



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

COOPERATIVE AGREEMENT
NOTICE
No. 80GSFC20R0046

A Cooperative Agreement Notice for the
Establishment of a Center for Research and Exploration
in Heliophysics

Application Due

January 11, 2021

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Acronyms and Other Abbreviations

ACE - Advanced Composition Explorer

AIM - Aeronomy of Ice in the Mesosphere

ARPP - Annual Research Program Plan

ARTEMIS - Acceleration, Reconnection, Turbulence, and Electrodynamics of the Moon's Interaction with the Sun

AWE - Atmospheric Waves Experiment

BITSE - Balloon-borne Investigation of Temperature and Speed of Electrons

CAGE - Commercial and Government Entity

CAN - Cooperative Agreement Notice

CCMC - Community Coordinated Modeling Center

CDAW - Coordinated Data Analysis Workshops

CDF - Common Data Format

CFR - Code of Federal Regulations

CIR - Co-rotating Interaction Region

CODEX - CORonal Diagnostic Experiment

COSPAR - Committee on Space Research

CREH - Center for Research and Exploration in Heliophysics

DSCOVR - Deep Space Climate Observatory

DONKI - Database of Notifications, Knowledge Information

DUNS - Dun and Bradstreet (D&B) Data Universal Numbering System

EMAC - Exoplanet Analysis and Modeling Center

EUV - Extreme Ultraviolet

FAR - Federal Acquisition Regulations

G&A - General & Administrative

GDC - Geospace Dynamics Constellation

GOLD - The Global-scale Observations of the Limb and Disk

GRIPS - Gamma-Ray Imager/Polarimeter for Solar flares

GSFC - Goddard Space Flight Center

HERMES - Heliophysics Environmental & Radiation Measurement Experiment Suite

HBCU - Historically Black College and University

HSD - Heliophysics Science Division

IBEX - Interstellar Boundary Explorer

ICME - Interplanetary Coronal Mass Ejection

ICON - Ionospheric Connection Explorer

IMAP - Interstellar Mapping and Acceleration Probe

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IRIS - Interface Region Imaging Spectrograph
ITM - Ionosphere/Mesosphere/Thermosphere
iSWA - integrated Space Weather Analysis system
ISWI - International Space Weather Initiative
JWST – James Webb Space Telescope
LFT - Large File Transfer
NASA - National Aeronautics and Space Administration
NFS - NASA FAR supplement
MLSO - Mauna Lao Solar Observatory
MMS - Magnetospheric Multiscale Mission
NSO - National Solar Observatory
PDF – Portable Document Format
PSP- Parker Solar Probe
PUNCH - Polarimeter to Unify the Corona and Heliosphere
RST - Roman Space Telescope
SAM - System for Award Management
SDAC - Solar Data Analysis Center
SDO - Solar Dynamics Observatory
SEEC - Sellers Exoplanet Environments Collaboration
SMD - Science Mission Directorate
SO - Solar Orbiter
SOHO - Solar and Heliospheric Observatory
SPDF - Space Physics Data Facility
SPL - Solar Physics Lab
STEREO - Solar Terrestrial Relations Observatory
SWL – Space Weather Laboratory
THEMIS - Time History of Events and Macroscale Interactions during Substorms
TIMED - Thermosphere Ionosphere Mesosphere Energetics and Dynamics
TRACERS - Tandem Reconnection and Cusp Electrodynamics Reconnaissance Satellites
TWINS - Two Wide-angle Imaging Neutral-atom Spectrometers
US – United States
UV – Ultraviolet
VSO - Virtual Solar Observatory
WFIRST – Wide-field Infrared Space Telescope (now the Roman Space Telescope - RST)

1.0 Funding Opportunity Description

1.1 Introduction

NASA Goddard Space Flight Center (GSFC) Center for Research and Exploration in Heliophysics (CREH) for basic and applied research will carry out research in the field of heliophysics in relation to NASA Strategic Goals and for the public purpose of transferring results of federally funded research to the public. GSFC and external scientists will cooperatively carry out observational, experimental, and theoretical research in support of NASA's strategic Heliophysics science objectives relating to:

1. Heliophysics: the Sun; the interplanetary medium; the magnetosphere; the ionosphere, thermosphere, and mesosphere; other planetary atmospheres and space plasma environments; local interstellar medium and the interactions and couplings among these physical regimes;
2. The informational and computational science and engineering related to the unique needs of data systems and models required to interpret data from Heliophysics science missions; and
3. The development of instrument technology and theoretical techniques required to meet these scientific challenges.

NASA's prime strategic goal for Heliophysics as described in [SCIENCE 2020-2024: A Vision for Scientific Excellence](#) is to understand the Sun and its interactions with Earth, the solar system and the interstellar medium, including space weather.

The challenges of understanding the physical processes of the space environment and their impact on our planet and on human and robotic exploration are complex and require long-term focus in order to achieve meaningful results. The primary goal under the resulting cooperative agreement is to establish a focused GSFC/research partnership that:

- a. Brings together scientists from the Center for Research and Exploration in Heliophysics and GSFC scientists to implement the NASA strategic goals in Heliophysics science;
- b. Enhances the capabilities and strengths of participating organizations in Heliophysics science;
- c. Provides organization and staffing flexibility to adapt to evolving research program needs;
- d. Attracts superior scientists necessary to carry out programs which would be outside the capabilities of either partner working alone;
- e. Promotes the involvement of minority and women scientists in space science research, for example, via focused programs recruiting undergraduate and graduate students;

- f. Facilitates access to student talent and provides opportunities for their participation in NASA programs;
- g. Facilitates interdisciplinary research with other Divisions, such as Astrophysics, Solar System Science, and Earth Science, using Heliophysics research results and models that have applicability to these other disciplines (Strategy 1.3 of the Science 2020-2024: A Vision for Scientific Excellence, “Advance discovery in emerging fields by identifying and exploiting opportunities between traditional scientific disciplines.”); and,
- h. Facilitate the public purpose of transferring results of federally funded research to the public.

Thus, the competitive process is expected to result in the award of a single cooperative agreement to establish a center of excellence in heliophysics. Where multiple organizations are teaming in response to this Cooperative Agreement Notice (CAN), the team’s proposal should name a single organization to serve as the formal partner to, and recipient of, the cooperative agreement, with a description of how the research activities will be distributed and managed among the team partners and the results of the federally funded research made available to the public.

1.2 NASA Safety Policy

All prospective proposers to this CAN are advised that the highest priority in all of NASA’s programs is safety. Safety is the freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment. NASA’s safety priority is to protect the public, astronauts and pilots, the NASA workforce (including employees working under NASA award instruments), and high value equipment and property.

1.3 Funding

The Government’s obligation to make an award is contingent upon the availability of appropriated funds from which payment can be made and the receipt of proposals that NASA determines are acceptable for award under this announcement. The government anticipates and has planned for a budget of approximately \$65 Million over five years. .

2.0 AWARD INFORMATION

2.1 Scope of the Agreement

GSFC will establish a science center for basic and applied research between NASA and higher education or not-for-profit science organizations in the area of heliophysics to pursue the research objectives described herein. Close proximity to NASA Goddard Space Flight Center is not a requirement, and any institution committed to heliophysics is encouraged to submit a proposal, regardless of location. However, it is anticipated that

there will be individual scientists and research engineers who are part of the cooperative agreement and are co-located at GSFC, and that they will have monthly person-to-person contact with the Partner Institution. NASA GSFC expects that management personnel from the prime awardee will be available on site with virtual availability as required. The intent of the CAN is to allow proposers to propose an arrangement resulting in an optimal level of research and making available the results of the federally funded research to the public.

2.1.1 Objectives

A broad and vigorous space research program in NASA is vital for the advancement of knowledge. Scientists at NASA in collaboration with outside scientists play a key role in conceiving new space missions, providing mission requirements, and achieving research objectives aimed at understanding the Sun-Earth connection, exploring the Solar System origins, and understanding structure and evolution of systems in the universe.

