

# Arizona NASA Space Grant Consortium

# AY2024-2025 UArizona Graduate Fellowship Program Call for Proposals

Release Date: February 9, 2024 Application Deadline: April 15, 2024

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# AZSGC UArizona Graduate Fellowship Program Guide

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### **Graduate Fellowship Program Guide**

#### INTRODUCTION

The Arizona NASA Space Grant Consortium (AZSGC) is part of The National Space Grant College and Fellowship Program, which was established by Congress in 1989. Space Grant contributes to the nation's science enterprise by implementing research, education, and public service projects through a national network of university-based Space Grant consortia. Space Grant consortia have been established in all 50 states, the District of Columbia, and the Commonwealth of Puerto Rico. Nationally, the Space Grant network has 850 affiliate members from academia, industry, government agencies, the military and nonprofit institutions. Twenty-nine of these are members and partners of Arizona's Space Grant Consortium.

The UArizona NASA Space Grant Fellowship Program is just one of the many programs that AZSGC offers. The goals of the Fellowship Program are to encourage individuals to pursue graduate education in a STEM field, support NASA-related research happening at UArizona, support scientific outreach and communication, and promote diversity, equity, inclusion, and accessibility in the future STEM workforce.

The UArizona NASA Space Grant Program, in collaboration with the UArizona Graduate College and the applicant's nominating department, funds up to six graduate fellowships per year to students pursuing STEM degrees at the University of Arizona. In AY24-25 awards will include full in- and out-of-state tuition coverage and a stipend of at least \$22,838.

#### **ELIGIBILITY**

The Graduate Fellowship program is open to graduate students who meet the following criteria:

- U.S. Citizen, per NASA (federal) funding guidelines
- Enrolled as a full-time graduate student at the University of Arizona during the Fall and Spring award period. Awardee cannot graduate before May of the award period. Full time enrollment is:
  - Minimum enrollment of 9 units of graduate credit each semester if taking coursework.
  - Minimum enrollment of 6 units of graduate credit each semester if concurrently on a graduate assistant/associate appointment (regardless of where you are in your time to degree).
  - Minimum enrollment of 3 units of graduate credit each semester if completed coursework and enrolled in 900 level only units (thesis-dissertation) and not assigned a graduate assistant/associate appointment.
- Enrolled full time in an advanced degree program of study in a STEM field. Students pursuing any major from the College of Science, College of Social and Behavioral Sciences, College of Optical Sciences, College of Engineering, and College of Agricultural and Life Sciences are eligible to apply. Applicants may be studying Planetary Sciences, Astronomy, Physics, Earth Sciences and Global Change-related fields (Atmospheric Sciences, Geosciences, Hydrology and Water Resources, Geography, Ecology and others) Evolutionary Biology, Mathematics, Remote Sensing and Spatial Analysis, and in space-related fields in any college or field that uses space-related science and tools (e.g. Public Policy, the Social Sciences, Science Education, etc.) as long as the applicant is working toward a STEM degree.
- Receives support/commitment from department and/or primary advisor to meet the cost-share requirements for this award, including at least \$6,000 as a stipend or TA/RA/GA wages, and in-state tuition coverage.

#### **APPLICATION TRACKS**

The UArizona NASA Space Grant Fellowship Program is intended to support and retain outstanding graduate students pursuing STEM degrees. Space Grant Fellowships are competitively awarded and recognize students for their high achievements and academic merit. This includes their ability to communicate and present scientific research to the public, an important skill in sharing NASA's research with our community. The UArizona Space Grant Program is offering two application tracks to receive a Space Grant Fellowship. These tracks include a "Research Track" and "Outreach Track", explained below. The UArizona Space Grant Program will award up to 6 fellowships in total. The number of awards for each track will depend on the number of applications received.

