NASA SPACE TECHNOLOGY RESEARCH FELLOWSHIPS (NSTRF) -
Fall 2014

Event	Date
Call for applications released	September 18, 2013
Applications due from students (Phase A)	November 13, 2013 at 6 PM ET
Selection notification to students	April 16, 2014 (target)
Student intent to accept	April 30, 2014 (target)
Phase B packages due from universities	May 21, 2014 (target)
Start date of fellowships	August 1, 2014 (target)

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NASA SPACE TECHNOLOGY RESEARCH FELLOWSHIPS (NSTRF) -
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1.   Introduction

NASA's Space Technology Mission Directorate (STMD) seeks to sponsor U.S. citizen and permanent resident graduate student researchers who show significant potential to contribute to NASA's goal of creating innovative new space technologies for our Nation's science, exploration, and economic future.

This call for graduate student fellowship applications, entitled *NASA Space Technology Research Fellowships (NSTRF) – Fall 2014* (NSTRF14), solicits applications from individuals pursuing or planning to pursue master's (e.g., M.S.) or doctoral (e.g., Ph.D.) degrees in relevant space technology disciplines at accredited U.S. universities. NASA Space Technology Fellows will perform innovative space technology research and will improve America's technological competitiveness by providing the Nation with a pipeline of innovative space technologies.

Selected candidates will perform research at their respective campuses and at NASA Centers and/or at nonprofit U.S. Research and Development (R&D) laboratories. In addition to his or her faculty advisor, each student will be matched with a technically relevant and community-engaged researcher who will serve as the student's research collaborator. Through this collaboration, students will be able to take advantage of broader and/or deeper space technology research opportunities directly related to their educational and career objectives, acquire a more detailed understanding of the potential end applications of their space technology efforts, directly disseminate their research results within the NASA/nonprofit U.S. R&D lab community, and enhance their understanding of the research process.

Awards resulting from this competitive selection will be made in the form of training grants to accredited U.S. universities. This solicitation has two phases. Phase A is the application submission by the student. For the student applicant who is selected in Phase A, the accredited U.S. university where the student will be enrolled for the fall 2014 term as a full-time graduate student must submit a Phase B package (as specified later in this solicitation); complete Phase B package submissions will result in training grant awards.

The financial and programmatic support for NSTRF comes from STMD. The fellowships are a component of the Space Technology Research Grants Program. Awards are planned to coincide with the start of the 2014 academic year and are subject to the availability of appropriated funds.

This solicitation covers only new fellowship applications; renewal applications are handled separately.

2.   Background

The development of advanced and innovative space technologies is critical for our Nation to meet its goals to explore and understand the Earth, our solar system, and the universe. Space Technology efforts will improve the Nation's leadership in key research areas, enable far-term capabilities, and motivate disruptive innovations that make science, space travel, and space exploration more effective, affordable, and sustainable. These efforts will also provide a more robust national capability for aerospace activities, thereby improving our competitive posture in the international marketplace, enabling new industries, and contributing to economic growth. NASA's pursuit of a suite of revolutionary discoveries will also

lead to major breakthroughs that are needed to address energy, health, transportation, and environmental challenges. The fellowship endeavor is, thereby, coupled to a larger national research and development effort in science and technology that will lead to new products and services, new business and industries, and high-quality, sustainable jobs.

Investment in innovative low-TRL research increases knowledge and capabilities in response to new questions and requirements, stimulates innovation, and allows more creative solutions to problems constrained by schedule and budget. Moreover, it is investment in fundamental research activities that has historically benefited the Nation on a broader basis, generating new industries and spin-off applications.

Our Nation's universities couple fundamental research with education, encouraging a culture of innovation based on the discovery of knowledge. Universities are, therefore, ideally positioned to both conduct fundamental space technology research and disseminate newly-discovered knowledge into society at large through graduate students and industrial, government and other partnerships.

Material further describing STMD and its programs is available at http://www.nasa.gov/directorates/spacetech/home/index.html.

3.   Space Technology Areas of Support

STMD efforts are consistent with NASA's Mission:

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

More specifically, NASA's Space Technology efforts can be defined as the orderly pursuit of the following NASA strategic goal:

Goal: Create the innovative new space technologies for our exploration, science and economic future.

(NASA's Vision, Mission and Strategic Goals and Outcomes can be found in the 2011 NASA Strategic Plan, available at http://www.nasa.gov/pdf/516579main_NASA2011StrategicPlan.pdf.)

In support of this goal, STMD is interested in attracting outstanding young researchers and technologists who are committed to developing ***innovative technologies*** for the aerospace sector and to being part of NASA's technological future by working on high-priority technologies to sustainably explore space.

With this solicitation, NASA is seeking to support low Technology Readiness Level (TRL), suitable for university-based research, space technology research and development. It should be noted that NSTRF is specifically aimed at **space technology** and is intended to complement other NASA fellowship/scholarship opportunities (e.g., the Science Mission Directorate's NASA Earth and Space Sciences Fellowship). Applications which are not specifically focused on space technology may be deemed non-compliant and not be submitted for peer review.

2

NASA has developed a set of 14 Space Technology Roadmaps (STRs) in order to facilitate the development and demonstration of space technologies that address the needs of NASA's exploration systems, earth and space science, and space operations mission areas, as well as those that contribute to critical national and commercial needs in advanced space technology. Each of these roadmaps focuses on a technology area. The STRs were first released in draft form in December of 2010. At that time, NASA funded an independent review of the draft roadmaps by the National Research Council (NRC). The NRC's review resulted in findings, recommendations, and priorities – within and across the technology areas – intended to inform NASA's space technology investments. The NRC's final report (http://www.nap.edu/catalog.php?record_id=13354) was released early in 2012.

The final STRs (http://www.nasa.gov/offices/oct/strategic_integration/technology_roadmap.html) reflect the NRC's assessment. Specifically, each of the 14 final roadmaps includes the original draft roadmap and a new section that summarizes the NRC's recommendations and comments about the technology area.

