

NASA EARTH AND SPACE SCIENCE FELLOWSHIP (NESSF) PROGRAM 2017-2018 ACADEMIC YEAR

Call for proposals	November 1, 2016
Proposals due (new applications)	February 1, 2017 at 11:59 p.m. ET
Proposals due (renewal applications)	March 15, 2017 at 11:59 p.m. ET
Announcement of new fellowships	May 15, 2017 (target)
Announcement of renewal fellowships	June 15, 2017 (target)
Start date of fellowship grants	September 1, 2017

1. Introduction

The National Aeronautics and Space Administration's (NASA's) Mission,

Drive advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth.

and the U.S. Space Exploration Policy, the fundamental goal of which is

To advance U.S. scientific, security, and economic interests through a robust space exploration program,

allow the science objectives of the NASA Science Mission Directorate (SMD) to be clearly defined as the orderly pursuit of the agency's strategic goals. Specifically, SMD endeavors 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.*

This call for graduate fellowship proposals, entitled the *NASA Earth and Space Science Fellowship (NESSF) Program – 2017-2018 Academic Year*, solicits applications from accredited U.S. universities on behalf of individuals pursuing Masters or Doctoral (Ph.D.) degrees in Earth and space sciences, or related disciplines, at respective institutions. 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. 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.

The financial support for the NESSF Program comes from SMD's four Science Divisions: Earth Science, Heliophysics, Planetary Science, and Astrophysics. For the 2017-2018 academic year, NASA expects to award approximately 50 new graduate fellowships in Earth Science, 3-5 in Heliophysics, 25 in Planetary Science, and 6-10 in Astrophysics.

2. SMD Overview

The fundamental questions and goals for NASA's Earth and space science research activities are given in a series of Strategic Plans and Science Roadmaps; these documents can be accessed at <http://science.hq.nasa.gov/strategy> and <http://science.hq.nasa.gov/strategy/roadmaps/>.

Interested proposers are advised that a key criterion for proposal evaluation and selection is the relevance of the proposed investigation to the NASA mission as described in the Strategic Plans and Science Roadmaps and in the competed research solicitations of each Division. Students should consider applying to this program only if they can present valid lines of reasoning that their intended research is clearly relevant to NASA SMD science research programs, missions, and/or strategic objectives. 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.

3. Scientific Areas of Support

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 must clearly indicate to which Division they are proposing.

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, fulfills NASA's mission *to drive advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth* (see NASA 2014 Strategic Plan at <http://science.nasa.gov/about-us/science-strategy/>) and, 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 flight missions at <http://science.nasa.gov/about-us/smd-programs/earth-systematic-missions/> and <http://science.nasa.gov/about-us/smd-programs/earth-system-science-pathfinder/>, as well as information about data access and discovery at <http://earthdata.nasa.gov/>.

Additional examples of emphasis include:

- Research focused on NASA airborne or ship-borne research campaigns, such as, Operation IceBridge, SEAC⁴RS (Studies of Emissions, Atmospheric Composition, Clouds and Climate Coupling by Regional Surveys), HypsIRI (Hyperspectral Infrared Imager) preparatory airborne activities, snow remote sensing (e.g., ASO, SnowEX), soil moisture and state remote sensing (e.g., SLAPEX, SMAPVEX, ABoVE), ARISE (Arctic Radiation – Ice Bridge Sea Ice

- Experiment), SPURS, SABOR, Earth Venture-1 investigations (AirMOSS, ATTREX, CARVE, DISCOVER-AQ, HS3), Earth Venture-2 investigations (ACT-America, ATOM, CORAL, NAAMES, OMG, ORACLES), KORUS-AQ, and Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR) airborne research, etc. See <https://airbornescience.nasa.gov/> for further information.
- 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 (CREAT-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 under the National Strategic Computing Initiative (NSCI, <https://www.whitehouse.gov/the-press-office/2015/07/29/executive-order-creating-national-strategic-computing-initiative>). 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 <http://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 modeling, these technologies cover a broad range of scientific observations, operational requirements, as well as practical science applications 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 prepare or analyze big 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 *NASA Strategic Plan 2014*. 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.