The Center for Research and Exploration in Heliophysics will focus primarily on scientific research. It is expected to strengthen cooperative relationships between educational, not for profit, and government scientists in the Goddard Heliophysics Science Division (Code 670), and will provide a vehicle to increase the involvement of these communities in the pursuit of NASA goals.

The science center will conduct research collaboratively with organizational elements within the GSFC Heliophysics Science Division (Code 670). Research may involve analysis of data from operating and past missions, and modeling and design of missions planned or under development. Thus, the Government's "substantial involvement" in the science center will be the contribution of scientific expertise and data as necessary to efficiently and effectively conduct the research described herein.

Therefore, the primary role for civil servant scientists at NASA centers is to enable the entire US scientific community to benefit from NASA's investments. Much of this benefit comes from the NASA scientists' service as Program/Project Scientists who ensure the scientific integrity of the missions and to support the activities associated with all phases of a mission (spaceflight, suborbital, or ground-based). The broad combination of project management, engineering and science expertise found at a NASA center such as Goddard Space Flight Center (GSFC) provides a unique environment to develop new technologies and capabilities to further NASA's strategic goals in Space Science. Scientists at GSFC participate in mission studies and formulation activities, research and development of technologies for instruments, developing data analysis algorithms and calibrate/validate data from missions, archive and distribute data, and carry out research on mission data. The ability of NASA scientists to successfully operate in these roles comes from having a high degree of scientific expertise that is continually validated by the science community through their active participation in research and their successful competition through NASA's research program's peer review processes.

GSFC has successfully collaborated with the University community to further NASA's strategic goals and provided the results of the federally funded research to the public for educational purposes. These collaborations have brought expertise and talent to GSFC that otherwise would not be available and increased the flexibility of the scientific workforce. The University partner scientists at GSFC have primarily worked within the GSFC laboratories and facilities.

Current HSD operating missions include: Advanced Composition Explorer (ACE), Aeronomy of Ice in the Mesosphere (AIM), Acceleration, Reconnection, Turbulence, and Electrodynamics of the Moon's Interaction with the Sun (ARTEMIS), The Global-scale Observations of the Limb and Disk (GOLD), Hinode, Ionospheric Connection Explorer (ICON), Interface Region Imaging Spectrograph (IRIS), Interstellar Boundary Explorer (IBEX), Geotail, Magnetospheric Multiscale Mission (MMS), Parker Solar Probe (PSP), Deep Space Climate Observatory (DSCOVR), Solar Dynamics Observatory (SDO), Solar and Heliospheric Observatory (SOHO), Solar Orbiter, Solar Terrestrial Relations Observatory (STEREO), Time History of Events and Macroscale Interactions during Substorms (THEMIS), Thermosphere Ionosphere Mesosphere Energetics and Dynamics (TIMED), Two Wide-angle Imaging Neutral-atom Spectrometers (TWINS), Voyager, and Wind.

Missions planned or under development include: Atmospheric Waves Experiment (AWE), COroanal Diagnostic EXperiment (CODEX), Heliophysics Environmental & Radiation Measurement Experiment Suite (HERMES), Geospace Dynamics Constellation (GDC), Interstellar Mapping and Acceleration Probe (IMAP), Polarimeter to Unify the Corona and Heliosphere (PUNCH), and Tandem Reconnection and Cusp Electrodynamics Reconnaissance Satellites (TRACERS)

Future research activities will evolve as a function of priorities, budgets, funding opportunities, and success of proposal submissions.

2.1.2 HSD Laboratories and Research Objectives

The participating components of Code 670 that will be collaborating with the CREH and areas of research are described in detail in the [GSFC Annual Reports and Plans](#) and outlined below:

2.1.2.1 Heliophysics Science Division (Code 670)

The Heliophysics Science Division provides scientific leadership to achieve NASA's strategic science goals in solar, heliospheric, magnetospheric, and ionosphere/mesosphere/thermosphere (ITM) physics as well as space weather research. It leads the definition and development of missions in support of these goals and performs research including: solar structure and magnetic activity and evolution thereof, energy buildup and release in solar eruptions, generation of the solar wind, heliospheric structure and

dynamics produced by solar disturbances, magnetospheric dynamics, magnetosphere-ionosphere coupling in response to the solar wind, upper atmospheric effects, internal dynamics of the geospace system (including lower atmosphere forcing), and possible effects of the Sun on the Earth's climate. The Division's scientists develop coupled models of the different aspects of the Sun, heliosphere, and interactions of the Sun with Earth and other planets. They also design, propose, and fly state-of-the-art instrumentation in the areas of photon and neutral atom imaging, electric and magnetic fields, and neutral, plasma, and energetic particles. They interact with scientists in other divisions on cross-disciplinary subjects including such topics as exoplanets; planetary exospheres, magnetosphere and atmospheres, and interplanetary meteoroid environments. HSD also develops unique data systems that manage a wide range of heliophysics data to enable rapid access and sophisticated analysis across mission and discipline boundaries for the international space science community. The scientists in the Division interpret and evaluate data gathered from currently operating instruments and archival data, draw comparisons with computer simulations and theoretical models, and publish the results. The Division's education and outreach activities communicate the excitement and societal relevance of NASA's array of operating and future Earth-Sun Exploration missions. The HSD elements participating in the science center are:

2.1.2.2. Solar Physics Laboratory (671)

The Solar Physics Lab (SPL) leads in the exploration and understanding of the Sun as a star and as the primary driver of activity throughout the solar system. Studies of the Sun are carried out in the gamma-ray, X-ray, EUV (extreme ultraviolet)/UV (ultraviolet) and visible, and radio portions of the spectrum from space observatories (SOHO, Wind, STEREO, SDO, CODEX), sounding rockets (Extreme Ultraviolet Normal Incidence Spectrometer (EUNIS)), balloons Gamma-Ray Imager/Polarimeter for Solar flares (GRIPS) and Balloon-borne Investigation of Temperature and Speed of Electrons (BITSE), and the ground (e.g., National Solar Observatory (NSO), Mauna Lao Solar Observatory (MLSO)). Solar physics research includes studies of solar active regions, coronal holes, the solar corona, solar eruptions and the science of space weather, helioseismology, solar irradiance, and solar magnetic fields (photospheric, chromospheric, and coronal). The Solar Physics Lab conceives and executes investigations that advance knowledge of the Sun-Earth system and enable robotic and human exploration. To facilitate this, the SPL develops innovative instruments and mission concepts, theoretical models, and techniques to access and analyze data. The Laboratory is involved with mission planning and supervision, advanced instrumentation development, experiment participation, data analysis, and theoretical modeling for increased understanding of the basic processes involved. Missions under development include the PUNCH), and CODEX. Missions under study include L5 and L4 observatories, out of the ecliptic/over the pole explorers, and far-side observatories. SPL runs the Solar Data Analysis Center and the CDAW Data Center that make data products from various space missions to enable science return from NASA missions. SPL also hosts the secretariat of the International Space Weather Initiative (ISWI) that promotes science, capacity building, and outreach activities in space weather.

For more information, please visit <https://science.gsfc.nasa.gov/heliophysics/solar/>.

2.1.2.3 Heliospheric Physics Laboratory (672)

The Heliospheric Physics Lab supports NASA missions designed to provide a better understanding of the composition, structure, and dynamics of the ionized and magnetized media in the heliosphere including the Sun's corona, the solar wind, the local interstellar medium, and their interaction with planetary plasma environments, including comets and other unmagnetized bodies. The Laboratory also focuses on the initiation and evolution of solar wind transients, e.g., interplanetary coronal mass ejections (ICMEs), shocks, co-rotating interaction regions (CIRs), and the acceleration and propagation of energetic particles. Missions in which Laboratory members participate include ACE, DSCOVR, IBEX, Voyagers, Wind, STEREO, Parker Solar Probe, and Solar Orbiter. The Laboratory is involved with mission planning and supervision, advanced instrumentation development, experiment participation, data analysis, and theoretical modeling for increased understanding of the basic processes involved.

