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- **USAP Program Indexes**
  - Astrophysics and Geospace Sciences
    Dr. Vladimir O. Papitashvili, Program Director
  - Organisms and Ecosystems
    Dr. Rebecca Gast, Dr. William Ambrose, Program Directors
  - Integrated System Science
    Dr. Rebecca Gast, Dr. William Ambrose, Program Directors
  - Antarctic Instrumentation and Research Facilities
    Dr. Michael E. Jackson, Program Director
  - Earth Sciences, Geodesy and Geophysics
    Dr. Michael E. Jackson, Program Director
  - Glaciology, Ice Core Science and Geomorphology
    Dr. Kelly Brunt, Program Director
  - Ocean and Atmospheric Sciences
    Dr. David Porter, Dr. Rebecca Gast, Dr. Michael E. Jackson, Program Directors
- **Other Points of Contact**
  - Antarctic Research Support Manager
    *Jessie L. Crain*
  - Antarctic Research Support Manager
    *Vacant*
  - Program Director, Polar Education
    *Elizabeth L. Rom*
  - Program Director, Polar Cyberinfrastructure
    *Vacant*
- **USAP Station and Vessel Indexes**
  - NSF Amundsen-Scott South Pole Station
  - NSF McMurdo Station
  - NSF Palmer Station
  - NSF RVIB *Nathaniel B. Palmer*
  - Special Projects
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## USAP Program Index
### Technical Event

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| Albert, Mary | T-150-M | Ice Drilling Program (IDP) |
| Blom, Lukas | T-396-M | Operation and maintenance of a CTBT class infrasound array at Windless Bight |
| Dickson, Jay | T-434-M | The Polar Geospatial Information Center: joint support |
| Harris, Mark | T-927-M | NASA / McMurdo Ground Station (MG1) |
| Hummon, Julia | T-933-N | University of Hawaii Data Acquisition System (UHDAS) support |
| Mattioli, Glen | T-312-M | EarthScope SAGE: Erebus Backbone Network Project |
| Melendy, Renee | T-940-M | Cold Regions Research and Engineering Laboratory (CRREL) activities: McMurdo Shear Zone |
| Melendy, Renee | T-941-M | Cold Regions Research and Engineering Laboratory (CRREL) support: Leverett Glacier |
| Melendy, Renee | T-942-S | Cold Regions Research and Engineering Laboratory (CRREL) support: South Pole Station |
| Melendy, Renee | T-946-M/S | Cold Regions Research and Engineering Laboratory (CRREL) Engineering Support for Antarctic Facilities |
| Williams, David | T-998-P | Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station |


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| Kenyon, Samantha | X-279-M | Collaborative Research: Research Infrastructure: CCRI: New: Distributed Space and Terrestrial Networking Infrastructure for Multi-Constellation Coexistence |

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# 2024-2025 USAP Field Season

Station and Vessel Schedules

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

## Opening Dates

| | Austral Summer Openings | | Austral Winter Openings |
|---|---|---|---|
| | Operational | Science | |
| McMurdo (Early Season*) | 14 Aug 2024 | Continuing through Winter/WinFly | 25 Feb 2025 |
| McMurdo (Mainbody) | 1 Oct 2024 | 9 Oct 2024 | |
| South Pole | 1 Nov 2024 | 4 Nov 2024 | 15 Feb 2025 |
| Palmer | 1 Oct 2024 | 23 Oct 2024 | 20 Mar 2025 |
| Research Vessel | Vessel Operates Year-Round | | |

**A limited number of science projects deploy early*

## Estimated Population

| | Summer | Winter |
|---|---|---|
| McMurdo | 975 (weekly average) | 280 (winter total) |
| South Pole | 105 (weekly average) | 45 (winter total) |
| Palmer | 30 (weekly average) | |
| RV/IB* NBP | Capacity per cruise: 45 science and staff | |

**RV/IB, Research Vessel/Icebreaker*

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# 2024-2025 USAP Field Season

Air Operations

## 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 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.

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. Antarctica New Zealand (ANZ) will be contracting an Astar B3 from Southern Lakes Helicopters this season. U.S. Antarctic Program aircraft are slated to provide several NSF-approved quid pro quo missions in support of ANZ's 2024-25 field science program as supportable throughout the season.

## Fixed Wing Aircraft

### 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, and Siple Dome.

### Kenn Borek Air

Kenn Borek Air (KBA) will provide four DHC-6 Twin Otter and one DC-3T Basler aircraft to support a number of USAP operations on continent. Both aircraft types will be based out of McMurdo Station, South Pole Station, WAIS Divide, Siple Dome and Union Glacier at different times throughout the season.

### Uncrewed Aircraft Systems (UAS)

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

# 2024-2025 USAP Field Season

Staffed Field Camps

During the 2024-25 summer season, ASC will operate six staffed field sites providing science support.

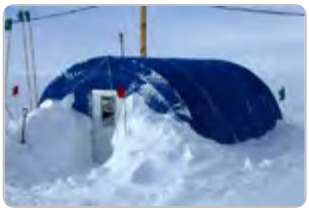
## Taylor Valley Camps

### ~50 Nautical Miles From McMurdo Station

#### 77° 36.350' S 163° 07.533' E (Lake Fryxell)

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 Fryxell will facilitate operations at Lake Fryxell, Lake Bonney and F6 camps. Supported groups in the Taylor Valley this season include C-505-M Gooseff (MCM-LTER), and B-047-M Sumner.

## WAIS Divide Camp (WSD)



### 891 Nautical Miles From McMurdo Station

#### 79° 29.000' S 112° 5.000' W

The WAIS Divide camp, with 14 resident staff will act as a regional aviation hub for West Antarctica. The camp will support O-283 AWS and the transit of G-065 Mitrovica from McMurdo Station to a forward field site. The West Antarctic Support Traverse will traverse between WAIS Divide and Byrd Surface Camp. WAIS Divide is supported by fixed wing aircraft and LC-130 operations.

## Lower Erebus Hut

### 21 Nautical Miles From McMurdo Station

#### 77° 30.683' S 167° 08.566' E

Lower Erebus Hut will open to provide support to T-312 Erebus Backbone Network. The camp consists of one Camp Supervisor with additional support provided by the Berg Field Center and Field Safety Coordinators. Lower Erebus Hut 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

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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. Siple Dome is supported by fixed wing aircraft.

## Allan Hills

### 132 Nautical Miles From McMurdo Station

#### 76° 44.35' S 159° 22.23' E

Allan Hills will open to support I-187 COLDEX, with two residential staff to provide aviation coordination and camp operations. Allan Hills is supported by fixed wing aircraft.

## 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.

# 2024-2025 USAP Field Season

Event Numbering System

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

| Prefix | USAP Program |
|---|---|
| A | Astrophysics and Geospace Sciences<br>Dr. Vladimir O. Papitashvili, Program Director |
| B | Organisms and Ecosystems<br>Dr. Rebecca Gast, Dr. William Ambrose, Program Directors |
| C | Integrated System Science<br>Dr. Rebecca Gast, Dr. William Ambrose, Program Directors |
| D | Antarctic Instrumentation and Research Facilities<br>Dr. Michael E. Jackson, Program Director |
| G | Earth Sciences, Geodesy and Geophysics<br>Dr. Michael E. Jackson, Program Director |
| I | Glaciology, Ice Core Science and Geomorphology<br>Dr. Kelly Brunt, Program Director |
| O | Oceans and Atmospheric Sciences<br>Dr. David Porter, Dr. Rebecca Gast, Dr. Michael E. Jackson<br>Program Directors |
| T | Technical Event |
| X | Other Science Events |


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## Location Suffixes

| Suffix | Supporting Location |
|---|---|
| M | NSF McMurdo Station |
| P | NSF Palmer Station |
| S | NSF South Pole Station |
| N | NSF RV/IB* *Nathaniel B. Palmer* |
| E | Special Projects Supported by the USAP<br>(e.g., Investigators working with other national Antarctic programs) |

**RV/IB, Research Vessel/Icebreaker*

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|---|---|---|
| Albert, Mary R | T-150-M | Ice Drilling Program (IDP) |
| Arrigo, Kevin | O-288-N | Collaborative Research: Understanding the massive phytoplankton blooms over the Australian-Antarctic Ridge |
| Blom, Lukas J | T-396-M | Operation and maintenance of a CTBT class infrasound array at Windless Bight |
| Bristow, William | A-369-M/S | Antarctic SuperDARN research, operations, and system enhancements |
| Chu, Xinzhao | A-123-M | Collaborative Research: Fe and Na LiDAR investigations of geospace-atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica |
| Cimino, Megan A | C-013-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Clem, John M | A-148-M/S | AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy |
| Conde, Mark Gerard | A-343-M/S | Local-scale drivers and responses of thermospheric weather above Antarctica |
| Emslie, Steven D | B-034-M | Using multiple stable isotopes to investigate middle to late Holocene ecological responses by Adélie penguins in the Ross |

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| | | |
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| | | Sea |
| Franco, Hugo | A-145-M | NASA Long Duration Balloon (LDB) support program |
| Friedlaender, Ari Seth | C-024-P | PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula |
| Gooseff, Michael N | C-505-M | MCM-LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem |
| Grubisic, Vanda | O-264-P | Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network |
| Grubisic, Vanda | O-257-M/S | Ultra-Violet (UV) measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network |
| Halzen, Francis | A-333-S | Management and operations of the IceCube Neutrino Observatory 2021-2026 |
| Harris, Mark | T-927-M | NASA / McMurdo Ground Station (MG1) |
| Higgins, John A | I-187-M | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |
| Karle, Albrecht | A-334-M/S | Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics |
| Kenyon, Samantha Parry | X-279-M | Collaborative Research: Research Infrastructure: CCRI: New: Distributed Space and Terrestrial |

| | | |
|---|---|---|
| | | Networking Infrastructure for Multi-Constellation Coexistence |
| Kingslake, Jonathan | I-347-E | NSFGEO-NERC: Investigating the direct influence of meltwater on Antarctic Ice Sheet dynamics |
| Mattioli, Glen NMI | T-312-M | EarthScope SAGE: Erebus Backbone Network Project |
| McDonald, Birgitte I | B-245-M | CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea |
| Morgan, Daniel Jones | G-049-M | Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations |
| Patterson, Molly O'Rourke | G-070-M | Collaborative Research: Sensitivity of the West Antarctic Ice Sheet to 2 Celsius (SWAIS 2C) |
| Pryke, Clement | A-149-S | Imaging the beginning of time from the South Pole: Completing the BICEP array survey |
| Risien, Julie Marie | W-491-N | Polar STEAM Artists, Writers, and Educators |
| Rotella, Jay | B-009-M | Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions |
| Schofield, Oscar | C-019-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Seunarine, Surujhdeo | A-118-S | Collaborative Research: The Simpson Neutron Monitor Network |

| | | |
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| Steinberg, Deborah | C-020-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Taylor, Michael John | A-119-M/S | Pan-Antarctic investigations of mesospheric wave dynamics and influences using the ANGWIN Network |
| van Gestel, Natasja | B-086-P | Antarctica as a model system for responses of terrestrial carbon balance to warming |
| Van Mooy, Benjamin | C-045-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Warner, Jacob | B-004-M | Collaborative Research: Genomic mechanisms controlling the slow development of the Antarctic urchin *Sterechinus neumayeri* |
| Williams, David G | T-998-P | Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station |
| Wilson, David NMI | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Wilson, David NMI | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Winebrenner, Dale nmi | I-186-M/S | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |

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| Carlstrom, John | A-379-S | South Pole Telescope (SPT) operations and data products |
| Chu, Xinzhao | A-123-M | Collaborative Research: Fe and Na LiDAR investigations of geospace-atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica |
| Clem, John | A-148-M/S | AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy |
| Conde, Mark | A-343-M/S | Local-scale drivers and responses of thermospheric weather above Antarctica |
| Franco, Hugo | A-145-M | NASA Long Duration Balloon (LDB) support program |
| Hailey, Charles | A-132-M | GAPS (General AntiParticle Spectrometer) Experiment: A Search for Dark Matter Using Low Energy Antiprotons and Antideuterons |
| Halzen, Francis | A-333-S | Management and operations of the IceCube Neutrino Observatory 2021-2026 |
| Karle, Albrecht | A-334-M/S | Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics |
| Kim, Hyomin | A-111-M/P/S | The next generation of Geospace research facilities at South Pole, McMurdo, and |

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| | | Palmer Stations |
| Kim, Hyomin | A-108-E | Collaborative Research: Investigation of deep polar cap dynamics using an autonomous instrument network |
| LaBelle, James | A-128-S | First Conjugate-station studies and continued satellite-conjunction studies of LF/MF/HF auroral radio emissions at South Pole |
| Pryke, Clement | A-149-S | Imaging the beginning of time from the South Pole: Completing the BICEP array survey |
| Seunarine, Surujhdeo | A-118-S | Collaborative Research: The Simpson Neutron Monitor Network |
| Taylor, Michael | A-119-M/S | Pan-Antarctic investigations of mesospheric wave dynamics and influences using the ANGWIN Network |
| Zhan, Zhongwen | A-137-S | Pilot fiber seismic networks at the Amundsen-Scott South Pole Station |

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| Ballard, Grant | B-200-M | Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies |
| Emslie, Steven | B-034-M | Using multiple stable isotopes to investigate middle to late Holocene ecological responses by Adélie penguins in the Ross Sea |
| Gerken, Sarah | B-010-N | Collaborative Research: ANT LIA Cumacean -Omics to Measure Mode of Adaptation to Antarctica (COMMAA) |
| Graham, Rebecca | B-042-N | Collaborative Research: The roles of seasonality, silicification, and alteration in nitrogen and silicon isotope paleo-proxy variability |
| Khan, Alia | B-466-E | CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts |
| McDonald, Birgitte | B-245-M | CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea |
| Rotella, Jay | B-009-M | Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions |
| Sumner, Dawn | B-047-M | Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys |


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| Thurber, Andrew | B-249-M | CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps |
| van Gestel, Natasja | B-086-P | Antarctica as a model system for responses of terrestrial carbon balance to warming |
| Warner, Jacob | B-004-M | Collaborative Research: Genomic mechanisms controlling the slow development of the Antarctic urchin *Sterechinus neumayeri* |

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### Integrated System Sciences

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| Cimino, Megan | C-013-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Friedlaender, Ari | C-024-P | PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula |
| Gooseff, Michael | C-505-M | MCM-LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem |
| Schofield, Oscar | C-019-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Steinberg, Deborah | C-020-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Van Mooy, Benjamin | C-045-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |

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### Antarctic Instrumentation & Research Facilities

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| Elosegui, Pedro | D-550-M | A new instrument and measurement approach to cryo-seismogeodesy: Monitoring Antarctic ice shelf stability using ice penetrators |

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### Earth Sciences, Geodesy and Geophysics

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| Bertrand, Paul | G-078-M | Dry Valley seismic project |
| Levy, Joseph | G-083-M | CAREER: Linking cold desert groundwater to thermokarst & chemical weathering in partnership with the Geoscience UAV Academy |
| Mitrovica, Jerry | G-065-M | Constraining West Antarctic Ice Sheet elevation during the last interglacial |
| Morgan, Daniel | G-049-M | Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations |
| Patterson, Molly | G-070-M | Collaborative Research: Sensitivity of the West Antarctic Ice Sheet to 2 Celsius (SWAIS 2C) |
| Shen, Weisen | G-298-M/S | A comprehensive seismic investigation to the crust and uppermost mantle beneath the South Pole, East Antarctica |
| Swanger, Kate | G-064-M | Collaborative Research: Holocene and late Pleistocene stream deposition in the McMurdo Dry Valleys, Antarctica as a proxy for glacial meltwater and paleoclimate |
| Tominaga, Masako | G-082-N | Collaborative Research: Heat source and flux distributions in the Western Ross Sea seafloor |
| Wilson, David | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |


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| Wilson, David | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Wilson, Terry | G-079-M | Collaborative Research: Investigating Ice Sheet - Solid Earth Feedbacks in West Antarctica: Implications for ice sheet evolution and stability |

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| Kingslake, Jonathan | I-347-E | NSFGEO-NERC: Investigating the direct influence of meltwater on Antarctic Ice Sheet dynamics |
| Petrenko, Vasilii | I-159-E | Using new ice cores from Dome C to test the assumption of a constant galactic cosmic ray flux and improve understanding of the Holocene methane budget |
| Winebrenner, Dale | I-186-M/S | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |

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| Cassano, John | O-400-M | Observing the atmospheric boundary over the West Antarctic ice sheet |
| Coffin, Richard | O-269-N | Collaborative Research: Gas hydrate contribution to the Ross Sea carbon budget; Shallow sediment to water column; Present and future |
| Grubisic, Vanda | O-264-P | Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network |
| Grubisic, Vanda | O-257-M/S | Ultra-Violet (UV) measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network |
| Lazzara, Matthew | O-283-M | Collaborative Research: Antarctic automatic weather station program |
| Lubin, Dan | O-325-P | Collaborative Research: Antarctic Low Cloud Interaction with Natural Aerosol (ALCINA) |
| Munro, David | O-214-N | Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage |
| Salesky, Scott | O-315-M | Collaborative Research: Snow transport in katabatic winds and implications for the |


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| | | Antarctic surface mass balance: observations, theory, and numerical modeling |
| Zappa, Christopher | O-401-E | Formation, transformation, and northward spreading of dense saline water derived from Terra Nova Bay, Ross Sea, Antarctica |

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| Carlstrom, John | A-379-S | South Pole Telescope (SPT) operations and data products |
| Clem, John | A-148-M/S | AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy |
| Conde, Mark | A-343-M/S | Local-scale drivers and responses of thermospheric weather above Antarctica |
| Grubisic, Vanda | O-257-M/S | Ultra-Violet (UV) measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network |
| Halzen, Francis | A-333-S | Management and operations of the IceCube Neutrino Observatory 2021-2026 |
| Karle, Albrecht | A-334-M/S | Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics |
| Kim, Hyomin | A-111-M/P/S | The next generation of Geospace research facilities at South Pole, McMurdo, and Palmer Stations |
| LaBelle, James | A-128-S | First Conjugate-station studies and continued satellite-conjunction studies of LF/MF/HF auroral radio emissions at South Pole |
| Melendy, Renee | T-942-S | Cold Regions Research and Engineering Laboratory |


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| | | (CRREL) support: South Pole Station |
| Melendy, Renee | T-946-M/S | Cold Regions Research and Engineering Laboratory (CRREL) Engineering Support for Antarctic Facilities |
| Pryke, Clement | A-149-S | Imaging the beginning of time from the South Pole: Completing the BICEP array survey |
| Seunarine, Surujhdeo | A-118-S | Collaborative Research: The Simpson Neutron Monitor Network |
| Shen, Weisen | G-298-M/S | A comprehensive seismic investigation to the crust and uppermost mantle beneath the South Pole, East Antarctica |
| Taylor, Michael | A-119-M/S | Pan-Antarctic investigations of mesospheric wave dynamics and influences using the ANGWIN Network |
| Wilson, David | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Wilson, David | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Winebrenner, Dale | I-186-M/S | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |
| Zhan, Zhongwen | A-137-S | Pilot fiber seismic networks at the Amundsen-Scott South Pole Station |

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| Ballard, Grant | B-200-M | Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies |
| Bertrand, Paul | G-078-M | Dry Valley seismic project |
| Blom, Lukas | T-396-M | Operation and maintenance of a CTBT class infrasound array at Windless Bight |
| Bristow, William | A-369-M/S | Antarctic SuperDARN research, operations, and system enhancements |
| Cassano, John | O-400-M | Observing the atmospheric boundary over the West Antarctic ice sheet |
| Chu, Xinzhao | A-123-M | Collaborative Research: Fe and Na LiDAR investigations of geospace-atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica |
| Clem, John | A-148-M/S | AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy |
| Conde, Mark | A-343-M/S | Local-scale drivers and responses of thermospheric weather above Antarctica |
| Dickson, Jay | T-434-M | The Polar Geospatial Information Center: joint support |
| Elosegui, Pedro | D-550-M | A new instrument and measurement approach to cryo-seismogeodesy: |


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| | | Monitoring Antarctic ice shelf stability using ice penetrators |
| Emslie, Steven | B-034-M | Using multiple stable isotopes to investigate middle to late Holocene ecological responses by Adélie penguins in the Ross Sea |
| Franco, Hugo | A-145-M | NASA Long Duration Balloon (LDB) support program |
| Gooseff, Michael | C-505-M | MCM-LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem |
| Grubisic, Vanda | O-257-M/S | Ultra-Violet (UV) measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network |
| Hailey, Charles | A-132-M | GAPS (General AntiParticle Spectrometer) Experiment: A Search for Dark Matter Using Low Energy Antiprotons and Antideuterons |
| Harris, Mark | T-927-M | NASA / McMurdo Ground Station (MG1) |
| Higgins, John | I-187-M | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |
| Karle, Albrecht | A-334-M/S | Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics |
| Kenyon, Samantha | X-279-M | Collaborative Research: Research Infrastructure: CCRI: New: Distributed Space and Terrestrial Networking Infrastructure for Multi-Constellation Coexistence |
| Kim, Hyomin | A-111-M/P/S | The next generation of Geospace research facilities at South Pole, McMurdo, and Palmer Stations |

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|---|---|---|
| Lazzara, Matthew | O-283-M | Collaborative Research: Antarctic automatic weather station program |
| Levy, Joseph | G-083-M | CAREER: Linking cold desert groundwater to thermokarst & chemical weathering in partnership with the Geoscience UAV Academy |
| Mattioli, Glen | T-312-M | EarthScope SAGE: Erebus Backbone Network Project |
| McDonald, Birgitte | B-245-M | CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea |
| Melendy, Renee | T-940-M | Cold Regions Research and Engineering Laboratory (CRREL) activities: McMurdo Shear Zone |
| Melendy, Renee | T-941-M | Cold Regions Research and Engineering Laboratory (CRREL) support: Leverett Glacier |
| Melendy, Renee | T-946-M/S | Cold Regions Research and Engineering Laboratory (CRREL) Engineering Support for Antarctic Facilities |
| Mitrovica, Jerry | G-065-M | Constraining West Antarctic Ice Sheet elevation during the last interglacial |
| Morgan, Daniel | G-049-M | Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations |
| Patterson, Molly | G-070-M | Collaborative Research: Sensitivity of the West Antarctic Ice Sheet to 2 Celsius (SWAIS 2C) |
| Rotella, Jay | B-009-M | Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions |

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| Salesky, Scott | O-315-M | Collaborative Research: Snow transport in katabatic winds and implications for the Antarctic surface mass balance: observations, theory, and numerical modeling |
| Shen, Weisen | G-298-M/S | A comprehensive seismic investigation to the crust and uppermost mantle beneath the South Pole, East Antarctica |
| Sumner, Dawn | B-047-M | Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys |
| Swanger, Kate | G-064-M | Collaborative Research: Holocene and late Pleistocene stream deposition in the McMurdo Dry Valleys, Antarctica as a proxy for glacial meltwater and paleoclimate |
| Taylor, Michael | A-119-M/S | Pan-Antarctic investigations of mesospheric wave dynamics and influences using the ANGWIN Network |
| Thurber, Andrew | B-249-M | CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps |
| Warner, Jacob | B-004-M | Collaborative Research: Genomic mechanisms controlling the slow development of the Antarctic urchin *Sterechinus neumayeri* |
| Wilson, Terry | G-079-M | Collaborative Research: Investigating Ice Sheet - Solid Earth Feedbacks in West Antarctica: Implications for ice sheet evolution and stability |
| Winebrenner, Dale | I-186-M/S | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |

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| Friedlaender, Ari | C-024-P | PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula |
| Grubisic, Vanda | O-264-P | Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network |
| Kim, Hyomin | A-111-M/P/S | The next generation of Geospace research facilities at South Pole, McMurdo, and Palmer Stations |
| Lubin, Dan | O-325-P | Collaborative Research: Antarctic Low Cloud Interaction with Natural Aerosol (ALCINA) |
| Schofield, Oscar | C-019-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Steinberg, Deborah | C-020-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| van Gestel, Natasja | B-086-P | Antarctica as a model system for responses of terrestrial carbon balance to warming |
| Van Mooy, Benjamin | C-045-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |


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| Williams, David | T-998-P | Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station |
| Wilson, David | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Wilson, David | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |

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| Coffin, Richard | O-269-N | Collaborative Research: Gas hydrate contribution to the Ross Sea carbon budget; Shallow sediment to water column; Present and future |
| Gerken, Sarah | B-010-N | Collaborative Research: ANT LIA Cumacean -Omics to Measure Mode of Adaptation to Antarctica (COMMAA) |
| Graham, Rebecca | B-042-N | Collaborative Research: The roles of seasonality, silicification, and alteration in nitrogen and silicon isotope paleo-proxy variability |
| Hummon, Julia | T-933-N | University of Hawaii Data Acquisition System (UHDAS) support |
| Munro, David | O-214-N | Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage |
| Risien, Julie | W-491-N | Polar STEAM Artists, Writers, and Educators |
| Tominaga, Masako | G-082-N | Collaborative Research: Heat source and flux distributions in the Western Ross Sea seafloor |

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| Kim, Hyomin | A-108-E | Collaborative Research: Investigation of deep polar cap dynamics using an autonomous instrument network |
| Kingslake, Jonathan | I-347-E | NSFGEO-NERC: Investigating the direct influence of meltwater on Antarctic Ice Sheet dynamics |
| Petrenko, Vasilii | I-159-E | Using new ice cores from Dome C to test the assumption of a constant galactic cosmic ray flux and improve understanding of the Holocene methane budget |
| Zappa, Christopher | O-401-E | Formation, transformation, and northward spreading of dense saline water derived from Terra Nova Bay, Ross Sea, Antarctica |

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| Ballard, Grant | B-200-M | Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies |
| Bertrand, Paul A | G-078-M | Dry Valley seismic project |
| Blom, Lukas J | T-396-M | Operation and maintenance of a CTBT class infrasound array at Windless Bight |
| Bristow, William | A-369-M/S | Antarctic SuperDARN research, operations, and system enhancements |
| Carlstrom, John | A-379-S | South Pole Telescope (SPT) operations and data products |
| Cassano, John | O-400-M | Observing the atmospheric boundary over the West Antarctic ice sheet |
| Chu, Xinzhao | A-123-M | Collaborative Research: Fe and Na LiDAR investigations of geospace-atmosphere temperature, composition, chemistry, and dynamics at McMurdo, Antarctica |
| Cimino, Megan A | C-013-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Clem, John M | A-148-M/S | AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy |

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| Conde, Mark Gerard | A-343-M/S | Local-scale drivers and responses of thermospheric weather above Antarctica |
| Dickson, Jay NMI | T-434-M | The Polar Geospatial Information Center: joint support |
| Elosegui, Pedro NMI | D-550-M | A new instrument and measurement approach to cryo-seismogeodesy: Monitoring Antarctic ice shelf stability using ice penetrators |
| Emslie, Steven D | B-034-M | Using multiple stable isotopes to investigate middle to late Holocene ecological responses by Adélie penguins in the Ross Sea |
| Franco, Hugo | A-145-M | NASA Long Duration Balloon (LDB) support program |
| Friedlaender, Ari Seth | C-024-P | PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula |
| Gerken, Sarah Anne | B-010-N | Collaborative Research: ANT LIA Cumacean -Omics to Measure Mode of Adaptation to Antarctica (COMMAA) |
| Gooseff, Michael N | C-505-M | MCM-LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem |
| Graham, Rebecca Robinson | B-042-N | Collaborative Research: The roles of seasonality, silicification, and alteration in nitrogen and silicon isotope paleo-proxy variability |
| Grubisic, Vanda | O-264-P | Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network |

