

NASA EARTH AND SPACE SCIENCE FELLOWSHIP (NESSF) PROGRAM 2018-2019 ACADEMIC YEAR

Call for proposals released	November 1, 2017
Proposals due (new applications)	February 1, 2018 at 11:59 p.m. ET
Proposals due (renewal applications)	March 15, 2018 at 11:59 p.m. ET
Announcement of new fellowships	May 15, 2018 (target)
Announcement of renewal fellowships	June 15, 2018 (target)
Start date of fellowship grants	September 1, 2018

1. Introduction

Through this NASA Earth and Space Science Fellowship (NESSF) solicitation, the National Aeronautics and Space Administration (NASA) Science Mission Directorate (SMD) invites applications for 2018-2019 Academic Year fellowships from accredited U.S. universities on behalf of their students pursuing Masters or Doctoral (Ph.D.) degrees in Earth and space sciences or related disciplines. The purpose of the NESSF is to ensure continued training of a highly qualified workforce in disciplines needed to achieve NASA's scientific goals outlined above by performing research projects. Awards resulting from the competitive selection will be made in the form of training grants to the respective universities with the advisor serving as the principal investigator. Potential proposers should refer to the [NESSF 2018-2019 Proposal Submission Instructions \(PDF\)](#) and the [Frequently Asked Questions \(PDF\)](#), which may be found on [the NSPIRES page for this solicitation](#).

In addition to Scientific Merit, the other key criterion for proposal evaluation and selection is the relevance of the proposed investigation to NASA. NASA's strategic objectives as presented in the [2014 NASA Strategic Plan](#) are to:

- Understand the Sun and its interactions with Earth and the solar system, including space weather;
- Advance knowledge of Earth as a system to meet the challenges of environmental change and to improve life on our planet;
- Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere; and
- Discover how the universe works, explore how it began and evolved, and search for life on planets around other stars.

These four objectives correspond to the four science divisions of SMD: Heliophysics, Earth Science, Planetary Science, and Astrophysics. [Chapter 4 of the NASA Science Plan](#), presents detailed plans by science area.

To ascertain whether a potential research topic is relevant to NASA prospective proposers may refer to the aforementioned [2014 NASA Strategic Plan](#), Chapter 4 of the NASA Science Plan, and competed research solicitations of each Division (e.g., [the topics listed in ROSES](#), especially the Research Program Overviews). Students should apply to this program only if they can present valid lines of reasoning that their intended

research is clearly relevant to NASA SMD. Programmatic factors may also affect selection (for example, see specific priorities in the Science Divisions listed below). The proposal should present a well-defined problem and a justification of its scientific significance, as well as a detailed approach for its solution.

The financial support for the NESSF Program comes from SMD's four Science Divisions and for the 2018-2019 academic year, NASA expects to award approximately 40 new graduate fellowships in Earth Science, 3-5 in Heliophysics, 25 in Planetary Science, and 6-10 in Astrophysics.

All applications to the NESSF must address the goals and objectives of one or more of the four SMD Science Divisions as outlined below. Individuals will indicate to which Division they are proposing in response to a program specific question presented by the NSPIRES web page prior to submission.

The student shall have the primary initiative in defining the proposed research to the NESSF and must be the primary author, with input or supervision from his or her advisor, as appropriate. In cases when the advisor already has an ongoing research award from NASA, the research proposed under the NESSF may address a similar topic, but the proposal should make clear how the proposed research goes beyond that which NASA has already agreed to support.

I. Earth Science Research Program

The Earth Science Research Program, managed by the Earth Science Division of the Science Mission Directorate, contributes to NASA's mission, in particular, the strategic objective 2.2, to advance knowledge of Earth as a system to meet the challenges of environmental change, and to improve life on our planet. This strategic objective is motivated by the following key questions:

- How is the global Earth system changing?
- What causes these changes in the Earth system?
- How will the Earth system change in the future?
- How can Earth system science provide societal benefit?