For more information, please visit <https://science.gsfc.nasa.gov/heliophysics/heliospheric/>.

2.1.2.4 Geospace Physics Laboratory (673)

The Geospace Physics Laboratory focuses on processes occurring in the magnetospheres of magnetized planets and on the interaction of the solar wind with planetary magnetospheres as well as phenomena, such as magnetofluid turbulence, that permeate the heliosphere from the solar atmosphere to the edge of the solar system. The Geospace Laboratory boasts a diversity of areas of expertise including theory, modeling and simulations; mission support; and instrument development fostering the conception and development of missions to observe plasma phenomena throughout geospace, other planetary magnetospheres, and the heliosphere, including smallsat and CubeSat missions. The Laboratory develops improved instrumentation and theoretical models to investigate plasma processes. It establishes partnerships throughout the international science community, providing data access, analysis tools, and user support. Scientists in the Geospace Laboratory play key roles in a vast array of Science Mission Directorate (SMD) missions, including Wind, Voyager, THEMIS, Messenger, MMS, TWINS, IBEX, ACE, DSCOVR, Solar Orbiter, and many other NASA missions.

For more information, please visit <https://science.gsfc.nasa.gov/heliophysics/geospace/>.

2.1.2.5 Space Weather Laboratory (674)

The Space Weather Laboratory (SWL) undertakes data analysis, theoretical, and modeling studies of the causal chain of events that lead to space weather effects of interest to NASA, other US government agencies, and the general public. For this

purpose, SWL maintains a world-class space environment research program, including leadership roles in the development of space environment theories and models and soft X-ray imaging instrumentation for geospace applications. Many SWL activities are pursued through partnerships with the heliophysics and space-weather communities' worldwide, Federal agencies, industry, academia, and international organizations. SWL staff play active roles in the development of space environment missions, analysis and visualization tools, and state-of-the-art computational models. SWL communicates NASA research results to the scientific community, to various space-weather end users, and to the general public. The SWL also supports strategic planning activities at NASA, other government agencies, and international organizations (e.g., COSPAR).

For more information, please visit

<https://science.gsfc.nasa.gov/heliophysics/spaceweather/>.

2.1.2.6 Ionosphere, Thermosphere, Mesosphere (ITM) Physics Lab (675)

The Ionosphere, Thermosphere, Mesosphere Physics Laboratory works to understand the complex dynamics and chemistry of the middle and upper atmosphere (above 50 km altitude), including its internal dynamics, electrodynamics, and chemistry, and also its tight coupling to the magnetosphere and lower atmosphere, as well as its response to variations in direct solar forcing and the influence of extraterrestrial sources such as meteoroid influx. ITM Lab research expands knowledge of our home planet, including a region that is the “home” of space weather effects. Lab research uses this accessible natural laboratory to study fundamental phenomena of rarefied gases, plasma-gas interactions, neutral dynamics and plasma electrodynamics that are universal and apply to bodies in our Solar System as well as exoplanets. The ITM Lab conceives, develops, and supports ground-based, suborbital and space-borne missions to observe gas and plasma dynamics throughout this region. The Laboratory develops improved instrumentation, theoretical models, and data analysis techniques to investigate neutral and electrodynamic processes. Lab personnel establish and support partnerships throughout the international science community, communicating research results, and providing data access and analysis techniques and tools.

For more information, please visit <https://science.gsfc.nasa.gov/heliophysics/itmphysics/>.

2.1.2.7 Heliophysics Data and Modeling Centers and Final Archives

The Solar Data Analysis Center (SDAC, <https://umbra.nascom.nasa.gov>) and the Space Physics Data Facility (SPDF, <https://spdf.gsfc.nasa.gov>) are the NASA archives for heliophysics data, as well as centers for excellence in providing multi-project, cross-disciplinary access to data and tools to support the broad range of science possible with present and past missions. They also produce and maintain other critical Heliophysics Data Environment (HPDE) components such as the Common Data Format (CDF)

software for making and using files in a self-documenting format and the SolarSoft set of routines for solar data analysis, and the Virtual Solar Observatory (VSO) for solar data access. The SPDF and SDAC are responsible for ensuring the capture, accessibility, and preservation of legacy data from NASA Heliophysics missions.

The Community Coordinated Modeling Center (CCMC) was established as a strategic investment into the National Space Weather Program with two main goals: 1) to facilitate research and model development to advance understanding; 2) to support the transition of research models to space weather operations. The needs of CCMC science customers are primarily met through the CCMC-developed Runs-on-Request system, which allows the execution of space plasma simulations via the Internet upon customer request. The CCMC's web site provides users with access to an expanding collection of often competing models and model combinations covering the entire domain from the solar corona to Earth's upper atmosphere. For every request, the CCMC configures the model, execute the simulation, and provide the user with science-quality visualizations of the run results, as well as archived output for future analyses.

The CCMC evaluates the impact on performance and robustness when new features are incorporated into existing operational models and demonstrates their usefulness and readiness for operational model use. The CCMC's real-time systems, displays for space weather situational awareness/prediction and for taking proper actions, databases and knowledge base populated in real-time (such as the integrated Space Weather Analysis system (iSWA), Database of Notifications, Knowledge Information (DONKI), validation scoreboards) serve as a showroom for demonstrating the operational potential of models, tools, applications, procedures, and forecasting techniques to operational agencies. For more information see <https://ccmc.gsfc.nasa.gov/>.

The staff supporting these centers includes scientists, software developers, information technology, education and visualization experts.

A complimentary interdisciplinary center at Goddard is the Exoplanet Analysis and Modeling Center (EMAC), a part of the Sellers Exoplanet Environments Collaboration (SEEC). EMAC hosts numerous codes for studies of exoplanets, their environments, their atmospheres, evolution, and observables such as spectra that can be potentially observed by upcoming missions like the James Webb Space Telescope (JWST) and the Wide-field Infrared Space Telescope (WFIRST), recently renamed as the Roman Space Telescope (RST). Thus, outputs from the CCMC are used as inputs to their hosted exoplanet models.

2.1.3 Research Activities during the Cooperative Agreement

The specific research activities of the Goddard Heliophysics Science Division will depend on the success rate of the Goddard civil servants, in concert with the scientists of the CREH, in submitting winning proposals to NASA Headquarters. As the description of HSD activities above demonstrates, the HSD brings a wide range of potential

resources to a collaborative science center and the CREH should pursue proposal opportunities in these areas.

2.1.4 External Proposals by Heliophysics Science Center scientists

CREH scientists will generally be encouraged to seek funding from other NASA programs and especially other non-NASA sources, following Heliophysics Science Division policy and procedures.

These include:

- Proposals submitted by CREH under the cooperative agreement must be relevant to NASA, GSFC, and HSD strategic goals.
- Any requirements for on-site space, facilities, or other resources must be approved by the HSD in advance.
- Funding for GSFC institutional costs must be included in the proposal, and arrangements must be made to transfer the funds to GSFC.
- Any proposal requiring a substantial commitment from GSFC (e.g., instrument, balloon or sounding rocket payload development) must be coordinated with the GSFC New Business process through the HSD.

Because this is a collaborative agreement, proposals including an HSD Co-Investigator are strongly encouraged.

2.2 Special Programs

2.2.1 Visiting Scientists

When research objectives require unique science discipline expertise or partnership with other organizations, the CREH may be expected to support the identification, recruitment, and selection of potential collaborative partners, including:

1. Recruiting scientists in specialty disciplines for specific research projects;
2. Providing positions for scientists from other organizations to team with GSFC scientists on proposals for new initiatives.