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| Grubisic, Vanda | O-257-M/S | Ultra-Violet (UV) measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network |
| Hailey, Charles James | A-132-M | GAPS (General AntiParticle Spectrometer) Experiment: A Search for Dark Matter Using Low Energy Antiprotons and Antideuterons |
| Halzen, Francis | A-333-S | Management and operations of the IceCube Neutrino Observatory 2021-2026 |
| Harris, Mark | T-927-M | NASA / McMurdo Ground Station (MG1) |
| Higgins, John A | I-187-M | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |
| Hummon, Julia M | T-933-N | University of Hawaii Data Acquisition System (UHDAS) support |
| Karle, Albrecht | A-334-M/S | Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics |
| Kenyon, Samantha Parry | X-279-M | Collaborative Research: Research Infrastructure: CCRI: New: Distributed Space and Terrestrial Networking Infrastructure for Multi-Constellation Coexistence |
| Khan, Alia Lauren | B-466-E | CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts |
| Kim, Hyomin NMI | A-111-M/P/S | The next generation of Geospace research facilities at South Pole, McMurdo, and Palmer Stations |
| Kim, Hyomin NMI | A-108-E | Collaborative Research: Investigation of deep polar cap |

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| | | dynamics using an autonomous instrument network |
| Kingslake, Jonathan | I-347-E | NSFGEO-NERC: Investigating the direct influence of meltwater on Antarctic Ice Sheet dynamics |
| LaBelle, James | A-128-S | First Conjugate-station studies and continued satellite-conjunction studies of LF/MF/HF auroral radio emissions at South Pole |
| Lazzara, Matthew | O-283-M | Collaborative Research: Antarctic automatic weather station program |
| Levy, Joseph | G-083-M | CAREER: Linking cold desert groundwater to thermokarst & chemical weathering in partnership with the Geoscience UAV Academy |
| Lubin, Dan | O-325-P | Collaborative Research: Antarctic Low Cloud Interaction with Natural Aerosol (ALCINA) |
| Mattioli, Glen NMI | T-312-M | EarthScope SAGE: Erebus Backbone Network Project |
| McDonald, Birgitte I | B-245-M | CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea |
| Melendy, Renee | T-940-M | Cold Regions Research and Engineering Laboratory (CRREL) activities: McMurdo Shear Zone |
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| Melendy, Renee | T-942-S | Cold Regions Research and Engineering Laboratory (CRREL) support: South Pole Station |
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| Mitrovica, Jerry X | G-065-M | Constraining West Antarctic Ice Sheet elevation during the last interglacial |
| Morgan, Daniel Jones | G-049-M | Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations |
| Munro, David Russel | O-214-N | Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage |
| Patterson, Molly O'Rourke | G-070-M | Collaborative Research: Sensitivity of the West Antarctic Ice Sheet to 2 Celsius (SWAIS 2C) |
| Petrenko, Vasilii Victorovich | I-159-E | Using new ice cores from Dome C to test the assumption of a constant galactic cosmic ray flux and improve understanding of the Holocene methane budget |
| Pryke, Clement | A-149-S | Imaging the beginning of time from the South Pole: Completing the BICEP array survey |
| Risien, Julie Marie | W-491-N | Polar STEAM Artists, Writers, and Educators |
| Rotella, Jay | B-009-M | Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions |
| Salesky, Scott Thomas | O-315-M | Collaborative Research: Snow transport in katabatic winds and implications for the Antarctic surface mass balance: observations, theory, and numerical modeling |
| Schofield, Oscar | C-019-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances |

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| | | along a rapidly changing West Antarctic Peninsula |
| Seunarine, Surujhdeo | A-118-S | Collaborative Research: The Simpson Neutron Monitor Network |
| Shen, Weisen | G-298-M/S | A comprehensive seismic investigation to the crust and uppermost mantle beneath the South Pole, East Antarctica |
| Steinberg, Deborah | C-020-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Sumner, Dawn Yvonne | B-047-M | Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys |
| Swanger, Kate | G-064-M | Collaborative Research: Holocene and late Pleistocene stream deposition in the McMurdo Dry Valleys, Antarctica as a proxy for glacial meltwater and paleoclimate |
| Taylor, Michael John | A-119-M/S | Pan-Antarctic investigations of mesospheric wave dynamics and influences using the ANGWIN Network |
| Thurber, Andrew | B-249-M | CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps |
| Tominaga, Masako NMI | G-082-N | Collaborative Research: Heat source and flux distributions in the Western Ross Sea seafloor |
| van Gestel, Natasja | B-086-P | Antarctica as a model system for responses of terrestrial carbon balance to warming |
| Van Mooy, Benjamin | C-045-P | PAL-LTER: Ecological response to "Press-Pulse" disturbances along a rapidly changing West Antarctic Peninsula |
| Warner, Jacob | B-004-M | Collaborative Research: |

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| | | Genomic mechanisms controlling the slow development of the Antarctic urchin *Sterechinus neumayeri* |
| Williams, David G | T-998-P | Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station |
| Wilson, David NMI | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Wilson, David NMI | G-090-P/S | Global seismograph station (GSN) at South Pole Station, Palmer Station and Scott Base |
| Wilson, Terry | G-079-M | Collaborative Research: Investigating Ice Sheet - Solid Earth Feedbacks in West Antarctica: Implications for ice sheet evolution and stability |
| Winebrenner, Dale nmi | I-186-M/S | STC: Center for OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau |
| Zappa, Christopher | O-401-E | Formation, transformation, and northward spreading of dense saline water derived from Terra Nova Bay, Ross Sea, Antarctica |
| Zhan, Zhongwen | A-137-S | Pilot fiber seismic networks at the Amundsen-Scott South Pole Station |

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# 2024-2025 USAP Field Season
Project Indexes

## Deploying Team Members Index

| Team Member | Event No. | Principal Investigator |
|---|---|---|
| Ackert, Robert | G-065-M | Jerry X Mitrovica |
| Adams, Byron | C-505-M | Michael N Gooseff |
| Adams, Byron James | C-505-M | Michael N Gooseff |
| Adams, Daniel Eric | T-927-M | Mark Harris |
| Adshead, Molly NMI | B-466-E | Alia Lauren Khan |
| Anderson, Adam NMI | A-379-S | John Carlstrom |
| Anderson, Kent | G-090-P/S | David NMI Wilson |
| Anderson, Kent | T-299-M | |
| Anderson, Kent | T-312-M | Glen NMI Mattioli |
| Andrews, Ian Alexander Jose | G-083-M | Joseph Levy |
| Aoyama, Kazutaka NMI | A-132-M | Charles James Hailey |
| Askren, Cara Sheehan | O-288-N | Kevin Arrigo |
| Auer, Ralf Bernhard | A-333-S | Francis Halzen |
| Ayasse, Markus Denis | A-149-S | Clement Pryke |
| Azeez, Yusuf NMI | O-269-N | Richard B Coffin |
| Baines-Holmes, Joe NMI | A-333-S | Francis Halzen |
| Barnard, Tyler Rico | A-145-M | Hugo Franco |
| Barrett, John | C-505-M | Michael N Gooseff |
| Barrett, Pamela | O-288-N | Kevin Arrigo |
| Barry, Peter NMI | A-379-S | John Carlstrom |
| Bash, Simeon NMI | A-379-S | John Carlstrom |
| Battaion, Scott Gerard | A-145-M | Hugo Franco |

### Project Indexes

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### Project WebSites

Find more information about 2024-2025 USAP projects by viewing project websites.

### Feedback

Please send us an email with suggestions for improvement or to report an error.

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|---|---|---|
| Baumberger, Tamara NMI | O-288-N | Kevin Arrigo |
| Bayou, Nicolas P | T-295-M | |
| Bayou, Nicolas P | G-079-M | Terry Wilson |
| Beange, Alexander | A-145-M | Hugo Franco |
| Bellamy, Keegan Marie | G-065-M | Jerry X Mitrovica |
| Bench, Tristan Graham | G-064-M | Kate Swanger |
| Benson, Terry Leroy | A-334-M/S | Albrecht Karle |
| Berthord, Carole NMI | G-082-N | Masako NMI Tominaga |
| Bighin, Mika Hope | G-064-M | Kate Swanger |
| Bishop, Abigail Rae | A-333-S | Francis Halzen |
| Bodo, Ilya Adam | A-333-S | Francis Halzen |
| Boezio, Mirko NMI | A-132-M | Charles James Hailey |
| Borgmeier, Abigail NMI | C-505-M | Michael N Gooseff |
| Bornholdt, Thomas J | C-505-M | Michael N Gooseff |
| Bowman, Lacey Taylor | B-042-N | Rebecca Robinson Graham |
| Boyd, John Hayden | A-145-M | Hugo Franco |
| Bramich, Charlotte Frances | C-019-P | Oscar Schofield |
| Branning, Kylee Amanda | A-343-M/S | Mark Gerard Conde |
| Breeding, Garrison Scott | A-145-M | Hugo Franco |
| Breland, Kendall Elise | B-042-N | Rebecca Robinson Graham |
| Bridges, Gabriel Lewis | A-132-M | Charles James Hailey |
| Briggs, Matthew Eric | T-299-M | |
| Brown, Abram S. | B-009-M | Jay Rotella |
| Brügger, Adrian NMI | O-315-M | Scott Thomas Salesky |
| Bruno, Nicholas | T-295-M | |
| Buck, Nathaniel Jackson | O-288-N | Kevin Arrigo |

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| Bundy, Randelle May | O-288-N | Kevin Arrigo |
| Burnham, Christina Madison | B-200-M | Grant Ballard |
| Bustos, Danue Joseph | T-299-M | |
| Candey, Scott Owen | A-132-M | Charles James Hailey |
| Cannat, Mathilde Marie-Helene | G-082-N | Masako NMI Tominaga |
| Carleton, Tony NMI | A-334-M/S | Albrecht Karle |
| Chalif, Jacob Ian | I-187-M | John A Higgins |
| Chan, Jason NMI | A-334-M/S | Albrecht Karle |
| Chin, Frank NMI | G-298-M/S | Weisen Shen |
| Chipman, Allison Ann | B-009-M | Jay Rotella |
| Christianson, Knut | I-186-M/S | Dale nmi Winebrenner |
| Clarke, Andrew D | O-257-M/S | Vanda Grubisic |
| Clavette, Renee N | G-065-M | Jerry X Mitrovica |
| Cole, Mason Russell | C-024-P | Ari Seth Friedlaender |
| Collins, Jared Michael | C-505-M | Michael N Gooseff |
| Collins, Jared Michael | C-505-M | Michael N Gooseff |
| Coolman, William R | A-379-S | John Carlstrom |
| Coop, Christian Kenneth-Lee | A-145-M | Hugo Franco |
| Copeland, Stewart Skylar | B-042-N | Rebecca Robinson Graham |
| Courville, Zoe | T-941-M | Renee Melendy |
| Courville, Zoe | T-940-M | Renee Melendy |
| Crocker, Roger Ian | O-257-M/S | Vanda Grubisic |
| D'Aoust, Anthony NMI | G-078-M | Paul A Bertrand |

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| Das, Indrani NMI | O-315-M | Scott Thomas Salesky |
| Davis, Annabelle Jane | O-288-N | Kevin Arrigo |
| Davis, Jessalyn Elaine | O-288-N | Kevin Arrigo |
| De La Vega Ferreira, Tiego NMI | B-086-P | Natasja van Gestel |
| DeHolton, Kayla Leonard | A-333-S | Francis Halzen |
| DeLuna, Juan Carlos | A-145-M | Hugo Franco |
| Diaz, Melisa Antonia | C-505-M | Michael N Gooseff |
| Dibert, Karia Radha | A-379-S | John Carlstrom |
| Diddams, Ariel Benjamin Heiser | A-123-M | Xinzhao Chu |
| Dodge, Helena Marie | C-013-P | Megan A Cimino |
| Donnelly, Dylan Levi | T-927-M | Mark Harris |
| Doran, Peter T | C-505-M | Michael N Gooseff |
| Doran, Peter T | C-505-M | Michael N Gooseff |
| Dougherty, Charles Edward | C-505-M | Michael N Gooseff |
| Dougherty, Charles Edward | C-505-M | Michael N Gooseff |
| Dougherty, Jennifer NMI | T-927-M | Mark Harris |
| Dove, Isabel Anna | B-042-N | Rebecca Robinson Graham |
| Dubose, Jennifer Charlotte | O-269-N | Richard B Coffin |
| Dugger, Katie Marie | B-200-M | Grant Ballard |
| Dunbar, Nelia | G-065-M | Jerry X Mitrovica |
| DuVernois, Michael | A-334-M/S | Albrecht Karle |
| Echter, Michael Andrew | A-149-S | Clement Pryke |
| Eddy, Alex Christopher | T-299-M | |
| Edwards, Jeanne Marie Teresa | A-334-M/S | Albrecht Karle |

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| Ejdepalm, Erik NMI | A-334-M/S | Albrecht Karle |
| Elrod, Megan Lynn | B-200-M | Grant Ballard |
| Engel, Chandler Stephen | T-946-M/S | Renee Melendy |
| Epifanio, Jenna NMI | I-187-M | John A Higgins |
| Erwin, Emma Margaret | T-940-M | Renee Melendy |
| Everson, Erik Thomas | A-132-M | Charles James Hailey |
| Fatigoni, Sofia NMI | A-149-S | Clement Pryke |
| Fedynitch, Anatoli Vatersname Walerjewitsch | A-334-M/S | Albrecht Karle |
| Fenner, Jennifer nmo | B-004-M | Jacob Warner |
| Filiano, Dominic L | T-942-S | Renee Melendy |
| Filip, Forbes Austin | O-283-M | Matthew Lazzara |
| Flores, David Othoniel | A-369-M/S | William Bristow |
| Flowers, Joseph Derias Daughton | A-145-M | Hugo Franco |
| Folmer, Brent | A-334-M/S | Albrecht Karle |
| Folmer, Brent T | A-334-M/S | Albrecht Karle |
| Frazier, Curtis | A-145-M | Hugo Franco |
| Fudge, Tyler | I-187-M | John A Higgins |
| Funk, Raymond Michael | T-927-M | Mark Harris |
| Gahbauer, Florian Helmuth | A-132-M | Charles James Hailey |
| Ghislotti, Luca NMI | A-132-M | Charles James Hailey |
| Giometto, Marco Giovanni | O-315-M | Scott Thomas Salesky |
| Giovannetti-Nazario, David A | C-505-M | Michael N Gooseff |
| Goetz, Kimberly Thea | B-245-M | Birgitte I McDonald |

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| Grulke, Skyler L | A-334-M/S | Albrecht Karle |
| Haala, Andrew John | I-187-M | John A Higgins |
| Halanych, Kenneth M. | B-004-M | Jacob Warner |
| Hall, Bridget NMI | I-186-M/S | Dale nmi Winebrenner |
| Harmon, Forest Daniel Rubin | G-065-M | Jerry X Mitrovica |
| Hawes, Ian NMI | B-047-M | Dawn Yvonne Sumner |
| Hayden, Eric NMI | G-082-N | Masako NMI Tominaga |
| Hayes, Lydia Ann | O-269-N | Richard B Coffin |
| Heilman, Brent Wayne | A-145-M | Hugo Franco |
| Heins, Megan Kathleen | G-070-M | Molly O'Rourke Patterson |
| Heinzen, Jennifer Lynn | A-334-M/S | Albrecht Karle |
| Henderson, Randall | A-145-M | Hugo Franco |
| Hermanson, Victoria nmi | C-013-P | Megan A Cimino |
| Hill, Colton Marius | A-333-S | Francis Halzen |
| Hodge, Brendan Evans | B-466-E | Alia Lauren Khan |
| Hodge, Wriley Wilson | C-013-P | Megan A Cimino |
| Hofmann, Antares James Medhurst | O-269-N | Richard B Coffin |
| Hogan, Lindsay Karin | O-401-E | Christopher Zappa |
| Hogg, Derek Justin | A-145-M | Hugo Franco |
| Howe, Kathryn Lynn | O-269-N | Richard B Coffin |
| Hubbard, Kayla Ann | C-505-M | Michael N Gooseff |
| Hudak, Abigail Marie | I-187-M | John A Higgins |
| Hynous, Andrew Thomas | A-145-M | Hugo Franco |
| Ihle, Alexander Charles | I-159-E | Vasilii Victorovich Petrenko |
| Iribarren, Jack Carlos | A-123-M | Xinzhao Chu |

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| Ishraque, Fairuz NMI | I-187-M | John A Higgins |
| Iverson, Nels | G-065-M | Jerry X Mitrovica |
| Jackson, Jennifer Southgate | O-288-N | Kevin Arrigo |
| Jannke, Samuel NMI | T-299-M | |
| Jannke, Samuel NMI | T-312-M | Glen NMI Mattioli |
| Jeffrey, Wade H | O-269-N | Richard B Coffin |
| Jenness, Sophie Elizabeth | O-288-N | Kevin Arrigo |
| Jones, Joseph | A-145-M | Hugo Franco |
| Jordan, Skyler NMI | O-257-M/S | Vanda Grubisic |
| Juarez Rivera, Marisol NMI | B-047-M | Dawn Yvonne Sumner |
| Jungst, Steven Mathias Ekola | A-149-S | Clement Pryke |
| Kaifler, Bernd NMI | A-119-M/S | Michael John Taylor |
| Kaip, Galen Marshall | T-299-M | |
| Kaip, Galen Marshall | T-312-M | Glen NMI Mattioli |
| Kalemba, Jacquelyn Marie | G-082-N | Masako NMI Tominaga |
| Kelley, John | A-333-S | Francis Halzen |
| Kelly, Roger Patrick | B-042-N | Rebecca Robinson Graham |
| Kerr, Megan E | I-186-M/S | Dale nmi Winebrenner |
| Ketchell, Kyle Christian | T-396-M | Lukas J Blom |
| Kimble, Kristin Mary | B-042-N | Rebecca Robinson Graham |
| King, Ciera Rose | T-299-M | |
| King, Dianna Blaire | T-312-M | Glen NMI Mattioli |
| King, Dianna Blaire | T-299-M | |
| King, Isabella Kano | G-083-M | Joseph Levy |
| Kirkpatrick, Liam Reed | I-187-M | John A Higgins |

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| Kline, Gregory Micheal | T-998-P | David G Williams |
| Kocot, Kevin Michael | B-010-N | Sarah Anne Gerken |
| Kovac, John | A-149-S | Clement Pryke |
| Krieger, Elisabeth Rachelle | B-009-M | Jay Rotella |
| Kuentz, Lily Catherine | G-083-M | Joseph Levy |
| Kugelmeier, Mirko NMI | A-333-S | Francis Halzen |
| Kuhl, Tanner Weston | I-159-E | Vasilii Victorovich Petrenko |
| Kuhl, Tanner Weston | I-187-M | John A Higgins |
| Lamprecht, Kristen Alma | O-269-N | Richard B Coffin |
| Lamson, Lauren Grace | G-049-M | Daniel Jones Morgan |
| Landgraf, Victoria Grace | T-927-M | Mark Harris |
| Lankford, Todd A | A-145-M | Hugo Franco |
| Lauer, James Arthur Alexander | O-288-N | Kevin Arrigo |
| Lawrence, Jade NMI | C-505-M | Michael N Gooseff |
| Layton, Kimberly Janette | T-927-M | Mark Harris |
| Lescroel, Amelie Marie Sophie | B-200-M | Grant Ballard |
| Levinson, Parker McCosh | B-009-M | Jay Rotella |
| Lines, Austin P | T-940-M | Renee Melendy |
| Lipke, Carolyn Marie | O-400-M | John Cassano |
| Lopez, Sophia Roberts | G-049-M | Daniel Jones Morgan |
| Lowitz, Amy Elizabeth | A-379-S | John Carlstrom |
| Lucas, Erica Margaret | G-079-M | Terry Wilson |
| Lusted, Kitsel Wren | T-396-M | Lukas J Blom |
| Mackey, Tyler J | C-505-M | Michael N Gooseff |
| MacQueen, Bethany N | A-145-M | Hugo Franco |
| Maher, Nolan James | A-149-S | Clement Pryke |

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| Manghisoni, Massimo NMI | A-132-M | Charles James Hailey |
| Manos, John-Morgan NMI | I-186-M/S | Dale nmi Winebrenner |
| Mansfield-Parisi, Maclean Robb | A-333-S | Francis Halzen |
| Mayer, Sydney Julia-Woodford | A-123-M | Xinzhao Chu |
| McAuliffe, Anna Mariah | O-214-N | David Russel Munro |
| McBride, Amanda Bustos | B-042-N | Rebecca Robinson Graham |
| McGaugh, Ausan Betz | A-145-M | Hugo Franco |
| McIntosh, William | G-065-M | Jerry X Mitrovica |
| Mechbal, Sarah NMI | A-333-S | Francis Halzen |
| Mendez, Juan Pablo | A-145-M | Hugo Franco |
| Merz, Elisa NMI | B-047-M | Dawn Yvonne Sumner |
| Middleton, Julien Thomas | B-042-N | Rebecca Robinson Graham |
| Mills, Matthew | O-288-N | Kevin Arrigo |
| Mizukoshi, Keita NMI | A-132-M | Charles James Hailey |
| Mochizuki, Brent Alan | A-132-M | Charles James Hailey |
| Mondragon, Denise NMI | C-505-M | Michael N Gooseff |
| Monreal, Patrick Joseph | O-288-N | Kevin Arrigo |
| Monteiro, Bryan NMI | A-334-M/S | Albrecht Karle |
| Moravec, Elliot Richard | G-065-M | Jerry X Mitrovica |
| Morris, Daniel Asmus Arriaga | A-145-M | Hugo Franco |
| Morton, Elizabeth Tarrant | I-187-M | John A Higgins |
| Moulton, Riley Ross | O-288-N | Kevin Arrigo |
| Mullenax, Robert | A-145-M | Hugo Franco |
| Munini, Riccardo NMI | A-132-M | Charles James Hailey |
| Munoz, Valerie Aileen | B-034-M | Steven D Emslie |

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| Muthyala, Rohi NMI | I-347-E | Jonathan Kingslake |
| Mutter, Ellen Lucinda | I-186-M/S | Dale nmi Winebrenner |
| Nakato, Yuka NMI | A-149-S | Clement Pryke |
| Naklicki, Victor NMI | G-082-N | Masako NMI Tominaga |
| Nesbit, Jacob Daniel | A-334-M/S | Albrecht Karle |
| Neumann, Florian NMI | G-082-N | Masako NMI Tominaga |
| Newberger, Tim | O-214-N | David Russel Munro |
| Ng, Christopher Josiah | A-334-M/S | Albrecht Karle |
| Nichols, Ross C | C-024-P | Ari Seth Friedlaender |
| Nielsen, Christian Skov | A-334-M/S | Albrecht Karle |
| Niu, Lemona Yingzhuo | O-288-N | Kevin Arrigo |
| Nolan, Meredith Anne | C-020-P | Deborah Steinberg |
| Nolan, Meredith Anne | C-020-P | Deborah Steinberg |
| Nordin, Thomas Gray | A-334-M/S | Albrecht Karle |
| Normandeau, James NMI | G-079-M | Terry Wilson |
| Northey, Allison Danielle | C-013-P | Megan A Cimino |
| Novikov, Alexander NMI | A-333-S | Francis Halzen |
| O'Conke, Robert Andrew | G-082-N | Masako NMI Tominaga |
| O'Dell, Vivian Rickman | A-334-M/S | Albrecht Karle |
| Okal, Marianne | T-295-M | |
| Okazaki, Shun NMI | A-132-M | Charles James Hailey |
| Ong, Rene Ashwin | A-132-M | Charles James Hailey |
| Organ, Hannah NMI | O-269-N | Richard B Coffin |
| Oxborough, Alexis Rae | A-334-M/S | Albrecht Karle |

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| Paden, John Drysdale | I-186-M/S | Dale nmi Winebrenner |
| Palm, Ali J | O-288-N | Kevin Arrigo |
| Panter, Kurt | G-082-N | Masako NMI Tominaga |
| Panter, Kurt | G-082-N | Masako NMI Tominaga |
| Pappas, Kaliroe Mabelle West | A-132-M | Charles James Hailey |
| Parker, Brian Keith | A-145-M | Hugo Franco |
| Patrick, Christian Kyne | G-078-M | Paul A Bertrand |
| Paul, Larissa NMI | A-333-S | Francis Halzen |
| Pautet, Pierre-Dominique | A-119-M/S | Michael John Taylor |
| Pecher, Ingo A | O-269-N | Richard B Coffin |
| Pernic, David R | A-379-S | John Carlstrom |
| Petroff, Matthew Aidan | A-149-S | Clement Pryke |
| Pettit, Joseph R | T-299-M | |
| Pettit, Joseph R | T-312-M | Glen NMI Mattioli |
| Pettit, Joseph R | G-090-P/S | David NMI Wilson |
| Pettit, Joseph R | T-295-M | |
| Pickell, Derek J | T-941-M | Renee Melendy |
| Plekan, Tyler James | O-400-M | John Cassano |
| Powell, Tyler tbd | B-047-M | Dawn Yvonne Sumner |
| Power, Devin Shane | T-434-M | Jay NMI Dickson |
| Preheim, Kiley Danae | B-042-N | Rebecca Robinson Graham |
| Preine, Jonas NMI | G-082-N | Masako NMI Tominaga |
| Proctor, Claudette Jane | O-288-N | Kevin Arrigo |
| Rahlin, Alexandra S | A-379-S | John Carlstrom |
| Rand, Colby Francis | B-466-E | Alia Lauren Khan |
| Range, Ryan nmi | B-004-M | Jacob Warner |

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| Rawal, Bhavna NMI | O-288-N | Kevin Arrigo |
| Reed, Erin Michele | A-145-M | Hugo Franco |
| Reilly, Brendan Thomas | G-070-M | Molly O'Rourke Patterson |
| Resing, Joseph Anton | O-288-N | Kevin Arrigo |
| Reynebeau, Emily R | C-505-M | Michael N Gooseff |
| Rhodes, Georgia Anne | B-042-N | Rebecca Robinson Graham |
| Riceputi, Elisa NMI | A-132-M | Charles James Hailey |
| Rink, Joel - | B-466-E | Alia Lauren Khan |
| Rivera, Victoria Nevelyn | O-269-N | Richard B Coffin |
| Robbins, Richard Albert | C-013-P | Megan A Cimino |
| Roberts, Darren Tyler | C-013-P | Megan A Cimino |
| Roberts, Megan Elizabeth | C-013-P | Megan A Cimino |
| Roche, Katherine Mary | B-042-N | Rebecca Robinson Graham |
| Rogers, Field Rose | A-132-M | Charles James Hailey |
| Rorres, Christina Joubert | C-045-P | Benjamin Van Mooy |
| Rosprim, Zachary NMI | A-145-M | Hugo Franco |
| Rossilli, Jerricca Dale Ann | O-269-N | Richard B Coffin |
| Rotella, Sophia Love Yaping | B-009-M | Jay Rotella |
| Rouble, Maclean Carter | A-379-S | John Carlstrom |
| Ruszczyk, Chester NMI | D-550-M | Pedro NMI Elosegui |
| Ryan, Ellie unsure | B-466-E | Alia Lauren Khan |
| Salvatore, Mark | C-505-M | Michael N Gooseff |
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| Schwantes, Christopher Martin | A-145-M | Hugo Franco |
| Seegmiller, Daniel Verl | A-145-M | Hugo Franco |
| Sellers, Michael Shane | A-145-M | Hugo Franco |
| Severinghaus, Jeffrey Peck | I-187-M | John A Higgins |
| Shanks, Katherine Marie | G-082-N | Masako NMI Tominaga |
| Sharpe, Mya Heather | C-019-P | Oscar Schofield |
| Shaya, Margot NMI | I-187-M | John A Higgins |
| Siegel, Sophia Elise | O-288-N | Kevin Arrigo |
| Simper, Scott G | B-086-P | Natasja van Gestel |
| Singari, Baibhav NMI | A-149-S | Clement Pryke |
| Sinsabvrodom, Chana NMI | A-334-M/S | Albrecht Karle |
| Smith, Elizabeth Ann | B-086-P | Natasja van Gestel |
| Sobrero, Franco Sebastian | G-079-M | Terry Wilson |
| Soldo, Logan Michael | O-257-M/S | Vanda Grubisic |
| Stanford, Susan E | T-299-M | |
| Stanton, Rebekah NMI | G-049-M | Daniel Jones Morgan |
| Steiger, Aaron Paul | A-149-S | Clement Pryke |
| Stoessl, Johannes Achim | A-132-M | Charles James Hailey |
| Storaasli, Zoe D'Amico De Almeida | G-049-M | Daniel Jones Morgan |
| Studt, Kurt Friedrich | A-334-M/S | Albrecht Karle |
| Sulanke, Karl-Heinz | A-334-M/S | Albrecht Karle |
| Swanson, Nadia Jean | B-200-M | Grant Ballard |
| Tandberg, Anne Helene Solberg | B-010-N | Sarah Anne Gerken |