These science questions translate into seven overarching science goals to guide the Earth Science Division's selection of investigations in scientific and technological research and other programmatic decisions:

- Advance the understanding of changes in the Earth's radiation balance, air quality, and the ozone layer that result from changes in atmospheric composition (Atmospheric Composition)
- Improve the capability to predict weather and extreme weather events (Weather)
- Detect and predict changes in Earth's ecological and biogeochemical cycles, including land cover, biodiversity, and the global carbon cycle (Carbon Cycle and Ecosystems)
- Enable better assessment and management of water quality and quantity to accurately predict how the global water cycle evolves in response to climate change (Water and Energy Cycle)

- Improve the ability to predict climate changes by better understanding the roles and interactions of the ocean, atmosphere, land, and ice in the climate system (Climate Variability and Change)
- Characterize the dynamics of Earth's surface and interior, improving the capability to assess and respond to natural hazards and extreme events (Earth Surface and Interior)
- Further the use of Earth system science research to inform decisions and provide benefits to society

The outcomes that NASA anticipates from its research and development in these overarching scientific goals are summarized in detail in Chapter 4.2 of the NASA 2014 Science Plan available at <http://science.nasa.gov/about-us/science-strategy/>.

The Earth System Science component of the NESSF encourages proposals that place particular emphasis on the utilization of NASA unique capabilities in study of the Earth. Foremost among NASA's unique capabilities is its fleet of Earth observing satellites and sensors aboard the International Space Station, providing a comprehensive suite of measurements of all the components of the Earth system. See descriptions of the missions at <https://science.nasa.gov/missions-page/> with more details about related airborne missions at <https://airbornescience.nasa.gov/>, and information about data access and discovery at <https://earthdata.nasa.gov/>. Additional examples of emphasis include:

- Integration of satellite-, aircraft-, and surface-based measurements, in conjunction with models and simulations. NASA encourages research and development projects that make use of NASA capabilities such as Observations for Model Intercomparison Projects (obs4MIPs; <https://www.earthsystemcog.org/projects/obs4mips/>), Analysis for Model Intercomparison Projects (Ana4MIPs; <https://earthsystemcog.org/projects/ana4mips/>), Collaborative REAnalysis Technical Environment – Intercomparison Project (CREATE-IP; <https://www.earthsystemcog.org/projects/create-ip/>), NASA Earth Exchange (NEX; <http://nex.nasa.gov>).
- Innovative scientific and engineering research in the areas of remote sensing technologies, including those which are relevant to the suite of Earth-viewing missions and measurements recommended by the National Academy of Sciences in its 2007 Decadal Survey for Earth Science, *"Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond,"* the 2011 Decadal Survey for Geodetic Science, *"Precise Geodetic Infrastructure: National Requirements for a Shared Resource"* and the additional missions described by NASA in its June 2010 report *"Responding to the Challenge of Climate and Environmental Change: NASA's Plan for a Climate-Centric Architecture for Earth Observations and Applications from Space."*
- Research contributing significantly to interagency programs established by Congressional and/or administration direction (e.g., US Global Change Research Program; <http://www.globalchange.gov>), national and international assessments, including approaches enhancing the usefulness of NASA data and/or models to such assessments (through either direct participation in them or in the use of data

and models so that they are documented in the peer reviewed literature and thus available for use in future assessments). These assessments include, but are not limited to, the National Climate Assessment being carried out under the auspices of the US Global Change Research Program (see <http://www.globalchange.gov/what-we-do/assessment/nca-overview> and <http://weather.msfc.nasa.gov/nca/research.html>), the Climate Change Assessments of the Intergovernmental Panel on Climate Change, and the quadrennial ozone assessments of the World Meteorological Organization and United Nations Environment Programme.

- Research on the design and implementation of the next generation weather and climate models, with the aim of producing models capable of working on the computing technology developed by DOE's Exascale Computing Project (ECP; <https://exascaleproject.org/>) under the National Strategic Computing Initiative (NSCI). As one of the NSCI implementation agencies, NASA encourages research and development of next generation models that address the requirements specific to weather and climate models and influence the early stages of the design of new High-Performance Computing (HPC) systems, software and application.