Student applicants are strongly encouraged to familiarize themselves with the roadmap document most closely aligned with their space technology interests. Links to the individual final roadmap documents are provided below:

TA01   Launch Propulsion Systems
        http://www.nasa.gov/pdf/500393main_TA01-ID_rev6-NRC-wTASR.pdf

TA02   In-Space Propulsion Technologies
        http://www.nasa.gov/pdf/501329main_TA02-ID_rev3-NRC-wTASR.pdf

TA03   Space Power and Energy Storage
        http://www.nasa.gov/pdf/501328main_TA03-ID_rev7_NRC_wTASR.pdf

TA04   Robotics, Tele-Robotics, and Autonomous Systems
        http://www.nasa.gov/pdf/501622main_TA04-ID_rev6b_NRC_wTASR.pdf

TA05   Communication and Navigation
        http://www.nasa.gov/pdf/501623main_TA05-ID_rev6_NRC_wTASR.pdf

TA06   Human Health, Life Support, and Habitation Systems
        http://www.nasa.gov/pdf/500436main_TA06-ID_rev6a_NRC_wTASR.pdf

TA07   Human Exploration Destination Systems
        http://www.nasa.gov/pdf/501327main_TA07-ID_rev7_NRC-wTASR.pdf

TA08   Science Instruments, Observatories, and Sensor Systems
        http://www.nasa.gov/pdf/501624main_TA08-ID_rev5_NRC_wTASR.pdf

TA09   Entry, Descent, and Landing Systems
        http://www.nasa.gov/pdf/501326main_TA09-ID_rev5_NRC_wTASR.pdf

TA10   Nanotechnology
        http://www.nasa.gov/pdf/501325main_TA10-ID_rev8_NRC-wTASR.pdf

TA11   Modeling, Simulation, Information Technology and Processing
        http://www.nasa.gov/pdf/501321main_TA11-ID_rev4_NRC-wTASR.pdf

TA12   Materials, Structures, Mechanical Systems, and Manufacturing
        http://www.nasa.gov/pdf/501625main_TA12-ID_rev6_NRC-wTASR.pdf

TA13   Ground and Launch Systems Processing
        http://www.nasa.gov/pdf/501626main_TA13-ID_rev4_NRC-wTASR.pdf

TA14   Thermal Management Systems
        http://www.nasa.gov/pdf/501320main_TA14-ID_rev6a-NRC-wTASR.pdf

The STRs have an accompanying Technology Area Breakdown Structure (TABS). The TABS, down to three levels, is summarized in the *TABS_NSTRF_FY14.pdf* file under "Other Documents" on the NSPIRES (NASA Solicitation and Proposal Integrated Review and Evaluation System) webpage associated with the NSTRF14 solicitation. Each student applicant is required to identify, in response to Program Specific Data Question #1, the TABS element, at the second level (level 2), most closely associated with his/her NSTRF14 application. The student applicant will also be required to provide justification for the level 2 TABS selection (Program Specific Data Question #2). The Program Specific Data Questions are described more fully in Section 9 and are included, for reference, in the Appendix to this solicitation. The student applicant's response to Program Specific Data Question #2 may be considered during the evaluation process (see Section 10). Moreover, the student applicant should not assume that NASA will, for review purposes, reassign an application to a more appropriate TABS element or technology area.

4.   Eligibility

This call for graduate fellowship applications, entitled *NASA Space Technology Research Fellowships (NSTRF) – Fall 2014*, solicits applications from students pursuing (or planning to pursue) master's or doctoral degrees relevant to space technology.

This call is open to students who meet the following eligibility requirements:
- Pursuing or seeking to pursue advanced degrees directly related to space technology (only technical degrees, and not degrees in policy or management, will be supported)
- U.S. citizens or permanent resident aliens of the U.S. (at the time of Phase A application submission)
- Have or will have a bachelor's degree prior to the 2014 fall term
- Are or will be enrolled in a full-time master's or doctoral degree program at an accredited U.S. university in fall 2014 (awards may not be deferred)
- Meet one of the eligibility profiles described in the Table of Eligibility Profiles below

The eligibility requirement displayed in the table below reflects NASA's desire to establish partnerships between the students, their faculty advisors, and the NASA or R&D lab research collaborators relatively early in the graduate students' careers. In general, students who have completed more than one year in their current master's program (as of October 1, 2013) and doctoral students who have completed more than three years of graduate school (as of October 1, 2013) are not eligible to apply. As part of the

Program Specific Data Questions (#24, #25 and #26), student applicants will be asked to identify and justify their eligibility in terms of one of the following four profiles:

Table of Eligibility Profiles

Profile	Title	Description
1	Entering Master's Student	• seeking a master's degree • will have completed one year or less toward this degree by the start of the fall 2014 term • holds no technical graduate degree
2	Entering Doctoral Student	• seeking a doctoral degree • has completed less than one year toward this degree as of October 1, 2013 • holds no technical graduate degree as of October 1, 2013 Note: If the student is scheduled to receive a master's degree prior to the fall 2014 term, he/she is eligible under this profile only if the total amount of time spent in pursuit of the master's degree, at the time of degree conferral, will have been 2 years or less.
3	Doctoral Student with Master's Degree	• seeking a doctoral degree • has completed less than one year toward this degree as of October 1, 2013 • holds <u>one</u> graduate degree (at the master's level) as of October 1, 2013, and spent 24 months or fewer in the pursuit of this master's degree Note 1: This profile applies to cases where the master's degree represents a transition (i.e., different research topic) in graduate research and not to cases where the master's degree is a pro forma milestone in a doctoral program. Note 2: As part of meeting the requirements of this profile, the student applicant's transcript must clearly indicate that a master's degree has been conferred.
4	Continuing Doctoral Student	• seeking a doctoral degree • has completed fewer than three years toward this degree as of October 1, 2013 Note 1: This profile is intended for cases where the student applicant has been in steady pursuit of a doctoral degree since receiving a bachelor's degree. Note 2: All post-bachelor's work must be counted in claiming eligibility under this profile.

