information Center [AGIC]) covers both polar regions. PGC provides geospatial support in the form of mapping, data delivery, and geographic information systems (GIS) analysis to science and logistics communities of the National Science Foundation's Arctic and Antarctic research programs. PGC provides satellite

imagery of aircraft landing sites, satellite radar, elevation models, real-time surface imagery, and historical time-lapse sequences of changing ice conditions.

Field Season Overview

Two PGC participants will deploy on a staggered timeline from mid-October through mid-December 2026. PGC will provide cartographic support, remote sensing products, and geospatial analysis assistance to science event grantees and other United States Antarctic Program contractor and logistics entities. These data products rely on satellite and aerial imagery from a variety of national and international sources and include both commercial and governmental satellite constellations. The scope of PGC's work varies each season based on the requirements of science groups and Antarctic Support Contract operations.

Deploying Team Members

- Devin Power
- Nicole Schiller

Project Detail

TECHNICAL EVENT - SCIENCE

Operation and Maintenance of a CTBT Radionuclide Monitoring Station at Palmer Station

Event Number:

T-998-P

NSF / DTRA Agreement

Program Director:

Ms. Jessie Crain

Science Support POC / Implementer(s):

Allison Barden / Jamee Johnson

Principal Investigator(s):

Mr. Matthew Stephen Wright

Matt.wright@gd-ms.com 

Chantilly, Virginia

Project Web Site:

<https://www.ctbto.org/> 

Location(s):

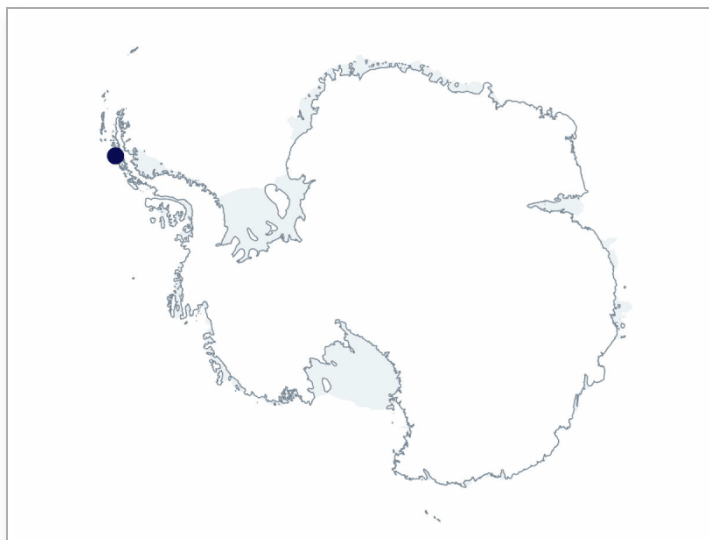
- **Supporting Stations:** Palmer Station
- **Research Locations:** Palmer Station, Terra Lab

Project Description:

This project services and calibrates the automated radionuclide aerosol sampler analyzer (RASA) air particulate monitoring system in the International Monitoring Station (IMS) building (i.e., Terra Lab) at Palmer Station (RASA station code RN73). The IMS continuously collects and automatically analyzes daily air samples for radiation. The collected filter media samples from the



Terra Lab at Palmer Station. Photo by Mike Lucibella. Image courtesy of NSF/USAP Photo Library.



T-998-P Research Location(s): Palmer Station, Terra Lab

RASA are sent to Vienna, Austria, quarterly for archiving. Filter samples are shipped upon request to various laboratories in the world.

Field Season Overview

The project operates, maintains, upgrades, and sustains the RN73 RASA monitoring instrument. The RASA continuously collects and automatically analyzes daily air samples for radiation. The collected filter media samples from the RASA are sent to Vienna for archiving on a quarterly basis.

Additionally, periodic requests are made for single samples to be shipped to various laboratories in the world. General Dynamics Mission Systems (GDMS) ships consumables for standard operation on an annual basis to RN73. The United States Antarctic Program provides year-round, on-site support via the Antarctic Support Contract research associate to help operate and maintain the RASA. Additionally, a GDMS engineer deploys each season for maintenance of the RASA, network switches, the uninterruptable power supply, computers, and other station-related hardware.