The Earth Science Applications component of the NESSF encourages submissions from individuals pursuing interdisciplinary degrees linking Earth science research results with policy, business, operations, and management, including but not limited to:

- Potential application of research results, or advancing the readiness of application science, to specific fields such as natural resource or ecosystem management, environmental policy, public health, disaster and emergency management (e.g., preparedness, response, and initial recovery), land or marine ecosystem planning, conservation biology, international development;
- Analysis of climate-related influences and impacts; and
- Examination of relevant issues in public and private sector decision-making (e.g., uncertainty, risk, alternatives, valuation, implications, costs, benefits, etc.).

Proposals that use NASA data, science and technology to inform a decision are encouraged. The current focus areas include:

- Disasters
- Ecosystems and Ecological Forecasting
- Health and Air Quality
- Water Resources

More information is available at <https://appliedsciences.nasa.gov/>.

In addition, the Earth Science Division encourages technology research relating to advanced components, advanced information systems, and instrument development complementing the investments of NASA's Earth Science Technology Office (<http://esto.nasa.gov>). From space-borne instruments and components to data systems and models, these technologies cover a broad range of scientific observations, operating environments, as well as applied science approaches that benefit the society at large.

Proposals that bring the techniques of other scientific disciplines to bear on remote-sensing relevant Earth science problems are also encouraged. For example, proposals that will bring techniques and methodologies from computing and computational sciences and software engineering to bear on the large modeling and data systems used to integrate and analyze large and diverse Earth science data sets are encouraged.

The Earth Science components of NESSF discourage submission of paleo-climate, paleo-ecology, and paleo-hydrology related proposals, except when used for "out-of-sample" comparison of NASA modeling efforts. Submissions that address the molecular biology, biochemistry, development, physiology, or evolution of living organisms, without a direct utilization of remote sensing approaches or global/regional modeling which makes use of remote sensing data, as well as efforts in laboratory and/or theoretical chemistry that are not directly related to remote sensing and/or computational modeling of atmospheric gas phase and particulate composition, are encouraged to seek other applicable components in NESSF (e.g., astrobiology in the Planetary Science Research Program) or other Federal graduate research opportunities.

II. Heliophysics Research Program

The Heliophysics Research Program seeks to "Understand the Sun and its interactions with Earth and the solar system, including space weather," which is Objective 1.4 of the [2014 NASA Strategic Plan](#). In pursuit of this objective, and with guidance from the National Research Council's most recent decadal survey (*Solar and Space Physics, A Science for a Technological Society*, www.nap.edu), the following questions are posed:

- What causes the Sun to vary?
- How do the geospace, planetary space environments, and the heliosphere respond?
- What are the impacts on humanity?

To address these questions, the Heliophysics Division implements missions and scientific research with three overarching science goals.

- Explore the physical processes in the space environment from the Sun to the Earth and throughout the solar system.
- Advance our understanding of the connections that link the Sun, the Earth, planetary space environments, and the outer reaches of our solar system.
- Develop the knowledge and capability to detect and predict extreme conditions in space to protect life and society and to safeguard human and robotic explorers beyond Earth.

The Heliophysics research program and missions are described in Chapter 4.1 of the *SMD Science Plan 2014* available at <http://science.hq.nasa.gov/strategy>. The program supports theory, modeling, and data analysis utilizing remote sensing and in-situ measurements from a fleet of missions; the Heliophysics System Observatory (HSO). Frequent suborbital rockets, balloons, and ground-based instruments add to the observational base. Supported research activities include projects that address understanding of the Sun and planetary space environments, including the origin, evolution, and interactions of space plasmas and electromagnetic fields throughout the heliosphere and in connection with the galaxy.

The program seeks to characterize these phenomena on a broad range of spatial and temporal scales, to understand the fundamental processes that drive them, to understand how these processes combine to create space weather events, and to enable a capability for predicting future space weather events.

The program supports investigations of the Sun, including processes taking place throughout the solar interior and atmosphere and the evolution and cyclic activity of the Sun. It supports investigations of the origin and behavior of the solar wind, energetic particles, and magnetic fields in the heliosphere and their interaction with the Earth and other planets, as well as with the interstellar medium.