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| Tenti, Martina NMI | O-269-N | Richard B Coffin |
| Thomas, Maya India | C-020-P | Deborah Steinberg |
| Thomas, Tyler Evan | B-042-N | Rebecca Robinson Graham |
| Tivey, Maurice A | G-082-N | Masako NMI Tominaga |
| Tomita, Abby Lynn | C-019-P | Oscar Schofield |
| Torgilsson, Åse NMI | A-334-M/S | Albrecht Karle |
| Tosi, Delia | A-334-M/S | Albrecht Karle |
| Tosi, Delia | A-334-M/S | Albrecht Karle |
| Tournier, Martin Vincent | B-245-M | Birgitte I McDonald |
| Tytus, Grace Emmalee | A-132-M | Charles James Hailey |
| Van Dijken, Gerrit | O-288-N | Kevin Arrigo |
| Vandersommen, Victoria Marie | B-010-N | Sarah Anne Gerken |
| Vanegas Ledesma, Amanda Isabel | O-288-N | Kevin Arrigo |
| Varsani, Arvind | B-200-M | Grant Ballard |
| Vega, Alejandro NMI | A-145-M | Hugo Franco |
| Villasana, Cesar Rene | A-145-M | Hugo Franco |
| von Doetinchem de Rande, Philip Albert | A-132-M | Charles James Hailey |
| VonLintig, Matthew Ryan | T-396-M | Lukas J Blom |
| Waddell, Neil Douglas | A-334-M/S | Albrecht Karle |
| Wagner, Cameron Joseph | T-942-S | Renee Melendy |
| Wagner, Gavin P | C-505-M | Michael N Gooseff |
| Walker, Stevie Lin | O-288-N | Kevin Arrigo |
| Wallace, Kyle Matthew | G-078-M | Paul A Bertrand |
| Walling, Jonathan Ray | A-145-M | Hugo Franco |

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| Wang, Jennifer nmi | T-927-M | Mark Harris |
| Ward-Bourdeaux, Christian Andrew | A-145-M | Hugo Franco |
| Weber, Corey | A-145-M | Hugo Franco |
| Weber, Jeff Scott | A-334-M/S | Albrecht Karle |
| Welch, Kathleen Ann | C-505-M | Michael N Gooseff |
| Westerlund, Cameron Elliott | A-343-M/S | Mark Gerard Conde |
| Whetu, Mark Anthony | G-079-M | Terry Wilson |
| Wildrick, Daniel Joseph | G-082-N | Masako NMI Tominaga |
| Winkelman, Andrew Thomas | G-078-M | Paul A Bertrand |
| Winkelman, Andrew Thomas | T-396-M | Lukas J Blom |
| Wisniewski, Paul Anthony | A-334-M/S | Albrecht Karle |
| Witscheber, Matthew Christian | G-064-M | Kate Swanger |
| Witte , Carson | O-401-E | Christopher Zappa |
| Wood, Morgan Nicole | C-505-M | Michael N Gooseff |
| Wu, Hanxiao NMI | G-298-M/S | Weisen Shen |
| Wu, Jyun-nai NMI | G-082-N | Masako NMI Tominaga |
| Yee, Kelsey Amber | A-132-M | Charles James Hailey |
| Yoder, Christopher Doolin | A-145-M | Hugo Franco |
| Young, Matthew Rowan | A-379-S | John Carlstrom |
| Yu, Hao NMI | O-269-N | Richard B Coffin |
| Zebrowski, Jessica Avva | A-379-S | John Carlstrom |
| Zeglin, Lydia | C-505-M | Michael N Gooseff |
| Zernick, Michael Anthony | A-334-M/S | Albrecht Karle |

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| Zhang, Cheng NMI | A-149-S | Clement Pryke |
| Zhao, Yucheng NMI | A-119-M/S | Michael John Taylor |
| Zimmerman, Kelsey Paige | T-434-M | Jay NMI Dickson |
| Zuluaga, Juan Daniel | B-034-M | Steven D Emslie |
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| Alaska Fairbanks, University of | T-396-M | Blom, Lukas |
| Alaska Fairbanks, University of | A-343-M/S | Conde, Mark |
| California Davis, University of | B-047-M | Sumner, Dawn |
| California Institute of Technology | A-137-S | Zhan, Zhongwen |
| California Santa Barbara, University of | B-249-M | Thurber, Andrew |
| California Santa Cruz, University of | C-013-P | Cimino, Megan |
| California Santa Cruz, University of | C-024-P | Friedlaender, Ari |
| Chicago, University of | A-379-S | Carlstrom, John |
| Colgate University | G-083-M | Levy, Joseph |
| Colorado Boulder, University of | O-214-N | Munro, David |
| Colorado Boulder, University of | A-123-M | Chu, Xinzhao |
| Colorado Boulder, University of | O-400-M | Cassano, John |
| Colorado Boulder, University of | C-505-M | Gooseff, Michael |
| Columbia Scientific Balloon Facility | A-145-M | Franco, Hugo |
| Columbia University | I-347-E | Kingslake, Jonathan |
| Columbia University | A-132-M | Hailey, Charles |
| Columbia University | O-401-E | Zappa, Christopher |
| Dartmouth College | A-128-S | LaBelle, James |
| Dartmouth College | T-150-M | Albert, Mary |

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| EarthScope Consortium | T-312-M | Mattioli, Glen |
| Harvard University | G-065-M | Mitrovica, Jerry |
| Hawaii Manoa, University of | T-933-N | Hummon, Julia |
| Massachusetts Institute of Technology | D-550-M | Elosegui, Pedro |
| Massachusetts, University of | G-064-M | Swanger, Kate |
| Minnesota, University of | T-434-M | Dickson, Jay |
| Minnesota, University of | A-149-S | Pryke, Clement |
| Montana State University Bozeman | B-009-M | Rotella, Jay |
| Moss Landing Marine Laboratories | B-245-M | McDonald, Birgitte |
| National Aeronautics and Space Administration | T-927-M | Harris, Mark |
| National Oceanic and Atmospheric Administration | O-264-P | Grubisic, Vanda |
| National Oceanic and Atmospheric Administration | O-257-M/S | Grubisic, Vanda |
| New Jersey Institute of Technology | A-111-M/P/S | Kim, Hyomin |
| New Jersey Institute of Technology | A-108-E | Kim, Hyomin |
| North Carolina at Wilmington, University of | B-004-M | Warner, Jacob |
| Ohio State University | G-079-M | Wilson, Terry |
| Oklahoma, University of | O-315-M | Salesky, Scott |
| Oregon State University | W-491-N | Risien, Julie |
| Pennsylvania State University | A-369-M/S | Bristow, William |
| Point Reyes Bird Observatory | B-200-M | Ballard, Grant |
| Princeton University | I-187-M | Higgins, John |

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| Rhode Island, University of | B-042-N | Graham, Rebecca |
| Rochester, University of | I-159-E | Petrenko, Vasilii |
| Rutgers University | C-019-P | Schofield, Oscar |
| Scripps Institution of Oceanography | O-325-P | Lubin, Dan |
| Stanford University | O-288-N | Arrigo, Kevin |
| State University of New York Stony Brook | G-298-M/S | Shen, Weisen |
| Texas A & M University | O-269-N | Coffin, Richard |
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| Utah State University | A-119-M/S | Taylor, Michael |
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| Virginia Institute of Marine Sciences | C-020-P | Steinberg, Deborah |
| Virginia Tech | X-279-M | Kenyon, Samantha |
| Washington, University of | I-186-M/S | Winebrenner, Dale |
| Western Washington University | B-466-E | Khan, Alia |
| Wisconsin Madison, University of | O-283-M | Lazzara, Matthew |
| Wisconsin Madison, University of | A-333-S | Halzen, Francis |
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| Woods Hole Oceanographic Institution | C-045-P | Van Mooy, Benjamin |
| Woods Hole Oceanographic Institution | G-082-N | Tominaga, Masako |

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| 013 | C-013-P | Cimino, Megan |
| 019 | C-019-P | Schofield, Oscar |
| 020 | C-020-P | Steinberg, Deborah |
| 024 | C-024-P | Friedlaender, Ari |
| 034 | B-034-M | Emslie, Steven |
| 042 | B-042-N | Graham, Rebecca |
| 045 | C-045-P | Van Mooy, Benjamin |
| 047 | B-047-M | Sumner, Dawn |
| 049 | G-049-M | Morgan, Daniel |
| 064 | G-064-M | Swanger, Kate |
| 065 | G-065-M | Mitrovica, Jerry |
| 070 | G-070-M | Patterson, Molly |
| 078 | G-078-M | Bertrand, Paul |
| 079 | G-079-M | Wilson, Terry |
| 082 | G-082-N | Tominaga, Masako |
| 083 | G-083-M | Levy, Joseph |
| 086 | B-086-P | van Gestel, Natasja |
| 090 | G-090-P/S | Wilson, David |
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| 264 | O-264-P | Grubisic, Vanda |
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| 279 | X-279-M | Kenyon, Samantha |
| 283 | O-283-M | Lazzara, Matthew |
| 288 | O-288-N | Arrigo, Kevin |
| 298 | G-298-M/S | Shen, Weisen |
| 312 | T-312-M | Mattioli, Glen |
| 315 | O-315-M | Salesky, Scott |

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| 325 | O-325-P | Lubin, Dan |
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| 334 | A-334-M/S | Karle, Albrecht |
| 343 | A-343-M/S | Conde, Mark |
| 347 | I-347-E | Kingslake, Jonathan |
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| 927 | T-927-M | Harris, Mark |
| 933 | T-933-N | Hummon, Julia |
| 940 | T-940-M | Melendy, Renee |
| 941 | T-941-M | Melendy, Renee |
| 942 | T-942-S | Melendy, Renee |
| 946 | T-946-M/S | Melendy, Renee |
| 998 | T-998-P | Williams, David |

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# 2024-2025 USAP Field Season
Project Detail

## Project Title

Ice Drilling Program (IDP)

## Summary

**Event Number:**
T-150-M
NSF Agreement

**Program Directors:**
Dr. Michael Jackson and Dr. Kelly Brunt

**ASC POC / Implementer:**
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:**
http://www.icedrill.org

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Mount Waesche, Allan Hills, Dome C

## Description

The 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, equipment, and drilling expertise needed by the 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 U.S. National Science Foundation's strategic goals for desired societal outcomes.

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### Project WebSites

Find more information about 2024-2025 USAP projects by viewing project websites.

### Feedback

Please send us an email with suggestions for improvement or to report an error.

## Field Season Overview

IDP will provide cold regions drilling equipment and support to projects confirmed for deployment in the 2024-25 season, including G-065-M, I-187-M, and I-159-E.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Operation And Maintenance Of A CTBT Class Infrasound Array At Windless Bight

## Summary

**Event Number:**
T-396-M
NSF / DTRA Agreement

**NSF Contact:**
Ms. Jessie Crain

**ASC POC / Implementer:**
Allison Barden / Jane Dell / Jenny Cunningham

## 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

**Supporting Stations:** McMurdo Station
**Research Locations:** Windless Bight

## Description

This project operates, maintains, upgrades, calibrates, and services the joint United States Comprehensive Nuclear Test Ban Treaty (CTBT) Infrasound Array at Windless Bight. Windless Bight's location on the Ross Ice Shelf is unique for its low wind levels, which makes infrasound detection possible. 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, like large explosions, at great distances from the sound-producing events. Detection of events occurring worldwide are routinely made at the Windless Bight site.

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### Project WebSites

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### Feedback

Please send us an email with suggestions for improvement or to report an error.

## Field Season Overview

Four participants will deploy from late October to mid-December to perform servicing of the array and hybrid power system at Windless Bight. The team will camp at the field site for 17 to 21 days. The field camp, consisting of two Polarhavens, an outhouse, and individual mountain tents, will be set-up by Antarctic Support Contract (ASC) and accessed by ground vehicles. Major service work performed will include excavation and raising of system components, performance of power system service work, 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-milvan in McMurdo Station is used for year-round cold storage of supplies and spare parts. ASC will provide year-round research associate support and deliver JP8 fuel to the field site. This season, team members will also provide assistance to the G-078-M Bertrand AFTAC team performing maintenance of their hybrid power systems at Mount Newall and Bull Pass in the McMurdo Dry Valleys.

## Deploying Team Members

- Kyle Ketchell
- Kitsel Lusted
- Matthew VonLintig
- Andrew Winkelman

# 2024-2025 USAP Field Season
Project Detail

## Project Title

The Polar Geospatial Information Center: Joint Support

## Summary

**Event Number:**
T-434-M
NSF / OPP Award 2129685

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
Ryan Steiner / Randolph Jones

## Principal Investigator(s)

**Dr. Jay Dickson**
jdickson@umn.edu
University of Minnesota
Polar Geospatial Center (PGC)
Saint Paul, Minnesota

## Location

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

## Description

The Polar Geospatial Center (PGC) was founded in 2007 as the Antarctic Geospatial Information Center (AGIC) and has since expanded to include 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 U.S. National Science Foundation's Arctic and Antarctic research programs. PGC provides satellite imagery of aircraft landing sites, satellite radar, elevation models, mapping, GIS services, real-time surface imagery, and historical time lapse sequences of changing ice conditions.

## Field Season Overview

Two sequential team members (with team size of one participant) will be based at McMurdo Station from mid-October through mid-

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### Project WebSites

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### Feedback

Please send us an email with suggestions for improvement or to report an error.

January, and will provide cartographic support, remote sensing products, and geospatial analysis assistance to science-project grantees and other U.S. Antarctic Program contractor and logistics entities.

## Deploying Team Members

- Devin Power
- Kelsey Zimmerman

# 2024-2025 USAP Field Season
Project Detail

## Project Title

NASA / McMurdo Ground Station (MG1)

## Summary

**Event Number:**
T-927-M
NSF / NASA Agreement

**NSF Contact:**
Mr. Pat Smith

**ASC POC / Implementer:**
John Rand / Carrie Piesen

## Principal Investigator(s)

**Mr. Mark Harris**
mark.a.harris@nasa.gov
National Aeronautics and Space Administration
Wallops Flight Facility
Wallops Island, Virginia

**Project Web Site:**
https://esc.gsfc.nasa.gov/

## Location

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

## Description

The National Aeronautics and Space Administration (NASA) Near Space Network (NSN) Direct To Earth (DTE) communications services provided is supported by McMurdo Ground Station (MG1). The NASA MG1 earth station operations and maintenance is managed under the NASA Space Exploration Network Services and Evolution (SENSE). The MG1 is a 10-meter antenna housed in a large radome located on a ridge overlooking McMurdo Station. It is used primarily for data recovery from polar-orbiting science and environmental remote sensing satellites. MG1 also provides launch and early operations phase support for launches from Vandenberg Space Force Base involving satellite missions launching into high inclination polar orbits that require downrange telemetry;

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### Feedback

Please send us an email with suggestions for improvement or to report an error.

telemetry and command for satellite housekeeping; and recovery from satellite operational emergencies.

In collaboration with the National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite and Data Information Service, the MG1 recovers data for the EUMETSAT MetOp polar weather satellites.

## Field Season Overview

Annual ongoing maintenance and support continues for McMurdo Ground Station antennas, radomes, and associated devices and equipment. This project maintains a year-round presence of two persons and plans to deploy one additional mechanic during the summer season.

## Deploying Team Members

- Daniel Adams
- Dylan Donnelly
- Jennifer Dougherty
- Raymond Funk
- Victoria Landgraf
- Kimberly Layton
- Jennifer Wang

# 2024-2025 USAP Field Season
Project Detail

## Project Title

University Of Hawaii Data Acquisition System (UHDAS) Support

## Summary

**Event Number:**
T-933-N
NSF / UH Agreement

**Program Director:**
Dr. David Porter

**ASC POC / Implementer:**
Kenneth Vicknair / Bruce Felix

## Principal Investigator(s)

**Dr. Julia M Hummon**
hummon@hawaii.edu
University of Hawaii Manoa
Joint Institute for Marine and Atmospheric Research (JIMAR)
Honolulu, Hawaii

## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Southern Ocean

## Description

This project consists of the maintenance of Acoustic Doppler Current Profiler computer system on the RV/IB *Nathaniel B. Palmer*. Port calls are required every one to two years to service these systems. Typically, this consists of upgrading or re-installing the UHDAS software on the shipboard data processing computers. Occasionally this will require hardware upgrades that require pre-approval by the U.S. National Science Foundation to ensure the costs are covered by the grant. These computers are used to manage and post-process data.

## Field Season Overview

We expect to send one person to Punta Arenas, Chile to service the RV/IB *Nathaniel B. Palmer* computers sometime during the August

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## Feedback

Please send us an email with suggestions for improvement or to report an error.

through September open period.

No other field work anticipated.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

EarthScope SAGE: Erebus Backbone Network Project

## Summary

**Event Number:**
T-312-M
NSF Agreement

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Paul Sullivan / Jenny Cunningham

## Principal Investigator(s)

**Dr. Glen Mattioli**
glen.mattioli@earthscope.org
EarthScope Consortium
Longmont, Colorado

**Project Web Site:**
https://www.earthscope.org/

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Mount Erebus

## Description

EarthScope SAGE (formerly IRIS/PASSCAL) is designing and fabricating components for a near-real time seismic network to be installed at various locations near the summit of Mount Erebus. This infrastructure will support the scientific and hazard monitoring objectives of the Office of Polar Programs community and supplant the temporary Erebus Interim observational array. The PASSCAL (Program for Array Seismic Studies of the Continental Lithosphere) Instrument Center at New Mexico Tech supports cutting edge seismological research into Earth's fundamental geological structure and processes. The scope of this project does not include a directive for ongoing monitoring of the resulting data, but the data will be archived at the IRIS Data Management Center. This network will be comprised of five stations that each will include broadband, strong motion, and infrasound sensing capabilities.

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### Project WebSites

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### Feedback

Please send us an email with suggestions for improvement or to report an error.

They will also be able to facilitate the expansion of other sensing capabilities.

## Field Season Overview

Support for T-312-M will be entirely provided by EarthScope SAGE participants. The goal this season will be to service the three low-elevation Erebus Perimeter Experiment sites, and to drill boreholes to emplace new seismic sensors and upgraded seismic equipment at the five Erebus Backbone Network (EBN) sites. To work on the summit of Mt. Erebus, the team will acclimatize at Fang Camp and then move up to and reside at Lower Erebus Hut (LEH). LEH will be managed by Antarctic Support Contract (ASC) staff while the team resides there. A drill team of two will first begin drilling 2.5 m deep boreholes at the EBN sites, requiring helicopters to sling the drill to the sites in several trips. The seismic team of four, including one ASC mountaineer, will follow with additional helicopter slings to install seismic equipment in the new boreholes. Installations include new enclosures and power systems, solar panels, broadband seismometers, near-real time telemetry systems, infrasound sensors, and motion sensors. Existing old equipment at the sites will be decommissioned.

## Deploying Team Members

- Samuel Jannke
- Galen Kaip (Team Leader)
- Dianna King (Team Leader)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Cold Regions Research And Engineering Laboratory (CRREL) Activities: McMurdo Shear Zone

## Summary

**Event Number:**
T-940-M
NSF Agreement

**NSF Contact:**
Ms. Carla Haroz

**ASC POC / Implementer:**
Matthew Erickson / Jessica Palen

## Principal Investigator(s)

**Ms. Renee Melendy**

Renee.D.Melendy@usace.army.mil
US Army Cold Regions Research & Engineering Lab
Hanover, New Hampshire

## Location

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

## Description

The Cold Regions Research and Engineering Laboratory (CRREL) activities encompass engineering and basic research in support of a variety of projects at both McMurdo Station and South Pole Station. Work to be completed by CRREL under this event includes program management and support for shear Zone field work and the white out area ground penetrating radar (GPR) survey.

## Field Season Overview

ANT-24-14: Conduct GPR survey to determine if there are other crevasses in the area that are not visible satellite imagery, and to determine the geometry (length and width) of the crevasses that were observed in optical satellite imagery using traditional

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### Feedback

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mountaineering techniques to probe the crevasse (i.e., avalanche probing or digging out). GPR survey will be performed on the ground by two persons on snowmobiles or PistenBully(s) and would require at least one month in McMurdo Station due to the large area. Requires at least one additional mountaineer from Field Support and Training in a second vehicle for safety and support.

## Deploying Team Members

- Zoe Courville
- Emma Erwin
- Austin Lines

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Cold Regions Research And Engineering Laboratory (CRREL) Support: Leverett Glacier

## Summary

**Event Number:**
T-941-M
NSF Agreement

**NSF Contact:**
Ms. Carla Haroz

**ASC POC / Implementer:**
Matthew Erickson / Jessica Palen

## Principal Investigator(s)

**Ms. Renee Melendy**

Renee.D.Melendy@usace.army.mil
US Army Cold Regions Research & Engineering Lab
Hanover, New Hampshire

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Leverett Glacier

## Description

The Cold Regions Research and Engineering Laboratory (CRREL) activities encompass engineering and basic research in support of a variety of projects at both McMurdo and South Pole Stations. At McMurdo Station, CRREL supports ground penetrating radar (GPR) work with the South Pole Traverse (SPoT) and support for the McMurdo Station airfields. CRREL also provides general engineering analysis for projects at McMurdo and South Pole Stations. Work to be completed by CRREL includes ANT-24-03/Leverett Re-route Fieldwork.

## Field Season Overview

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ANT-24-03: Ground campaign using manual GPR surveying to both validate the remote sensing imagery compiled as part of the ANT-22-03 CRREL project and find a safer route that is free of crevasses. In addition, we will collect snow property data (e.g., snow density and hardness) in order to determine best-practice snow bridge crossing criteria for the area, where snow properties are currently unknown, for the range of vehicles using the route as well as ice velocity movement data using GPS station installations. Requires fieldwork in conjunction with the SPoT project, with the timeline coordinated with SPoT2 so that SPoT2 personnel can conduct the fieldwork component of the project, namely field supervision, field safety coordination, blasting, heavy equipment operation, and mechanic duties.

## Deploying Team Members

- Zoe Courville
- Derek Pickell

# 2024-2025 USAP Field Season
Project Detail

## Project Title

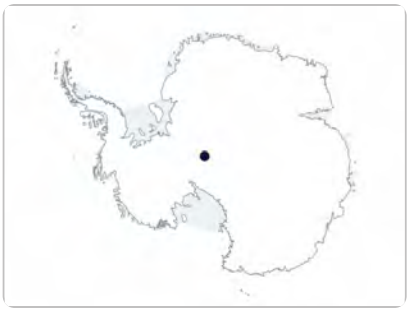
Cold Regions Research And Engineering Laboratory (CRREL) Support: South Pole Station

## Summary

**Event Number:**
T-942-S
NSF Agreement

**NSF Contact:**
Ms. Carla Haroz

**ASC POC / Implementer:**
Matthew Erickson / Jessica Palen / Sheryl Seagraves



## Principal Investigator(s)

**Ms. Renee Melendy**

Renee.D.Melendy@usace.army.mil
US Army Cold Regions Research & Engineering Lab
Hanover, New Hampshire

## Location

**Supporting Stations:** South Pole Station
**Research Locations:** South Pole Station

## Description

The Cold Regions Research and Engineering Laboratory (CRREL) activities encompass engineering and basic research in support of a variety of projects at both McMurdo Station and Amundsen-Scott South Pole Station. Snow drifting poses a significant challenge to polar infrastructure due to increased loads on buildings and the challenges drifts pose to access and maneuverability. Each year, personnel at the South Pole Station must remove significant amounts of deposited snow that accumulate via drifting to prevent overload on buildings and denial of access to facilities. Of particular concern at South Pole Station is the upwind drift, which prevents the Station from acting as a snow-catchment and pushes blowing snow toward the buried power plant, logistics building, garage (Arches) and Elevated Station stairwell structures on Station. The

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project will develop and deploy the Snow Drift Observation System (SnowDOS), a low SWaP (size, weight, power) kinematic mapping system and associated automated processing software suite for monitoring deposited snow drift distribution and volumes at South Pole Station. Resulting observations will provide near-real time maps of the snow drift distribution, depth, accumulation rates and volumetric measurements to be used in both assessing drift mitigation techniques and in snow removal planning.

## Field Season Overview

Two CRREL participants will deploy to South Pole Station for 1 - 1.5 weeks to set up a snow drift observing system, collect initial data, and train on-site staff to operate the system throughout the following year.

## Deploying Team Members

- Dominic Filiano
- Cameron Wagner

# 2024-2025 USAP Field Season
Project Detail

## Project Title

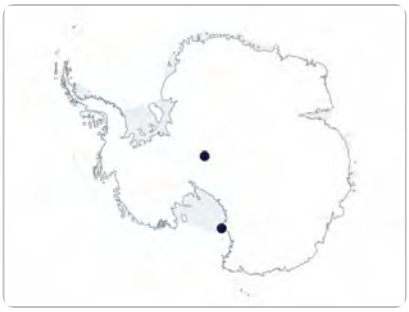
Cold Regions Research And Engineering Laboratory (CRREL) Engineering Support For Antarctic Facilities

## Summary

**Event Number:**
T-946-M/S
NSF Agreement

**NSF Contact:**
Ms. Carla Haroz

**ASC POC / Implementer:**
Matthew Erickson / Tammy Abbett / Sheryl Seagraves



## Principal Investigator(s)

**Ms. Renee Melendy**

Renee.D.Melendy@usace.army.mil
US Army Cold Regions Research & Engineering Lab
Hanover, New Hampshire

## Location

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

## Description

The Cold Regions Research and Engineering Laboratory (CRREL) activities encompass engineering and basic research in support of a variety of projects at both McMurdo Station and South Pole Station. CRREL also provides general engineering analysis for projects at McMurdo Station and South Pole Station. Work to be completed by CRREL under this Engineering Support for Antarctic Facilities.

## Field Season Overview

South Pole Station ANT-24-20: One CRREL participant will deploy to South Pole Station to conduct deformation measurements in the utility tunnels in order to monitor closure rates. As tunnel

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maintenance continues, monitoring points along the tunnel interior and will need to be re-baselined in locations where the walls and ceiling have been disturbed. Participant will also observe the operation and performance of water production and wastewater systems.