Students who are not yet committed to a specific academic institution or program may apply. Students are encouraged to apply in their senior year prior to receiving their bachelor's degree.

Students just beginning their graduate studies with the goal of receiving a doctoral degree may request "Doctoral" support even if their university requires them to obtain a master's degree first. The application submitted must cover the entire intended period of study with a single, continuous research topic (see Program Specific Data Question #18).

Students who have participated or are participating in joint BS/MS programs may be eligible to apply under profile 2 or profile 3. Please note that the joint BS/MS degree must be conferred (or expected to

be conferred) prior to the fall 2014 term. Students who have been or are enrolled on a part-time basis may also be eligible to apply; the justification provided in the response to Program Specific Data Question #25 should compare the student applicant's progress to-date with typical graduate student progress in the time interval cited in the selected profile. For example, students who have completed three courses over three years, following the receipt of a non pro forma master's degree, meet the requirements of profile 3 since they have completed less than the equivalent of one year toward a doctoral degree.

A student may submit only one application in response to this solicitation; if multiple applications are submitted, NASA will require the student applicant to withdraw all but one application. Students requesting doctoral support under NSTRF will not be eligible if they have applied to two previous NSTRF solicitations; this restriction is addressed by Program Specific Data Question #19.

A student accepting this award may not concurrently receive any other federal fellowship or traineeship.

This NSTRF call is open to student applicants who are **citizens, nationals or permanent resident aliens of the United States (at the time of Phase A application submission)**. The term "nationals" refers to native residents of a possession of the United States such as American Samoa. Students with disabilities and/or from underrepresented minority groups are urged to apply. No student applicant shall be denied consideration or appointment as a NASA Space Technology Research Fellow on the grounds of race, creed, color, national origin, age, or sex.

5.   Terms and Conditions

NSTRF awards are made initially for one year and may be renewed as follows:

- A student seeking master's degree support (profile 1 from Section 4) may be renewed for no more than one additional year
- A student seeking doctoral degree support (profiles 2-4 from Section 4) may be renewed for no more than three additional years

Renewals are contingent upon satisfactory progress (as reflected in academic performance, research progress, recommendation by the faculty advisor, and recommendation by the NASA Center or nonprofit R&D lab research collaborator) and the availability of funds.

Special consideration: four years is the maximum amount of time a student may receive support from NSTRF. A student who has received master's degree support as an NSTRF fellow may formally re-apply, if eligible, to a subsequent NSTRF solicitation for doctoral support (i.e., not via a renewal application); however, the maximum number of years of doctoral support will be adjusted by the year(s) of NSTRF master's support already received.

Fellowships are awarded as training grants. The maximum amount of an NSTRF award issued as a result of this solicitation is $68,000 per year. Not-to-exceed values in each category are provided in the table below. Not all awards will require the maximum amount per year.

Table of NSTRF14 Budget Categories

Category	Maximum value
Student Stipend	$36,000
Faculty Advisor Allowance	$9,000
Visiting Technologist Experience Allowance	$10,000
Health Insurance Allowance	$1,000
Tuition and Fees Allowance	$12,000
TOTAL	**$68,000**

The NSTRF budget categories are explained below.

1. **Student Stipend**: It is expected that the student will receive the maximum value, without deductions. Stipend payments may not be reduced by items that the university would normally consider indirect costs or fringe benefits. Stipends are assumed to be for student personal expenses and are not intended for supporting research expenses. The stipend value assumes a 12-month tenure and should be prorated for shorter periods.

2. **Faculty Advisor Allowance**: To be used to directly enhance the student's training experience. May be used to cover fellowship student travel to technical and scientific meetings; it is expected that the fellowship student will attend at least one technical conference annually for presentation of the work being conducted under the fellowship. Other permissible charges in this category include lab books, expendable laboratory supplies, page charges for journal articles, printing of a thesis, and similar charges. Faculty advisor time and travel in direct support of the student are permitted. This allowance may not be used to supplement the student stipend.

3. **Visiting Technologist (NASA Center/R&D Lab) Experience Allowance**: This allowance is to allay costs associated with temporarily relocating to a NASA Center or nonprofit R&D laboratory location that represents a strong technical fit with the student's research. It may be used ONLY in preparation for the experience (e.g., trips prior to and in preparation for the actual on-site experience) and the student's relocation and living expenses associated with the actual experience.

4. **Health Insurance Allowance**: Permissible up to maximum value, only to the level of expected actual expense.

5. **Tuition and Fees Allowance**: Permissible up to maximum value. While the student is a NASA Space Technology Research Fellow, the university must exempt the student from paying the difference between the tuition and fees allowance and the actual tuition and fees.

Equipment, including computers, may NOT be purchased with NSTRF funds. Government furnished equipment will not be provided.

With the exception of the Faculty Advisor Allowance, transfer of funds between budget categories is not allowed.

The training grant does not provide university overhead.

The NSTRF budget is submitted, for Phase A-selected students, by the university as part of the Phase B package. The budget is not required at the time of student application submission (Phase A).

6.   Visiting Technologist Experience Guidelines

NASA Space Technology Research Fellows will perform research at their respective campuses and at NASA Centers and/or at nonprofit U.S. R&D laboratories. Through this experience, NSTRF graduate researchers will have the opportunity to work collaboratively with leading engineers and scientists in the students' chosen area of study; they will be able to take advantage of broader and/or deeper space technology research opportunities directly related to their educational and career objectives, acquire a more detailed understanding of the potential end applications of their space technology efforts, directly disseminate their research results within the NASA/nonprofit U.S. R&D lab community, and enhance their understanding of the research process.