Deploying Team Members

- Jason Hutchinson

2026–2027

USAP FIELD SEASON PROJECTS

ARTISTS AND WRITERS

Dr. Lauren Culler, Program Director

Project Detail

ARTISTS AND WRITERS

Polar STEAM Artists, Writers, and Educators

Event Number:

W-491-M

NSF / OPP Award 2221990

Program Director:

Dr. Lauren Culler

Science Support POC / Implementer(s):

Allison Barden / Randolph Jones / Jenny Cunningham

Principal Investigator(s):

Kari Elizabeth Bisbee O'Connell

kari.oconnell@oregonstate.edu 

Oregon State University
Corvallis, Oregon

Project Web Site:

<https://polarsteam.info/> 

Location(s):

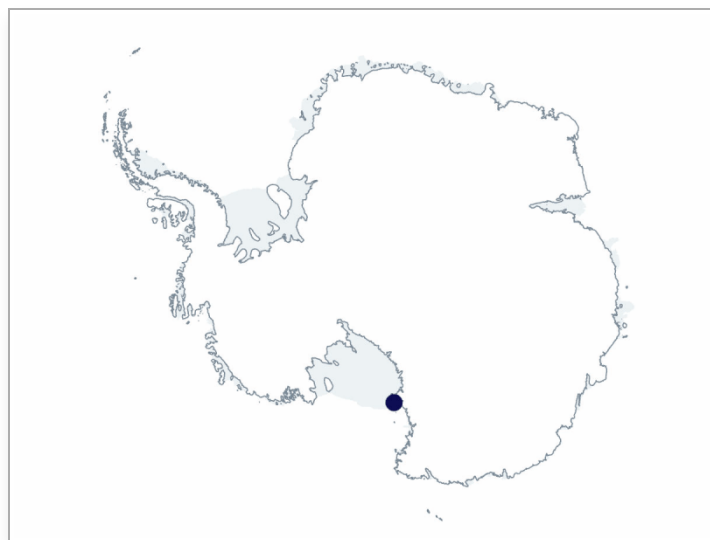
- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Station

Project Description:

Polar STEAM (science, technology, engineering, arts, and math) is a National Science Foundation-funded project that integrates and enhances two long-standing NSF programs — the Polar Educators program and the Antarctic Artists and Writers program — and facilitates virtual and deployment



Polar STEAM Antarctica Artists and Writers Fellow, Rebecca Adorno Davila, capturing sounds with a hydrophone off a small boat operated by the R/V Sikuliaq in waters near the Antarctic Peninsula. Photo by Alison Murray.



W-491-M Research Location(s): McMurdo Station

collaborations with scientists conducting research in the polar regions. Joining the programs creates new opportunities to connect the perspectives and work of creatives, educators, and researchers in some of the most interesting and critical ecosystems on the planet.

Field Season Overview

Four artists will immerse themselves in the Antarctic environment and scientific process, enabling them to return and translate the experience into captivating artistic creations to broaden the reach of the science to new audiences. All artists will deploy to McMurdo Station, each assisting with scientific sampling plans detailed in the associated approved research project.

Artist Margeaux Walter will capture the Antarctic environment through an interactive 2-D and 3-D narrative that depicts both the landscape and its story. Embedded with the B-249 (Thurber) project team, she will use photography that explores camouflage, perception, and the challenge of seeing within changing polar landscapes.

Artist Brad Johnson will create a large-scale immersive mixed-media experience that combines scientific insight and storytelling to reveal hidden Antarctic environments across scales, from macro to micro and through time. Embedded with the McMurdo Long-Term Ecological Research (MCM-LTER) project team, he will collect photographs, video, sound recordings, and other visual references while traveling through the McMurdo Dry Valleys.

Artist Erica Xin will create an interactive installation that translates Antarctic natural phenomena into tactile and responsive artistic forms. Embedded with the B-009 (Rotella) project team, she will use analog photography, long-exposure videography, interviews, audio recordings, and environmental observations to document the Antarctic environment and scientific fieldwork.

Artist Kamala Sankaram will create an immersive sound experience that explores Antarctic environmental change through music, field recordings, and scientific data sonification. Embedded with the I-169 (Banwell) project team, she will record environmental sounds and vocal performances in Antarctica using multimicrophone recording arrays and other audio equipment.

Deploying Team Members

- Bradley Johnson
- Kamala Sankaram
- Margeaux Walter
- Erica Xin

2026–2027

USAP FIELD SEASON PROJECTS

INSTRUMENTATION AND TECHNOLOGY DEVELOPMENT

Dr. Deepankar Medhi, Program Director

Project Detail

INSTRUMENTATION AND TECHNOLOGY DEVELOPMENT

Collaborative Research: Research Infrastructure: CCRI: New: Distributed Space and Terrestrial Networking Infrastructure for Multiconstellation Coexistence

Event Number:

X-279-M

NSF / OPP Award 2235139

Program Director:

Dr. Deepankar Medhi

Science Support POC / Implementer(s):

Marissa Goerke / Carrie Piesen

Principal Investigator(s):

Dr. Samantha Parry Kenyon

spkenyon@vt.edu ✉

Virginia Tech

Blacksburg, Virginia

Project Web Site:

<https://leoscope.surrey.ac.uk/>

Location(s):