III. Planetary Science Research Program

The Planetary Science Research Program, managed by the Planetary Science Division, sponsors research that addresses objective 1.5 of NASA's 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 investigations into the nature and origin of the celestial bodies in our Solar System and whether life exists beyond Earth.

Topics may include, but are not limited to:

- Investigations aimed at understanding the formation and evolution of the Solar System and 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 other planetary 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 those which may represent a risk of 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.

IV. Astrophysics Research Program

The Astrophysics Research Program and missions, managed by the Astrophysics Division, sponsors research that addresses objective 1.6 of NASA's Strategic Plan: "Discover how the universe works, explore how it began and evolved, and search for life on planets around other stars." Three broad scientific questions flow from this objective:

- How does the universe work?
- How did we get here?
- Are we alone?

NASA's Astrophysics goals, as described in Chapter 4.4 of the SMD 2014 Science Plan (<http://science.hq.nasa.gov/strategy>), are:

- Probe the origin and destiny of our universe, including the nature of black holes, dark energy, dark matter, and gravity.
- Explore the origin and evolution of galaxies, stars and planets that make up our universe.
- Discover and study planets around other stars, and explore whether they could harbor life.

In order to address these goals, the Astrophysics Research Program 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.

4. Eligibility

This call for graduate fellowship proposals, entitled *NASA Earth and Space Science Fellowship (NESSF) Program – 2076-2018 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. 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; however, U.S. citizens and permanent residents will be given preference when choosing between two or more proposals of equal scientific merit. 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.

In accordance with Public Law 112-55, Section 539(a), 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. For more information about how NASA SMD is implementing Public Law 112-55 see <http://science.nasa.gov/researchers/sara/faqs/prc-faq-roses/>.

5. 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 \$45,000 per year. NASA's guideline for the student stipend is \$35K per calendar year; however, the stipend should be comparable with the prevailing rate on the student's campus. An allowance of \$10,000 is provided for tuition, fees, and other expenses 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 their institution's 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 14 through 16 in the 2017 NESSF Program Specific Questions.

The NESSF supports graduate education and does not provide university overhead.

6. Increasing Access to the Results of Federally Funded Research

In keeping with the [NASA Plan for Increasing Access to Results of Federally Funded Research](#), new terms and conditions about making manuscripts publically accessible may be attached to awards derived from the NESSF opportunity. SMD anticipates that awards deriving from this opportunity will include terms and conditions requiring that as accepted manuscript versions of peer-reviewed publications (hereinafter "manuscripts") that result from awards be uploaded into NASA's part of the [PubMed Central \(PMC\)](#) repository called [NASA PubSpace](#). This applies only to peer reviewed publications. Patents, publications that contain material governed by personal privacy, export control, proprietary restrictions, or national security law or regulations will not be covered by this requirement. The manuscript will appear in PMC for free public access following a maximum 12 month embargo period after the publication date. PMC will release the manuscript when the embargo has ended. 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> .

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/.

7. 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.

8. 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.

9. 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 their graduate program earlier than projected, please consult Section VII. Changes in Grant Conditions of the NESSF Program Guide, which appears under “Other Documents” on the NSPIRES web page for this solicitation.

10. 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 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.

11. 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 2017-2018 announcement. Also refer to “Proposal Submission Instructions” listed under “Other Documents.”

New Applications must include:

1. NSPIRES generated proposal cover page to be completed on line, which includes a proposal summary/abstract and responses to the NESSF Program Specific Data questions, **which includes the proposal budget;**
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 (using an easily read font of no more than ~15 characters per inch [typically 12-point font] with at least one-inch margins on all sides). 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;
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 required proposal elements, which are not part of the NSPIRES cover page form must be combined into as a single .pdf document and uploaded on the NSPIRES site for submission.