The program also supports investigations of the physics of magnetospheres, including their formation and fundamental interactions with plasmas, fields, and particles and the physics of the terrestrial mesosphere, thermosphere, ionosphere, and auroras, including the coupling of these phenomena to the lower atmosphere and magnetosphere. Proposers may also review the information in the ROSES-17 [Heliophysics Research Program Overview](#) for further information about the Heliophysics Research Program.

III. Planetary Science Research Program

The Planetary Science Research Program, managed by the Planetary Science Division, sponsors research that addresses objective 1.5 of the [2014 NASA Strategic Plan](#): "Ascertain the content, origin, and evolution of the Solar System and the potential for life elsewhere."

NASA's planetary science goals, as described in Chapter 4.3 of the SMD 2014 Science Plan (<http://science.hq.nasa.gov/strategy>), are:

- Explore and observe the objects in the Solar System to understand how they formed and evolve.
- Advance the understanding of how the chemical and physical processes in the Solar System operate, interact and evolve.
- Explore and find locations where life could have existed or could exist today.
- Improve our understanding of the origin and evolution of life on Earth to guide our search for life elsewhere.
- Identify and characterize objects in the Solar System that pose threats to Earth or offer resources for human exploration.

In order to address these goals, the Planetary Research Program invites a wide range of planetary science and astrobiology investigations.

Topics may include, but are not limited to:

- Investigations aimed at understanding the formation and evolution of the Solar System and (exo) planetary systems in general, and of the planetary bodies, satellites, and small bodies in these systems;
- Investigations of extraterrestrial materials, including meteorites, cosmic dust, presolar grains, and samples returned by the Apollo, Stardust, Genesis, and Hayabusa missions;

- Investigations which enhance the scientific return of missions through the analysis of data collected by those missions;
- Investigations of the properties of planets, satellites (including the Moon), satellite and ring systems, and smaller Solar System bodies such as asteroids and comets;
- Investigations of the coupling of a planetary body's intrinsic magnetic field, atmosphere, surface, and interior with each other, with other planetary bodies, and with the local plasma environment;
- Investigations into the origins, evolution, and properties of the atmospheres of planetary bodies (including satellites, small bodies, and exoplanets);
- Astronomical observations of our Solar System that contribute to the understanding of the nature and evolution of the Solar System and its individual constituents;
- Investigations into the origin and early evolution of life, the potential of life to adapt to different environments, and the implications for life elsewhere;
- Investigations that provide the fundamental research and analysis necessary to characterize exoplanetary systems;
- Investigations related to understanding the chemistry, astrobiology, dynamics, and energetics of exoplanetary systems;
- Investigations to inventory and characterize the population of Near Earth Objects (NEOs) or mitigate the risk of NEOs impacting the Earth;
- Investigations into the potential for both forward and backward contamination during planetary exploration, methods to minimize such contamination, and standards in these areas for spacecraft preparation and operating procedures;
- Advancement of laboratory- or spacecraft-based (including small satellites, e.g., CubeSats) instrument technology that shows promise for use in scientific investigations on future planetary missions; and
- Analog studies, laboratory experiments, or fieldwork to increase our understanding of Solar System bodies or processes and/or to prepare for future missions.

Proposers may also review the information in the ROSES-17 [Planetary Science Research Program Overview](#) for further information about the Planetary Science Research Program.

IV. Astrophysics Research Program

The Astrophysics Research Program, managed by the Astrophysics Division, explores the universe beyond our solar system: from the search for planets and life in other stellar systems to the origin, evolution, structure, and destiny of the universe itself. The broad themes of the Astrophysics Research Program are:

(i) Physics of the Cosmos:

to discover how the universe works at the most fundamental level; to explore the behavior and interactions of the particles and fundamental forces of nature, especially their behavior under the extreme conditions found in astrophysical situations; and to explore the processes that shape the structure and composition of the universe as a whole, including the forces which drove the Big Bang and continue to drive the accelerated expansion of the universe.

(ii) Cosmic Origins:

to discover how the universe expanded and evolved from an extremely hot and dense state into the galaxies of stars, gas, and dust that we observe around us today; to discover how dark matter clumped under gravity into the tapestry of large-scale filaments and structures which formed the cosmic web for the formation of galaxies and clusters of galaxies; to discover how stars and planetary systems form within the galaxies; and to discover how these complex systems create and shape the structure and composition of the universe on all scales.

