ANTARCTIC RESEARCH

AERONOMY/ASTROPHYSICS
BIOLOGY/ECOLOGY
CLIMATE SYSTEMS/METEOROLOGY
ENVIRONMENTAL RESEARCH
GEOLOGY/GEOPHYSICS
GLACIOLOGY
MEDICAL RESEARCH
OCEANOGRAPHY

Program Announcement
NSF 99-93

OFFICE OF POLAR PROGRAMS

DEADLINE: 1 JUNE 1999

NATIONAL SCIENCE FOUNDATION

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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Name: United States Antarctic Program

Program Description:

The National Science Foundation invites scientists at U.S. institutions to submit proposals—

–to perform research in Antarctica

–to perform related research and data analysis in the United States

Successful candidates will be provided funds and operational support needed to perform the research.

Scientific research, and operational support of that research, are the principal activities supported by the United States Government in Antarctica. The goals are to expand fundamental knowledge of the region, to foster research on global and regional problems of scientific importance, and to use the region as a platform from which to support research that can be done only in Antarctica or best from Antarctica.

In the U.S. Antarctic Program, three year-round research stations, additional research facilities and camps, airplanes, helicopters, surface vehicles, and ships support approximately 130 research projects each year throughout the continent and its surrounding oceans.

This announcement summarizes research opportunities, describes the support available, explains how to prepare a proposal, connects to an online system (the Electronic Support Planner) that can be used in describing needed operational support, and suggests sources of further information.

Program Officers: See the Office of Polar Programs, Antarctic Sciences Section, roster at http://www.nsf.gov/od/opp/roster/antlst.htm.

Applicable Catalog of Federal Domestic Assistance (CFDA) No.: 47.078 — Polar Programs

ELIGIBILITY

Limitation on the categories of organizations that are eligible to submit proposals:
See NSF *Grant Proposal Guide* (NSF 99-2). Federal agencies may also submit proposals.

PI eligibility limitations: **See *Grant Proposal Guide.***

Limitation on the number of proposals that may be submitted by an organization:
See NSF *Grant Proposal Guide*.

AWARD INFORMATION

Type of award anticipated: **Standard or continuing grants**

Number of awards anticipated in FY 00: **110 awards**

Amount of funds available: **NSF estimates that some $30 million will be available in FY 2000 for new and continuing awards**

Anticipated date of award: **Notification within 6 months of receipt of proposal**

PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS

Proposal Preparation Instructions

Letter of Intent requirements: **None**

Preproposal requirements: **None**

Proposal preparation instructions: **Use this announcement and the NSF *Grant Proposal Guide***

Supplemental proposal preparation instructions: **None**

Deviations from standard (GPG) proposal preparation instructions: **Operational support package required, separate from research proposal**

Budgetary Information

Cost sharing/matching requirements: **Standard NSF cost sharing. Show on line M of NSF Form 1030.**

Indirect cost (F&A) limitations: **None**

Other budgetary limitations: **None**

FastLane Requirements

FastLane proposal preparation requirements: **FastLane use strongly urged**

FastLane point of contact: **Sarita Rich, 703-306-1033,** srich@nsf.gov**, FastLane User Support, 703-306-1142,** fastlane@nsf.gov**.**

Deadline/Target Dates

Full Proposal Deadline **1 June 1999**

PROPOSAL REVIEW INFORMATION

Merit Review Criteria: **Standard National Science Board approved criteria**

AWARD ADMINISTRATION INFORMATION

Grant Award Conditions: **Standard**

Special grant conditions anticipated: **Polar Programs data policy statement**

Special reporting requirements anticipated: **None**

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INTRODUCTION

The National Science Foundation invites scientists at U.S. institutions to submit proposals—

–to perform research in Antarctica

–to perform related research and data analysis in the United States

For field work in the Antarctic, successful candidates will be provided laboratory support and operational support in addition to award of funding through home institutions.

Use this document with NSF's *Grant Proposal Guide* at http://www.nsf.gov/cgi-bin/getpub?nsf992. This document—

- ✓ summarizes antarctic research opportunities
- ✓ describes support available in Antarctica
- ✓ explains how to prepare a proposal for research project support
- ✓ connects to an online system (the Electronic Support Planner) that can be used in preparing an operational support package if your proposed project would involve field work in Antarctica
- ✓ links to further information

PROGRAM DESCRIPTION

RESEARCH AREAS

Introduction

Scientific research, and operational support of that research, are the principal activities supported by the United States Government in Antarctica. The goals are to expand fundamental knowledge of the region, to foster research on global and regional problems of current scientific importance, and to utilize the region as a platform from which to support research. The U.S. Antarctic Program supports only that research that can be done exclusively in Antarctica or that can be done best from Antarctica. The research is performed by investigators from universities and, to a lesser extent, from federal agencies and other organizations.

In the U.S. Antarctic Program, three year-round research stations, additional research facilities and camps, airplanes, helicopters, various types of surface vehicles, and ships support approximately 130 research projects each year at numerous locations throughout the continent and its surrounding oceans. See the section below titled "Facilities, Logistics, and Support."

The program has been in continuous operation since the 1957-1958 International Geophysical Year. U.S. activities in Antarctica support the Nation's adherence to the Antarctic Treaty, which reserves the region for peaceful purposes and encourages international cooperation in scientific research. At present, 43 nations adhere to the treaty, and about 27 of them participate in antarctic field activities. The United States cooperates scientifically and operationally with many of the Antarctic Treaty nations.

The National Science Foundation funds and manages the U.S. Antarctic Program. Recent and proposed NSF antarctic funding is discussed in the OPP FY 2000 Budget Request <http://www.nsf.gov/od/opp/budget/budstart.htm> and the NSF request for fiscal 2000 <http://www.nsf.gov/home/budget/start.htm>.

The Foundation supports antarctic research in these areas:

Aeronomy and astrophysics

The polar regions have been called Earth's window to outer space. This term originally applied to study of aurora and other phenomena related to interaction of solar plasmas and fields. In this context the polar upper atmosphere is a screen on which the results of such interactions can be viewed and through which other evidence of space physics

processes can pass. Today, this concept of Earth's polar atmosphere as a window includes research in other fields as well. With discovery of polar stratospheric ozone depletions, a window previously thought "closed" (the ultraviolet window) is now known to "open" in certain seasons. In astronomy and astrophysics, favorable atmospheric conditions and the unique location of the South Pole enable scientists to use this window to probe the structure of the Sun and the universe with unprecedented precision.

The aeronomy and astrophysics program supports studies of three regions:

- the stratosphere and the mesosphere. Current research focuses on stratospheric chemistry and aerosols, particularly in the context of the ozone hole. The polar stratosphere is expected to be a field of continued interest and growth.

- the thermosphere, the ionosphere, and the magnetosphere. These regions derive many of their characteristics from the interplay of ionized plasmas and energetic charged particles with geomagnetic and geoelectric fields. The upper atmosphere, particularly the ionospheric portion of it, is the ultimate sink of solar wind energy that is transported into the magnetosphere. Energy dissipates in the ionosphere because of particle precipitation, which is the result in part of resonant wave-particle interactions, and because of the Joule heating that is a result of currents driven by electric fields.

- astronomy and astrophysical studies of the regions of the universe outside the magnetosphere, including solar astronomy and cosmic ray physics. Astrophysical studies are primarily conducted at the South Pole station or on long-duration balloon flights launched from McMurdo.

Major goals are to sponsor research that requires or would benefit from the unique conditions of the Antarctic, to contribute to understanding of the role of the Antarctic in global environmental change, to participate in interdisciplinary studies of geosphere-biosphere interactions in the middle and upper atmosphere, and to improve understanding of the coupling of the Earth's polar atmosphere with the magnetosphere and of the ways in which both are affected by solar activity.

Biology and medical research

The goal of antarctic biology and medical research is to improve understanding of life phenomena and processes. The program supports projects directed at all levels of organization from molecular, cellular, and organismal to communities, ecosystems, and global processes. Investigators should apply recent theory and technology to understanding how organisms, including humans, adapt and live in high latitude environments and how ecosystems may respond to global change. Support is focused on these areas:

- Marine ecosystem dynamics. Understanding the natural variability of marine ecosystems is the goal. An important direction is toward correlating the structure and function of the marginal ice-zone ecosystem with oceanic and atmospheric processes. Of particular interest is the influence of nutrient limitations on primary production and the role of marine phytoplankton in carbon dioxide cycling. Proposals to develop data collection technologies such as satellite remote sensing are encouraged.

- Terrestrial and limnetic ecosystems. Organisms in ice-free areas and in perennially ice-covered lakes show remarkable adaptations. The presence of relatively few species eases study of ecosystem dynamics and interpretation of experiments. Research is needed on adaptive mechanisms and evolutionary processes. Studies that include molecular biological approaches are encouraged. The McMurdo Dry Valleys of southern Victoria Land are of particular interest.

- Population biology and physiological ecology. Research is supported in population dynamics, especially metabolic, physiological, and behavioral adaptations of krill and other zooplankton and fish species. Marine mammals and birds have been the object of much research and merit further attention in some areas. Mechanisms necessary for maintenance of cell function in fishes and their feeding behavior are important topics. Long-term observations are needed to improve understanding of manmade or natural changes.