The CREH will as appropriate and as needed establish Visiting Scientist positions, including:

- arrangement of salaries with home institutions;
- arrangement of travel;
- arranging for and coordinating visas;
- assisting with green card applications;
- arranging access to the Center through GSFC Security; and

- providing other logistical support as needed.

In general, the positions must be approved in advance by HSD, with the needs and attributes jointly developed by the recipient with HSD.

2.2.2 Post-Doctoral Researchers and Graduate Students

The Heliophysics Science Center will support the recruitment (which may include advertising in journals, setting up booths at conferences, and visiting minority institutions) and selection of post-doctoral researchers and graduate students where appropriate for specific research tasks. Objectives of this program should include:

- Providing research opportunities for high potential recent doctoral graduates to develop candidates for future research positions in NASA and university programs;
- Maintaining a graduate student program to attract high potential students to participate in science center research activities;
- Providing research opportunities for and actively recruiting high potential post-doctoral researchers and students from under-represented groups to broaden the diversity of the hiring pool for future space science research positions;
- Providing science research, engineering, computer science, technician, or other technical expertise (especially in the area of heliophysics) needed to directly support research activities;
- Proposal development/writing support for post-doctoral and other researchers at the CREH including budget preparation and interface with proposal submission websites such as NSPIRES or Grants.gov.
- Providing travel support, mentoring, and career advancement training.

In general, the positions must be approved in advance by HSD, with the needs and attributes jointly developed by the Partner Institution with HSD.

2.2.3 Short-Term Visitors, Workshops, Conferences, Seminars, and Summer Schools

The CREH will support short-term visitors (up to a year) for collaboration, presentation of seminars, and program coordination. The CREH will arrange travel, center access, and other support as needed for selected researchers to participate in on-site and field activities with science center colleagues.

The CREH will also conduct workshops, conferences, and other special events. This may include summer programs for undergraduate and graduate students organized by the science center.

2.3 Program Management

The proposer shall provide an efficient management structure for planning research activities with GSFC scientists: identifying, recruiting, and retaining quality research staff; and (for team proposals) for allocating and managing research work among team members. Awardees will be responsible for on-boarding scientists by completing and disseminating forms and entering scientists into the NASA system for badging.

2.4 Facilities

Office and laboratory space on-site at GSFC may be available for work performed under the CREH based on approved research funding. Proposers should propose an approach for location of CREH researchers if not on-site at GSFC, and for use of any laboratory capabilities that could complement and extend the research capability at Goddard. It is estimated that there are 90 individuals currently working on-site as part of the current cooperative agreement.

For science center personnel proposed to work on-site at GSFC, GSFC may provide office space, telephone connections, and office supplies. Additionally, GSFC will provide existing on-site computer capabilities as available.

The CREH shall provide on-site personnel with computing capabilities necessary to conduct the research if such facilities are not available at GSFC. In accordance with the NASA Grant and Cooperative Agreement Manual, costs for the purchase of equipment will be permitted under the cooperative agreement only if it is determined that the equipment is technical in nature and relevant to the research being conducted.

Government property will not be provided to the CREH for use off-site unless required to perform approved research activities of limited duration and approved by GSFC/HSD in advance. The science center management will assure that all Government property is managed following NASA/GSFC property management policy and procedures.

2.5 Cancellation of the CAN

NASA reserves the right to make no awards under this CAN and, in absence of program funding or for any other reason, to cancel this CAN by having a notice published at Grants.gov. NASA assumes no liability for canceling the CAN or for anyone's failure to receive actual notice of cancellation. Cancellation may be followed by issuance and synopsis of a revised CAN.

2.6 Schedule

The schedule for the review and selection of proposals for this CAN is as follows:

Proposals Due – January 11, 2021
Selection, Award –March 15, 2021
Phase In - March 22, 2021
Effective/Start date –May 1, 2021

2.7 Term of Agreement

The term of the awarded Cooperative Agreement shall be for a period of five-years and it shall be effective on May 1, 2021. NASA has included a draft of the expected Cooperative Agreement terms and conditions with three (3) proposed attachments. NASA's Goddard Space Flight Center is conducting all aspects of this CAN through selection. After a recipient is selected, the current plan is for the selection package to be sent to the NASA Shared Services Center (NSSC) for award. NASA policy requires that all grant and cooperative agreement actions be processed, awarded, managed, and administered by the NSSC so the final determination of required terms and conditions will be determined by the NSSC. GSFC will provide the NSSC any unique terms and conditions necessary to comply with on-site performance.

3.0 ELIGIBILITY INFORMATION

3.1 Eligible Applicants

Participation in this program is limited to U.S. organizations, specifically higher education and not-for-profit institutions who are subject to 26 U.S.C. 501(c) (3) of the tax code (26 U.S.C. 501(c) (3)). Other NASA centers and other U.S. Government agencies are not eligible.

Work or research performed under a cooperative agreement resulting from these agreements must be performed within the United States unless required to support NASA international collaborative agreements and have prior approval by GSFC/HSD. Proposals including other work or research that will be performed outside of the United States, in whole or in part, are not acceptable and will not be given further consideration for award.

3.2 Cost Sharing or Matching

If an institution of higher education, or other non-profit organization, wants to receive a grant or cooperative agreement, cost sharing is not required, however, NASA can accept cost sharing if it is voluntarily offered. The NASA Grant cooperative Agreement Manual at Section C.2- Appendix A describes the acceptable forms of cost sharing.

4.0 PROPOSAL AND SUBMISSION INFORMATION

4.1 Conformance to Guidance

NASA does not have any mandatory forms or formats for preparation of responses to CANs; however, proposals should conform to the procedural and submission guidelines covered in these instructions. Because NASA may accept proposals without discussion, proposals should be as complete as possible and be submitted on the Proposer's most favorable terms.

In order to be considered responsive to the solicitation, a submission must, at a minimum, present a program for collaborative research to be conducted under the CREH within the areas of interest delineated by the CAN; contain sufficient technical, management and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific, current, or pending NASA solicitation. NASA reserves the right to decline any or all proposals received in response to the CAN when such action is considered in the best interest of the Government.

4.2 Funding Restrictions

- a. All proposed funds must be allowable, allocable and reasonable. Funds may only be used for the project. All activities charged under indirect cost must be allowed under 2 CFR 200 cost principles.
- b. Grants and Cooperative Agreements shall not provide for the payment of fee or profit to the recipient.
- c. Unless otherwise directed in 2 CFR 200, for changes to the negotiated indirect cost rate that occur throughout the project period, you must apply the rate negotiated for that year, whether higher or lower than at the time the budget and application was awarded.
- d. Proposals must not include bilateral participation, collaboration, or coordination with China or any Chinese-owned company or entity, whether funded or performed under a no-exchange-of-funds arrangement.
- e. Any funds used for match or cost sharing must be allowable under 2 CFR 200
- f. The non-Federal entity must use one of the methods of procurement as prescribed in 2 CFR 200.320. As defined in 2 CFR 200.67, the micro-purchase threshold for

acquisitions of supplies or services made under grant and cooperative agreement awards issued to institutions of higher education, or related or affiliated nonprofit entities, or to nonprofit research organizations or independent research institutes is \$10,000; or such higher threshold as determined appropriate by the head of the relevant executive agency and consistent with audit findings under chapter 75 of Title 31, United States Code, internal institutional risk assessment, or State law.

4.3 Proposal Contents

4.3.1 General

Proposals for the CREH must be submitted according to the instructions contained herein. At a minimum, proposals shall contain the sections and information identified below.

All Section pages shall be numbered and identified with the proposer’s name, CAN Number and date. Subsequent revisions, if requested, shall be similarly identified to show revision number and date. A table of contents shall be provided with figures and tables listed separately.