(iii) Exoplanet Exploration:

to search for planets and planetary systems about nearby stars in our Galaxy; to determine the properties of those stars that harbor planetary systems; to determine the percentage of planets that are in or near the habitable zone of a wide variety of stars, and identify candidates that could harbor life.

(iv) Research Analysis and Technology Development:

a vital component of the astrophysics program is the development of new techniques that can be applied to future major missions: the test-beds for these new techniques are the balloons and rockets that are developed and launched from NASA's launch range facilities.

This program also supports technology development that includes detectors covering all wavelengths and fundamental particles, as well as studies in laboratory astrophysics. Examples of these studies could include atomic and molecular data and properties of plasmas explored under conditions approximating those of astrophysical environments.

Investigations submitted to the Astrophysics research program should explicitly support past, present, or future NASA astrophysics missions. These investigations can include theory, simulation, data analysis, and technology development. The Astrophysics research program and missions are described in Chapter 4.4 of the SMD 2014 Science Plan available at <http://science.hq.nasa.gov/strategy>.

Proposers may also review the information in the ROSES-17 [Astrophysics Research Program Overview](#) for further information about the Astrophysics Research Program.

2. Eligibility

This call for graduate fellowship proposals, entitled *NASA Earth and Space Science Fellowship (NESSF) Program – 2018-2019 Academic Year*, solicits applications from accredited U.S. universities on behalf of individuals pursuing Masters or Ph.D. degrees in Earth and space sciences, or related disciplines, at respective institutions. Students admitted to, or already enrolled in, a full-time Masters and/or Ph.D. program at accredited U.S. universities are eligible to apply. Students may enter the fellowship program at any time during their graduate work. Students may also apply in their senior year prior to receiving their baccalaureate degree, but must be admitted and enrolled in a Masters and/or Ph.D. program at a U.S. university at the time of the award.

An individual accepting this award may not concurrently receive any other Federal fellowship or traineeship. NESSF applicants are strongly encouraged to inform NASA immediately, if they received/accepted a Federal fellowship or traineeship from another agency. If the annual cost on campus is more than the amount of the NASA fellowship, the NESSF may be partially supplemented by other forms of employment (i.e., a teaching or research assistant) other than by another Federal fellowship or traineeship. However, NASA may allow an applicant to receive supplements from other U.S. Federal agencies to cover expenses not covered by NASA's graduate fellowships; for example, the purchase of equipment, which is not permitted through a NASA fellowship.

The NESSF is open to all students enrolled full-time at accredited U.S. institutions. Students with disabilities and/or from underrepresented minority groups are urged to apply. No applicant shall be denied consideration or appointment as a NASA Earth and Space Science Fellow on the grounds of race, color, age, ethnicity, religion, pregnancy, sexual orientation, gender identity, sex, marital status, disability, or status as a U.S. Veteran. NASA recognizes and supports the benefits of having diverse and inclusive scientific, engineering, and technology communities and fully expects that such values will be reflected in the composition of all proposal teams as well as peer review panels (science, engineering, and technology), and mission and instrument teams.

In accordance with NASA Policy as described in the NASA Grant and Cooperative Agreement Manual ([link to doc version](#)), proposals must not include bilateral participation, collaboration, or coordination with China or any Chinese-owned organization. Prospective NESSF fellows should not be affiliated with Chinese institutions. As part of the submission process, the proposing organization will be required to certify compliance with this requirement.

For more information about how NASA SMD is implementing this requirement see <https://science.nasa.gov/researchers/sara/faqs/prc-faq-roses>.

3. Terms and Conditions

NESSF awards are made initially for one year and may be renewed for no more than two additional years, contingent upon satisfactory progress (as reflected in academic performance, research progress, and the recommendation by the faculty advisor) and the availability of funds. The three-year period is the maximum length a student may receive support from the NESSF in pursuing a Masters or Ph.D. For example, a student supported by a NESSF award for three years prior to obtaining her/his Masters degree cannot apply to the NESSF for an additional three years of Ph.D. support. However, a student in the second or third year of a Masters program may use the three years of support to complete the Masters and initiate Ph.D. research.