- Adaptation. The extremes of light, temperature, and moisture have resulted in unusual adaptations. Research topics include low temperature photosynthesis and respiration, enzymatic adaptations, adaptive strategies such as development of antifreeze compounds and modifications to circulation systems, and the response of organisms to increased UV-B from the ozone hole. Biotechnology offers unique approaches to addressing questions involving adaptation, and such applications are of special interest.

- Human behavior and medical research. Antarctica's extreme climate can induce social, psychological, and physiological stresses, particularly during the winter isolation, which can exceed 8 months. Research has applications to human health and performance both in the Antarctic and in other isolated environments such as space. Studies can focus on topics such as epidemiology, thermal regulation, immune system function, individual behavior, and group dynamics.

Geology and geophysics

Antarctica represents about 9 percent of Earth's continental crust and has been in a near-polar position for more than 100 million years. It is covered by a continental ice sheet with an average thickness of 3 km. There is unequivocal evidence that for a long period after the continent arrived at its high-latitude position, extensive continental ice sheets did not exist there. The ice sheets, through their interaction with and effect on oceanic and atmospheric circulation, play a key role in modulating global climate.

Some important program goals include:

- determining the tectonic evolution of Antarctica and its relationship to the evolution of the continents from Precambrian time to the present

- determining Antarctica's crustal structure

- determining the effect of the dispersal of antarctic continental fragments on the paleocirculation of the world oceans, on the evolution of life, and on global paleoclimates and present climate

- reconstructing a more detailed history of the ice sheets, identifying geological controls to ice sheet behavior, and defining geological responses to the ice sheets on regional and global scales

- determining the evolution of sedimentary basins within the continent and along continental margins

All of these problems involve the need for an improved understanding of where, when, and how Antarctica and its surrounding ocean basins were accommodated in the interplate movements inferred from studies of global plate kinematics. In short, the program encourages investigation of the relationships between the geological evolution of the antarctic plate and paleocirculation, paleoclimate, and the evolution of high-latitude biota.

In geophysics, the continent and its environs have a central role in the geodynamic processes that have shaped the present global environment. The tectonic role of the antarctic continent in the breakup of Gondwanaland, the close interaction of the antarctic crust and ice sheet with their attendant effects on the planet's fluid systems, and Antarctica's present-day seismically quiescent role defines the important thrusts of geophysical research in the high southern latitudes.

Ocean and climate systems

Antarctic oceanic and tropospheric studies focus on the structure and processes of the ocean-atmosphere environment and their relationships with the global ocean, the atmosphere, and the marine biosphere. As part of the global heat engine, the Antarctic has a major role in the world's transfer of energy. Its ocean/atmosphere system is known to be both an indicator and a component of climate change.

Research sponsored by the ocean and climate systems program is intended to improve understanding of the oceanic environment at high latitudes, including global exchange of heat, salt, water, and trace elements, sea-ice dynamics, and tropospheric chemistry and dynamics. Major program elements include—

- Physical oceanography, concerned with understanding the dynamics and kinematics of the polar oceans, the effects of interface driving forces such as wind, solar radiation, and heat exchange, water mass production and modification processes, ocean dynamics at the pack ice edge, and the effect of polynyas on ventilation.

- Chemical oceanography, concerned with chemical composition of sea water and its global speciation, reactions among chemical elements and compounds in the ocean, fluxes of material within ocean basins and at their boundaries, and the use of chemical tracers to study time and space scales of oceanic processes.

- Sea ice dynamics, including study of the material characteristics of sea ice down to the individual crystal level and the large-scale patterns of freezing, deformation, and melting. These processes have implications for both atmospheric and oceanic "climates." Advances in instrumentation, including remote sensing or telemetering of ice type, thickness, motion, and growth, should enable large scale dynamics of sea ice to be monitored over long periods.

- Meteorology, concerned with atmospheric circulation systems and dynamics. Research areas include the energy budget; atmospheric chemistry; transport of atmospheric contaminants to the Antarctic; and the role of large and mesoscale systems in global exchange of heat, momentum, and trace constituents.

Glaciology

Snow and ice are pervasive elements of high latitude environmental systems and have an active role in the global environment. The glaciology program is concerned with the study of the history and dynamics of all naturally occurring forms of snow and ice, including floating ice, seasonal snow, glaciers, and continental and marine ice sheets. Program emphases include paleoenvironments from ice cores, ice dynamics, numerical modeling, glacial geology, and remote sensing of ice sheets. Some specific objectives are:

- Correlation of climatic fluctuations evident in antarctic ice cores with data from arctic and lower-latitude ice cores, and integration of the ice record with the terrestrial and marine record.

- Documentation of the geographic extent of climatic events noted in paleoclimatic records; and the extension of the ice core time series to provide information on astronomical forcing of climate.

- Establishment of more precise dating methodologies for deep ice cores.

- Determination of the Cenozoic history of antarctic ice sheets and their interaction with global climate and uplift of the Transantarctic Mountains; response of the antarctic ice sheets to the Pliocene warming.

- Investigation of the physics of fast glacier flow with emphasis on processes at glacier beds.

- Investigation of ice-shelf stability.

- Identification and quantification of the feedback between ice dynamics and climate change.

Environmental research

Scientific research can help to reduce the environmental impact of activities in Antarctica. Areas of inquiry might include effects of past practices, materials and waste management, current impacts, resilience of ecosystems, and promising technologies. The goal is to foster and maintain Antarctica's natural conditions while promoting and supporting the range of scientific research that can be done best in Antarctica.

Submit proposals to the relevant disciplinary program (see above sections) in the Office of Polar Programs.

Instrumentation

Proposals for instrument development and support will be considered in such areas as acquiring new research equipment or modernizing existing equipment, developing instruments or techniques that extend research capabilities, supporting research technicians, doing demonstration or feasibility projects, and developing remote sensing techniques. Partnerships with engineering faculty in collaborative projects are encouraged. Integration of technique development with scientific applications should be described carefully.

Submit instrumentation proposals to the disciplinary program area in which the instrumentation will be used. See also NSF's Major Research Instrumentation (MRI) program at http://www.nsf.gov/cgi-bin/getpub?nsf9934 .

FACILITIES, LOGISTICS, AND SUPPORT

Facilities for research in Antarctica include research stations with scientific equipment and laboratories, helicopters, ski-equipped LC-130 airplanes, Twin Otter airplanes, surface vehicles, a wide array of equipment for use in establishing temporary camps, two research icebreakers, and a logistics icebreaker. These facilities are operated under the guidance of NSF's Polar Research Support Section (703-306-1032) by a contractor (Antarctic Support Associates, 303-790-8606, http://www.asa.org) and its subcontractors, by military units of the Department of Defense, and by the U.S. Coast Guard. The following facilities are expected to be available in the Antarctic.

Construction activities associated with the South Pole Modernization Project will constrain some logistics-intense research, particularly that dependent on LC-130 support, until around 2004.

McMurdo Station (77°53'S 166°40'E)

McMurdo, on Ross Island, is the hub of the U.S. Antarctic Program. Persons en route to South Pole and field camps pass through McMurdo. In the U.S. program, only Palmer Station is operationally separate. McMurdo is the largest station in Antarctica, accommodating up to 1,200 people in summer and 250 in winter.

McMurdo is the globe's farthest south land accessible by ship. It has a natural harbor, Winter Quarters Bay, accessed by a freighter and a tanker with Coast Guard icebreaker escort once a year in late summer.

U.S. antarctic air operations are centered at McMurdo. Nearby sea ice supports a runway for large transport planes between late September and early December, when flights are made between New Zealand and McMurdo several times per week. A second runway on groomed glacial ice can operate in all but the warmest months; flights from New Zealand are made to it over several days in mid-August and again near the end of the summer season in February. A skiway on the adjacent Ross Ice Shelf can be used at any time of year by LC-130s, ski-equipped, four-engine transports. LC-130s operated by the New York Air National Guard are stationed at McMurdo throughout the austral summer. In winter the station historically has been isolated except for emergencies.

Communications between McMurdo and the rest of the world, available year-round, 24 hours a day, include telephone, electronic mail, and the Internet. Regular U.S. mail service is provided in the austral summer.

McMurdo is a major research center. Science facilities include the Albert P. Crary Science and Engineering Center (more familiarly, the Crary lab), opened in 1991. The laboratory is a large, state-of-the-art facility that enables sophisticated procedures in the disciplines appropriate to Antarctica. The lab's five wings total 4,320 square meters of working area for information, computing, and telecommunications including Internet; biology; earth sciences; atmospheric sciences; and an aquarium and wet lab. The lab has flexible-use laboratory space, environmental rooms, equipment rooms, microscope rooms, offices, facilities for handling hazardous chemicals including radioisotopes, and conference rooms. Most lab spaces have single-pass air and fume hoods. The facility has specialized benchtop equipment for use both in the building and remotely. It is stocked with scientific supplies, chemicals, and other consumables. It also supports environmental and ecological investigations, bioassays, industrial hygiene surveys, chemical analyses, and snow and ice mechanics and engineering. A meteorology center <http://uwamrc.ssec.wisc.edu/amrchome.html> has AVHRR, HRPT, DMSP, and other data archives and an interactive data access system.