The visiting technologist experience is an integral part of a NASA Space Technology Research Fellowship. Ten weeks per year is the target duration, though the actual weeks chosen (number and timeframe during the year) will depend upon the student, his/her faculty advisor, and the NASA or R&D lab research collaborator. The visiting technologist experience must be in direct furtherance of the graduate student's research and career objectives. Because experts in a specific technology area are typically located at multiple labs/centers, multi-year Fellows will be encouraged to have visiting technologist experiences at multiple locations.

Requirements for Access to NASA Facilities and Information:
Section 1260.35, Investigative Requirements, of the NASA Grants and Cooperative Agreement Handbook, hereafter referred to as the *Grants Handbook,* available at http://prod.nais.nasa.gov/pub/pub_library/grcover.htm, requires in part that Recipients needing access to a NASA Center, facility, or computer system, or to NASA technical information shall provide the personal background and biographical information requested by NASA. In addition, Grant Recipients shall comply with the requirements of GIC 06-02 and its attached "PIV Card Issuance Procedures." GIC 06-02 may be found at the following URL:
http://prod.nais.nasa.gov/pub/pub_library/grantnotices/gic06-02.html.

7.   Reporting Requirements and Intellectual Property

In addition to the grants reporting requirements that will be specified by the official training grant sent to the student's host university upon issuance of the award (see sections 1260.22 and 1260.75 of the *Grants Handbook*), the NSTRF award will require the submission of a detailed research training plan at the conclusion of the first academic term (semester or quarter) of the award. The research training plan

will be based on the application and will more specifically tie the student's research being performed on campus with the research to be conducted at the NASA Center or R&D lab. These plans will be used as a catalyst, within the space technology fellowship community, to foster an awareness of the variety of activities that are being sponsored within each technology area and to encourage discussion, both virtual and in-person, between all students, faculty advisors, and research collaborators. 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.

In accordance with 35 U.S.C. 212, no scholarship, fellowship, training grant, or other funding agreement made by a Federal agency primarily to an awardee for educational purposes will contain any provision giving the Federal agency any rights to inventions made by the awardee.

8.   Obligation to the Government

A student receiving support under the described NSTRF activity does not thereby incur any formal obligation to the Government of the United States. However, the objectives of the fellowship will clearly be best served if the student actively pursues a career in a space technology-related field after completion of graduate studies.

9.   Application Procedures – Phase A

The student applicant shall be the principal author of the submitted Phase A application, with minimal assistance from current/prospective faculty advisors. By submitting the application for consideration, the student applicant certifies that he/she was the principal author.

An application that is so similar to one previously submitted as to indicate a lack of originality (unless it is the same student, who is still eligible and submitting a revision of his/her own previously submitted application), may be downgraded or deemed non-compliant.

All applications must be submitted via NSPIRES in electronic format only. No mail-in materials will be accepted. Detailed instructions for submitting electronic applications are located at http://nspires.nasaprs.com:

1. Click on "Solicitations,"
2. Then click on "Open Solicitations,"
3. Then select the **NASA Space Technology Research Fellowships (NSTRF) - Fall 2014** announcement (solicitation NSTRF14), and
4. Then select *NSTRF14 Phase A Application Submission Instructions.pdf* under "Other Documents."

Potential student applicants are urged to access the NSPIRES electronic proposal system well in advance of the application due date to familiarize themselves with its structure and to enter the requested information. See submission instructions for full details.

Phase A applications must include ALL of the following items, appropriately labeled, in the exact order specified. A summary table is provided at the end of this section. Non-compliant applications will not be submitted for peer review.

1. NSPIRES-generated *Proposal Cover Page*. The Cover Page, to be completed online, includes an application summary/abstract and responses to the NSTRF14 Program Specific Data Questions. The NSTRF14 Phase A submission requires the completion of 48 Program Specific Data Questions; these questions are provided, for informational purposes, in the Appendix. The Proposal Cover Page is part of the application and must be completed by the application deadline.

Due to the large number of questions and the level of detail required, it is suggested that the student applicant complete the 48 Program Specific Data Questions well in advance of the application deadline.

Please Note: The following required application elements (2-7) are not part of the NSPIRES Proposal Cover Page form and must be combined into a single PDF document and uploaded on the NSPIRES site for submission.

2. *Personal Statement.* The student applicant should use the Personal Statement to explain his/her space technology academic and career goals. The Personal Statement may not exceed 2 pages in length (using 12-point font with at least 1-inch margins on all sides). This section of the application must be clearly labeled as "Personal Statement."

    The Personal Statement could
    -   Describe how the proposed course of study and research will help in achieving these goals. Include a discussion on the rationale in applying to or selecting the university(ies) given in response to Program Specific Data Questions #36-38.
    -   Speak to his/her leadership and collaborative potential, communication ability, and potential for investigation and engagement in space technology problems and their solutions.
    -   Include any background information the student applicant believes is pertinent and provides insight into why he/she has chosen the goals set forth in this application.

3. *Project Narrative*. This section of the application must be entitled "Project Narrative" and may total no more than **5 single-spaced pages** (using 12-point font with at least 1-inch margins on all sides), not including the references or bibliography. Graphics/figures/tables are permitted, and they are counted towards the 5-page limit. The Project Narrative should be reflective of the student applicant's ability to think independently and creatively, as well as his/her ability to write about research or study plans accurately, thoughtfully, and concisely. The level of specificity provided in this section is expected to vary with the student's current educational level and degree for which he/she is seeking NSTRF support (as described in the Table of Eligibility Profiles in Section 4). A

student applicant who has already completed two or more years of graduate study is expected to provide more detail on the proposed course of study/research than a student applicant who is currently an undergraduate or first year graduate student.