The maximum amount of a NESSF award is \$45,000 per year. Not all awards require the full amount. NASA's guideline for the student stipend is \$35,000 per calendar year; however, the stipend should be comparable with the prevailing rate on the student's campus. An additional allowance of \$10,000 is provided for tuition, fees and other costs described in the paragraph below. The amounts in these two budget categories may be exchanged if valid justification is provided. Students are encouraged to work with their

advisor and the university Office of Sponsored Research to determine the appropriate allocation in each budget category.

The fellowship may be used to defray a student's stipend; tuition; fees; travel in support of the research investigation to conferences, symposia, or collaborative meetings; books; expendable laboratory supplies; page charges for journal articles; printing of a thesis; health insurance policy; and similar charges. Equipment, including computers, may NOT be purchased with NESSF funds. Government furnished equipment will not be provided. A NESSF budget should include itemization of the anticipated use of the grant funding. See items 7 through 9 in the 2018 NESSF Program Specific Questions.

The NESSF supports graduate education and does not provide Facilities and Administration (F&A) costs, indirect costs, or university overhead.

4. Obligation to the Government

A student receiving support under the NESSF does not thereby incur any formal obligation to the Government of the United States.

5. Change of Faculty Advisor

In the event that the faculty advisor ceases to participate in the program for any reason, the university, in consultation with the student, may nominate another faculty member to serve as the Principal Investigator of the fellowship award and the advisor of the proposed research described in the student's original application. If there is substantial deviation from the originally proposed research, the university must provide a detailed description of the deviation, which will be reviewed by NASA for scientific merit and continued relevance to NASA before an approval is made.

6. Disposition of Unused Funds

In the event that a student completes his or her graduate research program prior to the renewal or expiration date of the fellowship award, or ceases to participate in the program for any reason, NASA will terminate the fellowship award accordingly, and deobligate the unused funds remaining in the award.

To minimize the amount of administrative work in the deobligation of funds, the student, the advisor, and the university must prorate the stipend and allowances required in the renewal application, if the projected schedule for completion is less than 12 months. If the fellow completes the graduate program earlier than projected, please consult Section VII of the NESSF Program Guide (see Appendix A).

7. Proposal Evaluation and Selection

The Directors of the Science Divisions of SMD at NASA Headquarters or their designees will make respective selection of applications for award on a competitive basis. Criteria for evaluation include:

(a) the scientific merit of the proposed research;

- (b) the relevance of the proposed research to NASA's objectives in Earth or space science as outlined above; and
- (c) academic excellence based upon an applicant's personal statement, transcripts, the signed letter of recommendation by the student's academic advisor, the degree to which the applicant's academic background supports the proposed research, and the applicant's curriculum vitae. Evaluation will be conducted by community-based reviewers via either mail or panel review, or both, or by the relevant NASA SMD Division program managers.

The scientific merit of the proposed research includes:

1. The compelling nature of the research topic.
2. The exhibited depth of understanding of the research topic.
3. The expected impact of the research, should it succeed.
4. The feasibility of the proposed research plan, including the availability of resources for successful completion of the project.
5. The robustness of the research plan to anticipated setbacks.

The relevance of the proposed research to NASA's objectives in Earth or space science is an assessment of how well the work aligns to priorities summarized in Section 1 above.

Reviewers evaluating applications submitted to the NESSF may consider the following with respect to the "academic excellence" of a candidate: academic achievement and capability to successfully complete their proposed project.

Academic achievement is demonstrated by the candidate's past performance in coursework and training. Does the candidate's record of performance demonstrate an ability to excel and to learn?

Capability to successfully complete their proposed project is demonstrated by the candidate's past training, achievements, and strategy for graduate study. Has the applicant taken the appropriate coursework to successfully implement their proposed methodology, and do they lay out a plan to gain any skills they are missing? Does their choice of academic advisor or committee complement any lacking skills and training needs? Has the candidate considered cross-disciplinary skills that might enhance the project (i.e., computational techniques, statistical methods, etc)? Has the candidate been involved in any activities within or outside of academia that make them particularly capable of conducting the proposed work?