Additional McMurdo facilities provide direct support to science involving diving, balloon launches, field party training and outfitting, upper atmosphere investigations, etc. In summer, portable shelters and equipment aid research on and under the sea ice of adjacent McMurdo Sound. Helicopters support projects and camps within 150 kilometers of the station; and surface vehicles provide local transportation and support for traverses.

The McMurdo region has been the object of vigorous scientific attention. An abundant literature presents questions for further study in marine biology, earth sciences, and other areas.

Amundsen-Scott South Pole Station (90^{o}S)

Opened in 1957, Amundsen-Scott South Pole Station was rebuilt in 1975 as a research facility under a geodesic dome and steel arches. In recent years it has undergone substantial renovation and improvement to handle increased research needs. The station currently is undergoing a far-reaching modernization that over several years will substantially improve or replace existing structures and systems.

South Pole Station is at an elevation of 2,835 meters on the continental ice sheet and has a mean temperature of minus 49.3^{o}C.

Flights between McMurdo and South Pole are frequent from late October to mid-February; the station is isolated at other times. February-to-October (austral winter) population is about 28. More than 150 can be accommodated in the summer.

The station has an Atmospheric Research Observatory, the Martin A. Pomerantz Observatory for astrophysics, and computer systems for research and communication including Internet access. It has collected the longest continuous set of meteorological data from Antarctica's vast interior ice plateau, and it is well located for studies of the cusp region of the magnetosphere. Astronomy and astrophysics have flourished in recent years, taking advantage of excellent optical properties of the atmosphere (resulting from its high elevation, low temperature, and low humidity) and, for neutrino detection, the extremely clear and homogeneous thick ice below. A small biomedical research facility is present. Other areas of interest include geophysics, upper atmosphere sciences, and glaciology.

Palmer Station (64^{o}46'S 64^{o}03'W)

Palmer, on Anvers Island near the Antarctic Peninsula, has been in operation since 1965. It is operated in conjunction with the icebreaking research ship *Laurence M. Gould*. Small boats are available for sampling in the sea and at nearby islands. Access to Palmer, which is year-round, generally is by ship from the southern tip of South America.

The climate at Palmer is less severe than that at the other U.S. stations, and the fauna and flora are diverse. There are many opportunities for biology at or near the station; other disciplines (e.g., meteorology, upper atmosphere physics) also are represented. Palmer has extensive biology laboratories, including wet lab areas and sea water aquaria. Palmer's population has ranged from 8 to 12 in winter to 43 in summer.

The Palmer Station area in 1990 was designated by the National Science Foundation as a Long Term Ecological Research (LTER) site (see the U.S. LTER network home page at http://lternet.edu). For information contact the biology program manager at OPP.

Temporary camps

In the austral summer, aircraft from McMurdo can place scientific parties almost anywhere on the continent. Tents or heated shelters and snowmobiles can be provided. Helicopters sometimes are deployed to remote locations for close support of research parties. Substantial camps remote from McMurdo Station can be established for large research groups. Camps can be placed by ship in the Antarctic Peninsula area.

Automated data gatherers (AGO and AWS)

The program supports automated geophysical observatories (AGOs) for unmanned collection of data at remote locations. Investigators wishing to use these facilities or the resulting data should contact a science program manager

(see roster at http://www.nsf.gov/od/opp/roster/antlst.htm) or the AGO Web page, http://www.polar.umd.edu/ago.html.

Automatic weather stations (AWSs) have been placed at locations in Antarctica. For information and data, contact Dr. Charles Stearns, Department of Meteorology, University of Wisconsin, 1225 W. Dayton Street, Madison, Wisconsin 53706 (chucks@ssec.wisc.edu, or see the home page http://www.ssec.wisc.edu/~rbrbrn/awsproj.html).

UV radiation monitoring network

The program operates precision spectroradiometers optimized for measuring solar ultraviolet radiation at South Pole, Palmer, and McMurdo in Antarctica and at Ushuaia, Argentina; Point Barrow, Alaska; and San Diego. Data are distributed regularly in support of seasonal research and are available annually on CD-ROM. The data include irradiance scans and databases of integrated UV exposure and a variety of dosages. Contact ASA's subcontractor Biospherical Instruments, 5340 Riley Street, San Diego, California 92110-2521 (support@biospherical.com or http://www.biospherical.com/).

Research ships

For capabilities and schedules of research icebreakers, visit the Marine Operations home page at http://www.asa.org/marine/index.html)

Laurence M. Gould. This icebreaking research and resupply ship accommodates 28 researchers and support technicians, most in double rooms with bathrooms. Another eight can be transported in vans. It is equipped for marine biology, physical and chemical oceanography, and marine geophysics. It operates typically along the Antarctic Peninsula and in the South Shetland Islands; research cruises can be made elsewhere as required. Several trips are made between South American ports and Antarctica each austral summer; the ship regularly transports people and supplies between southern South America and Palmer Station. It entered into U.S. Antarctic Program service in 1997 under a 10-year charter from the builder and operator, Edison Chouest Offshore.

The hull has an ice classification of ABS-A1 rated for light icebreaking. The ship is thus permitted to perform missions in moderate pack ice, but must stay clear of heavy ice and consolidated pack to avoid besetment.

Research equipment includes a seismic system, a portable isotope laboratory, and dedicated oceanographic instrumentation (e.g., CTD). The ship has a deep sea trawl winch and hydrographic winches, cranes, an interior staging area with telescoping side boom, and starboard and aft A-frames. It has satellite navigation, radar, and precision depth recorders.

The ship's name commemorates Laurence M. Gould (1896-1995), chief scientist and second in command on Richard E. Byrd's first antarctic expedition, president of Carlton College, leader of the U.S. delegation to planning meetings for the antarctic portion of the International Geophysical Year, member of the National Science Board, and chairman of the National Academy of Sciences Polar Research Board, among other things.

Specifications

Built:	1997
Length:	230 ft (70.1 m)
Beam:	46 ft (14 m)
Draft:	19 ft (5.8 m)
Accommodations:	56 total, including 8 in vans
Gross tons:	1,599
Ice Class:	ABS A-1
Engines:	Two 3606 Cat diesels, total 4,575 bhp Bow thruster

Laboratories:

Wet lab	425 sq ft (40 sq m)
Hydro lab	526 sq ft (49 sq m)
Dry lab	356 sq ft (33 sq m)
Electronics lab	460 sq ft (43 sq m)
Aquarium room	6 tanks

Nathaniel B. Palmer. A research vessel with icebreaking capability, *Nathaniel B. Palmer* began antarctic operations in 1992 under a 10-year lease with the builder and operator, Edison Chouest Offshore. The ship is a first-rate platform for global change studies, including biological, oceanographic, geological, and geophysical components. It can operate safely year-round in antarctic waters that often are stormy or covered with sea ice. It accommodates 37 scientists and support technicians, has a crew of 22, and is capable of up to 75-day missions. It has 4,100 sq ft (380 sq m) of working deck area, 4,000 sq ft (370 sq m) of laboratory spaces, and modern oceanographic equipment.

Research equipment includes a seismic system, a portable isotope laboratory, and dedicated oceanographic instrumentation (e.g., CTD). The ship has a deep sea trawl winch and hydrographic winches, cranes, an interior staging area with telescoping side boom, and starboard and aft A-frames. It has satellite navigation, radar, precision depth recorders, multichannel and single channel seismic system, Seabeam bottom profiler, and acoustic doppler current profiler.

The ship is named *Nathaniel B. Palmer* to commemorate the American sealer credited with first seeing Antarctica, in 1820. Nathaniel Palmer later led a prosperous career as a sea captain and a designer and builder of clipper ships.

Specifications

Length overall	308 ft (94.0 m)
Length on waterline	280 ft (85.3 m)
Beam	60 ft (18.3 m)
Draft	22.5 ft (6.6 m)
Displacement	6,800 LT (6,620 tonnes)
Propulsion	4 main engines, total 13,000 hp, 2 shafts, variable pitch Kort nozzle propellers Bow thruster

Underway measurements. Instruments on *Nathaniel B. Palmer* and *Laurence M. Gould* are available for not-to-interfere underway measurements on behalf of investigators who do not join a cruise. Instruments include Seacat 21 thermosalinograph, Turner model 10 fluorometer, Simrad EK500 scientific echo sounder and other acoustic and bathymetric systems, LaCoste-Romberg gravity meter, XBTs, and meteorological sensors. A Seabeam wide-swath bottom mapping system is installed on the *Nathaniel B. Palmer*. Proposals for management of long-term measurements and data archiving will be considered. Identify technician staffing and other shipboard support both in the proposal and on the *Nathaniel B. Palmer* worksheet.

Other ships. University-National Oceanographic Laboratory Systems <http://www.gso.uri.edu/unols/unols.html> ships operate in the southern ocean in some years; see also the NSF Division of Ocean Sciences Web page <http://www.geo.nsf.gov/oce/start.htm>. The Coast Guard icebreaker <http://www.oz.net/~polarsea/> that provides operational support near McMurdo can provide underway research support in the southern ocean and the Ross Sea; direct a proposal for such support to the NSF Office of Polar Programs. Research ships of other Antarctic Treaty nations operate in antarctic waters (see "Non-U.S. facilities; international cooperation" below).