NO MAIL-IN MATERIALS WILL BE ACCEPTED

Renewal Applications must include:

1. NSPIRES generated proposal cover page to be completed on line, which includes a proposal summary/abstract and responses to the NESSF Program Specific Data questions, **which includes the proposal budget;**

2. A progress report, of approximately three to six uploaded pages (using an easily read font of no more than ~15 characters per inch [typically 12-point font] with at least one-inch margins on all sides), 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;
3. An updated schedule for completing the degree program;
4. 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
5. 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 (See Appendix B at <http://www.hq.nasa.gov/office/procurement/nraguidebook/>: Guidebook for Proposers Responding to NASA Research Announcements, January 2016) are applicable, except 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.).

Submission Deadlines:

Deadline for receipt of NEW applications: 11:59 p.m. EST, February 1, 2017

Deadline for receipt of RENEWAL applications: 11:59 p.m. EST, March 15, 2017

Announcement of Selections:

The target date to announce selection of new applications for award is May 15, 2017, with the start date of all new fellowship awards of September 1, 2017. The target date to notify renewing students concerning the continuation of the fellowship award applications is June 15, 2017.

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>,

Inquiries:

For further information, contact:

Program Administrator for NESSF Earth Science Research – Claire Macaulay at (202) 358-0151 or by E-mail at claire.i.macaulay@nasa.gov.

Program Administrator for NESSF Heliophysics Research, Planetary Science Research, and Astrophysics Research – Dolores Holland at (202) 358-0734 or by E-mail at hq-nessf-Space@nasa.gov.

Privacy Act Statement

General

Pursuant to Public Law 93-579, Privacy Act of 1974, as amended (5 U.S.C. 552a), the following information is being provided to persons who are asked to provide information to obtain a NASA graduate student fellowship.

Authority

This information is collected under the authority of the National Aeronautics and Space Act. Publication 85-568, as amended, 42 U.S.C. 2451, et. seq.

Purpose and Uses

The information requested on the application form will be used to determine your eligibility for participation in the NASA graduate student fellowship program. The information requested regarding your disability status would be used to determine the degree to which members of each ethnic/racial/disability group are being reached by NASA's announcement of this program, and will not affect your application. Additionally, NASA may disclose this information to other organizations or individuals having relationships with NASA, including but not limited to academic organizations, nonprofit organizations, and other governmental agencies, as well as Congressional offices in response to an inquiry made on your behalf. Disclosure may also be made to concerned parties in the course of litigation, to law enforcement agencies, and to other Federal agencies in exchanging information pertinent to an agency decision.

Effects of Nondisclosure

Furnishing the information on the application form is voluntary, but failure to do so may result in NASA's inability to determine eligibility for participation and selection for award in the Graduate Student Fellowship Program. However, your application will not be affected if you choose not to provide information on your ethnic, racial, or disability status.

Definitions for Applicant Background - Section VI

- American Native or Alaskan American: A Person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition.
- Hispanic or Latino: A person of Mexican, Puerto Rican, Cuban, or South American or other Spanish culture or origin, regardless of race.
- Asian: A person having origins in any of the original peoples of East Asia, Southeast Asia or the Indian subcontinent. This area includes, for example, China, India, Indonesian, Japan, Korea and Vietnam.
- Pacific Islander/Native Hawaiian: A person having origins in any of the original peoples of Hawaii; the U.S. Pacific territories of Guam, American Samoa, and the

Northern Marianas; the U.S. Trust Territory of Palau; the islands of Micronesia and Melanesia; or the Philippines.

- African American, not of Hispanic origin: A person having origins in any of the black racial groups of Africa.
- White, not of Hispanic Origin: A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.
- Individuals with Disabilities: An individual having a physical or mental impairment that substantially limits one or more major life activities; who has a record of such impairment; or who is regarded as having such impairment.