The Project Narrative should provide a description of the student applicant's academic and research plans. It is understood that a student's research objectives may evolve as he/she progresses in his/her graduate program, particularly for students at early stages of their graduate careers. However, the selected applicant is expected to pursue the space technology research described in the submitted Project Narrative. The Project Narrative should include a description of space technology research in which the student applicant would like to be engaged during his/her graduate study, including related specific research questions of interest to the student applicant. The student applicant should discuss the innovation of the proposed research. The student applicant should discuss the relevance of the proposed research to space technology and to the TABS element selected, citing the STRs, as appropriate. Research interests should be discussed in sufficient detail for an expert who is technically competent in the appropriate technology area to judge the student applicant's understanding, relative to his/her educational level, of the questions to be addressed. Appropriate detail includes relevant hypotheses and approaches one might establish toward answering the questions, benefits of the proposed research, and research principles required to investigate the identified research area. Profile 4 students, in particular, should provide detail on their dissertation topic and expected results of their research; these students should demonstrate a clear understanding of how their research relates to key research on their chosen topic.

Finally, the Project Narrative must discuss why the visiting technologist experience would be an important component of the student applicant's plans. The student applicant *may*, but is not required to, indicate a specific NASA center or R&D lab preference for consideration by NASA (based on research interests, and with contact information if available/desired) in this section. Please note that research collaborator identification and assignment are separate internal NASA processes that are performed outside of this solicitation. A student applicant should have no expectation that the final research collaborator (and associated NASA center) assignment will align with his/her preference(s). It should also be noted that the NASA Space Technology Research Grants Program will consider existing/ongoing collaborations during the research collaborator selection process, but will not be bound by them.

4. *Degree Program Schedule*. This section of the application is a schedule stating the proposed start and completion dates and anticipated milestones of the student applicant's degree program (there is no standard format). This section must be entitled "Degree Program Schedule" and may not exceed one page.

5. *Curriculum Vitae (CV) of the student applicant*. This could be up to two pages and should address the following:

- Academic degree(s) he/she has received or expects to receive in the near future, including the dates, discipline(s), and institution(s).
- Relevant (to this application) experiences with dates and a short description of responsibilities, listing the most recent positions first and the name and city/state of each employer. These relevant experiences could include, but are not limited to, paid employment, military service, research assistantships, internships, special studies, volunteer work, etc.
- Technical/scientific publications, if any. If the student applicant has published in any other media (newspaper, book, etc.), these should also be provided as part of the CV. If the student applicant has no relevant publications, that should be stated.
- Technical/scientific presentations given at professional meetings. The title of presentation, date of presentation, type of presentation [e.g., oral or poster], and name of meeting or conference should be provided.
- Honors and awards.

6. *Transcripts*. Transcripts that cover the entire college career, undergraduate and graduate, should be included. These should be legible and clearly unaltered (an explanation is required if the transcripts are not current or recent). If all or part of the student's social security number and/or the student's complete date of birth appear on the transcript, these items must be blocked out prior to submission. These are the only alterations permitted to a transcript.

7. *GRE general test scores*. These should be legible and clearly unaltered (an explanation is required if the GRE scores are not recent or current). If the student's complete date of birth appears on the GRE report, this item must be blocked out prior to submission. This is the only alteration permitted to a GRE report. If GRE scores are not available, an explanation (e.g., were not required for graduate school admission) must be provided in response to Program Specific Data Question #41.

The final component of the fellowship application is NOT part of the single PDF file. Please adhere to the following instructions carefully.

8. *Letters of Recommendation.* Each student applicant must arrange for the submittal, via e-mail and as per the instructions below, of three (3) current Letters of Recommendation. Failure to submit three Letters of Recommendation may negatively affect the evaluation of the application (see Section 10).

    Letters of Recommendation must be submitted by e-mail and by the Letter writers to hq-nstrf-lor@mail.nasa.gov by 6 PM ET on the solicitation closing date, November 13, 2013. Each Letter must be submitted as a PDF attachment to the e-mail and must include the student applicant's full name and application title (as entered by the student applicant in NSPIRES, as part of the Cover Page data) in the e-mail subject line; long application titles should be truncated to the first 10 words. Finally, the Letter writer is asked to include the student's e-mail address – *the same e-mail address that the*

student will specify as part of his/her official application submission – as the only item in the body of the e-mail message itself.

Note: On November 8, 2013, prospective student applicants will be informed (via hq-nstrf-lor@mail,nasa.gov) which Letter writers have submitted Letters on their behalf as of <u>6 PM Eastern on November 7, 2013</u>. One e-mail will be sent for every letter received; a prospective student applicant will not receive notification if no Letters were submitted prior to 6 PM Eastern on November 7, 2013. It is the student applicant's responsibility to contact Letter writers who have not yet submitted Letters and make sure that Letters are submitted by the solicitation deadline. Updates (i.e., Letters submitted after 6 PM Eastern on November 7, 2013) will not be communicated to the student applicant. NASA may reject any Letters submitted after the solicitation deadline of November 13, 2013.

If the student applicant has an advisor for his/her current graduate program, one of the Letters of Recommendation should come from that individual.

The Letters of Recommendation constitute a critical component of the application. They should come from individuals (professors, undergraduate/graduate advisors, mentors, internship or work supervisors, etc.) with detailed knowledge of the <u>student applicant's abilities</u>. The student applicant is strongly advised to present the guidelines below to the individuals writing the recommendations. These guidelines, and also some background information, are provided in a PDF file (*NSTRF14 LOR guidelines.pdf*) under "Other Documents" on the NSPIRES webpage associated with the NSTRF14 solicitation. The student applicant is encouraged to download this file and send it to the individuals writing Letters on his/her behalf. Letters should not be written by the student applicant. In addition, the student applicant is encouraged to approach Letter writers early in the application process (i.e., well in advance of the deadline) and to check with them frequently on the status of their submissions.