Airborne sensing

The Support Office for Aerogeophysical Research (SOAR) is a research facility that supports OPP-sponsored aerogeophysical work in Antarctica. The facility operates a suite of geophysical systems (gravimeter, magnetometer, laser altimeter, and ice-penetrating radar) aboard a Twin Otter aircraft. Positional information is provided by differential GPS (both pseudo-range and carrier-phase), supplemented by inertial navigation and precision pressure altimeter data.

Investigators wishing to use the SOAR facility should contact the science coordinator at SOAR no later than 60 days prior to proposal submission to ensure that the specific goals can be met, that the proposed project is technically feasible, and that the project can be accommodated with uncommitted facility time. SOAR will provide a feasibility statement to be included as an appendix for all proposals to use the facility. Scheduling of the facility will be the responsibility of the facility management team, with direction from NSF.

SOAR is supported through a cooperative agreement between NSF and the University of Texas at Austin. For further information or to be added to the SOAR mailing list, contact—

Sammantha Magsino, Science Coordinator
Support Office for Aerogeophysical Research
Institute for Geophysics
University of Texas at Austin
4412 Spicewood Springs Road, Building 600
Austin, Texas, 78759-8500
512-232-3291
512-232-3245 fax
www.ig.utexas.edu/soar
magsino@utig.ig.utexas.edu

Investigators developing programs utilizing airborne remote sensing techniques which are beyond the current capabilities of the SOAR facility should contact a science program manager.

High precision GPS

The Global Positioning System (GPS) is a worldwide, all-weather navigation and positioning system operated by the Department of Defense. GPS has been used in Antarctica for several years. The use of GPS for high precision antarctic surveying (1 mm–10 m) is increasing, with applications including geodetic surveying, glacial flow measurement, aircraft position, velocity and acceleration determination, mapping, seismic instrument positioning on moving ice sheets, glacial geology, isostasy, and sample positioning.

The U.S. Antarctic Program has an agreement with University Navstar Consortium (UNAVCO) for GPS support including equipment and predeployment support. Support includes (1) a pool of geodetic quality receivers for the field season, (2) in-field equipment repair, (3) in-field engineering support, (4) in-field and predeployment training in the use of GPS receivers, (5) training in GPS data processing, (6) archiving of GPS data, and (7) assistance in project planning and experiment design.

UNAVCO's assistance in the design of projects includes advice about both field support and data processing. Resources are limited, and investigators who have their own receivers and field staff are encouraged to use them. Investigators who do not have access to geodetic-quality GPS receivers and are contemplating their use for high-precision surveying as part of their proposed work should contact UNAVCO to discuss the requirements. In general, proposals should build GPS expertise into the science project plan and the budget.

On the Operational Requirements worksheets (see section with this title below), specify the number of receivers required, the time needed to complete the GPS field work, and the in-field engineering required from UNAVCO. Describe how the work will be done, including any need for permanent markers. Contact UNAVCO if you need help developing this information.

UNAVCO/UCAR
P.O. Box 3000
Boulder, Colorado 80307-3000
303-497-8034 (Bjorn Johns), 303-497-8007 (Barb Perin)
303-497-8028 (fax)
http://www.unavco.ucar.edu
Select "Polar Program" for project description
or "Contact Us" to e-mail polar@unavco.ucar.edu

Synthetic aperture radar

NSF encourages proposals to use synthetic aperture radar (SAR) data in oceanography, sea-ice research, glaciology, and geology. Under an agreement between NASA and NSF, an earth station has been put into operation at McMurdo. Similar earth stations have been established at the Japanese antarctic station Syowa and the Chilean antarctic station O'Higgins, enabling SAR data to be acquired from a large part of Antarctica. Data are available for areas north of 79°S from the European Remote Sensing Satellites ERS-1 and ERS-2 and the Canadian satellite RADARSAT. Opportunities exist for interferometric studies utilizing ERS-1 and -2 data collected with a 1-day separation between images. The first antarctic imaging campaign was completed successfully on 20 October 1997, and a second one is being planned.

Access to data is regulated according to international agreements between NASA and the foreign flight agency responsible for the satellite. For ERS-1 and -2, data received through McMurdo are available through the Alaska SAR Facility (ASF) at the University of Alaska, Fairbanks, which is sponsored by NASA (see below). All other antarctic SAR data from ERS-1 and -2 must be requested through the European Space Agency. Antarctic RADARSAT data are available through the ASF to approved investigators.

Agreements between NASA and the space agencies require you to be a registered user to obtain ASF's SAR-related data. Investigators submitting proposals to the U.S. Antarctic Research Program for analysis of SAR data must also submit a proposal to NASA to receive data credits.

For more information about SAR data, contact the Alaska SAR Facility (see below). For related opportunities in NASA's Earth Science Enterprise, contact NASA (see below). For U.S. Antarctic Program information, contact the OPP program officer for your area of research (see roster at http://www.nsf.gov/od/opp/roster/antlst.htm).

User Services Office
Alaska SAR Facility
PO Box 757320
Geophysical Institute
University of Alaska Fairbanks
Fairbanks, Alaska 99775-0732
Tel: (907) 474-6166
Fax: (907) 474-5195
E-mail: uso@asf.alaska.edu
http://www.asf.alaska.edu

NASA Earth Science Enterprise
Polar Program, CODE YSG
NASA Headquarters
Washington, D.C.
Tel: (202) 358-1154
Fax: (202) 358-2771
http://www.earth.nasa.gov

Polar Ice Coring Office

The Polar Ice Coring Office (PICO) <http://www.pico.unl.edu/> is supported by the Office of Polar Programs to meet technological requirements of glaciologists and others. PICO focuses on designing, fabricating, and operating ice

drilling equipment in Antarctica, Greenland, and high alpine areas. Direct support to science parties as tasked by the Office of Polar Programs can include coordination of science support requirements, collection and dissemination of data, facilities and equipment, information systems, and logistics. Ice drilling and technical services include electro-mechanical ice core drills, hot water drill for deep access holes and shot holes, and sub-ice sampling. Notify the relevant NSF program manager (see roster at http://www.nsf.gov/od/opp/roster/antlst.htm) when you are requesting PICO support.

Specimens for research

Specimens collected in the Antarctic are available to qualified investigators for study. For information, including the policies and procedures for obtaining samples, contact the facilities listed below.

Ice cores. A facility supported by USGS and NSF houses approximately 12,000 meters of ice cores recovered from Greenland and Antarctica that are available for study.

National Ice Core Laboratory
Mail Stop 939, Box 25046
DFC, U.S. Geological Survey,
Denver, Colorado 80225
303 202 4828, fax 303 202 4856
jfitz@usgs.gov
http://www.nicl-smo.sr.unh.edu/NICL/

Ocean-bottom sedimentary cores and grab samples; continental cores. Shipboard coring supported by the U.S. Antarctic Program over four decades has produced the world's largest collection of antarctic piston cores. Investigators planning proposals that would result in collection of new marine sediment cores should contact the curation facility during proposal development. The facility can provide information about core handling protocols and, in special cases, can provide assistance to projects if planned and justified in the proposal. It should be considered the final repository for core material remaining from a project unless other specific arrangements are made.

AMGRF Curator
Department of Geology
Florida State University
Tallahassee, Florida 32016-3026
904 644-2407
curator@gly.fsu.edu
http://www.arf.fsu.edu/

Meteorite samples. More than half the world's meteorites available to science have been recovered from Antarctica since 1969. Samples are managed, described, curated, and made available for research under an interagency agreement between NSF, NASA, and the Smithsonian Institution.

Secretary, Meteorite Working Group
Curator's Branch SN2
Johnson Space Center, NASA
Houston, Texas 77058
http://www-curator.jsc.nasa.gov/curator/antmet/antmet.htm

Biological specimens. The Smithsonian Oceanographic Sorting Center from 1963 to 1992 received and sorted some 20,000 samples of benthic invertebrates, plankton, algae and fish collected by U.S. Antarctic Program researchers. Sorted specimens were sent to taxonomic specialists worldwide for study and identification. Hundreds of thousands of specimens, including newly identified types, were deposited at the National Museum of Natural History. The Center was dissolved in 1992 and merged into existing Natural History departments, with responsibility for the antarctic collection assigned to the Department of Invertebrate Zoology. The Department in 1995 entered a cooperative agreement with NSF to catalog and manage the antarctic collections. NSF-sponsored polar investigators continue to

deposit specimens and data. Future large collections will be acquired from NSF-sponsored Long Term Environmental Research (LTER) projects in the Antarctic.

National Museum of Natural History
Department of Invertebrate Zoology
Smithsonian Institution
Washington, D.C. 20560
202-357-2030
mnh.fanchald@ic.si.edu
http://www.nmnh.si.edu/iz/usap/

Maps, aerial photographs, and related information

An Antarctic Resource Center <http://usarc.usgs.gov> at the U.S. Geological Survey maintains the Nation's most comprehensive collection of antarctic maps, charts, satellite images and photographs. Formerly the United States SCAR (Scientific Committee on Antarctic Research) Library, the center is managed through an interagency agreement with the National Science Foundation that also supports USGS mapping and geodesy in the Antarctic. For information write the Antarctic Resource Center, USGS National Center, 12201 Sunrise Valley Drive, MS 515, Reston, Virginia 20192.