A NASA grant officer will conduct a pre-award review of risk associated with the proposer (i.e., submitting university) as required by 2 CFR 200.205. For all proposals selected for award, the grant officer will review the submitting university's information available through the Federal Awardee Performance and Integrity Information System (FAPIIS) and the System for Award Management (SAM) to include checks on entity core data, registration expiration date, active exclusions, and delinquent federal debt. Prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold (currently \$150,000), NASA is required to review and consider any information about the proposer that is in the designated integrity and performance system (currently FAPIIS) accessible through SAM (<https://www.sam.gov>) (see 41 U.S.C. 2313). A proposer, at its option, may review information in FAPIIS and comment on any

information about itself that NASA previously entered and is currently in FAPIIS. NASA will consider any comments by the proposer, in addition to the other information in FAPIIS, in making a judgment about the proposer's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by proposers as described in 2 CFR 200.205.

Limited Release of Proposers Confidential Business Information. For proposal processing, NASA may find it necessary to release information submitted by the proposer to individuals not employed by NASA. Business information that would ordinarily be entitled to confidential treatment may be included in the information released to these individuals. Accordingly, by submission of the Phase B proposal, the proposer hereby consents to a limited release of its confidential business information (CBI). Except where otherwise provided by law, NASA will permit the limited release of CBI only pursuant to nondisclosure agreements signed by the assisting contractor or subcontractor, and their individual employees who may require access to the CBI to perform the assisting contract.

8. Application Procedures for New and Renewal Applicants

The student must be the principal author of the application, with minimal assistance from the faculty advisor. Likewise, a progress report authored by the student must be submitted for fellowship renewal.

All proposals must be submitted in electronic format only. Instructions for submitting electronic proposals are located at <http://nspires.nasaprs.com> - click on "Solicitations" then click on "Open Solicitations" and then select the NESSF 2018-2019 announcement. Also refer to "Proposal Submission Instructions" listed under "Other Documents."

NO MAIL-IN MATERIALS WILL BE ACCEPTED

All applications and progress reports must use an easily read [typically 12-point] font of no more than 15 characters per horizontal inch, no more than 5.5 lines per vertical inch (i.e., single spaced), and at least one-inch margins on all sides. Non-compliant applications may be returned without review.

All applications require that the NSPIRES web interface cover pages be completed online, including a proposal summary/abstract and responses to the NESSF Program Specific Data questions, which includes the proposal budget.

New applications:

New applications must include the elements listed below, clearly identified, starting on a new page, and appearing in the following order in a single PDF file:

1. A personal statement which outlines a candidate's goals, experiences, attributes, and academic achievements that, when considered in combination with the other application components, shows academic excellence, as broadly construed (refer to "Proposal Evaluation and Selection"). This section may total no more than one single-spaced uploaded page.
2. A description of the proposed research project, including figures and tables, as appropriate. This section, excluding references, may total no more than six single-

spaced uploaded pages. References must follow the project description and are not included in the page limit. The project description should include the following elements:

- a. A well-defined problem with a justification of its scientific significance and a detailed approach for its resolution.
 - b. A statement describing the relevance of the proposed work to the appropriate SMD Division.
 - c. A timeline for the proposed project listing anticipated accomplishments and major milestones, including expected publications. Although this is initially a one-year award (renewable for two additional years), projects should be scoped for the entire intended length of the award (up to three years).
3. A schedule stating the start and completion dates, as well as anticipated milestones, of the applicant's degree program;
 4. Curriculum Vitae of the faculty advisor and the student, limited to two pages each;
 5. A signed letter of recommendation from the student's academic advisor on institutional letterhead, which must include the name of the student, the name of the proposing institution, and the NESSF proposal title, and should address some of the review criteria from Section 7;
 6. A statement signed by both the student and faculty advisor affirming the proposal is the work of the student and has not been written by another team member, such as the advisor, and
 7. Unofficial, legible, and clearly unaltered undergraduate and graduate transcripts (provide an explanation if the transcripts are not current or recent). If all or part of the applicant's Social Security Number or Date of Birth appears on the transcript, this **MUST** be blocked out prior to submission. This is the only alteration permitted to a transcript.