Section Component	Page Limitations
Proposal Cover Sheet	Excluded
Table of Contents	Excluded
Project Summary	2 Pages
Technical Section	25 Pages
Management Section	18 Pages
Cost Section	7 Pages (budget narrative), no limitations on excel spreadsheets
Key Personnel Biographies	2 pages each
References	Excluded
Representations and Certifications	Excluded

4.3.2 Proposal Requirements

The proposers shall submit one electronic copy in Microsoft Word for Windows or editable Adobe PDF format. The Cost section of the proposal shall be submitted in excel format. **(The Government must have the ability to edit all submission provided in Word, excel, adobe etc., therefore, offerors must make their proposals editable.)**

The page limit does not include References, which can be as long as necessary to support the content. The biographies shall be limited to two (2) pages per key personnel. These

biographies are excluded from the page limit. Any information in excess of the page limitation will not be evaluated.

A page is defined as one side of a sheet, 8-1/2" by 11", with at least one-inch margins on all sides, using not smaller than 12-point type Times New Roman font. Line spacing or the amount of vertical space between lines shall not be less than single line (Microsoft Word's default line spacing). Character spacing shall be "Normal", not "Expanded" or "Condensed." The margins may contain headers and footers, but shall not contain any quotation content to be evaluated.

Although proposals will be submitted electronically, they must be adequately put together that allows for ease of reading and understanding.

Restriction on Use and Disclosure of Proposal Information:

Information contained in proposals is used for evaluation purposes only. Proposers should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following notice on the title of the proposal and specify the information subject to the notice by inserting an appropriate identification in the notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

Notice Restriction on Use and Disclosure of Proposal Information

The information contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the Proposer, be used or disclosed other than for evaluation purposes; provided however, that in the event of a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this information (data) to the extent provided in the contract or other agreement. This restriction does not limit the government's right to use or is close this information (data) if obtained from another source without restriction.

Proposal Delivery

The proposal shall be submitted via NASA's secure Large File Transfer (LFT) system. Electronic submissions shall not contain hidden formulas, tables, be locked, be protected or contain links to data not included in the electronic copy. All electronic submissions must be searchable and shall not contain scanned documents. It is the Proposer's responsibility to ensure documents are free from virus and malware, as documents determined by NASA to contain a virus or malware will not be opened or evaluated. Significant partners for the Cost Volume may submit their required proposal information

separately using the instructions in this provision. Past Performance shall be submitted as part of the management section.

Proposers interested in submitting a proposal in response to this CAN shall request a LFT invitation email from Odessia H. Becks at the following email address: Odessia.h.becks@nasa.gov. Proposers must courtesy copy (cc) S. Pauline Barrett at Sislyn.P.Barrett@nasa.gov to ensure requests are accommodated timely. All Proposers must submit their request for an LFT invitation to the aforementioned emails, no later than 10 calendar days prior to the proposal due date. The Government anticipates responding with an invitation to use LFT no later than 5 calendar days prior to the proposal due date.

Upon receipt of the invitation email, a Proposer's representative must click the link in the email to access the LFT website and register for an account. Email invitations with LFT links expire in 168 hours. The Proposer's representative will create his/her own password. The LFT website contains an LFT Quick Start Guide and an LFT User Guide with additional instructions.

It is the Proposer's responsibility to follow instructions provided in the LFT Quick Start Guide and the LFT User Guide. After logging into LFT, the Proposer should click the Send File tab to enter the recipient's email address of Odessia.H.Becks@nasa.gov and a cc copy to Sislyn.P.Barrett@nasa.gov, compose a message to the recipient, and attach files. In the "Subject" block of the "Send File" tab state "insert LFT Acronym Proposal - Insert Company Name". Note: LFT sessions expire after 15 minutes of inactivity. Proposers are advised that notifications alerting users the session is about to expire will not be provided by the LFT system, and any changes to the email form on the Send File tab will not be saved if the session times out. If a Proposer wishes to send a file over 2GB, an Accellion applet will need to be downloaded. Files can be sent up to 100 GB in total size.

Immediately after all files have been transferred and the proposal has been submitted in its entirety, the Proposer shall email the Grants Officer with a listing of all documents that were submitted via LFT.

Each Proposer is responsible for ensuring its proposal reaches the Government office designated in the solicitation by the time and date specified in the solicitation. To ensure timely delivery, Proposers are therefore encouraged to submit their proposals by 5:00 p.m. Eastern Time one working day prior to the due date specified in this CAN.

4.3.3 Technical Section of the Proposal

The technical section of the proposal shall demonstrate the proposer's capability and approach for performing the research. The technical proposal shall contain the following, at a minimum:

- a. A technical discussion of the proposed CREH research program including challenges, objectives, key technical approaches, and the expected staffing level and skill mix (including faculty members, research scientists, post-docs, graduate students and undergraduate students), required to accomplish research in the areas of solar, heliospheric, geospace, space weather, and ITM sciences, as described in Section 2.1.2. This shall include a discussion of the proposed research program in Heliophysics and the plan for carrying it out, including the Annual Research Program Plan (ARPP). Discussion is expected to be detailed for the first year only. [Upon award of the cooperative agreement to the successful recipient, the first year ARPP will be included as Attachment 1 to the agreement]. For the subsequent years, the discussion in the technical portion of the proposal is expected to be general, to outline the Proposer's expectation of the next challenging research questions and an approach for exploring their answers.
- b. A discussion of the role of GSFC scientists and researchers in the overall program and areas where collaborative research is required.
- c. The names and a brief biography of the key personnel (up to ten members of the Proposer's team), who lead the research efforts described in the proposal. Personnel should be named in the technical section. Two page professional biographies should be provided in the Key Personnel Biographies section.
- d. A discussion of how the proposing institutions' educational curriculum reflects or will be aligned with CREH activities and interests. Proposers should include a description of the expertise of lead (point-of-contact) faculty members for each of the research areas represented by the five laboratories of the HSD, including their ability to connect the educational institutions educational curriculum with CREH activities.
- e. A description of the facilities to be used for the research and the benefits of these facilities, to include facilities located at GSFC as well as any other the Proposer may propose.
- f. A description of how the proposing institution will make the results of the federally funded research available to the public.

4.3.4 Management Section of the Proposal

The management portion of the proposal shall contain at a minimum:

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- a. A discussion of the overall management approach and the structure of the cooperative agreement including the roles, responsibilities for any partners and the management approach for their coordination.
- b. A discussion of how the CREH will efficiently and effectively plan the research effort, focusing on programmatic, reporting, financial and administrative matters. The discussion of the interaction of science center researchers with GSFC researchers in establishing the Annual Research Program Plan (described in 4.3.3 a) shall be included. This requires the offeror to use its best efforts to reach specific research objectives. The offeror should also address issues that may arise during the course of performance. For instance, how it will provide an adjustment or contingency if it appears that research goals will not be met.
- c. A discussion of the expected effectiveness of the CREH in attracting and retaining first rate, internationally recognized space science researchers and past performance of proposing institutions in doing so. This includes the following:
 - i. Provide a description of employee career development and performance evaluation processes, including how the research scientists will progress in their careers during the proposal period including advances in a job title series, pay progression and overall professional development.
 - ii. The proposers should also discuss how they will recruit and hire highly qualified personnel from other expiring agreements with the HSD or innovative approaches to partnerships with other US educational and not-for-profit institutions to retain access to the services of such highly qualified personnel.
- d. Discussion of how leading researchers from the broader science community can become involved in the activities of the CREH. In particular, the Proposer should outline plans for conducting the Special Programs described in Section 2.2, including attracting university professors to spend sabbatical years at Goddard from the academic community or other scientific organizations and attracting high potential graduate students to carry out their thesis research.
- e. A discussion of the offeror's commitment to connect, leverage, and develop an effective path for career development of researchers from historically black colleges and universities (HBCU's) and other minority institutions. The offeror should also address how they plan to involve them in performing innovative research efforts of the science center, including proposed metrics for assessing the performance of these initiatives, and annual reporting at board meetings.