Non-U.S. facilities; international cooperation

The United States cooperates in research with other Antarctic Treaty nations. U.S. scientists wishing to do research with other nations' programs are asked to contact an Office of Polar Programs program manager before submitting a formal proposal.

The U.S. Antarctic Program is enthusiastically open to cooperation with other Antarctic Treaty nations when mutually beneficial. These projects often occur because of initiative taken by individual scientists. In your discussions, remember that individuals cannot commit U.S. Antarctic Program resources. Your acceptance of a generous offer from another nation's antarctic program could be construed as commitment of U.S. resources for some later project.

Do not hesitate in your collaboration with overseas colleagues, but please contact an OPP program manager (703-306-1033) upon commencing discussions that could lead to U.S. Antarctic Program involvement.

ANTARCTIC CONSERVATION ACT (ACA) OF 1978

Public Law 95-541, the Antarctic Conservation Act of 1978, requires your involvement from the time you write a proposal to the time you leave Antarctica.

The law protects native mammals, birds, and plants and their ecosystems. The law applies to all U.S. citizens, whether or not they go to Antarctica with the U.S. Antarctic Program. It applies to all expeditions to Antarctica that originate from the United States.

The Act makes it unlawful, unless authorized by permit—

–to take native mammals or birds
–to engage in harmful interference
–to enter designated special areas
–to introduce species
–to introduce substances designated as pollutants
–to discharge designated pollutants
–to import certain antarctic items into the USA

The Act provides penalties of up to $25,000 and 1 year imprisonment for each violation. Other penalties could include removal from Antarctica, rescission of a grant, or sanctions by your employer.

A Protocol on Environmental Protection signed in 1991 by representatives of the United States and other Antarctic Treaty nations entered into force in 1998. The protocol strengthens antarctic environmental standards, and recent U.S. regulations under the Antarctic Conservation Act bind U.S. citizens to the Protocol.

The book *Antarctic Conservation Act of 1978 (Public Law 95-541), with Regulations, Descriptions and Maps of Special Areas, Permit Application Form, Agreed Measures for the Conservation of Antarctic Fauna and Flora, and Protocol on Environmental Protection* (NSF 95-154 at http://www.nsf.gov/pubs/1995/nsf95154/nsf95154.pdf) is free from NSF.

The following paragraphs discuss major provisions of the Antarctic Conservation Act and the Protocol on Environmental Protection.

Taking native mammals or birds

It is unlawful, unless authorized by permit, to take antarctic native mammals or birds. To *take* means to remove, harass, molest, harm, pursue, hunt, shoot, wound, kill, trap, capture, restrain, or tag a native mammal or bird or to try to do so.

If you are on the sea ice near McMurdo and try to hustle a Weddell seal into position for a photograph, you are breaking the law. If you are an ornithologist with a grant to band giant petrels, you may not do so until you apply for and receive a permit. A grant and a permit are two different things.

Mineral samples for scientific purposes normally may be collected and removed from Antarctica without an Antarctic Conservation Act permit. However, the Act requires a permit for "any activity that results in the significant adverse modification of habitats of any species or population of native mammal, bird, plant, or invertebrate." The Antarctic Protection Act of 1990 (Public Law 101-594) states, "it is unlawful for any person to engage in, finance, or otherwise knowingly provide assistance to any antarctic mineral resource activity."

Entering designated special areas

A number of precisely defined places in Antarctica are designated under the Antarctic Treaty, and in the U.S. law, as Specially Protected Areas or Sites of Special Scientific Interest. You must have a compelling need to enter one of these areas, and you must have a permit to do so.

Some of these special areas are near stations, such as Arrival Heights next to McMurdo or Litchfield Island near Palmer. Other special areas like the Barwick Valley are in remote locations in which geologists, for example, may want to work. The areas and their *management plans*, with which you must comply if you are permitted to enter, are described in publication NSF 95-154.

Introducing species

Introducing nonindigenous species to Antarctica (*i.e.*, south of 60^{o}S latitude) generally is prohibited. However, if your work requires it, a permit may be issued for the following species under controlled conditions:

(a) domestic animals and plants
(b) laboratory animals and plants including viruses, bacteria, yeast, and fungi

Living nonindigenous species of birds may not be introduced into Antarctica.

If you are uncertain whether the species you need to take to Antarctica is considered an introduced species, please contact the biology program at NSF (see roster in the NSF Web site).

Introducing substances designated as pollutants

The Antarctic Conservation Act regulates what types of materials can be taken to Antarctica and specifies how these materials must be used, stored, and disposed of.

Banned substances. These substances are banned from Antarctica:

(a) pesticides (except those required for science or hygiene: a permit is needed)
(b) polychlorinated biphenyls (PCBs)
(c) nonsterile soil
(d) polystyrene beads and plastic chips

Designated pollutants. This category is large and will require attention if you get a grant to work in Antarctica. Then, the Foundation's contractor Antarctic Support Associates will help you report the materials that fall in this category.

At the proposal stage, it is enough to think about how to *minimize* the types and amounts of substances you need, to *substitute* benign substances for designated pollutants wherever possible, and to *handle* the designated pollutants that you must take. In the proposal and, if you get a grant, in your later dealings with Antarctic Support Associates, err on the side of *disclosure*. In the proposal's *Operational Requirements* package (see section with this title below), use the worksheet to list major amounts of waste you expect to generate.

Designated pollutants include any substance listed by name or characteristic (flammable, corrosive, reactive, toxic) in the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, and other U.S. regulations. Waste containing designated pollutants is *antarctic hazardous waste*, and it has to be used, stored, and disposed of in controlled ways.

Many research and industrial supplies — and common substances like lighter fluid and fingernail polish remover — at U.S. antarctic stations are designated pollutants. Designated pollutants must be *permitted* to enter Antarctica. NSF's contractor Antarctic Support Associates annually compiles an application for a master permit to cover common items. The task obviously requires the cooperation of grantees; this chore is part of preparing for research in Antarctica.

Discharging designated pollutants

Some categories of waste must be removed from Antarctica. The list includes radioactive materials, batteries, fuel, heavy metals, lubricants, treated timbers, plastic (except low density storage bags), solid noncombustibles, and drums that held oil or chemicals.

The U.S. Antarctic Program employs specialists to handle and remove designated pollutants in accordance with the regulations. Grantees receive assistance and instructions in the Antarctic, but are required to keep track of the designated pollutants they use, to sort and store them according to instructions provided, and to turn the waste over to U.S. Antarctic Program officials in accordance with specified procedures.

Open burning is prohibited in Antarctica. If your proposal will include the operation of a remote field camp, plan to haul all your trash back to the station or ship from which you began your sortie.

Import into and export from the USA

In the United States it is unlawful, unless authorized by regulation or permit, to have or sell, or to import or export, antarctic plants from Specially Protected Areas, antarctic mammals, or antarctic birds. An application for a permit must demonstrate that the import or export would further the purposes for which the species was taken or collected, demonstrate that the import or export is consistent with the purposes of the Antarctic Conservation Act, and state which U.S. port will be used. There are seven designated ports: New York, Miami, Chicago, San Francisco, New Orleans, Seattle, and Honolulu.

Mailing items to or from the United States constitutes import or export.

Applying for a permit

You are the person who initially decides if an Antarctic Conservation Act permit (http://www.nsf.gov/od/opp/antarct/aca/aca.htm) will be needed for your proposed activities. If there is any doubt, contact an Office of Polar Programs science program manager, the permit officer, or the environmental officer (see the OPP staff roster http://www.nsf.gov/od/opp/oppstaff.htm).

If a permit appears necessary, send NSF the *Antarctic Conservation Act Application and Permit Form* (http://www.nsf.gov/od/opp/antarct/aca/aca.htm) (see Operations Requirements section below) with the proposal's *Operational Requirements* package. You may turn in the form with the proposal's *Operational Requirements* package. Or give it to NSF no later than 90 days before field work is to start. During that time, a summary of your application is published in the *Federal Register* so that any member of the public can comment on it. The Foundation evaluates the public comments and performs an internal review. It then approves the application, approves it with modifications, or disapproves it. NSF will not allow work in Antarctica until a permit either has been approved and issued or is found to be not required. You may not do things that require a permit unless you have a permit. An application cannot be made retroactive.

ELIGIBILITY

See the "Who may submit proposals" <http://www.nsf.gov/pubs/1999/nsf992/ch1.htm#1-8> section of the *Grant Proposal Guide*.

Federal agencies may submit antarctic research proposals subject to NSF and Office of Polar Programs policy. Please consult the relevant program manager for further information (see roster at http://www.nsf.gov/od/opp/roster/antlst.htm.)

AWARD INFORMATION

NSF expects to fund approximately 110 standard and continuing research awards up to 3 years in duration depending on the quality of submissions and the availability of funds. In exceptional cases, awards for up to 5 years may be considered if the justification and promise are compelling. Approximately $30 million may be available for awards to scientists at research institutions in FY 2000. In addition, field and laboratory support will be available in Antarctica. Anticipated date of awards: No earlier than October 1999.