McMurdo Station ANT-24-20: Once CRREL participant will deploy to McMurdo Station to interact with U.S. National Science Foundation representatives, Antarctic Support Contract (ASC) FMC (Facilities, Maintenance, and Construction), ASC Operations, and others to oversee progress on construction projects, and facility maintenance executed during the 2024-2025 austral summer season.

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## Deploying Team Members

- Chandler Engel (Co-PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Operation And Maintenance Of A CTBT Radionuclide Monitoring Station At Palmer Station

## Summary

**Event Number:**
T-998-P
NSF / DTRA Agreement

**NSF Contact:**
Ms. Jessie Crain

**ASC POC / Implementer:**
Allison Barden / Jamee Johnson

## Principal Investigator(s)

**Mr. David G Williams**
david.g.williams36.civ@mail.mil
Alexandria, Virginia

**Project Web Site:**
https://www.ctbto.org/

## Location

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

## Description

This project services and calibrates the automated radionuclide air-particulate (RN73 RASA) monitoring system in the International Monitoring Station (IMS) building (i.e., Terra Lab) at Palmer Station. The IMS continuously collects and automatically analyzes daily air samples for radiation. The collected filter-media samples from the RASA are sent to Vienna, Austria quarterly for archiving. Filter samples are shipped, upon request, to various laboratories elsewhere in the world.

## Field Season Overview

The project operates, maintains, upgrades and sustains the RN73 RASA monitoring instrument. The RASA continuously collects and automatically analyses daily air samples for radiation. The collected

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### Feedback

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filter media samples from the RASA are sent to Vienna, Austria for archiving on a quarterly basis. Additionally, periodic requests are made for single samples to be shipped to various laboratories elsewhere in the world. General Dynamics Mission Systems (GDMS) ships consumables for standard operation on an annual basis to RN73. The U.S. Antarctic Program provides year-round, on-site support by the Antarctic Support Contract research associate to help operate and maintain the RASA. In addition, a GDMS engineer deploys each season for maintenance of the RASA, network switches, the uninterruptable power supply, computers and other station related hardware. A pending additional task requiring support from station staff is to replace the sampler's 10-inch inlet stack. Materials for this task are already on site.

## Deploying Team Members

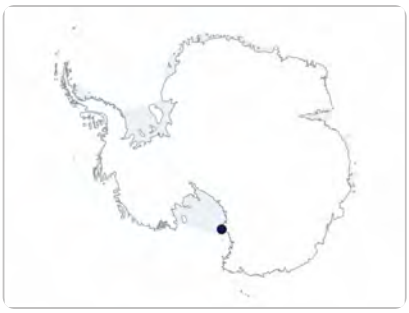
- Gregory Kline

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Research Infrastructure: CCRI: New: Distributed Space And Terrestrial Networking Infrastructure For Multi-Constellation Coexistence

## Summary



**Event Number:**
X-279-M
NSF / CNS 2235139

**NSF Contact:**
Mr. Pat Smith

**ASC POC / Implementer:**
John Rand / 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

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

## Description

Internet infrastructure is currently undergoing a transformative shift driven by ambitious projects aiming to provide global wireless internet connectivity for every individual and internet-connected device on Earth, leveraging mega-constellations of small satellites deployed in low Earth orbit (LEO). Companies such as Starlink, OneWeb, and Amazon Kuiper are at the forefront of this revolution, seeking to deliver low-latency and high-bandwidth internet/broadband services anywhere on Earth. These developments have created a need to conduct real-world experiments on real, deployed LEO networks to confirm performance parameters and potential bottlenecks, develop innovative LEO-specific solutions, and enhance the sophistication,

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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 here is to collect LEOScope data from a stand-alone Starlink terminal based in McMurdo Station, Antarctica. This network is of interest because it requires Starlink to employ inter-satellite links to route data from Antarctica to the internet access point in Sydney, Australia, which is only a subset of the constellation supports. Furthermore, this study will yield invaluable insights into how Starlink and satellite links in general would perform under the harsh polar weather conditions.

## Field Season Overview

The field work for this project will consist of the installation of LEOScope equipment at McMurdo Station. No deployment of grantees is anticipated. A ‘smart hands’ assistance approach will be utilized, with the logistical support contractor information technology and communications staff providing the on-ice equipment installation and assistance on an as-needed basis. Duration of the activity is currently planned to be 12 months, with a follow-on requested, if possible.

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| Cassano, John | O-400-M | Observing the atmospheric boundary over the West Antarctic ice sheet |
| Coffin, Richard | O-269-N | Collaborative Research: Gas hydrate contribution to the Ross Sea carbon budget; Shallow sediment to water column; Present and future |
| Grubisic, Vanda | O-264-P | Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network |
| Grubisic, Vanda | O-257-M/S | Ultra-Violet (UV) measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network |
| Lazzara, Matthew | O-283-M | Collaborative Research: Antarctic automatic weather station program |
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| Munro, David | O-214-N | Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage |
| Salesky, Scott | O-315-M | Collaborative Research: Snow transport in katabatic winds and implications for the |


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| | | |
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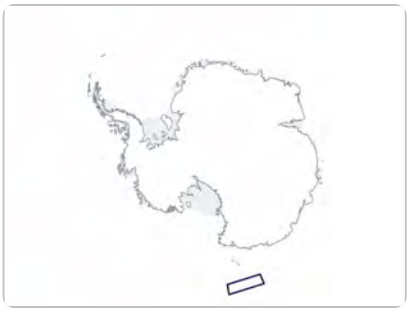
# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Understanding The Massive Phytoplankton Blooms Over The Australian-Antarctic Ridge

## Summary



**Event Number:**
O-288-N
NSF / OPP Award 2135184

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
Kenneth Vicknair / Jamee Johnson

## Principal Investigator(s)

**Dr. Kevin Arrigo**
arrigo@stanford.edu
Stanford University
Geophysics
Stanford, California

**Project Web Site:**
http://ocean.stanford.edu/aar_bloom/

## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Australian/Antarctic Ridge

## Description

Traditionally, it has been assumed that phytoplankton blooms in the Southern Ocean are stimulated by iron from either nearby land or sea-ice. However, recent work demonstrates that hydrothermal vents may be an additional iron source for phytoplankton blooms. This enhancement of phytoplankton productivity by different iron sources supports rich marine ecosystems and leads to the sequestration of carbon in the deep ocean. This interdisciplinary program combines satellite and ship-based measurements of a large, poorly understood phytoplankton bloom in the northwestern Ross Sea sector of the Southern Ocean with a detailed modeling study of the physical processes linking deep dissolved iron reservoirs to the surface phytoplankton bloom. The satellite-based

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component of the program will characterize the broader sampling region before, during, and after our cruise. During the cruise, an automated software system at Stanford University will download and process images of sea ice concentration, Chl-a concentration, sea surface temperature (SST), and sea surface height, and send them electronically to the ship. Operationally, the goal is to use all available satellite data and preliminary model results to target shipboard sampling both geographically and temporally to optimize sampling of the bloom.

## Field Season Overview

The centerpiece of this program will be a 40-day process study cruise in austral summer. The cruise will consist of an initial “radiator” pattern of hydrographic surveys/sections followed by Conductivity, Temperature, and Depth to selected submarine volcanoes. When/if eddies are identified, they will be sampled either during or after the initial surveys. The radiator pattern, or parts thereof, will be repeated two to three times. Hydrographic survey stations will include vertical profiles of temperature, salinity, oxygen, oxidation-reduction potential, light scatter, and PAR (400-700 nm). Samples will be collected for trace metals, ligands, 3He, and total suspended matter. Where intense hydrothermal activity is identified, samples for pH and total CO2 will also be collected to characterize the hydrothermal system. Water samples will be collected for characterization of macronutrients, and phytoplankton physiology, abundance, species composition and size. During transits, they will continuously measure atmospheric conditions, current speed and direction, and surface SST, salinity, pCO2, and fluorescence from the ship’s systems to provide detailed maps of these parameters. The ship will be used as a platform for conducting phytoplankton dissolved iron bioassay experiments at key stations throughout the study region both inside and outside the bloom.

Researchers will also perform detailed comparisons of algal taxonomic composition, physiology, and size structure inside and outside the bloom to determine the potential importance of each community on local biogeochemistry.

One Polar STEAM (Science, Technology, Engineering, Arts, and Math) educator and one Polar STEAM artist will participate in onboard outreach for this project.

## Deploying Team Members

- Kevin Arrigo (PI)
- Cara Askren
- Pamela Barrett
- Tamara Baumberger (Co-PI)
- Patrick Monreal
- Riley Moulton
- Lemona Niu
- Ali Palm
- Claudette Proctor

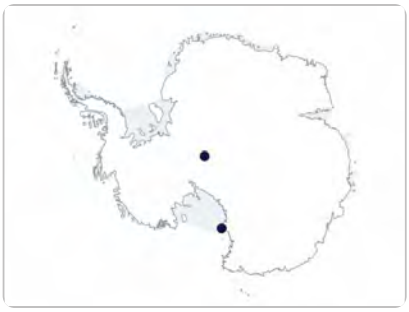
- Nathaniel Buck
- Randelle Bundy
- Annabelle Davis
- Jessalyn Davis
- Jennifer Jackson
- Sophie Jenness
- James Lauer
- Matthew Mills
- Bhavna Rawal
- Joseph Resing (Co-PI)
- Sophia Siegel
- Gerrit Van Dijken
- Amanda Vanegas Ledesma
- Stevie Walker

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Antarctic SuperDARN Research, Operations, And System Enhancements

## Summary



**Event Number:**
A-369-M/S
NSF / OPP Award 2035105

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Randolph Jones / Sheryl Seagraves

## Principal Investigator(s)

**Dr. William Bristow**
wab5217@psu.edu
Pennsylvania State University
Fairbanks, Alaska

**Project Web Site:**
http://superdarn.met.psu.edu

## Location

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

## Description

The Super Dual Auroral Radar Network (SuperDARN) is a global, international radar network of 32 installations observing high-frequency (HF) bands between eight and 22 MHz. These systems help answer questions about the geomagnetic conjugacy of global magnetic storms and substorms, and the differences in ionospheric plasma convection caused by the asymmetry of solar illumination in both hemispheres. The SuperDARN network can observe global-scale convection with excellent temporal and spatial resolution, which makes it a powerful tool for ground-based research, enabling scientists to address fundamental and important questions of space physics. The data it acquires are also relevant to space-weather

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### Feedback

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studies, and they enhance the usefulness of data from other instruments.

## Field Season Overview

Two participants will deploy to South Pole Station and McMurdo Station for equipment maintenance and upgrades. At McMurdo Station, it is anticipated that any damage from over the winter will be repaired, and additional mid-mast guying, to reduce future wind-induced damage, will be completed. In addition, at both stations, minor modifications to the transmitters and other minor annual maintenance will be undertaken within the limits of deployment time. Otherwise, the systems will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by Antarctic Support Contract staff and other station infrastructure (e.g., IT network, station services) as needed.

## Deploying Team Members

- William Bristow (PI)
- David Flores

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Fe And Na LiDAR Investigations Of Geospace-Atmosphere Temperature, Composition, Chemistry, And Dynamics At McMurdo, Antarctica

## Summary

**Event Number:**
A-123-M
NSF / OPP Award 2110428

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Randolph Jones / Richard Dean

## Principal Investigator(s)

**Dr. Xinzhao Chu**
xinzhao.chu@colorado.edu
University of Colorado Boulder
CIRES
Boulder, Colorado

**Project Web Site:**
http://cires1.colorado.edu/science/groups/chu/

## Location

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

## Description

Researchers on this project operate two narrow-band, multi-frequency Doppler LiDARs at McMurdo Station. These LiDAR can make high-resolution observations of winds and temperatures in the middle and upper atmosphere. Simultaneous observations by the two instruments - a sodium LiDAR and an iron Boltzmann LiDAR - provide unprecedented levels of detail to characterize atmospheric conditions. The instruments have been hosted by Antarctica New Zealand (ANZ) in their Arrival Heights laboratory since late 2010. The observations provide critical data to address key science challenges associated with the space-atmosphere

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### Feedback

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interaction region and, in particular, the sparsely observed high-latitude southern hemisphere.

## Field Season Overview

An Fe Boltzmann LiDAR and a STAR Na Doppler LiDAR have been operated at Arrival Heights AntNZ building (Lab C) all year round since late 2010. LiDAR data were first accumulated for 10 years from December 2010 through October 2020, then an unfortunate 22-month data gap due to the COVID-19 pandemic, and then data collection was resumed and has been ongoing since early September 2022. The season of 2024-2025 is a continuation of the McMurdo Station LiDAR observations since its successful restart during WinFly 2022 and a successful winter 2023. Two winterover LiDAR students operated the two LiDAR through winter 2024.

This 2024-2025 season presents the best opportunity for the team to conduct LiDAR upgrade, refurbishment, and student training, including re-coating of the STAR Na LiDAR's large telescope mirror (81 cm). Five participants to deploy for the season 2024-2025, including two winterover students for winter 2025, the PI, and two future winterover students for winter 2026.

## Deploying Team Members

- Xinzhao Chu (PI)
- Ariel Diddams
- Jack Iribarren
- Sydney Mayer
- Kamen Schaefle

# 2024-2025 USAP Field Season
Project Detail

## Project Title

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

## Summary

**Event Number:**
C-013-P
NSF / OPP Award 2224611

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Ryan Steiner / Jamee Johnson

## Principal Investigator(s)

**Dr. Megan A Cimino**
megan.cimino@noaa.gov
University of California Santa Cruz
Monterey, California

**Project Web Site:**
https://pallter.marine.rutgers.edu/

## Location

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

## 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 Time Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the 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 climate warming, natural climate variability and storms. These disturbances alter food-web composition and ecological interactions across temporal and spatial scales that are not well understood.

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### Feedback

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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 primary role of this component is broadly defined within the context of long-term research that seeks to identify and understand the factors that regulate the demography of Adélie penguins. Research is focused on breeding chronology, breeding biology, foraging ecology and population dynamics. The core data associated with these studies are derived primarily from local populations near Palmer Station. This approach capitalizes on databases that span more than three decades, allowing the Palmer seabird component to address a broad suite of ecological issues. These include interactions between climate migration and community structure, the effects of landscape geomorphology on biological populations, the mechanics of source-sink population dynamics, and establishing basic conceptual and empirical links between marine and terrestrial ecology.

Participants will deploy from roughly late October until mid-April. Three to four team members will live at Palmer Station while conducting their field research. The team will use small boats to access local islands in the Palmer Station vicinity and will make frequent day trips to seabird colonies in the local, distant and extended boating areas including Dream Island, Biscoe Point, the Joubin Islands, the Wauwermans Islands, and the Rosenthal Islands.

## Deploying Team Members

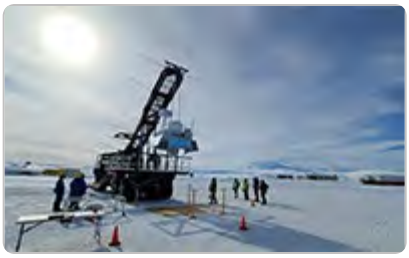
- Helena Dodge
- Victoria Hermanson
- Wriley Hodge
- Allison Northey
- Richard Robbins
- Darren Roberts
- Megan Roberts

# 2024-2025 USAP Field Season
Project Detail

## Project Title

AESOP-Lite: Anti-Electron Sub-Orbital Payload – Low Energy

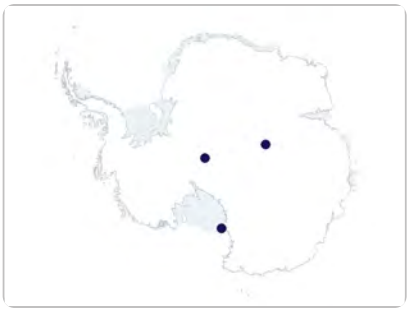
## Summary



**Event Number:**
A-148-M/S
NSF / NASA Agreement

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Kaija Webster / Chad Naughton



## Principal Investigator(s)

**Dr. John M Clem**
jmc@udel.edu
University of Delaware
Physics and Astronomy
Newark, Delaware

**Project Web Site:**
https://sites.udel.edu/aesoplite/

## Location

**Supporting Stations:** McMurdo Station, South Pole Station
**Research Locations:** South Pole Station, McMurdo Station, Long Duration Balloon Facility

## Description

The AESOP-Lite scientific balloon payload competed a successful flight in the 2023-24 season and landed 611 miles grid east of the South Pole Station. Due to the late-season flight and termination combined with the complicated logistics of recovery from AESOP-Lite's remote landing site, payload recovery was deferred to a subsequent season. This season's AESOP-Lite recovery operations are subcontracted through Arctic Truck without the onsite assistance of A-148-M, the NASA Columbia Scientific Balloon Facility (CSBF), or Antarctic Support Contract (ASC) personnel.

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### Feedback

Please send us an email with suggestions for improvement or to report an error.

## Field Season Overview

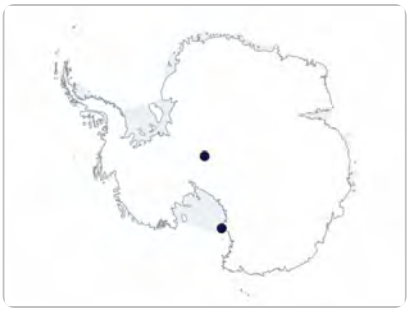
The fully integrated payload will be recovered from the field and transported by Arctic Trucks to the South Pole Station. South Pole Station ASC staff will prepare and palletize the instrument for shipment by LC-130 aircraft to McMurdo Station. ASC and CSBF team members will disassemble and pack the payload at McMurdo Station for shipment back to the United States.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Local-Scale Drivers And Responses Of Thermospheric Weather Above Antarctica

## Summary



**Event Number:**
A-343-M/S
NSF / OPP Award 2029459

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / 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

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

## Description

This project operates and maintains ground-based Fabry-Perot spectrometers at McMurdo Station and South Pole Station. The instruments measure mesospheric and thermospheric neutral winds and temperatures at heights of around 87 km, 120 km and 240 km. Data collected informs both large-scale changes in mean flow and small-scale local perturbations, independently resolves impacts due to forcing from above and from below and contributes to studies utilizing data from other types of observing systems located in Antarctica.

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## Project WebSites

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## Feedback

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## Field Season Overview

The baseline tasks at both South Pole Station and McMurdo Station for the 2024-25 field season include performing routine calibration and alignment procedures that were not done during the 2023-24 season, backing-up the computer systems and hand carrying full-resolution data files that are too large for reliable transmission over the U.S. Antarctic Program network, repairing any faults that may occur during the 2024-25 observing season, and restocking spare parts. The spectrometer filter wheel and sky/calibration view switch assemblies will be replaced with a newly developed 3D printed unit that combines both functions in a single mechanism.

In addition, instrumentation will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by Antarctic Support Contract staff and other station infrastructure (e.g., IT network, station services) as needed.

---

## Deploying Team Members

- Kylee Branning
- Cameron Westerlund

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Using Multiple Stable Isotopes To Investigate Middle To Late Holocene Ecological Responses By Adélie Penguins In The Ross Sea

## Summary

**Event Number:**
B-034-M
NSF / OPP Award 2135695

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Ryan Steiner / Jenny Cunningham

## Principal Investigator(s)

**Dr. Steven D Emslie**
emslies@uncw.edu
Department of Biological Sciences
Wilmington, North Carolina

**Project Web Site:**
https://itsweb02.uncw.edu/penguins/

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Marble Point, Dunlop Island, Cape Barne, Cape Royds, and Cape Crozier

## Description

The Adélie penguin (*Pygoscelis adeliae*) is the most abundant penguin in Antarctica, though its populations are currently facing threats from climate change, loss of sea ice habitat, and food supplies. In the Ross Sea region, the cold, dry environment has allowed preservation of Adélie penguin bones, feathers, eggshell, and even mummified remains, at active and abandoned colonies that date from before the Last Glacial Maximum (>45,000 years ago) to the present. A warming period at 4,000 to 2,000 years ago, known as the penguin 'optimum,' reduced sea ice extent allowing this species to access and breed along the Scott Coast in the southern Ross Sea. This coastline likely will be reoccupied in the future as marine conditions change with current warming

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trends. This project will investigate ecological responses in diet and foraging behavior of the Adélie penguin using well-preserved bones and other tissues that date before, during, and after the penguin 'optimum.' A suite of three stable isotopes (carbon, nitrogen and sulfur) will be analyzed in these bones and feathers from active and abandoned colonies to assess ecological shifts through time. Using these three isotopes from collagen, ancient, and modern penguin colonies will be investigated in the southern, central and northern Ross Sea to determine changes in populations and foraging locations over millennia.

## Field Season Overview

In 2024-25, a field team of three will deploy to McMurdo Station for three to four weeks. With helicopter day trips from McMurdo Station, they will collect ancient and modern Adélie penguin samples from the Marble Point region (including Marble Point to Dunlop Island), and Capes Barne, Crozier, and Royds, with two to three days of sampling per site.

Following collections in the McMurdo region, with an international support agreement between the U.S. Antarctic Program (USAP) and the Italian National Antarctic Program (ENEA), the team will deploy to Mario Zucchelli Station via USAP fixed-wing aircraft. From Mario Zucchelli, researchers will use Italian helicopter support over two weeks to sample in the central Ross Sea area including Cape Irizar, Adélie Cove, Inexpressible Island and Edmonson Point. Researchers will then move back to McMurdo Station and redeploy to New Zealand by late January.

## Deploying Team Members

- Steven Emslie (PI)
- Valerie Munoz
- Juan Zuluaga

# 2024-2025 USAP Field Season
Project Detail

## Project Title

NASA Long Duration Balloon (LDB) Support Program

## Summary

**Event Number:**
A-145-M
NSF / NASA Agreement

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / 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

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

## Description

The NASA Columbia Scientific Balloon Facility (CSBF) provides launch, tracking and control, airspace coordination, telemetry and command systems, and recovery services for unmanned high-altitude balloon operations in Antarctica. This season, two launches from McMurdo Station, and one recovery of a payload from a previous campaign, are scheduled:

- GAPS (General AntiParticle Spectrometer) on a 40mcf balloon.

- Salter Test Flight Universal on an 11.8mcf balloon.

  • The Salter mission is scheduled to carry up to 6 ‘piggyback’ payloads performing a variety of operational and observational

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### Feedback

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experiments. Included are the: Ice Dragon Drops, EMIDSS, BAS-M, MARSBOx, ANIHALA, and BIGS payloads. The MARSBOx experiment is notable in that it will be carrying melanized fungi for research designed to study the biological effects of cosmic interstellar radiation on live organisms in a Mars-analog environment.

- AESOP-Lite Recovery (Anti-Electron Sub-Orbital Payload – Low Energy).

The payloads consist of science instruments, command/control systems and solar/battery power units. The bulk of the data collected is stored on onboard hard drives, with a small amount of data transmitted to ground based receiving stations via radio telemetry. After the flight has been completed recovery support is required in order to disassemble the instrument and return data/equipment from the field to McMurdo Station for northbound shipping to the United States.

## Field Season Overview

NASA/CSBF will launch and support flight performance of balloon-borne science experiments designed to attain high-altitudes and extended flight durations from the LDB facility on the Ross Ice Shelf. On-site planning and preparation will begin mid-October. During this time CSBF will unpack cargo, de-winterize and test equipment, assemble flight systems, and support science teams with instrument construction. The target launch ready date for the science groups is December 1. This date typically coincides with the setup of the circumpolar stratospheric winds which move the balloons above Antarctica at the target altitude. The balloons will travel counterclockwise in a revolution around the Antarctic continent between 70 and 80 degrees south latitude at an altitude of ~115,000 to ~160,000 feet. Flight duration for one revolution is typically 8 to 15 days, however, overall flight time can be longer. At the end of the flight the balloons will be terminated over a suitable location and payloads recovered from the field.

## Deploying Team Members

- Tyler Barnard
- Scott Battaion (Co-PI)
- Alexander Beange
- John Boyd
- Garrison Breeding
- Christian Coop
- Juan DeLuna
- Joseph Flowers
- Curtis Frazier
- Juan Mendez
- Daniel Morris
- Robert Mullenax
- Brian Parker
- Erin Reed
- Zachary Rosprim
- Gilberto Sanchez
- Christopher Schwantes
- Daniel Seegmiller

- Brent Heilman
- Randall Henderson
- Derek Hogg
- Andrew Hynous
- Joseph Jones
- Todd Lankford
- Bethany MacQueen
- Ausan McGaugh
- Michael Sellers
- Alejandro Vega
- Cesar Villasana
- Jonathan Walling
- Christian Ward-Bourdeaux
- Corey Weber
- Christopher Yoder

# 2024-2025 USAP Field Season
Project Detail

## Project Title

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

## Summary

**Event Number:**
C-024-P
NSF / OPP Award 2224611

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
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

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

## 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 Time Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the 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 climate warming, natural climate variability and storms. These disturbances alter food-web composition and ecological interactions

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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

Cetaceans are a critical, yet poorly studied, component of the Antarctic marine ecosystem. Two participants will be deploying to Palmer Station to study the life history, recovery from commercial whaling, population structure, and foraging ecology of the whale population. They will use a combination of visual surveys, photographic identification, skin and blubber biopsy sampling, long-term satellite-linked tagging, and short-term multi-sensor behavioral tagging to understand the population recovery of these ocean giants and their ecological role in a changing environment. In combination with other components of the PAL-LTER, researchers will test specific ecological hypotheses regarding how changes in the physical and biological environment affect the distribution and behavior of baleen whales. Likewise, they will begin to test hypotheses about the potential for interspecific competition with other krill predators (e.g., penguins) throughout the PAL-LTER study area.

## Deploying Team Members

- Mason Cole
- Ross Nichols

# 2024-2025 USAP Field Season
Project Detail

## Project Title

MCM-LTER: MCM6 - The Roles Of Legacy And Ecological Connectivity In A Polar Desert Ecosystem

## Summary

**Event Number:**
C-505-M
NSF / OPP Award 2224760

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
Ryan Steiner / Jane Dell / 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

**Supporting Stations:** McMurdo Station
**Research Locations:** McMurdo Dry Valleys

## Description

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

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### Feedback

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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. Tests of these hypotheses will occur in field and modeling activities using new and long-term datasets already collected.

## Field Season Overview

In the second field season of MCM6, twenty participants will deploy between late October and mid-February to continue long-term monitoring efforts on glaciers, lakes, streams, and soils, as well as collect data from meteorological stations and a network of deployed sensors in and around the McMurdo Dry Valleys.

The team will use Crary Lab space to prepare for field work, process and store samples, conduct analyses, and pack samples for shipment. Helicopter support will be used to access Taylor Valley field camps and field sites throughout the Dry Valleys, with participants working from the camps for extended periods or making day trips from McMurdo Station. EarthScope GAGE (T-295-M) will provide support measuring lake levels, setting up and servicing GPS stations, and flying Uncrewed Aerial System surveys.

