National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230
www.nsf.gov

COOPERATIVE AGREEMENT(CA)

AWARD: AST-1519126

EFFECTIVE DATE: April 1, 2016

EXPIRATION DATE: September 30, 2026

COOPERATIVE SUPPORT AGREEMENT(S): 1639339
1638875

PROJECTED TOTAL AWARD FUNDING:

(Subject to availability of funds)
$01

CUMULATIVE AMOUNT:

$01

SOLICITATION:

(Incorporated by reference, as amended)

NSF 14-568

Management and Operation of the National Radio Astronomy Observatory

CFDA NUMBER:
47.049

OTHER AWARDS UNDER THIS PROGRAM:

Show List of Awards

AWARDEE: Associated Universities, Inc.

PROJECT TITLE: Management and Operation of the National Radio Astronomy Observatory (NRAO)

PROJECT ABSTRACT: https://www.fastlane.nsf.gov/servlet/showaward?award=1519126

Principal Investigator(s)	Proposal No.	Institution (s)
Ethan Schreier	AST-1519126	Associated Universities, Inc.

Anthony Beasley Associated Universities, Inc.

OTHER KEY PERSONNEL:

A. Any proposed substitutions to the Principal Investigator (PI) or Co-PIs identified in this award must be submitted through FastLane for review and approval by the NSF Program Officer and NSF Grants and Agreements Officer.

B. Other Personnel: The NSF Program Officer shall be notified in advance of any proposed substitutions to the NRAO Deputy Director, Associate Directors, and Site Directors.

C. This "Key Personnel" clause replaces the General PTC link listed below.

NSF Contact Information:

Financial/Administrative questions: e-mail your NSF Grants and Agreements Official, Jeffrey S. Leithead, at jleithea@nsf.gov or call the Division at 703-292-8242.

Programmatic questions: e-mail your NSF Program Officer, Philip J. Puxley, at ppuxley@nsf.gov or call the Program Division at 703-292-7835.

This CA is entered into between the United States of America, represented by the National Science Foundation (NSF), and the above named Awardee pursuant to the authority of the National Science Foundation Act of 1950, as amended (42 USC 1861-1875). This CA is provided electronically to the Awardee. The Awardee is responsible for full compliance with all Financial/Administrative and Programmatic Terms and Conditions as initially stated or as updated over the life of this CA. The Authorized Organizational Representative (AOR) will be electronically notified of any changes to these Terms and Conditions and is encouraged to immediately review these changes and contact the Grants and Agreements Official or Program Officer within thirty days with any questions.

NSF intends to issue funding through separate Cooperative Support Agreement(s) (CSA) for work to be done under this CA. Funding provided under the CSA may not be transferred to another CSA without prior submission of a request to the Program Officer and written approval from a Grants and Agreements Officer. The Awardee's request to draw down funds under a CSA will represent acceptance by the Awardee of all Terms and Conditions of this CA and any Specific Terms and Conditions mentioned in the CSA.

Financial/Administrative Terms and Conditions (FATC):

General FATC:
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=NSF99999FATC004

Award Specific FATC:

Part 1: Award Specific FATC:

The Award Specific FATCs are provided under the following link:

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf1519126fatc000

Programmatic Terms and Conditions (PTC):

General PTC:
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=NSF14568TPTC000

Award Specific PTC:

Programmatic Terms and Conditions (PTC):

General PTC:
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=NSF13582TPTC000

Part 2. Award Specific Programmatic Terms and Conditions

2.1. Program Description

A. Overview

This Cooperative Agreement (CA) is for the management and operation of the National Radio Astronomy Observatory (NRAO or Observatory). NRAO is a Federally Funded Research and Development Center (FFRDC), sponsored by NSF, and managed in accordance with the provisions of this CA by Associated Universities, Inc. (AUI or Awardee).

NRAO conceives, designs, builds, operates, and maintains world-class radio telescopes used by scientists from around the world to study virtually all types of astronomical objects, from bodies in our own Solar System to galaxies in the distant Universe. NRAO operates the Karl G. Jansky Very Large Array (VLA) near Socorro, New Mexico; North American contributions to the international Atacama Large Millimeter/submillimeter Array (ALMA) located in Chile; and associated development laboratories, including a Central Development Laboratory (CDL) in Charlottesville, Virginia.

NRAO carries out a vigorous program in education for public visitors to its facilities, undergraduates interested in astronomy, graduate students conducting dissertation research in astronomy, and postdoctoral researchers desiring access to its facilities.

B. Mission

NRAO provides a national science and technology resource in the field of radio astronomy. NRAO's mission is to:

- Maintain and operate facilities to support, sustain, and advance radio astronomy for the benefit of the scientific research community;
- Acquire, analyze, archive, and disseminate data from NRAO facilities;

- Develop instruments and techniques as necessary to support NRAO-enabled research in partnership with scientists from related sectors, including academia, industry, government, and the international community;
- Develop and maintain a skilled and diverse workforce as necessary to support radio astronomy;
- Provide integrated and effective education and training programs that utilize the knowledge and discoveries made at NRAO and that strengthen education and public awareness of radio astronomy and related engineering and technology;
- Develop and sustain appropriate partnerships with universities, industry, private organizations, and the international community to enhance NRAO's scientific productivity and educational impact.