- f. A discussion on how the science center can increase public understanding of space sciences through education and outreach such as making the results of the federally funded research available to the public.
- g. A description of the system(s) that will be employed for approval of task budgets, equipment loans, and other reports to and administrative interactions with the government.
- h. A description of institutional financial systems and processes that will be used in the operation of the CREH, including timelines for making task costing information available and employee and visitor reimbursement timelines. Specifically, the offeror shall describe its ability and approach to track costs by individual task orders, labor categories, labor hours, and individual personnel and its approach to submitting estimated costs monthly and reporting actual costs quarterly. This should also include a description of past performance regarding reporting to the government including costing and reimbursement timelines, and coordination with partner institutions.

4.3.5 Cost Section of the Proposal

The cost portion of the proposal must be submitted in Microsoft Excel for Windows.

Proposers should identify any resources they intend to contribute in the performance of this effort. Non-monetary resources should be fully described, and financial resources should be quantified and distinguished from those resources expected to be provided by NASA.

The cost portion of the proposal shall contain cost estimates sufficient for meaningful evaluation. For budget purposes, assume a start date on or about May 2021. Budgets must be presented by cost elements as detailed in the paragraph below. If a consortium proposes on this effort, separate annual budgets are required for each partner in the consortium. Additionally, summary budgets are required which show proposed cost by consortium partner for each year of proposed research. Any assumptions used to project the costs for individual partners should be stated.

The estimated costs must be broken down for each of the first five-years of the Agreement, using the assumed start date on or about May 1, 2021, to show the following:

- a. Direct labor categories, labor hours, and labor costs associated with the research effort. For universities, the percentage of research time and salaries to be charged should be identified by academic year and summer effort.
- b. An itemized list of permanent equipment to be acquired showing the cost of each item. Permanent equipment is any article of nonexpendable tangible

personal property having a useful life of more than two years, and an acquisition cost of \$1,000 or more per unit.

- c. A general description and total estimated cost of expendable equipment and supplies.
- d. Contemplated expenditures for travel with brief explanation (including travel required for monthly person-to-person visits with the partner institution). Estimated costs should include destination, number of days, airfare, per diem and transportation.
- e. Other direct costs (e.g., publications, computer costs, and insurance).
- f. Cost for consulting services, if any, showing number of days, daily rate, and estimated travel/per diem costs. The need for consulting services must be fully justified.
- g. A description of services or materials to be awarded by sub agreement or subcontract. For awards totaling **\$100,000** or more, provide the following specific information:
 - (1) If known, the identification of the proposed subawards and an explanation of why and how the subcontractor was selected or will be selected.
 - (2) Whether or not the award will be competitive and, if noncompetitive, rationale to justify the absence of competition.
 - (3) The proposed acquisition price in sufficient detail to allow for meaningful evaluation.
- h. Indirect costs indicating whether rates used are fixed or provisional and the time frames to which they are applicable (e.g., a fixed rate may apply until a specified date, after which the rate becomes provisional). Additionally, provide the name, address, and telephone number of the Federal Agency and official having cognizance over such matters for the organization (i.e. audit agency such as Defense Contract Audit Agency, Office of Naval Research, and Health and Human Services).

4.3.6 Representations and Certifications

The Authorized Organizational Representatives (AOR) signature on the Proposal Cover Page automatically certifies that the proposing organization has read and is in compliance with the Certifications Assurances, and Representations listed in Enclosure A.

4.4 Proposal Submission Requirements and Deadline

PROPOSAL MARKING AND DELIVERY

PROPOSALS MUST BE SUBMITTED VIA THE Large File Transfer (LFT) PORTAL.

4.4.2 Designated Receiving Office

Proposals must be received via the LFT portal no **later than January 11, 2021 at 3 p.m. EST**, with notification from the proposer to the Grants Officer.

4.4.3 Communications Regarding This Solicitation

Any questions or comments regarding this solicitation shall cite the solicitation number and be directed to the following Government representative: All communication shall be via electronic mail at Sislyn.p.barrett@nasa.gov. ***During this period that NASA GSFC is closed all correspondences shall be sent via email.**

Name: S. Pauline Barrett
E-Mail: Sislyn.P.Barrett@nasa.gov

The Government will answer relevant and appropriate questions regarding this solicitation and post responses to those questions via the same websites hosting this CAN. All Proposers are strongly encouraged to submit questions by no later than 20 calendar days after the CAN is released.

4.4.4 Type of Award

The Government contemplates a single award of one Cooperative Agreement resulting from this CAN.

4.5 Withdrawal

Proposals may be withdrawn by the proposer at any time. Proposers are requested to notify NASA if the proposal is funded by another organization or other changed circumstances which dictate termination of evaluation. A proposal funded by another organization must be withdrawn by a Proposer.

4.6 The NASA Grant and Cooperative Agreement Manual

The NASA Grant and Cooperative Agreement Manual can be accessed at:

https://prod.nais.nasa.gov/pub/pub_library/srba/documents/Grant_and_CooperativeAgreementManual.pdf

All applicants must provide the Dun and Bradstreet (D&B) Data Universal Numbering System (DUNS) number for their organization in the Cover Page of their proposal. The DUNS number is a unique nine-character identification number provided by the commercial company Dun & Bradstreet (D&B). Applicants may call D&B at 1-866-705-5711 to register and obtain a DUNS number, or access the D&B website at: <http://www.dnb.com/us/>. The process to request a DUNS number by telephone takes about 10 minutes, and is free of charge. The process to obtain a DUNS number through the web site takes about fourteen days, and is also free of charge. Organizations will use the same DUNS number with every proposal submitted for a Federal grant and cooperative agreement. Note that the DUNS number is site-specific.

NASA also requires the applicant's organization to be registered in the System for Award Management (SAM) database and obtain a Commercial and Government Entity (CAGE) code prior to submitting a proposal. The purpose of this requirement is to help centralize information about grant recipients and provide a central location for grant recipients to change organizational information. Information for registering in SAM and online documents can be found at <http://www.sam.gov>. Before registering applicants and recipients should review the System for Award Management, which is also located at <http://www.sam.gov>. The process for obtaining a CAGE code is incorporated into the SAM registration.

5.0 PROPOSAL EVALUATION

5.1 Risk Analysis

NASA Grant Officers will conduct a pre-award review of risk associated with the proposer as required by 2 CFR 200.205. For all proposals selected for award, the Grant Officer will review the submitting organization's information available through multiple government-wide repositories such as the System for Award Management (beta.SAM.gov), Federal Awardee Performance and Integrity Information System (FAPIIS), the Contractor Performance and Assessment Reporting System (CPARS), the Federal Audit Clearinghouse (FAC), USAspending.gov, and GrantSolutions Recipient Insight.

5.2 Risk Review

For any Federal award under a notice of funding opportunity, that will be greater than the simplified acquisition threshold on any Federal award under a notice of funding opportunity may include, over the period of performance (see §200.88 Simplified Acquisition Threshold), NASA will inform applicants that:

- i. Prior to making an award with a total amount of Federal share greater than the simplified acquisition threshold, NASA will review and consider any information about the applicant

that is in the designated integrity and performance system accessible through beta.SAM.gov (currently FAPIIS) (see 41 U.S.C. 2313);

ii. That an applicant, at its option, may review information in the designated integrity and performance systems accessible through beta.SA.gov and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through beta.SAM.gov;

iii. That NASA will consider any comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in §200.205 Federal awarding agency review of risk posed by applicants.

5.3 Evaluation Process

A selection decision will be made following a review of the proposals. The final decision is made by a designated NASA Source Selection Official.

5.4 Evaluation Criteria

Proposals will be evaluated as follows:

The Technical/Scientific Merit is more important than Management Approach which is more important than Cost. The combination of Technical/Scientific Merit and Management Approach are significantly more important than Cost. Findings and Adjectival ratings will be assessed for Technical/Scientific Merit and Management Approach. Cost will be evaluated for reasonableness and realism (risk).