## Deploying Team Members

- Byron Adams (Co-PI)
- John Barrett (Co-PI)
- Abigail Borgmeier
- Thomas Bornholdt
- Jared Collins (Team Leader)
- Melisa Diaz (Co-PI)
- Peter Doran (Co-PI)
- Charles Dougherty
- David Giovannetti-Nazario
- Michael Gooseff (PI)
- Kayla Hubbard
- Jade Lawrence (Team Leader)
- Tyler Mackey (Co-PI)
- Denise Mondragon
- Emily Reynebeau
- Mark Salvatore (Co-PI)
- Gavin Wagner
- Kathleen Welch
- Morgan Wood
- Lydia Zeglin (Co-PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collection Of Atmospheric Air For The NOAA/Global Monitoring Division (GMD) Worldwide Flask-Sampling Network

## Summary

**Event Number:**
O-264-P
NSF / NOAA Agreement

**Program Director:**
Dr. David Porter

**ASC POC / Implementer:**
Paul Sullivan / Jamee Johnson

## Principal Investigator(s)

**Dr. Vanda Grubisic**
vanda.grubisic@noaa.gov
National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

**Project Web Site:**
https://gml.noaa.gov

## Location

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

## Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) team conducts long-term measurements of ultra-violet (UV) radiation and trace gas constituents that influence climate and the ozone layer. The work at Palmer Station is done in conjunction with the ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. Similar work is performed at McMurdo Station and South Pole Station under another event number for administrative convenience. The measurements are used for time-series analysis

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### Feedback

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of multi-year data records that focus on stratospheric ozone depletion, trans-Antarctic transport and deposition, interplay of the trace gases and aerosols with the solar and terrestrial radiation fluxes on the polar plateau, the magnitude of seasonal and temporal variations in greenhouse gases, and the development of polar stratospheric clouds over Antarctica. Other objectives are to determine the rate at which concentrations of these atmospheric constituents change, and to examine their sources, sinks, and budgets. Working with climate modelers and atmospheric chemists, these data are used to determine how the rate of change of these parameters affects climate and serve as inputs and verification for climate models.

## Field Season Overview

The Palmer Station research associate (RA) provides year-round support for the UV monitoring instruments. Typically, site visits are needed every two years for one NOAA UV instrument participant. The next maintenance visit for the UV monitoring system is tentatively scheduled for the 2025 season. Additionally, the RA performs Scripps, CCGG and LOGOS air sampling. Samples are shipped back to the United States for analysis.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

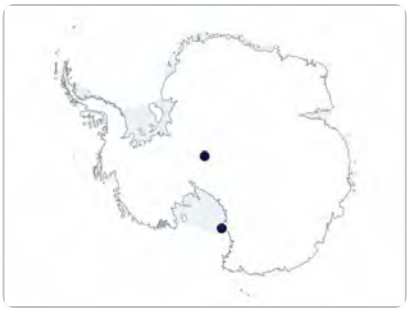
Ultra-Violet (UV) Measurements At McMurdo Station For The NOAA/Global Monitoring Division (GMD) Antarctic UV Network

## Summary

**Event Number:**
O-257-M/S
NSF / NOAA Agreement

**Program Director:**
Dr. David Porter

**ASC POC / Implementer:**
Paul Sullivan / Randolph Jones / Sheryl Seagraves



## Principal Investigator(s)

**Dr. Vanda Grubisic**
vanda.grubisic@noaa.gov
National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)
Boulder, Colorado

**Project Web Site:**
https://gml.noaa.gov/

## Location

**Supporting Stations:** McMurdo Station, South Pole Station
**Research Locations:** Field Local, Arrival Heights, South Pole Station Atmospheric Research Observatory (ARO)

## Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) team conducts long-term measurements of ultra-violet radiation and trace gas constituents that influence climate and the ozone layer. The work at McMurdo Station and South Pole Station is done in conjunction with the ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. Similar work is

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### Feedback

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performed at Palmer Station. The measurements are used for time-series analysis of multi-year data records that focus on stratospheric ozone depletion, trans-Antarctic transport and deposition, interplay of the trace gases and aerosols with the solar and terrestrial radiation fluxes on the polar plateau, the magnitude of seasonal and temporal variations in greenhouse gases, and the development of polar stratospheric clouds over Antarctica. Other objectives are to determine the rate at which concentrations of these atmospheric constituents change, and to examine their sources, sinks, and budgets. Working with climate modelers and atmospheric chemists, these data are used to determine how the rate of change of these parameters affects climate and serve as inputs and verification for climate models.

## Field Season Overview

This season, up to five deploying participants will focus on South Pole Station including upgrades and routine maintenance for the instruments located in the Atmospheric Research Observatory, regular launch of atmospheric balloons, and shipment of air samples to NOAA ESRL/GMD for analysis of carbon dioxide and other trace constituents. Two participants staff the South Pole Station Atmospheric Research Observatory facility year-round. At McMurdo Station, a research associate provides year-round support for the instruments located at Arrival Heights with daily checks, routine calibrations, and troubleshooting (as needed).

## Deploying Team Members

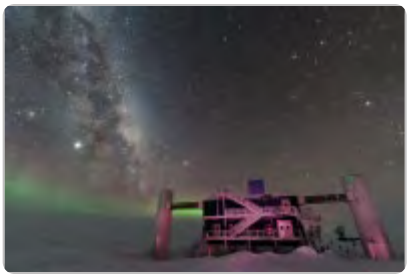
- Andrew Clarke
- Roger Crocker
- Skyler Jordan
- Logan Soldo

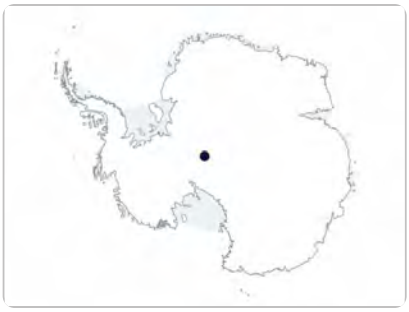
# 2024-2025 USAP Field Season
Project Detail

## Project Title

Management And Operations Of The IceCube Neutrino Observatory 2021-2026

## Summary





**Event Number:**
A-333-S
NSF / OPP Award 2042807

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
Paul Sullivan / 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

**Supporting Stations:** South Pole Station
**Research Locations:** South Pole Station: IceCube Laboratory

## Description

The IceCube Neutrino Observatory (ICNO) is located at the South Pole Station in the deep ice. The ICNO's Management & Operations (M&O) core team of researchers and engineers maintain the existing neutrino detector infrastructure at the South Pole and home institution, guaranteeing an uninterrupted stream of scientifically unique, high-quality data. The M&O activities are built upon more than a decade successful experience of managing the overall ICNO operations after completing the NSF-funded major research facility IceCube project where hardware and software systems were developed and deployed by the core team on schedule and within budget. Effective coordination of efforts by the

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### Feedback

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M&O personnel and from within the IceCube Collaboration has yielded significant increases in the performance of this cubic-kilometer detector with time. The broader impacts of the ICNO/M&O activities are strong, involving postdocs and students in day-by-day operation and calibration of the cubic-km neutrino detector. The extraordinary physics results produced by ICNO in the past decade and its extraordinary location at the South Pole have a high potential to excite the imagination of high school students and the public in general at a national and international level.

## Field Season Overview

On-site fieldwork for the upcoming season includes Maintenance and Operations improvements to the existing IceCube infrastructure located at the South Pole Station: 1) Winterover training and transition; 2) ICL firewall lifecycle replacement; 3) ICL remote power distribution unit replacements; 4) Disposal of old UPSs and lead-acid batteries; 5) On-ice DAQ support and DOMHub maintenance; 6) Replacement of archival data hard-drives; 7) ICL upwind drift management; 8) Construction of snow access ramp in front of ICL; 9) Annual survey of designated IceTop tanks; 10) IceTop marker pole extensions and maintenance; 11) IceACT upgrade; 12) ARA DAQ maintenance; 13) ICL mini wind turbine maintenance; and 14) Surface array antenna maintenance;15) Vault extension for ARA station A2. IceCube Upgrade integration and support activities including: 1) Termination of 50A power drops over rack-14; 2) Installation of rack-14 upgrade equipment; 3) Field support for upgrade cable pull; and 4) Upgrade DOM testing support.

## Deploying Team Members

- Ralf Auer
- Joe Baines-Holmes
- Abigail Bishop
- Ilya Bodo
- Kayla DeHolton
- Colton Hill
- John Kelley
- Mirko Kugelmeier
- Maclean Mansfield-Parisi
- Sarah Mechbal
- Alexander Novikov
- Larissa Paul

# 2024-2025 USAP Field Season
Project Detail

## Project Title

STC: Center For OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau

## Summary

**Event Number:**
I-187-M
NSF / OPP Award 2019719

**Program Director:**
Dr. Kelly Brunt

**ASC POC / Implementer:**
Allison Barden / Jenny Cunningham / Matthew Kippenhan

## Principal Investigator(s)

**Dr. John A Higgins**
higgins.ja@gmail.com
Princeton University
Department of Geosciences
Princeton, New Jersey

**Project Web Site:**
https://coldex.org/

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Allan Hills

## Description

The Center for Oldest Ice Exploration (COLDEX) will address fundamental questions critical to understanding past and future climate change, including sensitivity to higher levels of greenhouse gases, the role of greenhouse gases in the evolution of ice age cycles, and the behavior of the Antarctic ice sheet in warmer climates. This is a Science and Technology Center proposal that involves multiple United States institutions. Antarctic field campaigns are required to support the central focus of the effort: 1) To identify sites for a continuous 1.5-million-year ice core capable resolving orbital cycles in climate variables; and 2) To

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### Project WebSites

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### Feedback

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create an archive of well-documented old ice samples. I-187-M addresses that second goal.

## Field Season Overview

Eleven participants, including three U.S. Ice Drilling Program (IDP) drillers, will work out of a Twin Otter- and Basler-supported camp at the Allan Hills Blue Ice Area. Two Antarctic Support Contract staff will manage the camp. Over seven to eight weeks, the team will drill for ice cores using two drill rigs: The large-bore Blue Ice Drill, and a smaller diameter Eclipse Drill, both provided by IDP. The team will split in two to work each drill at different locations, drilling several cores between 80 and 200 m deep. Recovered ice cores will be packed in ice core boxes, then transported weekly by Twin Otter to McMurdo Station for storage and eventual shipment off continent to the U.S. National Science Foundation Ice Core Facility. The team will recover up to 24,000 lb of ice, filling up to 135 ice core boxes.

## Deploying Team Members

- Jacob Chalif
- Jenna Epifanio
- Tyler Fudge (Team Leader)
- Andrew Haala
- Abigail Hudak
- Fairuz Ishraque
- Liam Kirkpatrick
- Tanner Kuhl
- Elizabeth Morton
- Jeffrey Severinghaus (Team Leader)
- Margot Shaya

# 2024-2025 USAP Field Season
Project Detail

## Project Title

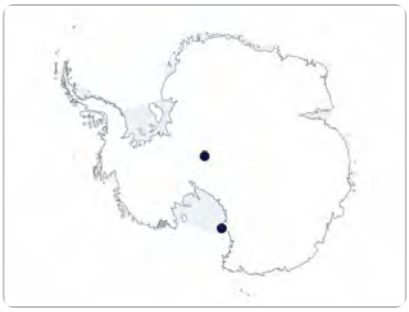
Collaborative Research: IceCube Upgrade: An IceCube Extension For Precision Neutrino Physics And Astrophysics

## Summary


**Event Number:**
A-334-M/S
NSF / OPP Award 2227092

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
Paul Sullivan / Sheryl Seagraves / Leah Street

## Principal Investigator(s)


**Dr. Albrecht Karle**
karle@icecube.wisc.edu
University of Wisconsin Madison
Department of Physics
Madison, Wisconsin


**Project Web Site:**
https://icecube.wisc.edu

## Location

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

## Description

The IceCube Upgrade will deploy seven additional strings of optical sensors in the bottom center of the current IceCube Neutrino Observatory. The new strings will use multi-Photo Multiplier Tube (PMT) Digital Optical Modules (mDOMs) which provide better direction and more than double the photocathode area per module than traditional IceCube DOMs. The Enhanced Hot Water Drill (EHWD) used previously will be upgraded and optimized for the needs of the proposed one-season drill campaign. Originally this was a 5-year project; year one started in Fiscal Year (FY) 2019. In FY 2020, the existing EHWD systems were tested, and the drill's refurbishment has begun. However, because of the COVID-19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### Feedback

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pandemic, the ice-work was significantly delayed. The Upgrade project is now re-baselined and field work started in FY 2024 (Field Season, FS1) with drilling scheduled in FY 2026 (FS4). The project will utilize an Antarctic Support Contract (ASC) project coordinator to facilitate cargo movement from McMurdo Station to South Pole Station via the South Pole Traverse (SPoT) and LC-130s as fits into the overall logistics schedule.

## Field Season Overview

On-site South Pole Station fieldwork for the upcoming season includes: 1) Excavate, warm, and recommission the winterized drill camp components, the Independent Firn Drill, and the ARA drill; 2) Complete drill camp build out; 3) Drill 9 firn holes with the Independent Firn Drill; 4) Integrate subsystems at the drill camp into a full system; 5) Complete upgrades and repairs to Tower Operations Site infrastructure (TOS 1, TOS 2, Tower 1 & Tower 2) and complete repairs and upgrades to winches and reels; 6) Continue the upgrades and repairs to subsystems, including completion of installation kits for new drill control system motor drives, TOS/Tower setup, reels testing, and motor drive and control system commissioning; 7) Install new drill hose and heating system on the drill supply hose reel; 8) Tune and demonstrate load sharing between the supply hose reel and main drill cable reel; 9) Commission, troubleshoot, and complete full system wet testing of the hot water drill; 10) De-water the drill, winterize, stow cargo for winter, and setup DNF storage and hose heating systems for winter; 11) Install the Surface Junction Boxes (SJB), trench surface cables, run surface cables from SJB to ICL server room patch panel; 12) Assemble DOM handling facility; 13) Prep and set up sensor handling facility, including sleds, tent, and heated shack; 14) Test two strings of optical modules in the sensor handling facility; and 15) Store all on-site optical modules in allocated DNF space for winter. McMurdo Station (ASC support only, no project tasking planned): 1) Prepare cargo for transport via SPoT or LC-130 and 2) Provide housing and workspace for transiting personnel.

## Deploying Team Members

- Terry Benson
- Tony Carleton
- Jason Chan
- Michael DuVernois
- Jeanne Edwards
- Erik Ejdepalm
- Anatoli Fedynitch
- Brent Folmer
- Christian Nielsen
- Thomas Nordin
- Vivian O'Dell
- Alexis Oxborough
- Chana Sinsabvrodom
- Kurt Studt
- Karl-Heinz Sulanke
- Åse Torgilsson

- Skyler Grulke
- Jennifer Heinzen
- Albrecht Karle (PI)
- Bryan Monteiro
- Jacob Nesbit
- Christopher Ng
- Delia Tosi
- Neil Waddell
- Jeff Weber
- Paul Wisniewski
- Michael Zernick

# 2024-2025 USAP Field Season
Project Detail

## Project Title

NSFGEO-NERC: Investigating The Direct Influence Of Meltwater On Antarctic Ice Sheet Dynamics

## Summary

**Event Number:**
I-347-E
NSF / OPP Award 2053169

**Program Director:**
Dr. Kelly Brunt

**ASC POC / Implementer:**
Allison Barden / Diane Hutt

## Principal Investigator(s)

**Dr. Jonathan Kingslake**
j.kingslake@columbia.edu
Columbia University
Lamont-Doherty Earth Observatory
New York, New York

**Project Web Site:**
https://ldeo-glaciology.github.io/AntPen_NSF_NERC/

## Location

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

## Description

Surface melting is widespread in Antarctica and predicted to increase significantly as Antarctica warms. This United States/United Kingdom project will take steps toward understanding and predicting these changes. The team will test three 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 is widespread in Antarctica today; and 3) This results in a measurable increase in mean annual ice discharge. In addition to the fieldwork described below, the team will conduct a continent-wide remote sensing survey using synthetic aperture radar and multi-spectral imagery

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to comprehensively map meltwater on grounded ice and short-term velocity variations.

## Field Season Overview

This project is in conjunction with the British Antarctic Survey (BAS) with three seasons of field work scheduled in 2024-25, 2025-26, and 2026-27 for installation, maintenance, and removal of survey equipment respectively. Fieldwork will be conducted on Flask Glacier on the Antarctic Peninsula deploying GNSS, passive seismometers, Uncrewed Aerial Systems (UAS), Automatic Weather Stations (AWS), and ice-penetrating radar. For the 2024-25 season, the U.S. Antarctic Program (USAP) support will involve cargo and grantee travel support. Cargo will be shipped to Punta Arenas, Chile and transferred to BAS. BAS will then handle the cargo transportation to Rothera Station and into the field.

One USAP participant will deploy via the USAP travel system to Punta Arenas, Chile before flying to Rothera Station and joining the field team including BAS field guides. Field gear and camp rations will also be supplied by BAS. From Nov 2024 - Jan 2025 the team will install equipment (i.e., dGNSS systems, ApRES systems, thermistor strings, passive seismic and an AWS) at Flask Glacier. The team will conduct maintenance to raise and collect data from installed instruments in 2025-26 and will return in the 2026-27 field season to collect instruments during retrograde. During the first two seasons, the team will deploy a fixed-wing UAS equipped with single-frequency GNSS and an SLR camera on repeat flights along a ~ 40-km round-trip survey grid.

## Deploying Team Members

- Rohi Muthyala

# 2024-2025 USAP Field Season
Project Detail

## Project Title

CAREER: Foraging Ecology And Physiology Of Emperor Penguins In The Ross Sea

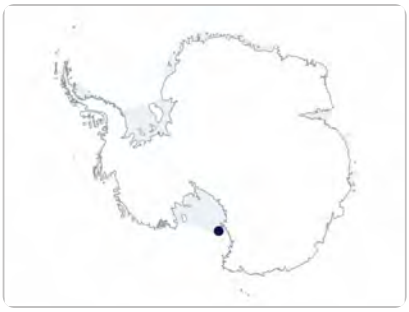
## Summary

**Event Number:**
B-245-M
NSF / OPP Award 1943550

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Ryan Steiner / Randolph Jones

## Principal Investigator(s)



**Dr. Birgitte I McDonald**
birgitte.mcdonald@sjsu.edu
Moss Landing Marine Laboratories
East Garrison, California

**Project Web Site:**
https://mlml.sjsu.edu/birdmam/

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Cape Crozier

## Description

Survival of Emperor penguins depends on their ability to effectively locate patchy prey resources. Changes in prey resources can permeate through the food web and modify penguin foraging behavior, and ultimately survival and reproduction. This project will address fundamental information gaps about the foraging ecology and habitat use of Emperor penguins during critical periods of their life history using a combination of technological and analytical tools. Specifically, we will: 1) Investigate the inter- and intra-individual behavioral variability exhibited by Emperor penguins during the three-month post-molt and early winter foraging trips; and 2) Integrate penguin behavioral data with environmental data to identify which environmental features are indicative of habitat preference when not constrained to returning to the colony to feed

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### Feedback

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a chick.

## Field Season Overview

In collaboration with researchers from the Antarctic New Zealand (ANZ) program, four participants (three U.S. and one NZ) will deploy to a Cape Crozier field camp to study foraging ecology and habitat use of Emperor penguins (*Aptenodytes forsteri*) during late-chick rearing (mid-October through late November). The team will capture up to 32 penguins departing for a foraging trip, which will be weighed, morphometrics collected, sampled (feather), and instrumented with data loggers. About 20 penguins will be instrumented with data loggers recording GPS, depth, and acceleration, and up to four of these penguins will also be instrumented with a video datalogger. When penguins return from a foraging trip, they will be relocated using a radio transmitter, recaptured, weighed, measured, and a blood sample collected. For the three American participants, the U.S. Antarctic Program will support Physical Qualification, travel to New Zealand, Extreme Cold Weather Gear, cargo support, and sample shipping. Antarctic New Zealand will support travel to and from the field site, laboratory supplies, helicopter support, pre-deployment training/s, lodging (at Scott Base and Cape Crozier), and other necessary field support while on the continent.

## Deploying Team Members

- Kimberly Goetz
- Birgitte McDonald (PI)
- Martin Tournier

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Unlocking The Glacial History Of The McMurdo Dry Valleys, Antarctica By Fingerprinting Glacial Tills With Detrital Zircon U-Pb Age Populations

## Summary

**Event Number:**
G-049-M
NSF / OPP Award 1842542

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
John Rand / Jenny Cunningham

## Principal Investigator(s)

**Dr. Daniel Jones Morgan**
dan.morgan@vanderbilt.edu
Vanderbilt University
Department of Geology
Nashville, Tennessee

**Project Web Site:**
https://my.vanderbilt.edu/danmorgan/antarctica/

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** McMurdo Dry Valleys

## Description

The goal of this project is to identify and distinguish different source areas of glacial sediment in the McMurdo Dry Valleys, Antarctica to determine past glacial flow direction. Understanding ice flow is critical for determining how the Antarctic Ice Sheet has behaved in the past. Such insight is fundamental for allowing scientists to predict how the Antarctic Ice Sheet will evolve and, in turn, forecast how much and how fast sea level may rise. The project study site contains a tremendous record of glacial deposits on land that extends back at least 14 million years. Chemistry of the rocks within the glacial deposits hold clues to the sources of ice that deposited the material. The chemical analyses of the glacial

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deposits will allow mapping of the former extent of glaciations providing a better understanding of ice flow history. The mapping of the largest ice sheet expansion of the past 14 million years in the McMurdo Dry Valleys is of broad interest to the global climate change community.

## Field Season Overview

A team of five participants will deploy from mid-November to mid-January to collect glacial till materials from several different types of glacial deposits in the McMurdo Dry Valleys. They will operate out of five consecutive sites at Miers Valley, Beacon Valley, Asgard Range, Olympus Range and New Harbor, spending about 35 days in the field. Camp put-ins, moves and resupplies, daytrips and shuttling of samples back to McMurdo Station will be supported by helicopter. Sampling locations will be accessed by foot from the camp sites, and samples will be collected from local rock outcrops and hand-dug soil pits. Approximately 1,000 lb of samples will be shipped from the field and on to the group's home institution.

## Deploying Team Members

- Lauren Lamson
- Sophia Lopez
- Daniel Morgan (PI)
- Rebekah Stanton
- Zoe Storaasli

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Sensitivity Of The West Antarctic Ice Sheet To 2 Celsius (SWAIS 2C)

## Summary

**Event Number:**
G-070-M
NSF / OPP Award 2035035

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
John Rand / Jenny Cunningham

## Principal Investigator(s)

**Dr. Molly O'Rourke Patterson**
patterso@binghamton.edu
Geosciences
Binghamton, New York

**Project Web Site:**
https://www.swais2c.aq/

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Scott Base, West Antarctica, Kamb Ice Stream

## Description

Sea level rise is one of the clearest planet-wide signals of human-induced climate change. Given the far-reaching and international consequences of Antarctica's future contribution to global sea level rise, the SWAIS 2C Project was developed through international collaboration to better forecast the size and timing of future changes. SWAIS 2C project scientists will collect and study geological (rocks), glaciological (ice), and geophysical (Earth physical properties) data and provide new information to guide the development of climate and ice sheet numerical models to better understand and predict how the ice sheet on West Antarctica will contribute to future sea level rise. The project's drilling campaign aims to recover ~200 m sediment cores from two locations

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beneath the eastern edge of the Ross Ice Shelf, designated as the Kamb Ice Stream (KIS-3) and Crary Ice Rise (CIR-1) field sites. This project, performed in collaboration with 10 nations and the Antarctica New Zealand Program acting as the project operator for coordination and most logistical needs, is supporting a United States (U.S.) scientific team. Key goals of the U.S. participation are to bring a range of scientific expertise to the project and to broaden involvement of early career scientists in Antarctic research.

## Field Season Overview

This season, the Antarctica New Zealand's SWAIS 2C Project drilling campaign aims to complete work at the Kamb Ice Stream (KIS-3) site by recovering additional sediment and water samples from beneath the ice. Up to three U.S. scientists will participate during the 2024-25 field season. Up to three participants will be housed at Scott Base prior to and upon returning from the field site. Extreme cold weather gear (ECW) and fixed wing transportation will be provided by the U.S. Antarctic Program (USAP). All support at the field site will be provided by Antarctica New Zealand except for intercontinental flights, ECW and sleep kits provided at McMurdo Station. Megan Heins will stay two weeks at McMurdo Station after field work and work in Crary Lab to obtain initial results. USAP will also provide fixed-wing support, consisting of up to 9 round-trip Basler missions between McMurdo Station and KIS-3.

## Deploying Team Members

- Megan Heins
- Molly Patterson (PI)
- Brendan Reilly

# 2024-2025 USAP Field Season
Project Detail

## Project Title

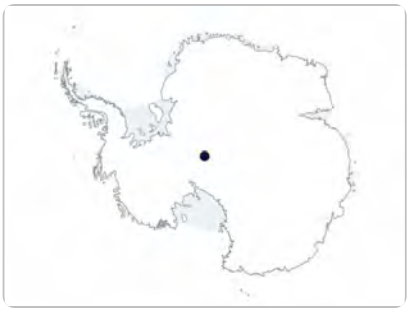
Imaging The Beginning Of Time From The South Pole: Completing The BICEP Array Survey

## Summary


**Event Number:**
A-149-S
NSF / OPP Award 2220444

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
Paul Sullivan / Sheryl Seagraves / Leah Street

## Principal Investigator(s)


**Dr. Clement Pryke**
pryke@physics.umn.edu
University of Minnesota
Minneapolis, Minnesota


**Project Web Site:**
http://bicepkeck.org

## Location

**Supporting Stations:** South Pole Station
**Research Locations:** South Pole Station: Dark Sector Laboratory, Martin A. Pomerantz Observatory

## Description

This project will continue the BICEP/Keck program of Cosmic Microwave Background (CMB) polarization observations by advancing the phased upgrade from Keck Array to BICEP Array in parallel with continuing observations with BICEP3. The goal is to extend the search for inflationary gravitational waves (IGW) by making deep observations at frequencies ranging from 30 to 270 GHz, in order to constrain the contributions of galactic dust and synchrotron foreground emission.

Following the successful pattern by which the SPUD program became Keck Array, two additional BICEP Array receivers are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currently being integrated by our teams at Caltech, Harvard and Stanford. The COVID-19 pandemic has impacted the deployment timeline of these receivers.

## Field Season Overview

On-site fieldwork for the upcoming season includes: 1) Deployment, characterization, and installation of the third BICEP Array receiver (BA4), and retrograde of the Keck receiver replaced by BA4. 2) Maintenance and minor upgrades to the ongoing BICEP3, BA1, BA2 and Keck receivers. 3) Winterover training. 4) Continued observations with BICEP3 and BICEP Array during the 2025 winter season. 5) Standard on-mount calibration activities with the BICEP3 and BICEP Array receivers.

## Deploying Team Members

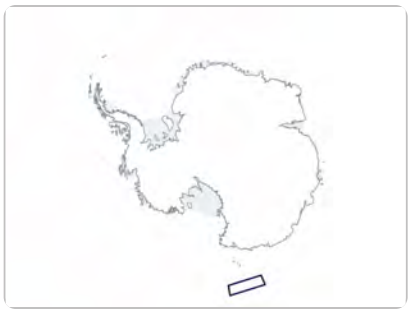
- Markus Ayasse
- Michael Echter
- Sofia Fatigoni
- Steven Jungst
- John Kovac
- Nolan Maher
- Yuka Nakato
- Matthew Petroff
- Clement Pryke (PI)
- Baibhav Singari
- Aaron Steiger
- Cheng Zhang

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Polar STEAM Artists, Writers, And Educators

## Summary



**Event Number:**
W-491-N
NSF / OPP Award 2221990

**Program Director:**
Ms. Elizabeth Rom

**ASC POC / Implementer:**
Allison Barden / Jane Dell

## Principal Investigator(s)

**Julie Marie Risien**
julie.risien@oregonstate.edu
Oregon State University
Corvallis, Oregon

**Project Web Site:**
https://polarsteam.info/

## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Southern Ocean

## Description

Polar STEAM (Science, Technology, Engineering, Arts, and Math) is a U.S. National Science Foundation (NSF)-funded project that integrates and enhances two long-standing United States NSF programs: the Polar Educators program and the Antarctic Artists and Writers program and facilitates virtual and deployment 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, vulnerable, and critical ecosystems on the planet. Expanding participation in the program to include faculty from community colleges and Minority Serving Institutions and virtual educator participants will allow both programs to reach new audiences and better engage the next generation of researchers and science learners.