PROPOSAL PREPARATION

Proposals submitted in response to this program announcement should be prepared and submitted in accordance with the general guidelines contained in the *Grant Proposal Guide* (GPG), NSF 99-2. The complete text of the GPG (including electronic forms) is available electronically on the NSF Web site at: <http://www.nsf.gov >. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone 301.947.2722 or by e-mail from pubs@nsf.gov.

Proposers are reminded to identify the program announcement number (NSF 99-93) in the program announcement/solicitation block on the NSF Form 1207, "*Cover Sheet for Proposal to the National Science Foundation*." Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

Candidates, particularly those who have not participated in the U.S. Antarctic Program, are invited to contact science program managers or operations specialists at the Foundation's Office of Polar Programs (see roster at http://www.nsf.gov/od/opp/roster/antlst.htm). The reason for these contacts is to help assure an effective research proposal that is supportable operationally and to help NSF match the program's operational support capabilities with projected science requirements. While the formal proposal is intended to achieve that end, Office of Polar Programs staff have observed that informal discussion with scientists in advance of a proposal can help to develop field support that is responsive to science while satisfying safety, environmental, and health requirements.

Environmental protection and waste management

Your proposal must convince the Foundation that your project, if approved, can be performed in compliance with antarctic environmental regulations. Worksheets (see below) will help you think through and define your plans to OPP managers. Much of your conservation planning will involve common sense — minimizing pollution, avoiding interference with animals — but the regulations are complex, and you cannot rely on common sense unassisted. Failure to provide for conservation and waste management in your proposal could change the Foundation's decision from award to declination.

The section above on the Antarctic Conservation Act contains summary information that should be enough for most proposals. However, do not hesitate to review the Antarctic Conservation Act book (at http://www.nsf.gov/pubs/1995/nsf95154/nsf95154.pdf) to be sure you understand your responsibilities for environmental protection and waste management. Fill out the Environmental Assessment Questionnaire and, if necessary, an Antarctic Conservation Act permit application (see Operational Requirements section below).

By attending to these matters in your proposal you will enable NSF staff to start to plan support of these aspects in time to avoid delaying or interrupting your field work. Neither the planning nor the implementation need be overwhelming. NSF and investigators have learned that diligence at the proposal stage prevents headaches later.

Safety and health

A proposal that involves work in Antarctica must consider aspects of the research that may pose safety and health risks. Current U.S. Antarctic Program policies regarding safety and health are consistent with U.S. laws and regulations affecting research in the USA.

Office of Polar Programs safety and health specialists will review your proposal carefully. They have found that most proposed antarctic research can be carried out without undue risk. However, advance planning is essential, often in collaboration with the proposer. Your full and careful attention to safety and health aspects in the proposal will help to make the planning efficient and effective. During proposal review you may be asked for more information.

Grants are made only if questions regarding a project's safety and health risks can be resolved.

Two Office of Polar Programs staff are assigned full time responsibilities in safety and health. Please feel free to call or write them (see roster at http://www.nsf.gov/od/opp/roster/prsslst.htm) during proposal preparation.

Radioactive materials and waste

If you wish to use radioactive materials (open or sealed sources) in Antarctica, you need to do so under your institution's radiation use license and with the approval of the U.S. Antarctic Program. Buy the materials through your institution, and register as a radioisotope user with its radiation safety committee. You also must abide by requirements imposed by the U.S. Antarctic Program, in particular radioactive waste generation and packaging criteria for proper disposal of low-level radioactive waste generated during the research.

If your research involves use of radioactive materials in Antarctica (open or sealed sources), complete the Radioactive Materials worksheets (see below). Investigators who have completed that section of the form will receive an additional questionnaire, after the proposal has been funded, requesting details of their proposed radioisotope usage. Proposed use of radioisotopes needs to be consistent with your institutional license and U.S. Antarctic Program policies. Your institutional Radiation Safety Officer will be required to endorse your use of radioisotopes in Antarctica. Submit the worksheet in the *Operational Requirements* package.

Research ship EEZ clearances

Any research that is north of 60^{o}S and involves work in the Exclusive Economic Zone (EEZ) of another nation (typically within 200 nautical miles of the coast of that nation), including underway measurements such as collecting multibeam data, gravity data, or surface water samples, requires an appropriate research clearance from the nation involved.

Justify any EEZ work in the proposal, and provide information needed for a permit application. NSF's contractor ASA submits the application to the Department of State, which must receive it no later than 6 months before the cruise.

Composition of field teams

Identify in your research proposal all people who will be involved in prospective field projects. Team members should be scientists, technicians, or students with experience or strong interests in the discipline of the project and should have a direct interest in its outcome.

Parties that intend to work in remote areas must have field safety expertise that is appropriate for the anticipated activities, conditions, and hazards. Examples of potentially hazardous situations include mountaineering activities, working in crevassed terrain, and working on sea ice. Investigators should consider augmenting their teams with persons experienced in field safety, particularly if the group is inexperienced in antarctic field work. Training of field party members in first aid is highly recommended.

Physical and psychological screening

Because medical facilities in Antarctica are not equipped to deal with all possible medical emergencies, and because immediate medical evacuation may be impossible, it is important that all persons deploying to Antarctica be in good health. Before deploying, participants must meet physical and dental health criteria established for the program. Candidates for work during the austral winter isolation also must pass a psychological screening.

Prospective travelers to the Antarctic with the U.S. Antarctic Program will be provided medical and dental examination forms by the antarctic support contractor. Travelers are responsible for completing their physical and dental examinations and sending the completed forms to the support contractor. Candidates for the winter isolation period will be provided instructions for the psychological screening.

PROPOSAL BUDGET

Budget provisions; field services

In Antarctica, most support services are provided and paid for by the NSF-funded U.S. Antarctic Program. NSF does not provide funds in antarctic research grants for acquisition of all needed field items and services. Instead, common-use items are bought and shipped to Antarctica in bulk. This practice, while affecting the way an investigator plans for field work, lowers the cost of acquiring and, especially, of shipping things to Antarctica.

Investigators use their proposals, and pertinent worksheets (see Operational Requirements section below), if they are useful, to specify services and items of equipment that are required for their research. To plan and budget for acquisition of these things, NSF must know well in advance what they are and approximately how much they cost.

Describe and budget in your proposal as necessary for these items:

(1) equipment and supplies required at home institutions or unique to the field project

(2) radioisotopes and specialized supplies required in Antarctica

(3) physical and dental examinations for all persons going to Antarctica (including those who have been before)

(4) field equipment that is unique to a field project, such as climbing boots and eye protection (the Foundation issues polar clothing including insulated underwear, mukluks, thermal boots, parka, insulated overalls, gloves, and other extreme-cold-weather gear)

(5) shipment of your gear between home institution and port of embarkation (usually a West Coast port; see worksheets)

(6) cost of shipping equipment and samples back home (the antarctic program provides northbound sea shipment to a U.S. port without cost to the grantee, but onward transport to the home institution is paid for using your grant funds)

(7) living expenses (per diem) during travel to and from Antarctica. Budget under foreign travel.

(8) mountaineering guide, if warranted, for field work.

Commercial air travel

Do *not* budget in your proposal for commercial air travel between your home institution and the departure point for Antarctica (normally Christchurch, New Zealand, or Punta Arenas, Chile). The Foundation's antarctic support contractor will issue tickets at no cost to your grant. Accompanied excess baggage authorized by NSF in advance also will be covered by the contractor. *Do* budget in the proposal for per diem during this travel [see (7) above] and for any travel not involving deployment to Antarctica.

Insurance

NSF does not provide insurance for grantee personnel in Antarctica, and it does not fund acquisition of this insurance in its research grants. Persons traveling to Antarctica are expected to have insurance appropriate to their normal life situations so that any needed health care, compensation for property loss, worker's compensation, or survivor benefit will be provided for. Medical care for USAP participants in Antarctica is provided in clinics at the year-round stations. Persons who may need care beyond the capabilities of these clinics will be transported to health care facilities in New Zealand, South America, or the United States, at which point they or their sponsors will be responsible for medical costs.

All research staff (paid or volunteer) should be affiliated in some manner with your institution(s), so any workers' compensation issues arising from injuries sustained while deployed can be addressed. Most health insurance policies cover travel to Antarctica, but some may not. Policies should be examined.

PROPOSAL SUBMISSION

Due dates

Antarctic proposals may be submitted each year during the 1-month window between 1 May and 1 June. Proposals received before 1 May normally will be returned for later submittal. Those postmarked after 1 June, or submitted on FastLane (see below) after 1 June, are subject to return without review.

Number of copies to send—main proposal

NSF urges investigators to submit proposals electronically by FastLane (see below).

If you are submitting a proposal on paper, send 20 copies to the National Science Foundation PPU as noted in the "How to Submit" part of the NSF *Grant Proposal Guide* at http://www.nsf.gov/pubs/1999/nsf992/ch1.htm#1-11 . For paper proposals, the delivery address must include the NSF announcement number (NSF 99-93).

Number of copies to send—Operational Requirements package

See the section below titled "Operational Requirements package."