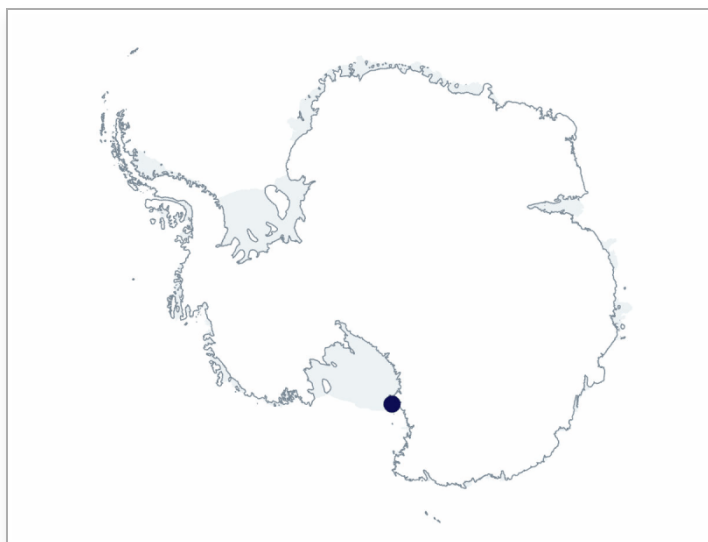
- **Supporting Stations:** McMurdo Station
- **Research Locations:** McMurdo Station

Project Description:

Internet infrastructure is currently undergoing a transformation driven by projects to provide global wireless internet to every individual and internet-connected device on Earth, leveraging megaconstellations of small satellites



McMurdo Station is the largest research facility on the Antarctic continent. Photo by Nicki Klein, courtesy of the USAP Photo Library.



X-279-M Research Location(s): McMurdo Station

deployed in low Earth orbit (LEO). Companies such as Starlink, OneWeb, and Amazon Kuiper are at the forefront of this work, seeking to deliver low-latency, high-bandwidth broadband services worldwide. These developments have created a need to conduct real-world experiments on deployed LEO networks to confirm performance parameters and potential bottlenecks, develop innovative LEO-specific solutions, and enhance the sophistication, data-driven nature of simulators and emulators used in the research community.

Virginia Tech and the University of Surrey are collaborating with global research institutions and industries to build LEOScope, a global LEO satellite network testbed to serve as the go-to platform for conducting customized network and application experiments over LEO networks. The primary objective is to collect LEOScope data from a stand-alone Starlink terminal based at McMurdo Station in Antarctica. This network requires Starlink to employ intersatellite links to route data from Antarctica to the internet access point in Sydney, Australia, which is only a subset of the constellation supports. This study will yield invaluable insights into how Starlink and satellite links in general perform under harsh polar weather conditions.

Field Season Overview

The support for this program for the upcoming season will be minimal. Currently the Intel Next Unit of Computing (NUCs) that were sent to the McMurdo Station a few years ago are still connected to the Starlink Terminal and are operational. The team may need occasional smart-hands help if the NUCs are no longer remote accessible, but the terminals have operated over the past 2 years with minimal needs of on-site help.

Project Detail

INSTRUMENTATION AND TECHNOLOGY DEVELOPMENT

NASA ISRO Synthetic Aperture Radar (NISAR)

Event Number:

X-498-M

NSF / NASA Agreement

Program Director:

(Other)

Science Support POC / Implementer(s):

Ryan Steiner / Jenny Cunningham

Principal Investigator(s):

Dr. Ian Joughin

irj@uw.edu 

University of Washington

Department of Earth and Space Sciences

Seattle, Washington

Location(s):

- **Supporting Stations:** McMurdo Station
- **Research Locations:** Ross Ice Shelf, Transantarctic Mountains

Project Description:

The NASA-ISRO Synthetic Aperture Radar (NISAR) launched in July 2025. The radar is acquiring L-band data that will be used to measure ice velocity for much of the

Antarctic ice sheet, with routine coverage extending to near the South Pole and campaign coverage to the pole. This season's calibration/validation mission will validate these data using a network of six global navigation satellite system receivers primarily on the Ross Ice Shelf. These instruments



A Twin Otter in the snow and misty air. Photo by Zane Ziebell, courtesy of the USAP Photo Library.



X-498-M Research Location(s): Ross Ice Shelf, Transantarctic Mountains

were deployed using United States Antarctic Program logistics support provided through the National Science Foundation and by EarthScope Geodetic Facility for the Advancement of Geoscience (GAGE) support personnel stationed at McMurdo Station.

Field Season Overview

In 2026-27, two EarthScope participants will support the X-498-M project to visit, raise, and perform maintenance on five NISAR sites via Twin Otter aircraft as scheduling allows.

Deploying Team Members

- Danue Bustos
- Joe Pettit