Please note: All of these required proposal elements, which are not part of the NSPIRES cover page forms, must be combined into a single PDF document and uploaded on the NSPIRES site for submission.

Renewal Applications

In addition to filling out the NSPIRES web interface cover pages on line, renewal applications must include the elements listed below, clearly identified, starting on a new page, and appearing in the following order in a single PDF file:

1. A progress report, of approximately three to six pages, which summarizes the work accomplished during the previous year, relating the actual accomplishments with the plan originally outlined in the proposal and/or including any unanticipated opportunities, surprises, or unusual developments; and a description of plans for the coming year, including explanations of any substantial deviation from the plan originally outlined in the proposal;
2. An updated schedule for completing the degree program;
3. A signed letter of recommendation from the student's faculty advisor on institutional letterhead, which must include the name of the student, the name of the proposing institution, and the NESSF proposal title; and

4. Unofficial, legible, and clearly unaltered transcripts for any classes taken during the previous year. If all or part of the student's Social Security Number or Date of Birth appears on the transcript, this MUST be blocked out prior to submission. This is the only alteration permitted to a transcript.

The general conditions described in the NASA Federal Acquisition Regulation Supplement Part 1852.235-72 are applicable, except where the special instructions provided herein pertaining to the NESSF (e.g., NESSF evaluation criterion (c), page limit for description of the proposed research, maximum award amount, NESSF application form, supporting documents, etc.) supersede those general guidelines.

9. Submission Deadlines:

Deadline for receipt of NEW applications: 11:59 p.m. Eastern, February 1, 2018

Deadline for receipt of RENEWAL applications: 11:59 p.m. Eastern, March 15, 2018

10. Announcement of Selections:

The target date to announce selection of new applications for award is May 15, 2018, with the start date of all new fellowship awards of September 1, 2018. The target date to notify renewing students concerning the continuation of the fellowship award applications is June 15, 2018.

At the conclusion of the review process, notification letters will be addressed to the student and faculty advisor at the university address entered on NSPIRES. New selections will be posted at <http://nspires.nasaprs.com>.

11. Reporting Requirements and Intellectual Property

Reporting requirements that will be specified by the official grant sent to the student's host university upon issuance of the award (see Exhibit E – Required Publications and Reports of the NASA Grant and Cooperative Agreement Manual (accessible from https://prod.nais.nasa.gov/cgi-bin/nais/nasa_ref.cgi).

Additionally, one of NASA's missions is to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof. Therefore, it is NASA's intent that all knowledge developed under this solicitation be shared broadly through publication of the results of the student's research. Award recipients may be subject to reporting requirements under the NASA Plan for Increasing Access to the Results of Scientific Research, including submitting peer-reviewed manuscripts and metadata to a designated repository (currently PubMed Central) and reporting publications with progress reports. For more details on public access to scientific publications and digital scientific data resulting from NASA-funded research, please see: <https://www.nasa.gov/open/researchaccess>. Any such requirements will be identified in the Notice of Award.

For information about data rights, and other aspects of intellectual property such as invention rights resulting from awards, see the file entitled "Award and Intellectual Property Information" under the section called "Grant and Cooperative Agreement Guidance" at https://prod.nais.nasa.gov/pub/pub_library/srba/.

12. Collection of Demographic Information

NASA is implementing a process to collect demographic data from proposers via NSPIRES for the purpose of analyzing demographic differences associated with its award processes. Information collected will include name, gender, race, ethnicity, disability status, and citizenship status. Submission of the information is voluntary, confidential and is not a precondition of award.

13. Inquiries

For further information, contact the NESSF Program Administrators listed below.

- For Earth Science: Program Administrator for NESSF Research – Claire Macaulay at (202) 358-0151 or by Email at claire.i.macaulay@nasa.gov.
- For Space Science (Heliophysics, Planetary Science, and Astrophysics): Program Administrator for NESSF Research – Marian Norris at (202) 358-4452 or by Email at mnorris@nasa.gov.