2.2. Core Expectations

As the NRAO managing organization, the Awardee will work closely with NSF and the scientific research community to ensure that, within available resources, NRAO supports, sustains, and advances frontier science as enabled by NRAO's unique research capabilities and as promoted through a culture of excellence. The Awardee will be accountable for fulfilling the NRAO mission through a visionary strategy that capitalizes on the federal investment to serve the scientific community and to promote world-class research and education. The NRAO program should embody the NSF Vision: a Nation that creates and exploits new concepts in science and engineering and provides global leadership in research and education.

The Awardee will be responsible for the overall management and performance of NRAO, including the infrastructure, instrumentation and staff, and for maximizing the benefits to the scientific research community within available resources through a strategically planned scope of activities. In discharging these responsibilities, the Awardee will ensure that NRAO maintains its character as a multi-user facility that enables first-rate research conducted by its user community.

In cooperation with NSF and within available resources, the Awardee will plan and execute a viable, coherent, and inclusive program of multi-user research and education, consistent with the objectives and priorities of the scientific community. The Awardee will manage facilities and equipment provided by NSF and by domestic and international partners; will provide additional facilities and equipment as necessary to fulfill the proposed programmatic scope; and will provide expert support and technical personnel to manage and operate NRAO as a well-integrated, forefront facility for research and education. The Observatory is a multi-user resource; as such, a significant portion of the NRAO research and education program should be carried out in collaboration with its stakeholder communities.

NSF intends that NRAO should serve as an exemplar of management excellence. The Awardee will be expected to meet the highest standards for service and delivery to the scientific community and to demonstrate proactive and effective approaches to planning, performance management, and workforce management. The Awardee will ensure that NRAO operates with integrity and transparency while maintaining quality and responsiveness in administration and management.

2.3. Awardee Governance and Oversight

As the manager of NRAO, AUI has the responsibility to engage the astronomical and related sciences communities, including universities and the broader scientific community, in its governance, planning, and program implementation. Strong involvement of the external community is essential for effective NRAO science and facility planning, especially on longer time scales. Examples of such engagement may include but are not limited to: external community membership on NRAO advisory committees; ad hoc conferences and workshops; and broad community surveys.

A. AUI Governance. AUI's overall governance is accomplished by its Board of Trustees, including its Board committees.

B. AUI's Board of Trustees. The Trustees hold the ultimate authority and fiduciary obligation for all AUI activities and in doing so, are responsible for oversight of all AUI's programmatic and administrative operations activities, including ensuring that AUI's obligations to NSF, as contained in this CA, are properly executed.

C. AUI President. The role of the AUI President is to provide executive leadership and management of all AUI programs, including NRAO. The AUI President is accountable to NSF in his/her role as Principal Investigator on this CA. The AUI President is responsible for ensuring the effective leadership and management of AUI and, as PI under this CA is ultimately responsible for adherence to high standards of scientific, managerial, operational and ethical excellence for the Observatory, and for maintaining AUI's strategic partnership with NSF.

D. NRAO Director. AUI appoints the NRAO Director in consultation with, and subject to the prior approval of NSF. The role of the NRAO Director is to serve as overall leader and manager of NRAO. The NRAO Director reports to the AUI President with whom he/she works to ensure that the AUI Trustees are fully informed of significant issues pertaining to NRAO activities. The NRAO Director is responsible for NRAO's day-to-day activities in accomplishing the mission and goals as identified in this CA, which includes responsibilities for the quality and productivity of the Observatory's science program. Additionally the NRAO Director is

responsible for developing long-range strategies, plans, and programs, for effectively allocating funding provided by NSF and building and maintaining a strategic partnership with NSF.

The NSF Program Officer is the NRAO Director's principal point of contact for programmatic matters. The salary of the NRAO Director and any changes thereto are subject to the prior approval of NSF. The Awardee will inform NSF of all other forms of compensation for the NRAO Director. The salary for the NRAO Director shall be wholly funded by this CA except as approved in advance by the NSF Program Officer in support of specific AUI corporate duties as an AUI Vice President and for a specified fraction of his/her time and duration.

2.4 Awardee Support of Ongoing Management and Oversight

The Awardee will ensure full commitment and cooperation among the relevant organizations, and all program staff during all ongoing NSF program management and oversight activities. The Awardee will ensure, through best efforts, the availability of all key institutional partners during any desk or on-site review as well as timely access to all program documentation.

2.5 Awardee Responsibilities and Performance Expectations

Awardee responsibilities and performance expectations are specified in the separate CSAs.

2.6 Awardee Performance Evaluation and Risk Assessment

A. A Performance Evaluation and Measurement Plan (PEMP) will be developed by AUI as the methodology and standards against which the overall performance of the Awardee and NRAO shall be assessed. The PEMP will describe the specific, recurring performance measures, their frequency of collection and reporting, procedures for analysis, targets, and, as appropriate, development of action plans including corrective interventions. The PEMP will be submitted to NSF within 6 months of the effective date of the CA, to be approved by the Program Officer, and modified annually as necessary.