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### Project WebSites

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## Field Season Overview

The selected Antarctic Artist & Writer (AAW) explores creative interventions through work in code, digital media, performance, and social practice. They will build a generative machine learning “speculative live cam” that interprets and visualizes the Antarctic environment in new and unexpected ways. Through the proposed project, the artist aims to develop a co-creative, participatory relationship with an audience, designing an online platform to be freely accessible to a variety of learning communities.

The AAW will join the NBP24-11 cruise on the RV/IB *Nathaniel B. Palmer*. The artist will collaborate with the Principal Investigator to collect and develop a deep understanding of the environmental data onboard. Data streams may include: Weather, benthic seafloor mapping, underwater sound, and continuous waterwall measurements. Data and imagery will serve as input and training data for a machine learning model that is capable of generating new scenes, soundscapes and data streams, based on scientific parameters, environmental inputs, and artistic considerations.

In addition, three Polar STEAM educators will also be embedded in the Robinson and Arrigo cruises to focus on science communication and education.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: The Drivers And Role Of Immigration In The Dynamics Of The Largest Population Of Weddell Seals In Antarctica Under Changing Conditions

## Summary

**Event Number:**
B-009-M
NSF / OPP Award 2147553

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
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

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

## Description

This is a continuation of a long-term study (1978-present) using an intensive mark-recapture tagging of Weddell seals in Erebus Bay to understand the population dynamics of a long-lived species. Recent results have documented strong annual variation in reproduction, abundance and population composition. The proposed work will continue population monitoring and add components to evaluate the demographic role of immigrant mothers; evaluate possible drivers of annual variation in overall population dynamics; assess genetic differences between immigrant and locally born mothers; and document patterns of gene flow among seal colonies in the

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Ross Sea region. These new aspects will add basic and applied approaches to improve understanding of population structure, function, and genetics, as well as provide key information for predicting how the population will respond to environmental change.

## Field Season Overview

Six McMurdo Station-based participants will deploy from early October to mid-December and will focus on all pupping colonies and haul outs across Erebus Bay from Cape Evans to Pram Point, as well as at White Island, and at select sites outside of Erebus Bay. These sites include Lewis Bay, Marble Point and several other sites 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 (all untagged mothers will be tagged). A sample of 100-150 pups born in Erebus Bay will be weighed ~35 days after birth. We will collect tissue samples from up to 150 locally born mothers and immigrant mothers throughout the study area for subsequent genetic comparisons. The team will also conduct six to eight 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 also use helicopter support for periodic reconnaissance flights over the study area and to outlying areas such as Marble Point and Lewis Bay to search for seals, and for travel to White Island to conduct population monitoring.

## Deploying Team Members

- Abram Brown
- Allison Chipman
- Elisabeth Krieger
- Parker Levinson
- Jay Rotella (PI)
- Sophia Rotella

# 2024-2025 USAP Field Season
Project Detail

## Project Title

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

## Summary


**Event Number:**
C-019-P
NSF / OPP Award 2224611

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
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

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

## 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 Time Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the 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 climate warming, natural climate variability and storms. These


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### Feedback

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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 phytoplankton and bio-optics component seeks to understand how changes in phytoplankton dynamics, such as an increase in fresher water due to melting ice, propagate through the ecosystem – with such effects ultimately affecting fish, seabirds and marine mammals. Because photosynthesis is driven by sunlight, characterizing the quality and quantity of light available for use by phytoplankton is important. They will deploy a wide range of sensors to measure these optical properties which in turn help our understanding of the underlying role of light variability in phytoplankton dynamics.

Two participants will deploy to Palmer Station to conduct twice weekly water sampling, bioacoustic surveys and irradiance surveys at Stations B and E. They will participate in twice weekly acoustic surveys along transects near Palmer Station. Incubations using 14C will be conducted throughout the summer. Additionally, the group will be bringing a Slocum glider, which will be deployed in December-January to conduct autonomous transects in the Western Antarctic Peninsula.

## Deploying Team Members

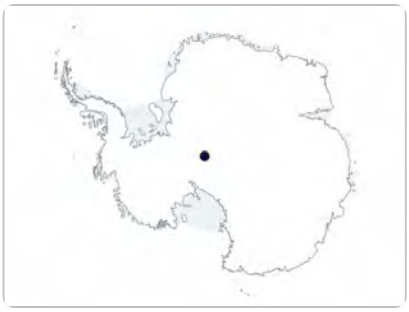
- Charlotte Bramich
- Mya Sharpe
- Abby Tomita

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: The Simpson Neutron Monitor Network

## Summary



**Event Number:**
A-118-S
NSF / OPP Award 2112437

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / 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/realtime/southpole.html

## Location

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

## Description

This project operates a neutron-monitor suite at South Pole Station. The science thrust of the project is an understanding of solar energetic particles using neutron monitor data, complemented with data from the nearby IceTop air shower detector. Another focus involves understanding the nature of multiple coincident particles observed in the neutron monitors, which extend the reach of the South Pole neutron monitor as a single station capable of doing cosmic ray spectral studies. Also central to the research is understanding the response of these detectors to the radiation environment of the South Pole, particularly in determining the cause of the decline in cosmic ray intensity at the South Pole over the last 50 years.

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### Feedback

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Understanding this decline is important because cosmic rays produce radionuclides such as Beryllium-10 that become trapped in the ice and are used to determine ice-core ages and precipitation levels over Earth's polar regions. An understanding of the production rate is vital to interpreting these data.

## Field Season Overview

On-site fieldwork for the upcoming season includes: Raising the outdoor equipment platform now that the surrounding snow level is high enough to begin impacting measurements. One person will deploy to safely disconnect and reconnect the power and data cables, in addition to performing annual maintenance and calibration operations.

In addition, research associate support will be provided throughout the year for routine monitoring and maintenance of equipment, to include observation of the equipment on the outdoor platform and in the B2 Laboratory to ensure it is in normal operating mode, shutdown and restart of software and hardware as needed, and communication with the project's PI and other personnel. Research associates will also support any required upgrades to electronics boards, mechanical stabilization of the Bare Neutron Monitor on the Mezzanine Level of the B2 laboratory, and heater and other checks on the outdoor equipment.

## Deploying Team Members

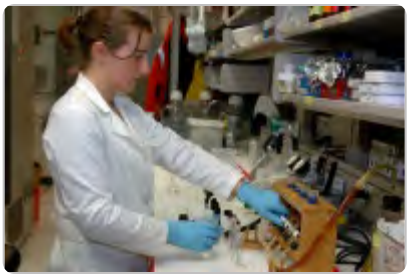
- Surujhdeo Seunarine (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

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

## Summary



**Event Number:**
C-020-P
NSF / OPP Award 2224611

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Ryan Steiner / Jamee Johnson

## Principal Investigator(s)

**Dr. Deborah Steinberg**
debbies@vims.edu
Virginia Institute of Marine Sciences
Department of Biological Sciences
Gloucester Point, Virginia

**Project Web Site:**
https://pallter.marine.rutgers.edu/

## Location

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

## 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 Time Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the 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 climate warming, natural climate variability and storms. These

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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

Zooplankton and micro-nekton provide the main trophic link between primary producers and apex predators in the Southern Ocean. Within the PAL-LTER study region, both oceanic and coastal zooplankton assemblages occur. Over much of the shelf region both the oceanic and coastal assemblages occur in varying mixes year to year with no clear boundaries between zones. Climate change, in particular changes in seasonal sea ice dynamics showing trends in longer periods of open water in summer, is apt to favor species with life histories that are less dependent on sea ice. Two participants will deploy to study temporal/spatial variability in the distribution and abundances of the zooplankton assemblages by doing biweekly net tows and acoustic transects. A moored sediment trap will be deployed and recovered weekly to capture deposition in the water column. Participants will focus on the population dynamics of Antarctic krill, an important prey item for many seabirds and seals, and environmental factors impacting its growth, reproduction and, ultimately, recruitment success.

## Deploying Team Members

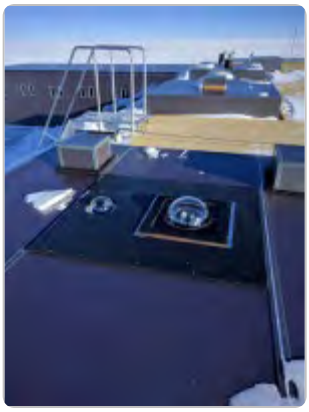
- Meredith Nolan
- Meredith Nolan
- Maya Thomas

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Pan-Antarctic Investigations Of Mesospheric Wave Dynamics And Influences Using The ANGWIN Network

## Summary

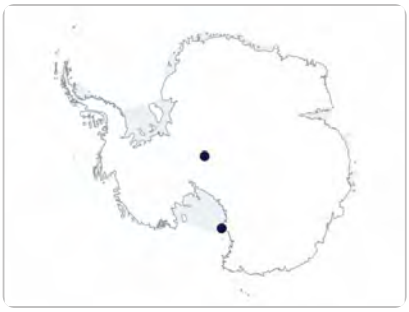


**Event Number:**
A-119-M/S
NSF / OPP Award 2029318

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Randolph Jones / Sheryl Seagraves

## Principal Investigator(s)



**Dr. Michael John Taylor**
mike.taylor@usu.edu
Utah State University
Center for Atmospheric and Space Sciences
Logan, Utah

**Project Web Site:**
http://digitalcommons.usu.edu/ail/

## Location

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

## Description

The Antarctic Gravity Wave Imaging Network (ANGWIN) is a cooperative effort of six international Antarctic programs to collect continent-wide gravity-wave measurements. This network capitalizes on existing optical and radar measurement capabilities at McMurdo Station, South Pole Station, and six other international research stations: Halley (UK), Syowa (Japan), Davis (Australia), Rothera (UK), and Ferraz (Brazil). The network quantifies the properties, variability, and momentum fluxes of short-period (less than one hour) mesospheric gravity waves and their dominant sources and effects over the Antarctic continent. The

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instrumentation at McMurdo Station consists of an Infrared (IR) all-sky mesospheric OH (hydroxyl) imager and an Advanced Mesospheric Temperature Mapper (AMTM). Instrumentation at South Pole Station includes an all-sky airglow imager, an AMTM and a Rayleigh lidar. Measurements at South Pole Station focus on quantifying the temperature signatures of gravity waves deep within the polar vortex and on complementing the ANGWIN sites around the continent. These measurements substantially contribute to much-needed climatology on effects of gravity waves and their impact on the upper atmosphere over Antarctica.

## Field Season Overview

On-site fieldwork for the upcoming season will focus mainly around South Pole Station. This includes finalizing repair of the AMTM instrument by installing a new top lens and installing a new all-sky camera. Both instruments were damaged in a fire event in June 2023. The DLR lidar system will undergo maintenance and upgrades, to include fixing a leaking window, installing a heating system inside the telescope enclosure, and realigning the system. In addition, research associate support will be provided throughout the year for routine monitoring and maintenance of equipment, to include observation of the equipment in the B2 Laboratory to ensure it is in normal operating mode, shutdown and restart of software and hardware as needed, data transfer and communication with the project's PI and other personnel. At McMurdo Station, on-site fieldwork will involve replacing a detector that was migrated in January 2024 to replace a damaged one at the South Pole Station, and servicing our second instrument (i.e., AMTM). The instruments at South Pole Station and McMurdo Station will 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., IT network, station services) as needed.

## Deploying Team Members

- Bernd Kaifler
- Pierre-Dominique Pautet (Co-PI)
- Yucheng Zhao (Co-PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Antarctica As A Model System For Responses Of Terrestrial Carbon Balance To Warming

## Summary

**Event Number:**
B-086-P
NSF / OPP Award 1947562

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Allison Barden / Jamee Johnson

## Principal Investigator(s)

**Dr. Natasja van Gestel**
natasja.van-gestel@ttu.edu
Texas Tech University
Lubbock, Texas

**Project Web Site:**
https://www.nvangestel.com/antarctica

## Location

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

## Description

This study will investigate carbon transformation processes and the microbial communities that are responsible for such transformations in soils of the Antarctic Peninsula. Researchers will examine net ecosystem carbon balance among soils with different exposure ages that have been uncovered by retreating glaciers. Researchers will identify individual members of the soil microbial community that are active versus those that are not active. This will create a better understanding of the fundamental processes of community succession in the Antarctic environment and whether continued warming could lead to community shifts in the active portion of the communities.

The overarching objective of this project is to link warming-induced

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shifts in ecosystem carbon balance in Antarctic terrestrial ecosystems to plant and microbial responses to warming. Specific goals are to determine 1) How carbon balance shifts in response to warming along a plant productivity gradient; 2) Whether a shift in this balance is related to stronger responses in carbon update or losses; and 3) The mechanisms responsible for these responses.

## Field Season Overview

This is the third of four field seasons. This upcoming 2024/2025 field season two people will deploy to Palmer Station from late October to March. The science party will deploy 15 open-top chambers (OTC) on land behind Palmer Station and five OTCs on Litchfield Island. These will remain in place only during the austral summer to simulate field warming along a latitudinal productivity gradient. Dataloggers are used in the chambers to record infrared gas measurements. During the field season the science team will take weekly carbon flux measurements and take photographs for vegetative cover analyses in all plots. Soil cores will be sent back to the United States for analysis. Additionally, to evaluate microbial responses to warming, the science team will use two growth chambers for a lab incubation experiment on field-collected plant and soil samples. The growth chamber settings will be the same as during the 2022/2023 field season.

A film crew of two people will deploy for approximately ten days to document the research for media/outreach. They plan to use cameras and Uncrewed Aerial Systems to obtain footage for a future documentary and other outreach media.

## Deploying Team Members

- Tiego De La Vega Ferreira
- Scott Simper
- Elizabeth Smith
- Natasja van Gestel (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

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

## Summary


**Event Number:**
C-045-P
NSF / OPP Award 2224611

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Ryan Steiner / Jamee Johnson


## Principal Investigator(s)


**Dr. Benjamin Van Mooy**
bvanmooy@whoi.edu
Woods Hole Oceanographic Institution
Marine Chemistry & Geochemistry
Woods Hole, Massachusetts


**Project Web Site:**
https://pallter.marine.rutgers.edu/

## Location

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

## 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 Time Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the 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 climate warming, natural climate variability and storms. These


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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

Microorganisms < 1 µm long form an important ecosystem component at the base of ocean foodwebs and catalyze critical biogeochemical transformations in the carbon, nitrogen and other elemental cycles. Two participants will deploy to Palmer Station to document the long-term trends and variability of bulk bacterial and Archaeal biomass and production rates in space and time. They will conduct twice weekly water sampling at Stations B and E, twice weekly bioacoustic transects, and deploy moored sediment traps to capture carbon transport in the water column. The goal of the biogeochemistry component is to understand how climate change and ecosystem responses impact key biogeochemical properties and processes: dissolved inorganic carbon and nutrients, net community production and particle export. The Southern Ocean is an important sink for atmospheric CO2. The studies of the metabolically active gases are aimed at clarifying the linkages among biological and physical processes affecting CO2 storage.

## Deploying Team Members

- Christina Rorres

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Genomic Mechanisms Controlling The Slow Development Of The Antarctic Urchin *Sterechinus Neumayeri*

## Summary

**Event Number:**
B-004-M
NSF / OPP Award 2038149

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Allison Barden / Randolph Jones

## Principal Investigator(s)

**Dr. Jacob Warner**
warnerj@uncw.edu
University of North Carolina at Wilmington
Wilmington, North Carolina

**Project Web Site:**
https://warnerlab.org/

## Location

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

## Description

This proposal is designed to use the well-characterized Antarctic sea urchin, *Sterechinus neumayeri* as a model system for studies of molecular based development of Antarctic invertebrates. The overarching goal is to identify genomic and molecular mechanistic adaptations that allow species to develop in extreme cold environments. To do this, the team will work with the U.S. Antarctic Program (USAP) dive team to collect urchins from McMurdo Sound. Then, using lab-based experiments that grow out urchin larvae in different temperatures, they will specifically evaluate gene regulatory networks (GRNs) to identify the GRN components responsible for regulating developmental timing in *S. neumayeri*. The main aim is to identify specific GRN elements that

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### Feedback

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have evolved during adaption to the extreme environment of the Southern Ocean.

## Field Season Overview

Four participants will deploy to McMurdo Station in teams of two with the overarching goal of identifying genomic and molecular adaptations that allow *S. neumayeri* (Antarctic sea urchin) to develop in polar environments. Fieldwork will include diving using SCUBA to collect approximately 100 – 200 individual *S. neumayeri* urchins, and may opportunistically collect other echinoderm species. Diving cadence is expected to taper after the first two weeks, and the team may utilize USAP divers to occasionally collect individuals in the second half of the team's deployment. The primary sampling location is the McMurdo Intake Jetty. In the lab, the team will primarily focus on the culturing and collection of urchin embryos, and will begin gene expressions and functional assays.

## Deploying Team Members

- Jennifer Fenner (Co-PI)
- Kenneth Halanych (Co-PI)
- Ryan Range (Co-PI)
- Jacob Warner (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Global Seismograph Station (GSN) At South Pole Station, Palmer Station And Scott Base

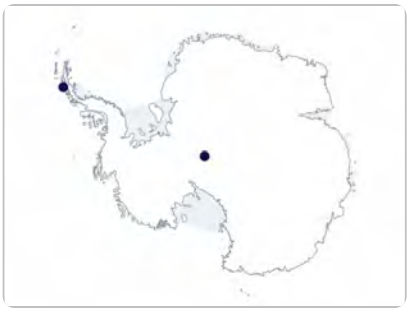
## Summary

**Event Number:**
G-090-P/S
NSF / USGS Agreement

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Paul Sullivan / Jamee Johnson / Sheryl Seagraves

## Principal Investigator(s)



**David Wilson**
dwilson@usgs.gov
Albequerque, New Mexico

**Project Web Site:**

https://earthquake.usgs.gov/monitoring/operations/stations/IU/PMSA

## Location

**Supporting Stations:** Palmer Station, South Pole Station
**Research Locations:** McMurdo Field Local, Palmer Station, Scott Base, South Pole Station

## Description

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

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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

Palmer Station (IU PMSA) The project has space in Terra Lab for data analyzer hardware. All other hardware and the seismometer are housed in the seismic vault behind Terra Lab. Antarctic Support Contract (ASC) provides year-round, onsite support by an ASC research associate. The science team does not typically deploy to Palmer Station but operates the Global Seismographic Network station remotely.

South Pole Station (IU QSPA) Two participants will deploy to replace a seismometer at the SPRESSO site, approximately five miles from the main station campus.

In addition, research associate support will be provided throughout the year for routine monitoring and maintenance of equipment, to include observation of the equipment housed in the SPRESSO vault to ensure it is in normal operating mode, shutdown and restart of software and hardware as needed, and communication with the project's Principal Investigator and other personnel.

Scott Base (GT SBA) Project participants will service the GSN Streckeisen STS-2/VBB Seismometer as needed while deploying through McMurdo Station.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

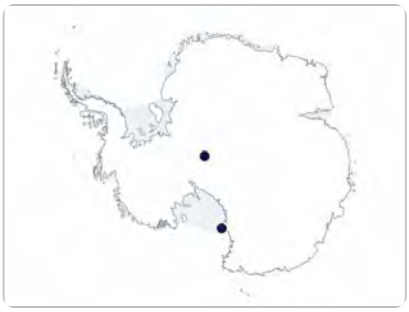
STC: Center For OLDest Ice EXploration (COLDEX): Surface Geophysics Surveys, East Antarctic Plateau

## Summary

**Event Number:**
I-186-M/S
NSF / OPP Award 2019719

**Program Director:**
Dr. Kelly Brunt

**ASC POC / Implementer:**
Allison Barden / Jenny Cunningham / Matthew Kippenhan



## Principal Investigator(s)

**Dale Winebrenner**
dpw@apl.washington.edu
University of Washington
Seattle, Washington

**Project Web Site:**
https://coldex.org/

## Location

**Supporting Stations:** McMurdo Station, South Pole Station
**Research Locations:** East Antarctic Plateau

## Description

The Center for Oldest Ice Exploration (COLDEX) seeks the oldest Antarctic ice samples to reconstruct past climate extending millions of years into the past. The overarching goals of COLDEX include: 1) To identify sites for a continuous 1.5-million-year ice core capable resolving orbital cycles in climate variables; and 2) To create an archive of well-documented old ice samples. I-187-M addresses that second goal. To address the first goal, in the 2024-25 season, I-186-M/S will deploy a geophysics team ~400 km from South Pole Station toward Dome A supported by the Heavy Science Traverse. They will use mixed radar, seismic and magnetotelluric techniques to investigate the deepest stratigraphic layers to better

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### Feedback

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understand conditions and possibility of stratigraphic preservation of old ice.

## Field Season Overview

A team of eight, including one grantee-provided mountaineer and one Antarctic Support Contract (ASC)-provided mountaineer, will conduct snowmobile-based geophysical surveys on the East Antarctic Plateau (EAP) out of South Pole Station. Prior to the team's arrival, the Heavy Science Traverse (HST) will travel from McMurdo Station to South Pole Station and on to the EAP study site, transporting cargo, fuel, structures and heavy equipment. The ASC mountaineer will travel with HST from South Pole Station to the site to ensure a safe route. With cargo delivered to the site, the science team will fly in via Twin Otter from South Pole Station to begin their work. They will drive snowmobile radar surveys on a 50 x 50 km grid around their campsite. Some ApRES units will be installed in this area overwinter to be recovered next season. The team will also make ApRES measurements by Twin Otter day trip to farther out areas. After approximately three weeks in the field, they will return to South Pole Station and redeploy through McMurdo Station.

## Deploying Team Members

- Knut Christianson (Co-PI)
- Bridget Hall
- Megan Kerr
- John-Morgan Manos
- Ellen Mutter
- John Paden

# 2024-2025 USAP Field Season
Project Detail

## Project Title

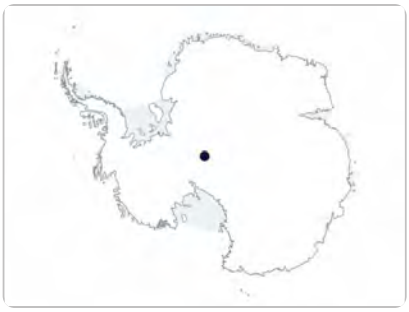
South Pole Telescope (SPT) Operations And Data Products

## Summary

**Event Number:**
A-379-S
NSF / OPP Award 2147371

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
Paul Sullivan / Sheryl Seagraves / Leah Street



## Principal Investigator(s)

**Dr. John Carlstrom**
jc@kicp.uchicago.edu
University of Chicago
Astronomy and Astrophysics
Chicago, Illinois

## Location

**Supporting Stations:** South Pole Station
**Research Locations:** South Pole Station: Dark Sector Laboratory

## Description

This project will conduct measurements of the 14-billion-year-old cosmic microwave background (CMB) with the South Pole Telescope (SPT) to address some of the most basic and compelling questions regarding the origin and composition of the universe. The telescope's siting is ideal for ultra-low-noise imaging surveys of the sky at the millimeter and submillimeter radio wavelengths. This unique geographical location allows SPT to obtain extremely sensitive 24/7 observations of targeted, low-galactic, foreground regions of the sky. The telescope's third-generation SPT-3G receiver has 16,000 detectors configured for polarization-sensitive observations in three millimeter-wave bands. The proposed operations also support SPT's critical role in the Event Horizon Telescope (EHT), a global array of telescopes to image the event horizon around the black hole at the center of the Milky Way

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Galaxy.

## Field Season Overview

On-site fieldwork for the upcoming season includes: 1) Service, upgrades, and maintenance of SPT-3G and EHT telescope components and computer systems; 2) Cryogenic maintenance of the SPT-3G and optics cryostats; 3) Winterover training; and 4) Installation of the SPT-SLIM instrument (NSF AST-2108763) followed by several weeks of test observations to demonstrate new on-chip spectrometer detector technology and constrain the molecular gas content of distant galaxies.

## Deploying Team Members

- Adam Anderson
- Peter Barry
- Simeon Bash
- William Coolman
- Karia Dibert
- Amy Lowitz
- David Pernic
- Alexandra Rahlin
- Maclean Rouble
- Matthew Young
- Jessica Zebrowski

# 2024-2025 USAP Field Season
Project Detail

## Project Title

GAPS (General AntiParticle Spectrometer) Experiment: A Search For Dark Matter Using Low Energy Antiprotons And Antideuterons

## Summary

**Event Number:**
A-132-M
NASA / NSF Agreement

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Kaija Webster / Chad Naughton

## Principal Investigator(s)

**Charles James Hailey**
chuckh@astro.columbia.edu
Columbia University
New York, New York

## Location

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

## Description

The General AntiParticle Spectrometer (GAPS) balloon-borne science experiment is designed to search for massive dark matter particles in our galaxy. The annihilation of dark matter particles with each other in the Galaxy leads to antimatter production. The GAPS experiment is optimized to detect low energy (LE) antideuterons. Because LE antideuterons are extremely difficult to produce by conventional astrophysical processes, the detection of LE antideuterons is a smoking gun signature of dark matter. GAPS can also detect LE antihelium, and candidate antihelium events have been reported. GAPS will also open new discovery space by detecting LE antiprotons. These are a guaranteed signature as they are produced by conventional astrophysical processes. An observed antiproton excess could arise from dark matter annihilation or

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primordial black hole evaporation.

## Field Season Overview

The GAPS instrument and team will deploy to McMurdo Station in early-November 2024. The instrument will be assembled and readied for flight at the McMurdo Station Long Duration Balloon (LDB) facility with a target launch in early December.

Target duration for flight is 30 days with a minimum of 10 days. This would permit researchers to validate the GAPS antimatter detection concept, allow for fresh discovery space with the first detection of low energy antiprotons in the GAPS energy band, and permit better understanding of ultimate sensitivity for antideuterons and antihelium through accurate characterization of in-flight backgrounds, and allow for completion of an initial search for these antimatter species. Target float altitude is >115,000-feet. Payload termination and recovery would ideally occur in January or early February.

The GAPS project was approved as a program of three flights with a total float duration of around 100 days. Hence, recovery of the detectors, after the first flight, is an absolute priority. Their value is approximately $5 million. COMAIR delivery back to the United States has been requested for the detectors, as they are sensitive to humidity and would be ruined by surface transport via the ocean. Data drives must also be recovered, as bandwidth will not permit all data to be transmitted to ground. Two to three GAPS team members will participate in instrument recovery, along with personnel from the NASA Columbia Scientific Balloon Facility and Antarctic Support Contract. If GAPS cannot be flown and subsequently transported north this season, we have requested that it be stored in a dry, cold environment at a temperature above -55C.