Proposal approval and implementation schedules

To provide time for proposal review and for operational planning, proposals normally will be considered for field work beginning no sooner than a year later. For example, properly prepared proposals received by 1 June 1999 and approved for award typically will be provided funds for performance periods as follows:

- for research in Antarctica: the 2000-2001 austral summer season and extending through the southern hemisphere winter of 2001.

- for research or data analysis in the United States: starting as early as 6 months following receipt of your proposal.

Grant notifications will be made no earlier than October.

Complicated projects, or those requiring large amounts of equipment in Antarctica, could require more lead time than indicated above. Projects that are easily fielded may be able to deploy more quickly than the schedule suggests, and NSF strives to make that happen. The rule of thumb, however, is that it takes 15 to 18 months to get ready for antarctic field work, and attempts to beat that schedule introduce uncertainty.

Submit electronic proposals on FastLane by 5:00 pm, your local time, 1 June 1999. Send the signed proposal cover sheet in accordance with instructions below.

Submission of Signed Cover Sheets. For proposals submitted electronically via the NSF FastLane Project, mail the signed proposal Cover Sheet (NSF Form 1207) by 8 June to—

National Science Foundation
DIS-FastLane Cover Sheet
4201 Wilson Blvd.
Arlington, Virginia 22230

A proposal may not be processed until NSF has received the complete proposal, including the signed Cover Sheet.

FastLane paperless proposal submittal

The NSF FastLane system is available for electronic preparation and submission of a proposal through the Web at the FastLane Web site at <http://www.fastlane.nsf.gov>. The Sponsored Research Office (SRO or equivalent) must provide a FastLane Personal Identification Number (PIN) to each Principal Investigator (PI) to gain access to the FastLane "Proposal Preparation" application. PIs that have not submitted a proposal to NSF in the past must contact their SRO to be added to the NSF PI database. This should be done as soon as the decision to prepare a proposal is made.

In order to use NSF FastLane to prepare and submit a proposal, the following are required:

Browser (must support multiple buttons and file upload)
- Netscape 3.0 or greater
- Microsoft Internet Explorer 4.01 or greater

PDF Reader (needed to view/print forms)
- Adobe Reader 3.0 or greater

PDF Generator (needed to create project description)
- Adobe Acrobat 3.01 or greater or
- Aladdin Ghostscript 5.10 or greater

A list of registered institutions and the FastLane registration form are located on the FastLane Web page.

For paper submission of proposals, the delivery address **must clearly identify the NSF announcement number** (NSF 99-93) under which the proposal is being submitted.

FastLane questions and answers

Color graphics? FastLane does not yet handle color proposals automatically. If a PI wants to submit a color figure in a project description, here are alternatives:

a) after submitting the proposal in FastLane, mail the required 20 copies of the project description in paper

b) prior to submission, tell the program office that the project description is coming in color and should be directed to the color printer. Give the program office the proposal number when you know it. Once the program office has the proposal number, it will ask the NSF Proposal Processing Unit to direct the proposal to the color printer.

Maps? Yes. With PDF the PI can scan graphics into the project description.

Math symbols? Yes. With PDF the PI can use software that converts math symbols to PDF. The PI should embed fonts in the PDF file.

Notifications? To assure immediate knowledge in the Office of Polar Programs that your proposal has been submitted, you may e-mail the relevant OPP program manager with the proposal number that you have received from FastLane.

Collaborative and group proposals

Institutions sometimes wish to submit group or collaborative proposals. As stated in the *Grant Proposal Guide*, proposals with three or more PIs can be considered a "group proposal": mark the box on the cover sheet (form 1207) as such. If three or more PIs are involved, up to ten pages of overall project description can be included plus up to five pages per PI for results from prior support. If there are only two PIs, the project description (including results from prior support for both PIs plus all figures) is limited to 15 pages. See the discussion in the *Grant Proposal Guide*, chapter II, D, 12, b, page 14 at http://www.nsf.gov/pubs/1999/nsf992/ch2.htm#2-50.

To make it clear to NSF staff that a proposal is part of a collaboration, begin the title with the words "Collaborative Research" followed by the specific title. Questions about putting together a collaborative proposal can be asked of your program manager.

FastLane (electronic) submittal. Collaborative proposals require simultaneous submission as explained here.

1. The collaborating institutions agree amongst themselves on which one of them will be the lead institution.
2. Before any of the proposals are submitted to NSF, the collaborating institutions send the lead institution their temporary proposal IDs.
3. The lead institution enters the collaborating institutions' temporary proposal IDs by using the Link Collaborative Proposals option on the FastLane Form Selector screen.
4. Each collaborating institution submits its proposal to NSF in the normal FastLane manner.
5. Each collaborating institution immediately informs the lead institution of the official NSF proposal number it has received from NSF via FastLane.
6. The lead institution lists the collaborating institutions' proposal numbers on an attachment to the signed proposal cover sheet that it mails to NSF.
7. The collaborating institutions mail their signed cover sheets in the normal manner.
8. As stated elsewhere in this document, the deadline for FastLane submittal of antarctic proposals is 1 June, and the deadline for submittal of the signed cover sheets is 8 June.

Mail (paper) submittal. Each institution submits the proposal with its cover sheet on top, followed by a copy of the cover sheet from the collaborating institution. One institution takes the lead, submitting the original plus 20 copies. The other institution submits one original copy to PPU. As specified in the *Grant Proposal Guide*, put into each copy of the proposal both institutions' cover sheets, abstract, proposal text, references, vitae, current and pending support, budget sheets, and budget justification so reviewers will have a complete picture of resources requested and personnel involved.

Operational requirements package. The PI whose institution takes the lead on proposal submission also coordinates submission of the Operational Requirements package for the entire project.

If recommended for funding, an award will be made to each successful collaborating institution.

PROPOSAL REVIEW

Merit review criteria

Reviews of proposals submitted to NSF are solicited from peers with expertise in the area of the proposed research or education project. These reviewers are selected by program officers charged with oversight of the review process. NSF invites the proposer to suggest, at the time of submission, names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from nonacademic institutions, minority-serving institutions, adjacent disciplines to that principally addressed in the proposal, etc.

Proposals will be reviewed against the following general merit review criteria established by the National Science Board. Following each criterion are potential considerations that reviewers may use in the evaluation. These are suggestions, and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he or she is qualified to make judgments.

What is the intellectual merit of the proposed activity? How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity? How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Integration of research and education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learner perspectives. PIs should address this issue in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give it careful consideration in making funding decisions.

Integrating diversity into NSF programs, projects, and activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- are essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports. PIs should address this issue in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give it careful consideration in making funding decisions.

Merit review

Most proposals submitted to NSF are reviewed by mail review, panel review, or some combination of mail and panel review. Review methods vary among the antarctic disciplines, and some cross-disciplinary programs have their own specified review methods. If you wish to know the method by which your antarctic proposal will be reviewed, contact the relevant program manager (see roster at http://www.nsf.gov/od/opp/roster/antlst.htm).

All proposals are carefully reviewed by at least three persons outside NSF who are experts in the field represented by the proposal. Reviewers are asked to comment and to recommend either support or decline. A program officer considers the advice of reviewers and forwards a recommendation. Proposers usually are contacted when the program officer recommends award, but this informal notification does not guarantee an eventual award. NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals in this category. Interagency proposals may take longer to review. The time interval begins on the date of receipt.

Proposals involving antarctic field work receive internal review in NSF's Office of Polar Programs (assisted by its contractor Antarctic Support Associates) to determine operational feasibility.

After an NSF program decides that a proposal should be funded, it forwards an award recommendation to the Division of Grants and Agreements, which reviews business, financial, and policy implications and then issues an NSF grant or other agreement. Only a Grants Officer may make commitments, obligations, or awards on behalf of NSF or authorize the expenditure of funds. Do not infer NSF commitment from technical or budgetary discussions with an NSF program officer. A principal investigator or an organization that makes financial or personnel commitments in the absence of a grant or a cooperative agreement signed by the NSF Grants Officer does so at its own risk.

AWARD ADMINISTRATION

Notification of the award

Notification of the award is made ***to the submitting organization*** by a Grants and Agreements Officer in the Division of Grants and Agreements (DGA). Organizations whose proposals are declined will be advised as promptly as possible by the Office of Polar Programs. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the principal investigator.

Grant award conditions

An NSF grant consists of: (1) the award letter, which includes any special provisions applicable to the grant and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable grant conditions, such as Grant General Conditions (NSF GC-1, http://www.nsf.gov/cgi-bin/getpub?nsf98gc1a)* or Federal Demonstration Partnership Phase III (FDP) Terms and Conditions* and (5) any NSF brochure, program guide, announcement or other NSF issuance that may be incorporated by reference in the award letter. Electronic mail notification is the preferred way to transmit NSF grants to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

***** Access these documents electronically at http://www.nsf.gov/ or get paper copies from the NSF Publications Clearinghouse (301.947.2722 or pubs@nsf.gov).