Primary goals:

- Provide an effective and efficient collaborative partnership with NASA Goddard Space Flight Center Heliophysics Science Division for advancing scientific understanding of Space Science through instrument technology, space observations, and research.

Supporting criteria:

The technical approach will be evaluated as follows:

- a. The proposed research program and plans for carrying it out will be evaluated for its effectiveness and efficiency in addressing the program challenges, objectives, key technical approaches, and the expected staffing level and skill mix. This includes the roles performed by faculty members, research scientists, post-docs, graduate students and undergraduate students, required to accomplish research in

- the areas of solar, heliospheric, geospace, space weather, and ITM sciences, described in Section 2.1.2. The range of the proposed scientific research program and its alignment with research being done in the HSD as described in Section 2.1.2 will be evaluated for its thoroughness and effectiveness. The proposal will be evaluated for scientific merit, feasibility, and efficiency of the proposed research program in Heliophysics and the plan for carrying it out, including the first year Annual Research Program Plan (ARPP). For subsequent years beyond year one, the proposal will be evaluated for the adequacy, reasonableness, knowledge, and understanding of its general outline of expectations for the next challenging research questions and an approach for exploring their answers.
- b. The proposal discussion of the role of GSFC Scientists and researchers will be evaluated for its extent, scientific and technical merit, and feasibility of the planned collaborations with GSFC scientists and researchers.
 - c. The qualifications of the proposed key personnel (**up to a maximum of 20 members of the Proposer's team**) to contribute to the proposed research will be evaluated for thoroughness, relevance, and merit, based on their relevant past accomplishments.
 - d. The proposal discussion of the proposing institutions' educational curriculum will be evaluated for the extent to which it reflects or will be aligned with the CREH and each of the areas represented by the five laboratories in the HSD. The faculty members designated as the point-of-contact for each of the research areas will be evaluated for expertise in these areas and ability to connect the educational institutions educational curriculum with CREH activities.
 - e. The facilities to be used for research will be evaluated for their appropriateness and benefits.
 - f. The explanation of the proposed process, by which results of the federally funded research that NASA indicates should be released to the public, will be evaluated for its thoroughness.

Management Approach

The management approach will be evaluated as follows:

- a. The overall management structure of the cooperative agreement, including the roles and responsibilities for any partners and the management approach, for coordination will be evaluated for effectiveness and efficiency.
- b. The proposed process through which the CREH will plan the research efforts, focusing on programmatic, reporting, financial and administrative matters,

will be evaluated for thoroughness, completeness, and efficiency. The discussion of the interaction of science center researchers with GSFC researchers in establishing the Annual Research Program Plan (AARP) and strategies will be evaluated for the effectiveness and efficiency by which the proposer will deal with potential problems that may arise in its implementation (including adjustments or contingency if it appears that research goals will not be met).

- c. The effectiveness and efficiency of proposed plans for and past performance in attracting and retaining first rate, internationally recognized space science researchers will be evaluated. This will include evaluation of the efficiency and effectiveness of the following:
 - i. The approach to career development and performance evaluation processes, including how the research scientists will progress in their careers during the proposal period including advances in a job title series, pay progression and overall professional development.
 - ii. The proposers plans to recruit and hire highly qualified personnel from other expiring agreements with the HSD or to utilize innovative approaches to partnerships with other US educational and not-for-profit institutions to retain access to the services of such highly qualified personnel.
- d. The discussion of how leading researchers from the broader science community can become involved in the activities of the CREH will be evaluated for its adequacy, thoroughness, and effectiveness. The effectiveness of the overall plans for conducting the special programs described in Section 2.2, will also be evaluated. In particular, this includes the proposed plan(s) to attract university professors to spend sabbatical leave at Goddard from the academic community or other scientific organizations. Plans for attracting high potential graduate students to carry out thesis research at Goddard also will be evaluated for their effectiveness and efficiency.
- e. The effectiveness of the proposer's plan to connect, leverage, and develop effective paths for career development for researchers from Historically Black College and Universities (HBCU's) and other minority institutions will be evaluated. The thoroughness and effectiveness of the plan to involve them in performing innovative research efforts, including the proposed metrics to assess/track performance of the initiatives as well as the adequacy of the annual reporting at board meeting will be evaluated.
- f. The proposer's plan to increase public understanding of Space Science through education and outreach will be evaluated for effectiveness.

- g. The effectiveness and efficiency of the proposed systems for approval of task budgets, equipment loans, and reports and administrative interactions with the government will be evaluated.
- h. The effectiveness and efficiency of the financial systems and processes that will be used in the operation of the CREH, including timelines for making task costing information available and employee and visitor reimbursement timelines. The offeror's approach for tracking costs by task orders, labor category, labor hours, and individual personnel and its approach to submitting estimated costs monthly and reporting actual costs quarterly will be evaluated for effectiveness and efficiency. The quality of past performance reporting to the government, including costing and reimbursement timelines, and coordination with partner institutions will be evaluated for proficiency and effectiveness.

Cost

Proposed costs will be evaluated, including consideration of the realism and reasonableness of the proposed cost and the relationship to available funds. The cost realism evaluation will assess potential performance risk for unrealistic or unsupported low cost elements and/or total cost. Cost sharing is not part of the evaluation criteria. Neither the existence of proposed voluntary cost sharing nor the amount of such cost sharing will be used as evaluation criteria for the purpose of selection or as conditions for award. As a cooperative effort, proposals may include commitment of resources (financial and/or non-monetary) to contribute their unique capabilities to enhance the success of this effort.

All of the above supporting criteria will be evaluated and factored into the selection decision.

5.5 Evaluation and Selection Process

As a matter of both policy and practice, panels composed of the proposer's professional peers who have been screened for conflicts of interest will review proposals submitted to NASA. Findings and Adjectival ratings will be assessed for Technical/Scientific Merit, and Management Approach. Cost will be evaluated for cost realism and Past Performance will be part of the Management Approach evaluation.

Adjective Rating	Definition
Excellent	A comprehensive, thorough, and compelling proposal section of exceptional merit as

	documented by numerous and/or significant strengths and having no significant weaknesses or deficiencies.
Very Good	A highly competent proposal section of very high merit, where strengths fully outweigh any weaknesses. No deficiencies exist.
Good	A competent proposal that represents section a credible response, where strengths and weaknesses approximately balance. No deficiencies exist.
Fair	A proposal section that provides a nominal response and weaknesses outweigh any strengths. No deficiencies exist.
Poor	A seriously flawed proposal section having one or more deficiencies or multiple significant weaknesses.

NASA will evaluate the proposal by assessing strengths and weakness as define below:

Weakness – a flaw in the proposal that increases the risk of unsuccessful performance.

Significant Weakness – a proposal flaw that appreciably increases the risk of unsuccessful performance.

Deficiency – a material failure of a proposal to meet a Government requirement or a combination of significant weaknesses in a proposal that increases the risk of unsuccessful performance to an unacceptable level.

Strength – a proposal area that enhances the potential for successful performance or contributes toward exceeding the requirements in a manner that provides additional

value to the government (this could be associated with a process, scientific/technical approach, materials, facilities, etc.).

Significant Strength – a proposal area that greatly enhances the potential for successful performance or contributes significantly toward exceeding the requirements in a manner that provides additional value to the government.

At the conclusion of the review process, a selection recommendation is developed by the Review Team, and submitted to the Selecting Official together with the evaluation document. In addition to the findings of the evaluation document, important consideration in the selection process will be the availability of funds and programmatic balance in the context of the objectives of the CAN and/or the existing program as a whole. The Selection Official will select the highest ranked proposal as judged against the evaluating criteria, the objectives of the Cooperative Agreement programmatic considerations and the available financial resources.

Following selection, each proposer will be notified of the disposition of their proposal and if desired provided the opportunity to be debriefed. The selected proposer will be contacted by the responsible NASA Procurement Office to initiate negotiations for potential award. It is important to note that until an award is made, there is no guarantee that the recommended financial resources will be available.