B. A Risk Management Plan will be developed by AUI, including a description of the processes for the routine collection and analysis of risks across the Awardee and NRAO, and for the development of action plans as appropriate, together with an observatory-wide risk register. The Risk Management Plan will be submitted to NSF within 6 months of the effective date of the CA, to be approved by the Program Officer, and modified annually as necessary. An initial risk register will be submitted along with the Risk Management Plan.

2.7 NSF Responsibilities

The NSF has a major responsibility for providing the Awardee general oversight and monitoring to help assure effective performance and administration. In addition to the NSF responsibilities outlined in the CA-FATC, NSF plans to monitor progress on all NRAO activities including via quarterly programmatic and financial reports and annual program reports; review the NRAO annual program plans and budgets submitted by the Awardee to ensure they meet community- and NSF-vetted priorities and NSF resource levels; and conduct site visits and other necessary reviews of NRAO activities. Unless NSF reserves specific responsibility, by a condition of this CA, for coordinating or integrating the program activities with other activities or sharing responsibility for certain aspects of the program, all such responsibilities remain with the Awardee.

In accordance with the NSF's responsibilities under this CA, the following conditions apply:

A. Performance of work under this CA shall be subject to the general oversight and monitoring of the cognizant NSF Program Officer. This NSF involvement may include, but is not limited to:
i. Advice on the resolution of concerns relative to organizational, programmatic, technical, managerial, and/or scheduling issues;
ii. Technical guidance and/or advice, especially with regard to the integration, collaboration, and coordination with other research and education projects funded by NSF;
iii. Reviewing of technical reports and information to be delivered by the Awardee;
iv. Approvals as required under the National Science Foundation Cooperative Agreement - Financial and Administrative Terms and Conditions (CA-FATC); and
v. Conduct of planned and ad-hoc reviews.

B. NSF involvement must be consistent with the terms and conditions as stated in this CA. The cognizant NSF Program Officer does not have the authority to and may not:
i. Request additional work outside the general scope of the CA;
ii. Issue instructions that constitute a change as defined in Article 8 of CA-FATC, "Significant Project Changes";
iii. Cause an increase or decrease in the estimated cost or time required for performance under the CA; and

iv. Change any of the expressed terms and conditions of the CA.

C. If, in the opinion of the Awardee, any instructions or requests issued by the NSF Program Officer are within one of the categories as defined in (2.7.B.i) through (2.7.B.iv) in this clause, the Awardee shall not proceed but shall notify the NSF Grants and Agreements Official and shall request, if appropriate, modification of the CA in accordance with Article 46, "Changes - Limitation of Funds", CA-FATC.

2.8 NSF Program Oversight

A. Comprehensive Management Review. NSF will conduct comprehensive reviews of all activities under the CA including facility operations, research and education activities, and management performance. The initial management review will occur within the first four years of the award. Agreement on the date of the review may not be unreasonably withheld by either party.

B. Annual Program Review. The NSF Program Officer will convene an annual review to assess NRAO's long range planning, annual program planning, annual performance, and AUI's management performance. Agreement on the date of the review may not be unreasonably withheld by either party.

C. Business Systems Review. A Business Systems Review (BSR) and/or other similar reviews may be conducted as deemed necessary by NSF. AUI will be evaluated annually for BSR planning in conjunction with NSF's risks assessment of its large facilities portfolio. If NSF chooses to use contractors to support the review, appropriate nondisclosure agreements shall be negotiated. Agreement on the date of the review may not unreasonably be withheld by either party.

D. Other Reviews. The content and scheduling of other reviews required by NSF will be specifically addressed in each separate CSA under this CA and will only apply to the performance under that CSA.

Detailed reporting requirements are specified in the separate CSAs.

2.9. Acknowledgement of NSF Support

Article 28 entitled "Publications" of the CA-FATC is modified to include the following requirements:

A. Acknowledgment. All news releases, publications, home pages on World Wide Web sites and similar items prepared by the Awardee and/or its employees that describe NRAO activities or the results of NSF-supported research shall acknowledge the sponsorship of NSF. NSF shall also be referenced in first use of the name of the facility e.g. "NSF"s Karl G. Jansky Very Large Array", thereafter VLA.

B. Signage. The Awardee shall acknowledge the sponsorship of NSF on any signs identifying NRAO at its various locations. The National Science Foundation name shall be prominently displayed on all NRAO buildings whenever possible.

C. Image credits. Images of NRAO facilities or activities that credit the Awardee or NRAO shall also credit NSF whenever possible.

D. Disclaimer. An acknowledgment of NSF support and the following disclaimer must appear in any publication, including World Wide Web sites, or any material based on or developed under this CA: "The National Radio Astronomy Observatory is sponsored by the National Science Foundation. Any opinions, findings and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the National Science Foundation." The second sentence may be omitted from scientific articles or papers appearing in technical or professional journals.

E. Outside Funding. If the work is supported by non-NSF sources, the names of those sources may be added to any acknowledgments and disclaimers.

Change History

Prior Awarded Funding Amount:
Per Original Award on

04/01/2016: $01