## Deploying Team Members

- Kazutaka Aoyama
- Mirko Boezio
- Gabriel Bridges
- Scott Candey
- Erik Everson
- Florian Gahbauer
- Luca Ghislotti
- Charles Hailey (PI)
- Massimo Manghisoni
- Keita Mizukoshi
- Riccardo Munini
- Shun Okazaki
- Rene Ong
- Kaliroe Pappas
- Elisa Riceputi
- Field Rogers
- Johannes Stoessl
- Grace Tytus
- Philip von Doetinchem de Rande
- Kelsey Yee

- Brent Mochizuki
- Jeffrey Zweerink

# 2024-2025 USAP Field Season
Project Detail

## Project Title

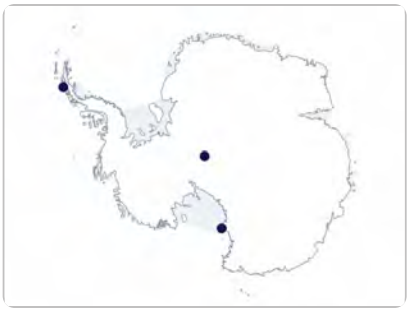
The Next Generation Of Geospace Research Facilities At South Pole, McMurdo, And Palmer Stations

## Summary


**Event Number:**
A-111-M/P/S
NSF / OPP 2332427

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Jamee Johnson / Randolph Jones / Sheryl Seagraves

## Principal Investigator(s)


**Dr. Hyomin Kim**
hmkim@njit.edu
New Jersey Institute of Technology
Department of Physics
Newark, New Jersey


## Location

**Supporting Stations:** McMurdo Station, Palmer Station, South Pole Station
**Research Locations:** Field Local, Arrival Heights, Terra Lab

## Description

The polar caps are specific areas around the geomagnetic poles where geomagnetic field lines are open and directly interact with the interplanetary magnetic field. Consequently, Antarctica is an ideal location for geospace research, as its land mass provides superior siting for observation of the Earth's high geomagnetic latitude magnetic field lines, thereby facilitating studies of the polar cap, cusp, auroral zone, and the geosynchronous altitude where communications satellites orbit, and allowing for extended and continuous observations of the sun. Because of these unique aspects, Antarctic stations have long been outfitted with a variety of instrumentation for observational studies of the geospace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### Feedback

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environment. This project integrates clustered instrumentation at all three U.S. Antarctic Program stations to examine the entire Geospace system. Instruments include ground-based fluxgate and search-coil magnetometers, extremely low (ELF), very-low (VLF), and high frequency (HF) receivers, imaging and broadband riometers, sky-looking optical systems, and GPS scintillation-rated receivers, and more. Much of this equipment has a long, rich history and is decades old, having been installed in the 1980s (or earlier!).

## Field Season Overview

No on-site field work is to be performed by the science team this year. The instruments will 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., IT network, station services) as needed.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Investigation Of Deep Polar Cap Dynamics Using An Autonomous Instrument Network

## Summary


**Event Number:**
A-108-E
NSF / OPP Award 2032421

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Jane Dell


## Principal Investigator(s)


**Dr. Hyomin Kim**
hmkim@njit.edu
New Jersey Institute of Technology
Department of Physics
Newark, New Jersey


## Location

**Supporting Stations:** Special Project
**Research Locations:** East Antarctic Plateau

## Description


The goal of this project is to fabricate, deploy and operate three unmanned AGO-NextGen instrument platforms on the East Antarctic Plateau. Designed to conduct geospace research by measuring magnetic field, radio signals, and auroral activity, these instruments will become part of a spatially extensive ground-based network of instrumentation focused on observing coupled Magnetosphere-Ionosphere (M-I) dynamics in the deep polar cap. The new platforms (designated KAGOs for Korean AGOs) are more compact, easy-to-transport, easy-to-install, next-generation power/instrument versions of the previous generation of AGO platforms. The systems are to be fabricated at the New Jersey Institute of Technology (NJIT) and will be outfitted with power systems and deployed by the Korean Polar Research Institute



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(KOPRI) along the Jang Bogo Station-Dome C ‘K-Route’ traverse route.

## Field Season Overview

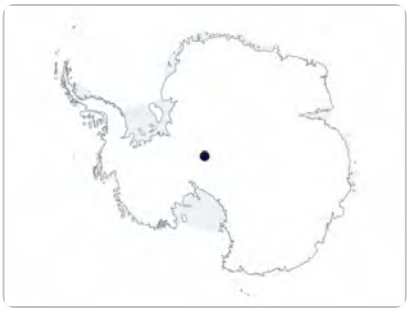
For the upcoming field season (2024-2025), the project will ship one KAGO platform to Antarctica for one year of on-the-ground testing. The U.S. National Science Foundation managed U.S. Antarctic Program (USAP) will provide cargo shipping support of the NJIT-fabricated portion of this KAGO to Christchurch, New Zealand via Port Hueneme, CA. In Christchurch, KOPRI representatives will pick up the platform from USAP and load it to the KOPRI icebreaker ("Araon") bound for Jang Bogo Station. NJIT is responsible for the fabrication and delivery of the system to Port Hueneme, CA. USAP will ship the KAGO system from Port Hueneme to Christchurch. The NJIT-fabricated portion of this KAGO will then be integrated with its power system by KOPRI team members and deployed in the vicinity of Jang Bogo Station. No USAP-sponsored participants will be deploying.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

First Conjugate-Station Studies And Continued Satellite-Conjunction Studies Of LF/MF/HF Auroral Radio Emissions At South Pole

## Summary



**Event Number:**
A-128-S
NSF / OPP Award 2205753

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Sheryl Seagraves

## Principal Investigator(s)

**Dr. James LaBelle**
James.W.LaBelle@dartmouth.edu
Dartmouth College
Department of Physics & Astronomy
Hanover, New Hampshire

## Location

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

## Description

This project operates instruments at South Pole Station to answer outstanding questions raised by the discovery of correlations between auroral kilometric radiation (AKR) observed 200,000 kilometers above Earth and AKR-like signals observed simultaneously at South Pole Station. The higher electron cyclotron harmonic radiation is polarized, which suggests a different and possibly nonlinear generation mechanism. These phenomena are best observed, and in most cases can only be observed, from Antarctica, making the South Pole a perfect location for this research.

## Field Season Overview

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### Feedback

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No on-site fieldwork will be performed by the science team this year. Research associate support will be provided throughout the year for routine monitoring and maintenance of equipment, to include observation of the equipment in the B2 Laboratory and V8 vault to ensure they are in normal operating mode, shutdown and restart of software and hardware, data transfer, and communication with the project's PI and other personnel as needed.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

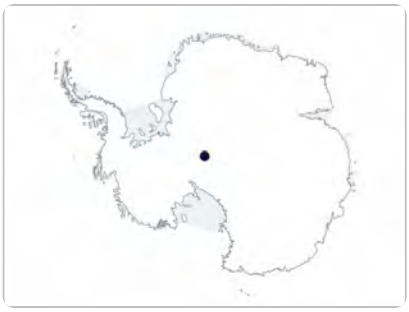
Pilot Fiber Seismic Networks At The Amundsen-Scott South Pole Station

## Summary


**Event Number:**
A-137-S
NSF / OPP Award 2022920

**Program Director:**
Dr. Vladimir Papitashvili

**ASC POC / Implementer:**
John Rand / Sheryl Seagraves

## Principal Investigator(s)


**Mr. Zhongwen Zhan**
zwzhan@caltech.edu
California Institute of Technology
Pasadena, California


## Location

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

## Description

This project has deployed a distributed acoustic sensing (DAS) system at the Amundsen-Scott South Pole Station. DAS is an emerging technology that transforms a single optical fiber into a massively multichannel seismic array and provides a scalable and affordable way to deploy a dense seismic network. This project has converted 8 km of existing fiber optic cable into more than 8,000 sensors to explore the potential of DAS as a breakthrough data engine for polar seismology. The currently deployed array is collecting data for the purposes of: 1) evaluation and calibration of the performance of the DAS technology in the extreme cold, very low noise (including during the exceptionally quiet austral winter) polar plateau environment; 2) recording and analysis of local ambient and transient signals from ice, anthropogenic signals, ocean microseism, atmospheric and other processes, as well as to study local, regional, and teleseismic tectonic events; and 3)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structural imaging of the firn, glacial ice, glacial bed, crust, and mantle, variously using active sources, ambient seismic noise, and natural icequake and earthquake events.

## Field Season Overview

This is the final season for the DAS project. The system will be dismantled and retrograded at the end of the summer. Retrograde activities will be performed by Antarctic Support Contract personnel.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Population Growth At The Southern Extreme: Effects Of Early Life Conditions On Adélie Penguin Individuals And Colonies

## Summary

**Event Number:**
B-200-M
NSF / OPP Award 1935870

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Ryan Steiner / Jenny Cunningham

## Principal Investigator(s)

**Dr. Grant Ballard**
gballard@pointblue.org
Point Reyes Bird Observatory
San Francisco, California

## Location

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

## Description

In the Ross Sea region, one of the largest Adélie penguin colonies in the world is growing quickly, despite signs of negative density dependence. Building on a long-term biologging and demographic datasets, this team will integrate the role of environmental factors with information on penguin foraging behavior, diet, growth, and survival at Cape Crozier and Cape Royds. Data will be used to evaluate how early-life conditions and penguin behavior relate to penguin energetics and population size. Results from this study will enhance the scientific understanding of important penguin and prey populations and provide information that will feed into the conservation of sea-ice ecosystems. The team will also lead a diverse training and public outreach program.

## Field Season Overview

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### Feedback

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Eight participants will deploy this season from early November to early 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. Some team members may stay one to two nights at the Cape Bird penguin colony, supported by Antarctica New Zealand. 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 surveys of the penguin colonies.

## Deploying Team Members

- Grant Ballard (PI)
- Christina Burnham
- Katie Dugger (Team Leader)
- Megan Elrod (Team Leader)
- Amelie Lescroel (Co-PI)
- Anne Schmidt (Co-PI)
- Nadia Swanson
- Arvind Varsani (Co-PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: ANT LIA Cumacean -Omics To Measure Mode Of Adaptation To Antarctica (COMMAA)

## Summary

**Event Number:**
B-010-N
NSF / OPP Award 2138993

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Kenneth Vicknair / Jamee Johnson

## Principal Investigator(s)

**Dr. Sarah Anne Gerken**
sagerken@alaska.edu
University of Alaska Anchorage
Anchorage, Alaska

## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Western Ross Sea, Terror Rift

## Description

Cumaceans are small marine crustaceans, commonly known as comma shrimp, that live in muddy or sandy sediments. In this program, cumaceans will be used as a model system to explore their biology and to evaluate invertebrate animal adaptations to the changing Antarctic. Integrative taxonomy, functional, comparative, and evolutionary genomics, and phylogenetic comparative methods will be used to evaluate diversity in different regions of the Antarctic and identify genes and gene families experiencing expansions, selection, or significant differential expression. A robust phylogenetic framework for Cumacea will be generated based on transcriptomes and genomes. Information related to the rates and timing of species diversification will significantly advance understanding of invertebrate adaptations to cold, stenothermic habitats. The broader impact activities include training for diverse early career scientists, K-12 education through

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schools and museums, and a variety of products for social media platforms. Curated morphological reference collections will be shared with public collections in the United States and in New Zealand.

## Field Season Overview

A science team of four will deploy on the RV/IB *Nathaniel B. Palmer* to the Western Ross Sea, specifically Terra Nova Bay, along with the Tominaga and Coffin groups for a 64-day cruise. Samples will be collected within the 200-500 meter range every other day primarily using an epibenthic sled.

The team will collect approximately 6,000 individuals. Laboratory preservation methods for collected samples will include:

- Flash frozen in liquid nitrogen
- Frozen and stored in RNAlater
- Frozen and stored in 95% Ethano
- Ambient temperature in 95% Ethanol
- Chilled and stored at +4°C

Post sampling activities will consist of sorting, photographing, cataloguing, and sample processing and storage.

## Deploying Team Members

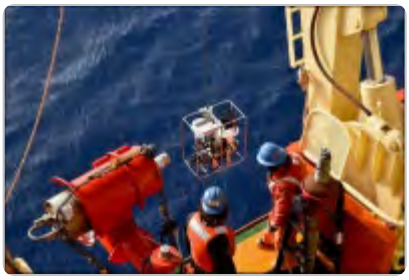
- Sarah Gerken (PI)
- Kevin Kocot (Co-PI)
- Anne Helene Tandberg
- Victoria Vandersommen

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: The Roles Of Seasonality, Silicification, And Alteration In Nitrogen And Silicon Isotope Paleo-Proxy Variability

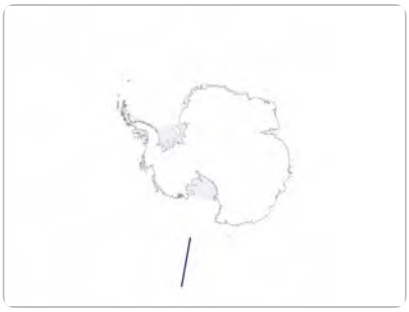
## Summary



**Event Number:**
B-042-N
NSF / OPP Award 2218704

**Program Director:**
Dr. William Ambrose

**ASC POC / Implementer:**
Allison Barden / Jamee Johnson



## Principal Investigator(s)

**Dr. Rebecca Robinson Graham**
rebecca_r@uri.edu
University of Rhode Island
Graduate School of Oceanography
South Kingstown, Rhode Island

## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Southern Ocean, North of Ross Sea

## Description

The chemistry of fossil diatoms, specifically their nitrogen and silicon isotopic ratio, reflects past changes in surface water nutrients and uptake by plants. Changes in sedimentary diatom nitrogen and silicon values from the Southern Ocean record to what degree ocean biology consumed nutrients in the surface ocean through time. These records have been interpreted to document changes in large-scale vertical ocean circulation as well as iron-stimulated biological production. These processes likely worked together to contribute to carbon exchange between the ocean and the atmosphere.

The proposed work will address gaps in our understanding of how the diatom proxies record surface nutrient conditions. Specifically, this includes an examination of environmentally controlled effects on physiology that lead diatoms to change how they build their

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### Feedback

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shells and of alteration during sinking and burial as potential influences on the isotopic composition of nitrogen and silicon. The results will improve reconstructions of nutrient drawdown in the past, highlight optimal geological conditions for robust reconstructions, and increase our understanding of observed spatial and temporal variability in existing diatom nitrogen and silicon isotope records. This work will ultimately improve our understanding of global-scale climate change in the past and contextualize future change.

## Field Season Overview

The primary activities in the field will be: 1) Collection of water for measurement of dissolved phases using Niskin casts (12 depths/cast) using a Conductivity, Temperature, and Depth (CTD) sensor; 2) Collection of near surface water for shipboard experiments (3 CTD casts to 100m); 3) Collection of particulates using large volume McLane filtration pumps (4 depths/cast), 2 casts per station; 4) Shipboard incubation experiments conducted in constant temperature cold room facilities. These incubations, in triplicate 20 L carboys, require a walk-in space rather than incubators. 5) Measurement of dissolved nitrogen and silicon species, chlorophyll, and evaluation and preservation of diatom assemblage samples. Two PolarSTEAM educators and one Vis-A-Thon artist from Rhode Island School of Design will participate in onboard outreach for this project.

## Deploying Team Members

- Lacey Bowman
- Kendall Breland
- Stewart Copeland
- Isabel Dove
- Rebecca Graham (PI)
- Roger Kelly
- Kristin Kimble
- Amanda McBride
- Julien Middleton
- Kiley Preheim
- Georgia Rhodes
- Katherine Roche
- Tyler Thomas

# 2024-2025 USAP Field Season
Project Detail

## Project Title

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

## Summary


**Event Number:**
B-466-E
NSF / OPP Award 2046240

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
Matthew Erickson / Diane Hutt


## Principal Investigator(s)


**Dr. Alia Lauren Khan**
khana8@wwu.edu
Western Washington University
College of the Environment
Bellingham, Washington


## Location

**Supporting Stations:** Special Project
**Research Locations:** Western Antarctic Peninsula

## Description


The team proposes a five-year time-series field project to assess the effects of changing cryosphere-albedo feedbacks in the Antarctic Peninsula and the Pacific Northwest. A variety of in situ and remote sensing data collected 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 fundamentally 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 0.5-3m spatial resolution, multi-spectral satellite imagery. The work will inform the role of LAP impacts from black carbon (BC) and dust that may intensify in a warming climate. Lastly, these results will be used to improve snow algae parameterization in a new version



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### Feedback

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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.

## Field Season Overview

Fieldwork for the project will occur over five years and requires various levels of support each year from the U.S. Antarctic Program (USAP).

The Principal Investigator (PI) and science team have been working to establish partnerships with several Antarctic cruise ship operators that work out of Argentina and Chile including, but not limited to, Hurtigruten and Lindblad Expeditions. Up to eight total participants will sample from a variety of cruise ships while simultaneously establishing a citizen science program to support this project through photography and sample collection. The science team and citizen scientists will stop at common tourism landing sites around the Western Antarctic Peninsula (WAP). Sampling at all locations will include taking snow and melt-water samples, as well as physical and Spectral Reflective measurements. The science team will also deploy an Uncrewed Aerial System (UAS), and time lapse cameras. Once delivered to USAP in Punta Arenas, Chile samples will be packed and shipped to researchers' home institutions.

## Deploying Team Members

- Molly Adshead
- Brendan Hodge
- Alia Khan (PI)
- Colby Rand
- Joel Rink
- Ellie Ryan

# 2024-2025 USAP Field Season
Project Detail

## Project Title

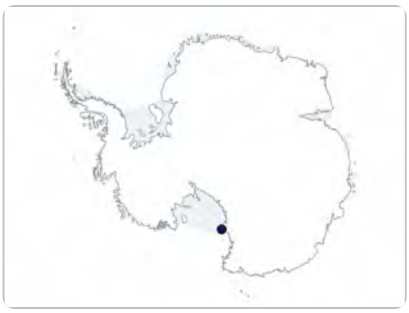
Seasonal Primary Productivity And Nitrogen Cycling In Photosynthetic Mats, Lake Fryxell, McMurdo Dry Valleys

## Summary

**Event Number:**
B-047-M
NSF / OPP Award 1937748

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
Ryan Steiner / Jenny Cunningham



## Principal Investigator(s)

**Dr. Dawn Yvonne Sumner**
dawninantarctica.23@gmail.com
University of California Davis
Geology Department
Davis, California

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Lake Fryxell

## Description

This project will evaluate the effect of light and microbial mat activity on biogeochemical cycling in winter and summer in Lake Fryxell, McMurdo Dry Valleys. The team will specifically evaluate the role of light on microbial mat oxygen production and nitrogen cycling in the system. Divers will deploy microsensors in and immediately above the benthic mats in different months to measure small scale changes in water chemistry with differing light exposure. Mats will also be subsampled to evaluate changes in microbial gene expression in differing conditions. The research will provide important new insights into the winter behaviors of microbes in mats and how biotic, abiotic, and environmental components of ecosystems interact within specific processes (e.g., redox and nitrogen cycling to affect the entire McMurdo Dry Valley ecosystem). Results will be used to construct a biogeochemical

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### Feedback

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model for seasonal biomass generation and phenotypic changes in the system.

## Field Season Overview

Five participants, including one Antarctica New Zealand collaborator, will deploy from December through late January, residing for five to six weeks at Lake Fryxell fixed camp in Taylor Valley. The team will conduct under-ice diving from a heated Polarhaven positioned at one dive site on the lake ice to study microbial mats on the lake floor. They will collect water and mat samples and deploy biogeochemical monitoring equipment and shades at three water depths near the mat surface between 6 and 10 m depth. The installed instruments and shades will remain in place over winter between deployment seasons, and all installations will be retrieved during the 2025-26 season.

## Deploying Team Members

- Ian Hawes (Co-PI)
- Marisol Juarez Rivera
- Elisa Merz
- Tyler Powell
- Dawn Sumner (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

CAREER: Ecosystem Impacts Of Microbial Succession And Production At Antarctic Methane Seeps

## Summary

**Event Number:**
B-249-M
NSF / OPP Award 2046800

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
Ryan Steiner / Randolph Jones

## Principal Investigator(s)

**Dr. Andrew Thurber**
athurber@ucsb.edu
University of California Santa Barbara
Corvallis, Oregon

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Cape Evans

## Description

This project involves 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 seepage in the high Antarctic was discovered in the McMurdo Sound in 2012, and five 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 Principal Investigator proposes to answer three scientific questions on microbes associated with methane seeps, in relation to species present and their evolution over time, the metabolic processes they support, and the role they play in providing food for benthic food webs. The sampling needs to occur in the late winter/early

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### Feedback

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spring before high light levels support growth of diatom mats over the benthos.

## Field Season Overview

In the 2023-24 season, an active methane seep was discovered at Cape Evans by scientists working with the New Zealand Antarctic Program (ANZ). As this falls under the overall aims of this project and builds upon collaborations between these two programs, the Thurber group will have one person deploy to collect samples, with the aid of U.S. Antarctic Program (USAP) dive support, from this methane seep. ANZ will provide the Cape Evans field camp structures and dive hole. Thurber and a USAP diver will do a series of dives there, but will be based at McMurdo Station, and will overnight at the ANZ camp up to three nights to minimize fuel and drive time between McMurdo Station and Cape Evans.

## Deploying Team Members

- Andrew Thurber (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

A New Instrument And Measurement Approach To Cryo-Seismogeodesy: Monitoring Antarctic Ice Shelf Stability Using Ice Penetrators

## Summary

**Event Number:**
D-550-M
NSF / OPP Award 1931131

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Ryan Steiner / Jenny Cunningham

## Principal Investigator(s)

**Mr. Pedro Elosegui**
elosegui@mit.edu
Massachusetts Institute of Technology
Cambridge, Massachusetts

## Location

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

## Description

Antarctic ice shelves, a critical element in the stability of the Antarctic Ice Sheet (AIS), are showing signs of rapid decline. Ice-shelf melting, retreating and thinning lead to increased discharge of grounded ice to the ocean, and to concomitant sea-level rise. Ice-shelf disintegration could drive the AIS to eventual collapse. Despite their key role in the future fate of the AIS under a warming climate, ice shelves are lacking in situ seismic and geodetic measurements. To address these challenges, researchers propose to combine cryoseismology and cryogeodesy for the first time into a single instrument, a seismogeodetic ice penetrator (SGIP), that can be air-dropped onto an ice-shelf surface to help advance understanding of Antarctic ice-ocean-atmosphere dynamics. The SGIP provides a means to efficiently observe and quantify ice-shelf

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### Feedback

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stability. The SGIP field testing will occur on the Ross Ice Shelf near McMurdo Station where two penetrators will be helicopter dropped in the first season and allowed to operate over winter along with reference geodesic and seismic installations. The SGIP and reference equipment will be recovered in the second season.

## Field Season Overview

Two participants will deploy to McMurdo Station in mid-November, with the goal of deploying three seismogeodetic ice penetrators (SGIPs) on the surface of the Ross Ice Shelf. The team, along with Antarctic Support Contract Field Support and Training personnel, will review imagery provided by the Polar Geospatial Center to identify SGIP deployment locations within 100 nautical miles of McMurdo Station. Researchers will use Crary Lab space to set up and calibrate the SGIP instruments. Two helicopters will be used for deployment of each SGIP, one with a long-line and remote hook to drop the instrument and one carrying participants to evaluate, guide and confirm the drop. Two SGIPs will be dropped in this manner, and one will be manually emplaced next to one of the dropped SGIPs for data validation. Following deployment of the SGIPs, the team will monitor data transmission to ensure proper function, then will redeploy. The SGIPs will remain in place over winter and will be recovered in 2025-26.

## Deploying Team Members

- Pedro Elosegui (PI)
- Chester Ruszczyk

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Dry Valley Seismic Project

## Summary

**Event Number:**
G-078-M
NSF / PLR-DoD MOA

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Allison Barden / Jane Dell / Jenny Cunningham

## Principal Investigator(s)

**Mr. Paul A Bertrand**
paul.bertrand@us.af.mil
United States Air Force
AFTAC
Patrick,AFB, Florida

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Mt Newall, Bull Pass

## Description

The McMurdo Dry Valley seismic project monitors regional and global seismicity. The Dry Valleys' stations near McMurdo Station are part of the Air Force Technical Applications Center's (AFTAC) southern network, which accumulates near-real-time data from nine locations in the Southern Hemisphere. The data are transmitted to the National Data Center in Florida and made available to the international scientific community.

## Field Season Overview

Four participants (two Air Force, two University of Alaska) will deploy to perform maintenance activities at the AFTAC seismic stations at Mount Newall and Bull Pass. They will spend approximately 14 days at each site, servicing the Hybrid Power

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Systems (HPS) and seismic equipment. They will make one trip back to McMurdo Station between field sites to resupply and work on equipment. All movements of personnel and cargo to and from the field will be supported by helicopters. Prior to and following field deployment, the team will review inventory and conduct data path maintenance on their telemetry and computer systems at McMurdo.

## Deploying Team Members

- Anthony D'Aoust
- Christian Patrick (Team Leader)
- Kyle Wallace
- Andrew Winkelman

# 2024-2025 USAP Field Season
Project Detail

## Project Title

CAREER: Linking Cold Desert Groundwater To Thermokarst & Chemical Weathering In Partnership With The Geoscience UAV Academy

## Summary

**Event Number:**
G-083-M
NSF / OPP Award 1847067

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Ryan Steiner / Jenny Cunningham

## Principal Investigator(s)

**Dr. Joseph Levy**
jlevy@colgate.edu
Colgate University
Department of Geology
Hamilton, New York

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** South Fork Wright Valley, Goldman Glacier, Beacon Valley

## Description

Water tracks are the basic hydrological unit that currently feeds the rapidly-changing polar and permafrost wetlands in the Antarctic McMurdo Dry Valleys. Despite the importance of water tracks in the Dry Valleys hydrologic cycle and their influence on biogeochemistry, little is known about how these water tracks control the unique brine processes operating in Antarctic ice-free areas. Both groundwater availability and geochemistry shape Antarctic microbial communities, connecting soil geology and hydrology to carbon cycling and ecosystem functioning. The objectives of this project are to: 1) map water tracks to determine the spatial distribution and seasonal magnitude of groundwater impacts on the McMurdo Dry Valleys near-surface environment; 2)

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### Feedback

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establish an Uncrewed Aerial Vehicle (UAV) academy training earth sciences students to answer geoscience questions using drone-based platforms and remote sensing techniques; and 3) provide a formative step in the development of the Principal Investigator as a teacher-scholar.

## Field Season Overview

In their second field season, four participants will deploy to McMurdo Station between mid-December and late January to continue monitoring water tracks in the McMurdo Dry Valleys. The team will rotate between tent camps at Howard Glacier and South Fork Wright Valley, where they will travel on foot to water tracks to conduct UAV surveys, collect water and soil samples, and download and retrieve dataloggers. They will also make a helicopter day trip to Beacon Valley to retrieve dataloggers deployed in the previous season. Camp put-in, moves, and take-out will also be accomplished by helicopter. The group will use Crary Laboratory space for preparing electronics prior to field deployment, and for sorting and repackaging samples after field deployment.

## Deploying Team Members

- Ian Andrews
- Isabella King
- Lily Kuentz
- Joseph Levy (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Constraining West Antarctic Ice Sheet Elevation During The Last Interglacial

## Summary

**Event Number:**
G-065-M
NSF / OPP Award 1744927

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Allison Barden / Jenny Cunningham

## Principal Investigator(s)

**Dr. Jerry X Mitrovica**
jxm@eps.harvard.edu
Harvard University
Cambridge, Massachusetts

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Mt. Waesche, West Antarctica

## Description

This project aims to place constraints on West Antarctic Ice Sheet (WAIS) elevations at Mt. Waesche, a young volcano in Marie Byrd Land, near the dome of the ice sheet during the last interglacial period. The project team will use cosmogenic nuclide inventories and 40Ar/39Ar dating of lava flows near and below the present ice level, and subglacial bedrock morphology, to identify and date lower than present ice levels.

This season, the project also incorporates Seth Campbell's EAGER award, NSF/OPP Award 2210092, and Collaborative Research: EAGER: Dating glacier retreat and readvance near Mt. Waesche, West Antarctica.