6.0 AWARD ADMINISTRATION INFORMATION

6.1 Notice of Award

As soon as possible after the selection is concluded, Government will inform each proposer of the selection or declination of his/her proposal by electronic mail and offers a debriefing. For the selected proposal, the proposer's business office will be contacted by a NASA Grants Officer, who is the only official authorized to obligate the Government regarding execution of the Cooperative Agreement. Any costs incurred by the Proposer in anticipation of any award will not be reimbursed.

6.2 Administrative and National Policy Requirements

This solicitation does not invoke any special administrative or National policy requirements, nor do the awards that will be made involve any special terms and conditions that differ from NASA's general terms and conditions as given in the Grants and Cooperative Agreements Manual other than the implementation of some local policies at Goddard Space Flight Center (GSFC) for on-site performance

6.3 Award Reporting Requirements

A. A quarterly technical status and business status report will be required along with an annual report and an annual budget.

B. REPORTING OF MATTERS RELATED TO RECIPIENT INTEGRITY AND PERFORMANCE

1. General Reporting Requirement

If the total value of the recipients' active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds \$10,000,000 for any period of time during the period of performance of this Federal award, then you as the recipient during that period of time must maintain the currency of information reported to the System for Award Management (beta.SAM) that is made available in the designated integrity and performance system (currently the Federal Awardee Performance and Integrity Information System (FAPIIS)) about civil, criminal, or administrative proceedings described in paragraph 2 of this award term and condition. This is a statutory requirement under section 872 of [Public Law 110-417](#), as amended ([41 U.S.C. 2313](#)). As required by section 3010 of [Public Law 111-212](#), all information posted in the designated integrity and performance system on or after April 15, 2011, except past performance reviews required for Federal procurement contracts, will be publicly available.

2. Proceedings About Which You Must Report

Submit the information required about each proceeding that:

- a. Is in connection with the award or performance of a grant, cooperative agreement, or procurement contract from the Federal Government;
- b. Reached its final disposition during the most recent five year period; and
- c. Is one of the following:
 - (1) A criminal proceeding that resulted in a conviction, as defined in paragraph 5 of this award term and condition;
 - (2) A civil proceeding that resulted in a finding of fault and liability and payment of a monetary fine, penalty, reimbursement, restitution, or damages of \$5,000 or more;
 - (3) An administrative proceeding, as defined in paragraph 5. of this award term and condition, that resulted in a finding of fault and liability and your payment of either a monetary fine or penalty of \$5,000 or more or reimbursement, restitution, or damages in excess of \$100,000; or
 - (4) Any other criminal, civil, or administrative proceeding if:
 - (i) It could have led to an outcome described in paragraph 2.c.(1), (2), or (3) of this award term and condition;
 - (ii) It had a different disposition arrived at by consent or compromise with an acknowledgment of fault on your part; and

(iii) The requirement in this award term and condition to disclose information about the proceeding does not conflict with applicable laws and regulations.

3. Reporting Procedures

Enter in the SAM Entity Management area the information that SAM requires about each proceeding described in paragraph 2 of this award term and condition. You do not need to submit the information a second time under assistance awards that you received if you already provided the information through SAM because you were required to do so under Federal procurement contracts that you were awarded.

4. Reporting Frequency

During any period of time when you are subject to the requirement in paragraph 1 of this award term and condition, you must report proceedings information through SAM for the most recent five year period, either to report new information about any proceeding(s) that you have not reported previously or affirm that there is no new information to report. Recipients that have Federal contract, grant, and cooperative agreement awards with a cumulative total value greater than \$10,000,000 must disclose semiannually any information about the criminal, civil, and administrative proceedings.

5. Definitions

For purposes of this award term and condition:

a. Administrative proceeding means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (*e.g.*, Securities and Exchange Commission Administrative proceedings, Civilian Board of Contract Appeals proceedings, and Armed Services Board of Contract Appeals proceedings). This includes proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does not include audits, site visits, corrective plans, or inspection of deliverables.

b. Conviction, for purposes of this award term and condition, means a judgment or conviction of a criminal offense by any court of competent jurisdiction, whether entered upon a verdict or a plea, and includes a conviction entered upon a plea of *nolo contendere*.

c. Total value of currently active grants, cooperative agreements, and procurement contracts includes -

(1) Only the Federal share of the funding under any Federal award with a recipient cost share or match; and

(2) The value of all expected funding increments under a Federal award and options, even if not yet exercised.

6.4 Award and Intellectual Property Information

Awards resulting from a proposal will be governed by the following:

2 C.F.R. 200 *Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards (Uniform Guidance)* at http://ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title02/2cfr200_main_02.tpl

2 C.F.R. 1800 NASA supplement to 2 C.F.R. 200 (open word file)

https://prod.nais.nasa.gov/pub/pub_library/srba/index.html

Grants and Cooperative Agreement Manual

https://prod.nais.nasa.gov/pub/pub_library/Grant_and_CooperativeManual.doc

Intellectual Property Resulting from Awards

Data Rights: NASA wishes to disseminate data and material produce under this award as broadly as possible with minimal restrictions. While recipients are not restricted in their own use and distribution of data first produced in performance of an award, NASA's goal is to reduce restrictions on dissemination and use of data to the greatest extent possible, consistent with the terms and conditions of the award. Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

Limited Rights Data: The U.S. Government will not normally require delivery of confidential or trade secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor scientific/technical progress and evaluate the potential of proposed technologies to reach specific scientific/technical and cost metrics.

Government Rights in Technical Data Produced under Awards: The U.S. Government normally retains unlimited rights in technical data produced under awards, including the right to distribute to the public. However, invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

Invention Rights: Recipients that are Small Business or nonprofit organizations may elect to retain title to their inventions pursuant to the Bayh-Dole Act (35 U.S.C. § 202). Large business recipients are subject to section 20135 of the National Aeronautics and Space Act (51 U.S.C. § 20135) relating to property rights in inventions. Title to inventions made under an award by a large business recipient initially vests with NASA. However, these recipients may request a waiver to obtain title to inventions made under the award. Such a request may be made in advance of the award or within 30 days thereafter. Even if a waiver request is not made, or denied, a large business recipient may request a waiver on individual inventions made during the course of the award.

In the case of awards, intellectual property provisions (patent and data rights) are subject to the Terms and conditions set forth in the Grants and Cooperative Manual (GCAM).

In the case of grants and cooperative agreements, intellectual property provisions are subject to the terms and conditions in 2 CFR 200, 2CFR 1800, and 14 CFR 1274.

6.5 Research Terms and Conditions

Awards from this funding announcement that are issued under 2 CFR 1800 are subject to the Federal Research Terms and Conditions (RTC) located at <http://www.nsf.gov/awards/managing/rtc.jsp>. In addition to the RTC and NASA-specific guidance, three companion resources can also be found on the website: Appendix A— Prior Approval Matrix, Appendix B—Subaward Requirements Matrix, and Appendix C—National Policy Requirements Matrix.

7.0 NASA CONTACT(S)

Further Information

***During this period that NASA GSFC is closed all correspondences shall be sent via email.**

Address further questions regarding this CAN to:

Heliophysics Science Center/CAN
NASA/Goddard Space Flight Center
Attn: S. Pauline Barrett/Code 210.8
Email: Sislyn.P.Barrett@nasa.gov

8.0 ANCILLARY

NASA fosters and encourages the submission of proposals relevant to agency mission requirements by solicitations that describe areas of interest to NASA. Proposals received in response to this CAN will be used only for evaluation purposes.

NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to the CAN to be used as the basis of a solicitation, or in negotiation with other organizations, nor is a pre-award synopsis published for individual proposals.

A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific requests. However, information or materials that NASA and the awardees mutually agree to be of a confidential or privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

If a recipient intends to assert limited rights data or propose restricted computer software (as outlined in the GCAM), then such data and software shall be clearly identified in the proposal.