Instructions for Writing NSTRF14 Letters of Recommendation:

a. Letters of Recommendation must be written on official letterhead, when permitted, and must be submitted as a PDF attachment.
b. A Letter of Recommendation may not exceed two pages in length.
c. The Letter itself must include the student applicant's full name (as opposed to nicknames or shortened names) and application title (as entered by the student applicant in NSPIRES, as part of the Cover Page data); the student applicant should provide these to the Letter writer.
d. The Letter of Recommendation should include details explaining the nature of the writer's relationship to the student.
e. Letters are NOT intended to endorse the proposed space technology research. The Letter should be about the student applicant.
f. Letters of Recommendation that appear to be mass produced do not generally lead to high rankings by the reviewers. It is always useful if the writer also conveys a sense of who the

student applicant is as an individual, particularly the student applicant's maturity, responsibility, and integrity.

g. Further, Letters of Recommendation should provide insight into the student applicant's

- scientific acumen and creativity
- motivation for space technology-related study
- potential for success, including in a research environment
- leadership potential, including ability to collaborate
- communication ability, including ability to disseminate research results and information

Note: Applications e-mailed to hq-nstrf-lor@mail.nasa.gov will be rejected without review; this e-mail address is for Letters of Recommendation only. The student applicant is encouraged to use the following table as a checklist to ensure that he/she has assembled all of the required components in the correct order.

Summary of Application Components

Component	Page Limit	Notes
1 - Proposal Cover Page (which includes responses to the Program Specific Data Questions)	N/A	Completed online (NSPIRES)
2 - Personal Statement	2 pages	Part of single PDF
3 - Project Narrative	5 pages graphics/tables/figures included in limit references not included in limit	Part of single PDF
4 - Degree Program Schedule	1 page	Part of single PDF
5 - CV of student	2 pages	Part of single PDF
6 – Transcripts	N/A	Part of single PDF
7 - GRE scores	N/A	Part of single PDF
8 - Letters of Recommendation	2 pages per Letter	Three are required, submitted by Letter writers directly to hq-nstrf-lor@mail.nasa.gov

The general conditions described in the NASA Federal Acquisition Regulation Supplement Part 1852.235-72 (see Appendix B of Guidebook for Proposers Responding to a NASA Research Announcement (NRA) or Cooperative Agreement Notice (CAN), January 2013, available at http://www.hq.nasa.gov/office/procurement/nraguidebook/proposer2013.pdf) are applicable, except

the special instructions provided herein pertaining to NSTRF (e.g., NSTRF evaluation criterion, page limit for description of the proposed research, maximum award amount, NSTRF application form, supporting documents, etc.).

Phase A Submission Deadline: 6:00 PM ET, November 13, 2013. Please note that no extensions will be granted to accommodate either late or partial submissions.

10. Application Evaluation and Selection

All eligible Phase A fellowship applications will undergo a review by technical experts; electronic and/or panel reviews will be employed. The following two equally weighted criteria will be used:

1. **Academic excellence, potential, and commitment to space technology**. Reviewers will be asked to consider the following elements *relative to the student applicant's educational level* as specified in his/her profile declaration:
   - The candidate's organizational, analytical, and written skills;
   - The candidate's scientific curiosity, creativity, acumen, and potential for success in research environment as indicated in his/her planned course of study;
   - The candidate's potential for success in attaining an advanced degree in a space technology-related field; and
   - The candidate's demonstrated commitment to space technology – the degree to which the candidate possesses a strong potential for making substantial contributions to space technology.

   All aspects of the application will be considered: the student applicant's Personal Statement, the Project Narrative, the Letters of Recommendation, the CV, undergraduate and graduate (if applicable) transcripts, and GRE scores (if applicable).

2. **Relevance and Technical Merit of the student applicant's Project Narrative**. Aspects of the Personal Statement and Program Specific Data Question responses may also be taken into consideration. Reviewers will be asked to consider the following elements *relative to the student applicant's educational level*:
   - The merit of the space technology research area description and knowledge of relevant research literature;
   - The relevance of the proposed plan to the student applicant-selected technology area;
   - The potential impact of the on-site experience on the student applicant's academic/research plans;
   - The appropriateness of the student applicant's choice(s) of institution(s) relative to the proposed plan for graduate study;
   - The extent to which the proposed activity represents a potentially innovative space technology idea.

Subsequent to the review of Phase A applications, candidates deemed excellent will be submitted to the Space Technology Mission Directorate at NASA Headquarters for final programmatic consideration and selection. Balance within and across technology areas may be considered.

11.   Announcement of Phase A Selections

The target date to announce the fellowship selections is on or about April 16, 2014. Notification letters will be made available via the NSPIRES system; student applicants will be notified when the notification letters are available for download. The selected student applicant will be asked to verify his/her intention to accept the fellowship within seven days of notification; the student will also be required to indicate his/her chosen university.

The selected student will need to work with his/her chosen university (i.e., the university where the student will be enrolled full-time in fall 2014) to submit the Phase B package. The general scope of the Phase B package is provided in Section 12.

The planned start date for awards resulting from this solicitation is August 1, 2014.

Feedback to the student applicant will be provided upon request; requests for feedback should be submitted as instructed in the notification letter and within 30 days of notification.

12.   Submission Procedures – Phase B

Universities may only submit Phase B Packages on behalf of students who were selected in Phase A.

The NASA Space Technology Research Fellowships are awarded as training grants to accredited U.S. universities. This section provides an outline of the required Phase B elements. Detailed instructions will be released, via NSPIRES, coincident with the Phase A selection announcement. Phase B of this solicitation will require submission of a package, via NSPIRES, by a university Authorized Organizational Representative (AOR). The Principal Investigator on the training grant award will be the faculty advisor; the faculty advisor will also have a role in the submission of the Phase B package. The selected student must work with the faculty advisor and AOR to ensure that all of the following components are submitted by the Phase B deadline (currently shown as May 21, 2014):

1. NSPIRES Proposal Cover Page (with the advisor as PI and additional Program Specific Data Questions)
2. *Unrevised*, except as specified below, components 2 through 7 of the Phase A submission:
    a. The Phase A-submitted Personal Statement
    b. The Phase A-submitted Project Narrative
    c. The Phase A-submitted Degree Program Schedule
    d. The Phase A-submitted student applicant CV
    e. The selected student's transcripts, with updates as available
    f. The selected student's Phase A-submitted GRE scores
3. The faculty advisor's CV

4. Statement from the faculty advisor on the planned use of the faculty advisor allowance and a brief description of ongoing or pending research awards from NASA that are related to the selected student's Project Narrative
5. The fellowship training grant funding request for Year 1 of the award, by category and with justifications

Submission of the Phase B package implies concurrence with the Terms and Conditions specified in Section 5.