## Field Season Overview

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### Feedback

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A team of eight participants, including two United States Ice Drilling Program (IDP) personnel, will focus on drilling two transects of four bedrock cores in the vicinity of Mt. Waesche. The team and their cargo will position to WAIS Divide camp via LC-130 aircraft, then will be shuttled on to Mt. Wasche camp by Basler and Twin Otter. At Mt. Waesche, the team will drill 100 m through firn and ice to reach bedrock. They will also re-measure stakes established in the 2018-19 season to determine ice ablation and movement over the past six years and will conduct additional mapping of exposed lava flows and glacial moraines. In addition to bedrock cores, the team will collect ice samples using the IDP Eclipse drill and a horizontal trencher, with the goal of dating unconformities in the ice that indicate lower ice levels. Ice samples will be melted and bottled for transport out of the field. All activities will take place within five miles of the Mt. Waesche camp site.

## Deploying Team Members

- Robert Ackert
- Keegan Bellamy
- Renee Clavette
- Nelia Dunbar
- Forest Harmon
- Nels Iverson
- William McIntosh
- Elliot Moravec

# 2024-2025 USAP Field Season
Project Detail

## Project Title

A Comprehensive Seismic Investigation To The Crust And Uppermost Mantle Beneath The South Pole, East Antarctica

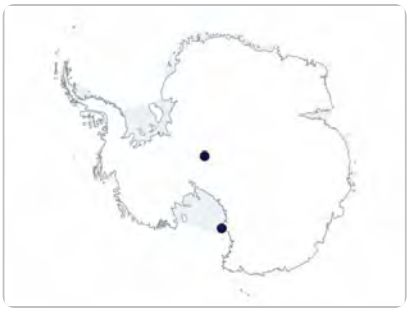
## Summary

**Event Number:**
G-298-M/S
NSF / OPP Award 2145410

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Paul Sullivan / Jenny Cunningham / Sheryl Seagraves / Leah Street

## Principal Investigator(s)



**Dr. Weisen Shen**
weisen.shen@stonybrook.edu
State University of New York
Stony Brook
Stony Brook, New York

## Location

**Supporting Stations:** McMurdo Station, South Pole Station
**Research Locations:** South Pole Station, Field Location

## Description

Being geographically significant, the area within 300 km of the South Pole Station and its sub-ice structures are equally, if not more, critical in studying Antarctic earth sciences. Given its gateway locality between the high Southern Transantarctic Mountains (STAM) and East Antarctic craton, the area is critical for studying geological history and modern tectonism of the continent, modeling its continental dynamics, and developing more accurate ice sheet dynamic models to predict their response to the global climate change. This significance, however, is contrasted by the lack of direct knowledge of the sub-ice structure, owning to its remoteness and 3 km ice cover, calling for a comprehensive study to fill this knowledge gap.

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### Feedback

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## Field Season Overview

On-site fieldwork for the upcoming season includes: 1) Deployment of up to 300 high-frequency, 3-component, portable seismic nodes near the South Pole, encompassing the nearby STAM and the polar subglacial basins; 2) Service of nine broadband station deployed in 2023-2024; and 3) Collection of continuous seismic data for four weeks before the nodes are retrieved.

Arctic Trucks will provide a light traverse platform for all field activities.

The science team will initially stage at McMurdo Station before deploying to the South Pole. The team will be housed at the non-governmental organization camp outside of South Pole Station and all support will be provided though Antarctic Logistics and Expeditions (ALE) subcontractor and Arctic Trucks. The U.S. Antarctic Program will provide inter and on continent fixed wing transportation and extreme cold weather gear. The team will be provided working space in McMurdo Station as they transit through to the South Pole.

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## Deploying Team Members

- Frank Chin
- Weisen Shen (PI)
- Hanxiao Wu

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Holocene And Late Pleistocene Stream Deposition In The McMurdo Dry Valleys, Antarctica As A Proxy For Glacial Meltwater And Paleoclimate

## Summary

**Event Number:**
G-064-M
NSF / OPP Award 2039419

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Ryan Steiner / Jenny Cunningham

## Principal Investigator(s)

**Dr. Kate Swanger**
Kate_Swanger@uml.edu
University of Massachusetts
Lowell, Massachusetts

## Location

**Supporting Stations:** McMurdo Station
**Research Locations:** Taylor Valley, Wright Valley, and Victoria Valley

## 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 climate conditions 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 climate change and fluctuating glaciers. Thus, deposits from these streams can address questions about past climate, meltwater, and lake level changes in this region. How did meltwater streamflow respond to past climate change? How did streamflow vary during periods of glacial advance and retreat? At

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### Feedback

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what times did large lakes fill many of the valleys and what was their extent? The researchers plan to acquire a record of stream activity for the Dry Valleys that will span the three largest valleys and a time period of about 100,000 years. This record will come from a series of active and ancient alluvial fans that were deposited by streams as they flowed from valley sidewalls onto valley floors. The study will provide a long-term context with which to assess recent observed changes to stream activity and lake levels.

## Field Season Overview

This is the first of a two-season field effort, with four participants deploying between mid-November and mid-January to collect sediment samples from multiple alluvial fans and stratigraphically related units in the McMurdo Dry Valleys for dating, geochemical analyses, stratigraphy and provenance studies. The team will also collect rock samples to aid in provenance analyses, and permafrost cores to test the Shaw Drill that will be used extensively in the second season. The team will work out of three consecutive tent camps at Taylor, Wright and Victoria Valleys, spending about six weeks in the field. Helicopters will support camp put-ins, moves, resupplies sample shuttling back to McMurdo Station, and two day trips to additional sampling locations. All other sampling locations will be accessed on foot from the tent camps.

## Deploying Team Members

- Tristan Bench
- Mika Bighin
- Kate Swanger (PI)
- Matthew Witscheber

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Heat Source And Flux Distributions In The Western Ross Sea Seafloor

## Summary


**Event Number:**
G-082-N
NSF / OPP Award 2217127

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Kenneth Vicknair / Jamee Johnson


## Principal Investigator(s)


**Dr. Masako Tominaga**
mtominaga@whoi.edu
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts


## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Western Ross Sea/Terror Rift

## Description

Understanding the origins and nature of heat available at the base of the cryosphere is essential in deciphering the extent and residence time of the ice in Antarctica and its oceans. Constraints on parameters that control ice-sheet stability, response of the crust to ice loading and unloading, and the effects of volcanism and heat from Earth's interior on overlying ice is of broad interest to the global climate change community. The goal of this study is to identify and to document the distribution of heat source and heat flux within the seafloor of the southwestern Ross Sea. Geothermal heat flux is one of the basic parameters that shape and control ice flow, ocean circulation, and ecosystems, connecting with subglacial hydrology and its influence on the ability of the ice sheet to slide and internally deform. Despite the importance, particularly in the Antarctic environments, there have been few investigations made


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### Feedback

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in the Ross Sea on how lithospheric heat flux contributes to cryospheric dynamics over time.

## Field Season Overview

This cruise will originate and terminate in Lyttelton, New Zealand. A total of 24 days of on-site science time will be dedicated to science collection for this group. Fifteen participants will sail on the RV/IB *Nathaniel B. Palmer*. They plan to work in Terra Nova Bay in the Ross Sea. Major areas of interest are: 1) shipboard geophysical remote sensing, including multibeam bathymetry, sub-bottom profiler, gravimeter and towed magnetometer; 2) heat flow and conductivity probing utilizing CICESE heat probe; 3) rock sampling via dredge and where loose volcaniclastic sediments are dominant; and 4) direct near-seafloor imaging and chemical sensing using the MISO TowCam.

## Deploying Team Members

- Carole Berthord
- Mathilde Cannat
- Eric Hayden
- Jacquelyn Kalemba
- Victor Naklicki
- Florian Neumann
- Robert O'Conke
- Kurt Panter (Co-PI)
- Kurt Panter (Co-PI)
- Jonas Preine
- Katherine Shanks
- Maurice Tivey
- Masako Tominaga (PI)
- Daniel Wildrick
- Jyun-nai Wu

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Investigating Ice Sheet - Solid Earth Feedbacks In West Antarctica: Implications For Ice Sheet Evolution And Stability

## Summary


**Event Number:**
G-079-M
NSF / OPP Award 1745074

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Paul Sullivan / Jenny Cunningham


## Principal Investigator(s)


**Dr. Terry Wilson**
wilson.43osu@gmail.com
Ohio State University
Geological Sciences and Byrd Polar and Climate Research Center
Columbus, Ohio


## Location

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

## Description

The Polar Earth Observing Network-Antarctic Network (POLENET-ANET) autonomous GPS and seismic network has been reconfigured to acquire higher-resolution in-situ data around the Amundsen Embayment. The network captures spatially varying crustal motions and Earth structure in a region where the ice sheet is rapidly changing. Observations will be integrated into three-dimensional modeling to investigate the solid-earth cryosphere feedback processes that influence the past, present, and future behavior of the West Antarctic Ice Sheet (WAIS). Advanced models, constrained by the new observations, will improve estimates of West Antarctic ice-mass changes, establish where the


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### Feedback

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WAIS may be stabilized by ongoing Earth deformation, and reduce uncertainties in future sea-level change projections.

## Field Season Overview

A team of six participants, including three scientists, one mountaineer, one T-295-M EarthScope GAGE engineer, and one T-299-M EarthScope SAGE engineer will service existing GPS/seismic stations of the POLENET/ANET network in West Antarctica. The team will be based out of Union Glacier and will be primarily supported by Antarctic Logistics and Expeditions (ALE) subcontractor. The U.S. Antarctic Program (USAP) will support transport of participants and cargo to/from Punta Arenas, Chile, and ALE will facilitate movement of the team and cargo to Union Glacier. The team will then make day trips by a USAP-provided Twin Otter to POLENET station sites. ALE will provide all fuel and remote camp support as needed. Service and maintenance work at the station sites involves excavation of instrumentation from beneath years of accumulated snow, collection of project seismic data, equipment replacements, and battery replacement to ensure continued data collection.

## Deploying Team Members

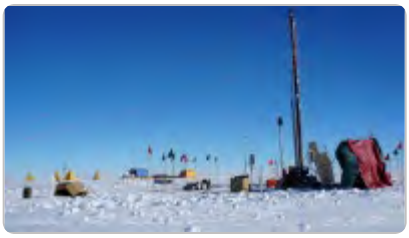
- Nicolas Bayou
- Erica Lucas
- James Normandeau
- Franco Sobrero
- Mark Whetu
- Terry Wilson (PI)

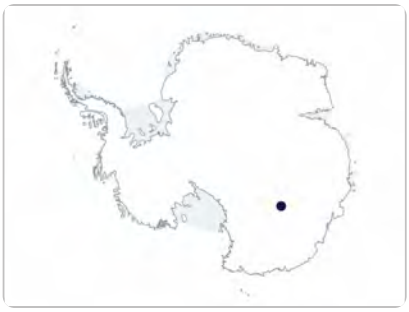
# 2024-2025 USAP Field Season
Project Detail

## Project Title

Using New Ice Cores From Dome C To Test The Assumption Of A Constant Galactic Cosmic Ray Flux And Improve Understanding Of The Holocene Methane Budget

## Summary





**Event Number:**
I-159-E
NSF / OPP Award 2146131

**Program Director:**
Dr. Kelly Brunt

**ASC POC / Implementer:**
Matthew Erickson / Jenny Cunningham

## Principal Investigator(s)

**Dr. Vasilii Victorovich Petrenko**
vasilii.petrenko@rochester.edu
University of Rochester
Earth and Environmental Sciences
Rochester, New York

## Location

**Supporting Stations:** Special Project
**Research Locations:** Concordia Station, Dome C

## Description

The proposed project will drill two shallow 4-inch (10cm) diameter ice cores to ~300m depth at Dome C, Antarctica in collaboration with the French Polar Institute. Trapped air will be extracted from most of the ice on site immediately after drilling. Carbon-14 of carbon monoxide (14CO) and methane (14CH4) would be analyzed in the extracted air samples. The 14CO measurements would be interpreted with the aid of a model of in situ cosmogenic 14C production in glacial firn and ice and used to examine the galactic cosmic ray (GCR) flux history for the last 7,000 years. The 14CH4 measurements would be interpreted with the aid of a 1-box atmospheric model and used to constrain the contribution of

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### Feedback

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geologic methane, permafrost, and marine methane hydrates to the Holocene methane budget.

## Field Season Overview

This project is supported in collaboration with the French Polar Institute (IPEV) and the Italian Antarctic Program (ENEA). Five participants, including two United States scientists, one U.S. Ice Drilling Program (IDP) driller, and two French scientists, will deploy to Concordia Station via Mario Zucchelli Station. In 2023-24, heavy cargo was delivered to French station Dumont d'Urville by French cargo vessel and traversed to Concordia. This season, the U.S. Antarctic Program (USAP) Basler will deliver additional science cargo from McMurdo Station to Concordia Station. The team will be fully supported by IPEV at Dome C, where they will drill two shallow (300 m) ice cores. Most of the cores will be melted on site to extract air for analyses of carbon monoxide and methane isotopes. Some core will be packed in ice core boxes, which along with the gas samples will be sent to McMurdo Station via Basler for northbound shipment on the USAP cargo vessel. Participants will return to Mario Zucchelli Station and will redeploy from there, with heavy cargo going north on the French cargo vessel.

## Deploying Team Members

- Alexander Ihle
- Tanner Kuhl
- Vasilii Petrenko (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Observing The Atmospheric Boundary Over The West Antarctic Ice Sheet

## Summary

**Event Number:**
O-400-M
NSF / OPP Award 1745097

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
John Rand / Randolph Jones

## Principal Investigator(s)

**Dr. John Cassano**
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University of Colorado Boulder
CIRES
Louisville, Colorado

## Location

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

## Description

Atmospheric warming, along with oceanic forcing, is contributing to ice sheet melt and hence rising global sea levels. The atmospheric boundary layer links the atmosphere and the surface of the Antarctic ice sheet. Within the atmospheric boundary layer the exchange of heat, moisture, momentum and other atmospheric constituents occur and are critical for climate processes such as ice sheet melt. An observational campaign with a small uncrewed aerial system component will be carried out using a 30 m tall tower (TT) near McMurdo Station. The 30 m TT will provide year-round observations of the lower portion of the atmospheric boundary layer while the sUAS campaign will allow profiling through the full depth of the boundary layer.

## Field Season Overview

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### Feedback

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This group will conduct an observational campaign, focused on the atmospheric boundary layer over the Ross Ice Shelf, using an instrumented 30-m tall tower located outside McMurdo Station along Williams Field Road, approximately two miles from the Scott Base Transition. The field team will be based at McMurdo Station. Two participants will deploy and will work with Antarctic Support Contract riggers to deploy instrumentation onto the tower in early-December 2024. Note that this field deployment will be combined with that for another project, led by Professor Scott Salesky. An Uncrewed Aerial System field campaign will be conducted and will sample the near-surface boundary layer up to 1,000 ft in the 2025-26 season during WinFly.

## Deploying Team Members

- Carolyn Lipke
- Tyler Plekan

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Gas Hydrate Contribution To The Ross Sea Carbon Budget; Shallow Sediment To Water Column; Present And Future

## Summary


**Event Number:**
O-269-N
NSF / OPP Award 2044453

**Program Director:**
Dr. David Porter

**ASC POC / Implementer:**
Kenneth Vicknair / Jamee Johnson


## Principal Investigator(s)


**Dr. Richard B Coffin**
richard.coffin@tamucc.edu
Texas A & M University
Corpus Christi, Texas


## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Western Ross Sea/Terror Rift

## Description


Understanding Earth's warming requires significant insight on geochemical and geobiological cycles in both polar regions. The Ross Sea is suggested to have extensive ocean – sediment transitory methane and gas hydrate interfaces that may be subject to future rapid warming. This project seeks to determine the significance of a vast transitory gas hydrate carbon reservoir in the coastal Southern Ocean. Recent double-bottom simulating reflections observed through seismic profiles indicates a thermogenic carbon source and extensive carbon storage in deep sediment hydrates. This warming and ice melting coupled with high thermogenic gas hydrate loadings suggest the Ross Sea is essential to determine contributions of current and potential future methane, petroleum, and glacial carbon to shallow sediment and



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### Feedback

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water column carbon cycles. This group will examine methane which is abundant in ocean sediments and can be a significant source of carbon dioxide. Comparison of carbon source(s) and cycling will include phytoplankton, glacier ice, shallow sediment organoclastic carbon, deep sediment oil and methane trapped in gas hydrates. Data collection will include seismic profiling, light element isotope, real-time heat flux measurements, and broad geochemical and geo-microbiology parameters. Data will provide a new understanding of climate change and the effect on the ocean carbon budget.

## Field Season Overview

Thirteen participants will deploy on the RV/IB *Nathaniel B. Palmer* from February to April 2025 on a 64-day expedition. The target locations are near Terra Nova Bay in the Ross Sea. These sampling locations were selected based on the results from multichannel seismic work the previous season. The Coffin group will focus on piston coring and heat flow probe deployments. Comparison of carbon sources and cycling will include phytoplankton, glacier ice, shallow sediment organoclastic carbon, deep sediment oil and methane trapped in gas hydrates. Piston coring will provide profiles to study vertical gas and fluid migration and water column sedimentation. Cores will be analyzed on board and replicates will be sent to the Marine and Geology Repository at Oregon State University. Additionally, water column sampling will analyze vertical migration of sediment carbon and the contribution to bacterioplankton carbon cycling. Ship time will be shared with several other groups working in the area.

## Deploying Team Members

- Yusuf Azeez
- Jennifer Dubose
- Lydia Hayes
- Antares Hofmann
- Kathryn Howe
- Wade Jeffrey (Co-PI)
- Kristen Lamprecht
- Hannah Organ
- Ingo Pecher (Co-PI)
- Victoria Rivera
- Jerricca Rossilli
- Martina Tenti
- Hao Yu

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Antarctic Automatic Weather Station Program

## Summary


**Event Number:**
O-283-M
NSF / OPP Award 2301362

**Program Director:**
Dr. David Porter

**ASC POC / Implementer:**
John Rand / Jenny Cunningham


## Principal Investigator(s)


**Dr. Matthew Lazzara**
mattl@ssec.wisc.edu
University of Wisconsin Madison
Space Science and Engineering Center/AMRC
Madison, Wisconsin


## Location

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

## Description

The Antarctic Automatic Weather Station (AWS) network has been making meteorological observations since the early 1980s. This continent-wide network is positioned to observe significant meteorological events in real-time and increase our understanding of the climate of the Antarctic surface. The activities for this project will be focused on the care of the AWS network, the establishment of an advisory board, student engagement, and outreach activities. This project aims to continue to maintain and operate the AWS network. This effort will upgrade real-time AWS processing, evolve with changing data telemetry methods, continue the development of the Polar Climate and Weather Station to continue development of a robust version that can be reliably utilized year-round in Antarctica. The observations will be quality-controlled and placed


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### Feedback

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into a database where the public will be able to search and select observations. A test system of different radiation shields (with and without aspiration) will be deployed for one year at South Pole Station. This is to resolve conflicting radiation shield bias corrections of historical data, but also to inform optimal setup for temperature observations going forward. The project will be advised by a group of peers with the development of an AWS Advisory Board. The team will engage the public with Antarctic weather and climate via scaled-up interactions with television meteorologists from several states.

## Field Season Overview

A team of two will deploy from mid-November to mid-January to service AWS weather stations in West Antarctica and in the vicinity of McMurdo Station. For the West Antarctica stations, the team will spend approximately four weeks at WAIS divide, accessing stations by Twin Otter as weather allows. From McMurdo Station, the team will access stations by Twin Otter, helicopter and ground transport for local stations. The two AWS participants will also assist with outfitting the O-400-M Cassano/O-315-M Salesky tower in the vicinity of McMurdo.

A McMurdo Station research associate will assist with monitoring and troubleshooting AWS network equipment in McMurdo Station year-round.

## Deploying Team Members

- Forbes Filip (Team Leader)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

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

## Summary

**Event Number:**
O-325-P
NSF / OPP Award 2130203

**Program Director:**
Dr. David Porter

**ASC POC / Implementer:**
Matthew Erickson / Jamee Johnson

## Principal Investigator(s)

**Dr. Dan Lubin**
dlubin@ucsd.edu
Scripps Institution of Oceanography
La Jolla, California

## Location

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

## Description

This project will collect data on aerosol chemical and microphysical properties simultaneously with cloud optical properties at Palmer Station continuously for 18 months, sampling aerosols sourced from both the ocean and from the continent. Encompassing all seasons including two austral summers, these new observations will yield robust aerosol-cloud interaction statistics for climate model evaluation and improvement. Aerosol property measurements include size distributions, number concentrations of cloud condensation nuclei and ice nucleating particles (INPs), chemical composition including mineral, sulfate, sea salt and organics, and microbial community structure from DNA sequencing. These new measurements will also differentiate between influences of algal blooms and continental dust on INPs, for which there is presently a great scarcity of data over Antarctica.

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### Feedback

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## Field Season Overview

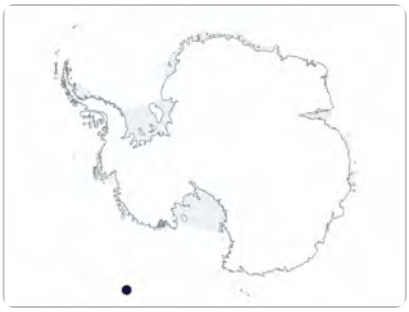
In 2024-25, prior to the data collection season, the Antarctic Support Contract will construct a base, receive and assemble a temporary LEER structure (~2,400lbs) designed to house scientific equipment scheduled to arrive during the 2025-26 season.

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Investigating Biogeochemical Fluxes And Linkages To Climate Change With Multi-Scale Observations In The Drake Passage

## Summary



**Event Number:**
O-214-N
NSF / NOAA Agreement

**Program Director:**
Dr. David Porter

**ASC POC / Implementer:**
Kenneth Vicknair / Bruce Felix

## Principal Investigator(s)

**Dr. David Russel Munro**
david.munro@noaa.gov
University of Colorado Boulder
CIRES
Boulder, Colorado

## Location

**Supporting Stations:** RV/IB Nathaniel B. Palmer
**Research Locations:** Southern Ocean

## Description

The Southern Ocean plays an important role in the global carbon cycle and yet the timing, magnitude, and trends of key biogeochemical fluxes in this region remain poorly known due in large part to a lack of surface ocean data. The primary objective of this project is to collect observations of the partial pressure of carbon dioxide (pCO2) in the surface ocean needed to assess the current state and long-term change of the flux of carbon dioxide (CO2) between the atmosphere and ocean. Researcher measurements are focused in the North Pacific, Arctic, and Southern Oceans to better understand air-sea carbon fluxes over high-latitude oceans, a large uncertainty in future climate change scenarios. This project supports the ongoing operation and maintenance of the underway air-sea pCO2 systems installed on the RV/IB *Nathaniel B. Palmer*.

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### Feedback

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## Field Season Overview

This project supports ongoing surface measurements of the partial pressure of CO2 (pCO2) from aboard the RV/IB *Nathaniel B. Palmer*. In addition, discrete measurements will be made from water and air samples collected underway. A permit to collect data within the Argentine EEZ has not been requested. All sampling and data collection will be supported by marine staff onboard U.S. Antarctic Program-funded cruises and transit vessel movements. No additional sea days are required.

## Deploying Team Members

- Anna McAuliffe
- David Munro (PI)
- Tim Newberger

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Collaborative Research: Snow Transport In Katabatic Winds And Implications For The Antarctic Surface Mass Balance: Observations, Theory, And Numerical Modeling

## Summary

**Event Number:**
O-315-M
NSF / OPP Award 2034874

**Program Director:**
Dr. Rebecca Gast

**ASC POC / Implementer:**
John Rand / Randolph Jones

## Principal Investigator(s)

**Dr. Scott Thomas Salesky**
salesky@ou.edu
University of Oklahoma
Norman, Oklahoma

## Location

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

## Description

The goal of this project is 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. The evolution of the ice sheets through snow deposition, erosion, and transport in katabatic winds (which are 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 a lack of accurate numerical modeling tools. To achieve the main research objectives, the investigators will conduct a field campaign to measure the mean flow and turbulent structure of katabatic winds and snow transport. Observations will be used to develop a unique feature: resolving numerical algorithm capable of representing the fine-scale physics of snow transport, redistribution, and sublimation in katabatic

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### Feedback

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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 2024-25 field season, a science team of three will deploy to McMurdo Station to install instruments on a 30-meter micrometeorological tower which will then operate autonomously for 12 months, monitoring winds, temperature, radiation, turbulence and blowing snow. In the 2025-26 season, science team members will return to decommission and retrograde their equipment. The tower/research site is located on the Ross Ice Shelf along Williams Field Road, approximately two miles from the Scott Base Transition. Antarctic Support Contract staff will erect the tower and provide all climbing support needed. Note that this field deployment will be combined with that for another project, led by Professor John Cassano.

## Deploying Team Members

- Adrian Brügger
- Indrani Das
- Marco Giometto (Co-PI)
- Scott Salesky (PI)

# 2024-2025 USAP Field Season
Project Detail

## Project Title

Formation, Transformation, And Northward Spreading Of Dense Saline Water Derived From Terra Nova Bay, Ross Sea, Antarctica

## Summary

**Event Number:**
O-401-E
NSF / OPP Award 2332418

**Program Director:**
Dr. Michael Jackson

**ASC POC / Implementer:**
Kenneth Vicknair / Jane Dell

## Principal Investigator(s)

**Dr. Christopher Zappa**
zappa@ldeo.columbia.edu
Columbia University
Lamont-Doherty Earth Observatory
Palisades, New York

## Location

**Supporting Stations:** Special Project
**Research Locations:** Western Ross Sea, Special Project supported by Korean Polar Research Institute (KOPRI) aboard the RV *Araon*

## Description

The primary goal of this project is to investigate the formation, transformation, and northward spreading of dense saline water derived from Terra Nova Bay (TNB), along the Drygalski Trough off the western coast of the Ross Sea and off the shelf to the Southern Ocean, to form the Antarctic Bottom Water (AABW). The project will deploy a series of moorings – two 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

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### Project WebSites

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### Feedback

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measurements include the following: 1) How do the water column profile and dense salty shelf water (HSSW) characteristics evolve on time scales ranging from hourly/daily through seasonal? 2) What regulates the transformation and northward spreading of the dense saline water derived in TNB?

This project involves international cooperation between the United States, South Korea, New Zealand, and Italy.

## Field Season Overview

Two participants will deploy to Christchurch, New Zealand and board the R/V *Araon*. Field work will consist of the deployment and recovery of five oceanographic moorings over the span of three years. These moorings will consist of two heavy moorings (instrumented from the ocean floor to 50 m beneath the ocean surface in water depths of roughly 400m-500m and 800m-1000m) deployed in Terra Nova Bay and three deep bottom moorings (instrumented within the bottom 10m-100m of sea floor). One deep bottom mooring will be deployed near Cape Washington in the northern extent of Terra Nova Bay, and the remaining two deep bottom moorings will be deployed along the Drygalski Basin/Trough. The deployment and recovery of the moorings will be supported by Korean Polar Research Institute (KOPRI) aboard the R/V *Araon* and the New Zealand vessel *Tangaroa*. PI Zappa will redeploy to the U.S. with an 18-day gap then deploy with one team member to meet the New Zealand vessel *Tangaroa* in Wellington, New Zealand to mobilize equipment on the *Tangaroa*. U.S. Antarctic Program support for this work consists of the movement of cargo and personnel to/from the port of departure/arrival of the R/V *Araon* in all three field seasons and the storage of equipment in New Zealand between seasons.

## Deploying Team Members

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