Polar Programs data policy

The Office of Polar Programs requires submission of OPP-supported data, derived data products, samples, physical collections, and other supported materials to national data centers and other specified repositories. It expects investigators to share these things with other researchers at no more than incremental cost and within a reasonable time. The office also considers metadata (information about data or data sets) as vital to the exchange of information on polar research; archives of OPP-supported projects should include easily accessible information about the holdings including quality assessments, supporting ancillary information, and guidance for locating and obtaining the data. Investigators should use national and international standards to the greatest extent possible for collection, processing, and communication of OPP-sponsored data sets. See the Office of Polar Programs *Guidelines and Award Conditions for Scientific Data* at http://www.nsf.gov/cgi-bin/getpub?opp991.

Reporting requirements

For all multiyear grants (both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after expiration of a grant, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has an electronic project reporting system, available through FastLane, that permits electronic submission and updating of project reports, including information on: project participants (individual and organizational); activities and findings; publications; and, other products and contributions. Reports will continue to be required annually and after the expiration of the grant, but PIs will not need to re-enter information previously provided, either with the proposal or in earlier updates using the electronic system.

Since 1 October 1998 PIs have been required to use the new reporting format for annual and final project reports. PIs are strongly encouraged to submit reports electronically via FastLane. For those who cannot access FastLane, paper copies of the new report formats may be obtained from the NSF Clearinghouse as specified above. NSF expects to require electronic submission of all annual and final project reports via FastLane beginning in October, 1999. NSF's FastLane system, initiated in 1994, is helping to fulfill its vision of a fully integrated electronic proposal and award system that provides a quick, secure, paperless record and transaction mechanism for all NSF awards, from program announcement to award closeout, by October 2000. See Important Notice No. 123: Working Toward a Paperless Proposal and Award System http://www.nsf.gov/cgi-bin/getpub?iin123.

New awardee information

If the submitting organization has never received an NSF award, the organization's administrative officials need to become familiar with the NSF *Grant Policy Manual* (at http://www.nsf.gov/cgi-bin/getpub?gpm), applicable to most NSF awards. The "Prospective New Awardee Guide" (NSF 97-100 at http://www.nsf.gov/cgi-bin/getpub?nsf97100) has information on: Administration and Management Information; Accounting System Requirements and Auditing Information; and Payments to Organizations with Awards. This information will assist an organization in preparing documents that NSF requires to conduct administrative and financial reviews of an organization. The guide also highlights accountability requirements associated with Federal awards.

CONTACTS FOR ADDITIONAL INFORMATION

For **antarctic science** questions use the Office of Polar Programs roster at http://www.nsf.gov/od/opp/roster/antlst.htm to find the right program manager in the Antarctic Sciences Section.

For **antarctic operational** questions use the roster at http://www.nsf.gov/od/opp/roster/prsslst.htm to find the right program manager in the Polar Research Support Section. The Foundation's contractor Antarctic Support Associates has a Web page (www.asa.org) with helpful operational information including ships' specifications and schedules.

For **FastLane** questions contact Sarita Rich, 703-306-1033, srich@nsf.gov, or **FastLane User Support, 703-306-1142,** fastlane@nsf.gov**.**

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For **general NSF** questions including those about other programs, see the Web site at www.nsf.gov or contact the NSF help desk (703-306-1234 or helpline@nsf.gov).

OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* (at http://www.nsf.gov/cgi-bin/getpub?nsf994 compiles funding opportunities for research and education in science, mathematics, and engineering. Beginning in fiscal year 1999, the *Guide* is

available only electronically. Many NSF programs offer announcements concerning specific proposal requirements; contact NSF offices listed in Appendix A of the *Guide*.

Changes are announced in the NSF E-Bulletin (at http://www.nsf.gov/home/ebulletin). Subscribers also can sign up for NSF's Custom News Service to find out new funding opportunities.

PROPOSAL DOs AND DON'Ts

A proposal must convince skeptics (reviewers, panelists, NSF) that the public good will be served by giving you public money. Suggestions:

Do read and follow this document and the *Grant Proposal Guide*.

Do keep text short (project description no more than 15 pages).

Do state the problem, the plan, and the anticipated results. Answer the "so what?" and "why do this?" questions early.

Do give credit where credit is due; cite your colleagues' work (include titles) where appropriate.

Do give results of research resulting from your previous NSF grants.

Do check and review the proposal with a colleague. *Reviewers may equate error with sloppy research.*

Don't assume that everyone reviewing your proposal is expert in all aspects of your research. *Some reviewers may be chosen for their knowledge of just part of the proposal.*

Don't use a low-quality printer. The type should be clear and easy to read.

Don't leave out vitae of major investigators, budget explanation, other-grant-support list, whole pages, etc.

Don't inflate the budget.

OPERATIONAL REQUIREMENTS PACKAGE

Discussion

The U.S. Antarctic Program is committed to the principle that scientific needs should determine the research conducted in Antarctica, with logistics deriving from and supporting the research rather than dictating it. Investigators should prepare proposals with the presumption that science can be supported operationally, even if it has not been done before.

To the extent that it is technologically and financially possible, this principle is reflected in the present-day field program. However, at any given time some proposals, highly meritorious scientifically, are not feasible operationally. The antarctic support system and sometimes the proposed field research itself must be modified.

Prior discussion with a science program manager in the Office of Polar Programs (703-306-1033) can help define research objectives that match the operational realities at any given time and will help NSF plan changes in operational support to meet research needs.

Operational capabilities of the U.S. Antarctic Program have evolved greatly in response to scientific requirements and will continue to do so, motivated primarily by dialog between the U.S. Antarctic Program staff and the research community.

For investigators who have not previously worked in Antarctica, contact with the Polar Research Support section of the Office of Polar Programs (703-306-1032) during proposal preparation can be helpful.

Operational Requirements package

If you will be proposing to do research that involves field work in the Antarctic, you will need to prepare a separate document, not a part of the 15-page research proposal, that discusses operational needs and contains the necessary worksheets. The U.S. Antarctic Program has an Electronic Support Planner <http://gentoo.asa.org> to help you complete and submit these worksheets.

Follow instructions on the planner's home page to download the application to your computer. Use it to fill out the mandatory and other relevant worksheets. Include narrative, and follow instructions for attaching tables, sketches — anything clear and organized that will help NSF evaluate your operational needs. *Details* of operational matters are not required with the proposal, but NSF needs to know the *scope* of your plan so research-support specialists can evaluate how to support it.

If you wish to use more traditional methods of filling out your Operational Requirements package, you can find PDF and MSWord versions of the worksheets on the Electronic Support Planner.

If the proposal appears likely to be approved, NSF's contractor Antarctic Support Associates will solicit details formally by means of a Support Information Package—a SIP—that is based on the worksheets you submitted when you submitted the proposal to NSF.

If you are submitting the proposal via FastLane, simply follow the instructions on the Electronic Support Planner Web site.

If you plan to submit the proposal on paper, you still can use an electronic means of submitting the worksheets you fill out. Follow the instructions on the Web site.

If you are mailing the proposal on paper, attach one copy of the operational requirements package to the signature copy of the proposal. Do *not* attach copies of this package to the other 19 copies of the proposal. **Put three copies of the operational requirements package in an envelope, mark the lower left corner "Operational Requirements Package," and mail it to:**

Senior Program Assistant, Antarctic
Room 755
National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230

Worksheets

The worksheets on the Electronic Support Planner (http://gentoo.asa.org) Web site can help you and the Office of Polar Programs evaluate your field needs. They were devised by antarctic research-support specialists who have years of experience in helping investigators plan field work. Some of them are not required. Use the ones that are relevant to your needs and that, in your judgment, help to present your operational needs.

If the proposal does *not* include field work in Antarctica, there is no need to download and install the Electronic Support Planner. Simply retrieve a PDF or MSWord copy of the Operational Requirements worksheets, fill it out, and check the "No" box. If you are submitting the proposal on paper, append the sheet to the original signed copy of your proposal, and separately mail three copies as instructed on the sheet. Do not send any other worksheets.

If the proposal includes field work in Antarctica, use the ESP to fill out the required worksheets and any other worksheets that are appropriate to your proposal. If a worksheet is not germane to your work, don't complete it.

The ***Antarctic Conservation Act Application and Permit Form*** (http://www.nsf.gov/od/opp/antarct/aca/aca.htm) is on the NSF home page and is not a part of the Electronic Support Planner.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities, and persons with disabilities to compete fully in its programs. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement or contact the program coordinator at (703) 306-1636.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation regarding NSF programs, employment, or general information. TDD may be accessed at (703) 306-0090 or through FIRS on 1-800-877-8339.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Reports Clearance Officer; Information Dissemination Branch, DAS; National Science Foundation; Arlington, VA 22230.

YEAR 2000 REMINDER

In accordance with Important Notice No. 120 dated June 27, 1997, Subject: Year 2000 Computer Problem, NSF awardees are reminded of their responsibility to take appropriate actions to ensure that the NSF activity being

supported is not adversely affected by the Year 2000 problem. Potentially affected items include: computer systems, databases, and equipment. The National Science Foundation should be notified if an awardee concludes that the Year 2000 will have a significant impact on its ability to carry out an NSF funded activity. Information concerning Year 2000 activities can be found on the NSF web site at http://www.nsf.gov/oirm/y2k/start.htm.

OMB number 3145-0058 .