NASA will examine the Phase B packages for completeness (i.e., all components submitted and correct). Training grants can only be awarded when all of the Phase B package components are complete. Note that negotiations with the university may be required prior to the award of a training grant; in such cases, the training grant award is contingent upon successful negotiations between NASA and the university.

13.   Inquiries

Inquiries regarding this call should be submitted via e-mail to hq-nstrf-call@mail.nasa.gov. An NSTRF14 Frequently Asked Questions (FAQ) document is available and will be maintained on NSPIRES (under "Other Documents").

For assistance with NSPIRES, you may contact the NSPIRES Help Desk at (202) 479-9376 or nspires-help@nasaprs.com. The Help Desk is staffed, Monday through Friday, from 8 AM to 6 PM ET.

Appendix - Program Specific Data Questions

As stated in Section 9, the Program Specific Data Questions are part of the NSPIRES application submission process. The questions, and associated answers, constitute part of the Cover Page of a submitted application. NSTRF14 includes 48 Program Specific Data Questions; they are repeated here to assist the student applicant in the application preparation process. An asterisk (*) indicates that the question must be answered for successful submission of the application. Please note that this Appendix is for informational purposes only. Where this Appendix and the NSPIRES Program Specific Data form differ, the NSPIRES form takes precedence. Actual pull-down menus and text boxes are not included in this Appendix.

Selection of TABS element: Questions 1 and 2 allow you to specify and explain the Level 2 TABS elements most closely associated with your application. Question 2 requires a thorough justification for your selection in Question 1. If you feel that there are other relevant Level 2 TABS elements, they may be discussed in your response to this question and in your Project Narrative. Please refer to the actual roadmap documents to gain an understanding of what each Level 2 element is seeking; do not merely rely on the Level 2 TABS titles. Your input may be considered during the application evaluation process. The complete TABS, including all Level 1, 2 and 3 elements, may be found in TABS_NSTRF_FY14.pdf.

1. Please select the TABS element most closely associated with your application.
    *Please select via pull-down menu. ***

2. Please provide a thorough justification for your selection in Question 1. It is permissible to specify lower level TABS elements (associated with the TABS element selected in your response to Question 1) and/or other relevant TABS elements in the roadmap documents. (you can enter up to 4000 characters)
    *Please type your answer in the text box. ***

Demographic Information

3. Gender
    *
    o   Female
    o   Male

4. Are you an individual with disabilities?
    Furnishing this information is voluntary.
    o   Yes
    o   No

5. Race/Ethnicity – Please check all that apply
   Furnishing this information is voluntary.
   - o American Native or Alaskan American
   - o Hispanic or Latino
   - o Asian
   - o Pacific Islander/Native Hawaiian
   - o African American, not of Hispanic
   - o White, not of Hispanic Origin

6. Birth Month
   *Please select via pull-down menu. *

7. Birth Year
   *Please select via pull-down menu. *

8. Birth City
   *Please type your answer in the text box. *

9. U.S. Birth State or Territory
   *Please select via pull-down menu. Note that "Not Applicable" is a menu option. *

10. Birth Country
    *Please select via pull-down menu. *

Eligibility and Years of Support Sought

11. Are you a U.S. citizen or permanent resident alien of the U.S.?
    *
    - o Yes
    - o No

12. If you are not a U.S. citizen, please provide your country of citizenship.
    Please select via pull-down menu.

13. Are you currently an undergraduate student?
    *
    - o Yes
    - o No

14. Month that your bachelor's degree was, or is expected to be, received
    *Please select via pull-down menu. *

15. Year that your bachelor's degree was, or is expected to be, received
    *Please select via pull-down menu. *

16. Are you currently receiving, or have you applied for, another federal fellowship or traineeship? Please see Section 4 – Eligibility of the NSTRF14 solicitation for additional information. (Note: your answer to this question will not impact the review of your application.)
    *
    o   Yes
    o   No

17. If your answer to Question 16 is Yes, please provide a specific explanation. If your answer to Question 16 is No, please type N/A. (you can enter up to 1000 characters)
    *Please type your answer in the text box. **

18. Degree which you are seeking under this fellowship. Note: students just beginning their graduate studies with the goal of receiving a doctoral degree may select "Doctoral" below even if their university requires them to obtain a master's degree first. The application submitted must cover the entire intended period of study (with a single, continuous research topic).
    *
    o   Master's
    o   Doctoral

19. Have you previously applied for doctoral support under a NASA Space Technology Research Fellowship? If so, please select the appropriate solicitation below. A student requesting doctoral support may apply to no more than two NSTRF solicitations (see Section 4 – Eligibility). If you have never requested doctoral support under a NASA Space Technology Research Fellowship, please select N/A.
    *
    o   N/A
    o   NSTRF13 - NASA Space Technology Research Fellowships (NSTRF) - Fall 2013 Start
    o   NSTRF12 - NASA Space Technology Research Fellowships (NSTRF) - Fall 2012 Start
    o   NSTRF11 - NASA Space Technology Research Fellowships (NSTRF) - Fall 2011 Start

20. Month that you began any graduate studies. Select N/A if you are currently an undergraduate or have not yet commenced any technical graduate studies.
    *Please select via pull-down menu. **

21. Year that you began any graduate studies. Select N/A if you are currently an undergraduate or have not yet commenced any technical graduate studies.
    *Please select via pull-down menu. **

22. List any graduate degree that you received prior to October 1, 2013. Please include field of study and date the degree was awarded. Type N/A if you have no graduate degree at this time. (you can enter up to 1000 characters)
    *Please type your answer in the text box. **

23. Please cite the specific components of your application (e.g., transcript from University A) which corroborate the information that you provided in response to Questions #20, #21 and #22. (you can enter up to 1000 characters)
    *Please type your answer in the text box. **

24. Please select your eligibility profile, as specified in Section 4 – Eligibility of the NSTRF14 solicitation.
    *
    o   Profile 1 – Entering Master's Student
    o   Profile 2 – Entering Doctoral Student
    o   Profile 3 – Doctoral Student with Master's Degree
    o   Profile 4 – Continuing Doctoral Student

25. Please point to specific data in your application (cite details) to substantiate your answer to Question #24. Your transcript must clearly show that a master's degree has been conferred if you select Profile 3. (you can enter up to 4000 characters)
    *Please type your answer in the text box. If you are currently an undergraduate student, enter "I am currently an undergraduate student." ***

26. If your response to Question #24 was Profile 3, please explain in technical terms why your master's degree represents a non pro forma milestone. Type N/A if you selected another Profile.
    *Please type your answer in the text box. ***

27. Total number of years of NSTRF support sought (partial years are permitted). Please see Section 5 – Terms and Conditions of the NSTRF14 solicitation for clarification. Note: Profile 1 students are eligible for a maximum of 2 years of support.
    *Please select via pull-down menu. Select the number that most closely matches your plans ***

Graduate and Undergraduate Grade Point Averages (GPAs), Past, Current and Planned Fields of Study and Universities, and GRE Scores

28. Undergraduate GPA
    *Please type your undergraduate GPA in the format X.XX (for example, 3.95). ***

29. Undergraduate GPA Scale
    *Please type the scale for the undergraduate GPA you provided in Question 28 in the format X.XX. For example, if your GPA is 3.95 out of 4.00, type 4.00 for your answer. ***

30. Institution from which you received your undergraduate degree. If you are currently an undergraduate student, please enter the institution you are attending.
    *Please type your answer in the text box. ***

31. Undergraduate Field of Study
    *Please type your answer in the text box. ***

32. Graduate GPA
    *Please type your graduate GPA in the format X.XX (for example, 3.95). If you are currently an undergraduate student or do not yet have a graduate GPA, type N/A for your answer. ***

33. Graduate GPA Scale
    *Please type the scale for the graduate GPA you provided in Question 32 in the format X.XX. For example, if your GPA is 3.95 out of 4.00, type 4.00 for your answer. If you are currently an undergraduate student or do not yet have a graduate GPA, type N/A for your answer. ***

34. Institution in which you are currently enrolled for graduate study. If you are currently an undergraduate student, please enter N/A.
Please type your answer in the text box. ＊

35. Graduate Field of Study
Please type your current graduate degree field of study in the text box. If you are currently an undergraduate student, type N/A for your answer. ＊

Questions 36-38 allow you to specify the university or universities that you are considering for the degree program for which you are requesting support. The NSTRF14 solicitation requires you to discuss your choice of academic institution(s) as part of the Personal Statement. Answers to all three questions are required. If you are certain of your fall 2014 graduate institution, enter N/A for Questions 37 and 38. Question 39 asks you to specify your graduate field of study that would be supported under an NSTRF fellowship.

36. The name of your first choice academic institution
Please type your answer in the text box. ＊

37. The name of an alternate choice academic institution
Please type your answer in the text box. ＊

38. The name of a second alternate choice academic institution
Please type your answer in the text box. ＊

39. Fall 2014 Graduate Field of Study
Please type your answer in the text box. ＊

Questions 40-47 of this section refer to the GRE General Test scores, a required part of your application (see Section 9 - Application Procedures - Phase A of the NSTRF14 solicitation). If you took the GRE General Test more than one time, you may choose which GRE scores to report, but all scores must be from the same GRE General Test date. If you did not take the GRE General Test, select N/A for your response to Question 40, provide an explanation in Question 41 and type N/A for your answer in response to Questions 42-47.

40. Please select the Verbal Reasoning and Quantitative Reasoning Score reporting scale on the test which you have chosen to provide.
＊
   o 200-800, in 10 point increments
   o 130-170, in 1 point increments
   o N/A

41. If your answer to Question 40 is N/A, provide an explanation why GRE scores are not available (e.g., were not required for graduate school admission). Enter N/A if you took the GRE General Test. (you can enter up to 1000 characters)
Please type your answer in the text box. If GRE scores are available, type "GRE scores are available." ＊

42. Verbal Reasoning GRE Score
   *Please type your answer in the text box. ***

43. Verbal Reasoning GRE % Below
   *Please type your answer in the text box. ***

44. Quantitative Reasoning GRE Score
   *Please type your answer in the text box. ***

45. Quantitative Reasoning GRE % Below
   *Please type your answer in the text box. ***

46. Analytical Writing GRE Score
   *Please type your answer in the text box. ***

47. Analytical Writing GRE % Below
   *Please type your answer in the text box. ***

48. How did you find out about the NASA Space Technology Research Fellowships?
   Please select all that apply.
   o   NASA e-mail announcement or press release
   o   Professor/Research Advisor
   o   University announcement/e-mail
   o   NASA contact
   o   NASA meeting
   o   NASA website
   o   NASA Space Grant Consortium communication
   o   Colleague
   o   Other

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 Space Technology Research 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 as part of the submission process will be used to determine your eligibility for participation in NSTRF. The information requested regarding your disability status and race/ethnicity will be used to determine the degree to which members of each ethnic/racial/disability group are being reached by NASA's announcement of this opportunity, 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 requested is voluntary, but failure to do so may result in NASA's inability to determine eligibility for participation and selection for award. However, your application will not be affected if you choose not to provide information on your ethnic, racial, or disability status.

Definitions for Student Applicant Background

- 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, Indonesia, 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 Marinas; 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.