#### Research Track

The Space Grant Fellowship research track application is for UArizona graduate students whose Master's or PhD fields of study are relevant to NASA's mission, and whose research is clearly aligned with one or more NASA mission directorates or topics of interest. Research track fellows are currently (or will be at the start of the award period) working on a faculty-mentored research project that has NASA STEM relevance. This research project must be NASA-related but does not need to be funded with a NASA grant. Faculty mentors must be affiliated with the University of Arizona and must provide a letter of support on behalf of the applicant. Space Grant Fellows on the research track will be required to participate in 20 hours of science communication and outreach activities each semester, including approximately 3-5 (1-hour) science communication and outreach workshops during the award period. By the end of the fellowship, Space Grant Fellows on the research track must demonstrate their new or improved science communication and outreach skills by bringing their NASA-related research to the public through a public presentation or other similar project (conference presentation to local audiences, state audiences, K-12 outreach, professional meetings, etc.).

#### **Outreach Track**

The Space Grant Fellowship outreach track application is for UArizona graduate students interested in using their knowledge, skills, and interests in science communication and outreach to work on a proposed outreach project. Outreach track fellows have a clearly defined educational outreach project that they would like to pursue during the award period. Space Grant Fellows in the outreach track are interested in promoting the understanding of NASA-related research to the public. Applicants establish a relationship with an organization or institution (i.e. a school, museum, park/forest, or an existing educational program) for their outreach project. This organization or institution does not need to be affiliated with the University of Arizona. Applicants identify an "outreach advisor" representing this organization or program who will provide a letter of support on behalf of the applicant. Space Grant Fellows on the outreach track will be required to participate in approximately 3-5 (1-hour) science communication and outreach workshops during the award period. By the end of the fellowship, Space Grant Fellows on the outreach track should have completed their proposed outreach project.

#### AWARD TERMS AND CONDITIONS

#### **Award Funds**

Up to six graduate fellowships will be awarded each academic year, contingent upon NASA funding. Fellowships are competitively awarded to graduate students enrolled full-time at the University of Arizona during the time of the fellowship (Fall and Spring).

In AY24-25, awards will include full in- and out-of-state tuition coverage and a stipend of at least \$22,838. These awards are funded with Space Grant and UArizona Graduate College monies, plus a required department cost-share from the applying student's home department. Specifically, awarded fellows will receive a \$10,000 stipend from the Graduate College, a \$6,838 stipend from the Space Grant Program, and a department commitment of at least \$6,000 as stipend or wages (wages can come in the form of TA/RA/GA appointments) for a total of at least \$22,838. In-state tuition is covered by the student's home department, and out-of-state tuition costs are covered by the Graduate College (if needed). Mandatory UArizona fees and student health insurance are not covered under this award (unless provided by the applicant's home department) and are the responsibility of the Fellow.

#### **Duration**

Graduate fellowships are academic year-long awards. Fellows may apply for a second year of funding with sufficient evidence of effort exerted towards meeting their goals in the first year of the program. Fellows may apply for the same track or a different track in Year 2, however, they should clearly showcase the knowledge and skills they learned in Year 1 and how that will aid them in expanding their science communication and outreach efforts in Year 2 of the award.

#### Diversity, Equity, Inclusion, and Accessibility (DEIA)

The Arizona Space Grant Consortium strives to align our Consortium policies, plans, and priorities with the Arizona Department of Education's Office of Equity, Diversity, and Inclusion Framework to "advance program area's goals and ensure Arizona's students and teachers are served equitably...[and to] support all of Arizona's students, families,

and educators." In addition, AZSGC works to provide an inclusive and interdisciplinary cohort of students, mentors, affiliates, and more, and aligns those efforts with the Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. We strongly encourage applications from traditionally underserved and underrepresented communities.

#### DATES AND DEADLINES

- Application Deadline: April 15, 2024
- Award Selections: April 30, 2024
- Duration of Award: August 26, 2024 to May 7, 2025
- Space Grant Award Disbursements: August 2024 and January 2025
  - Stipends equally distributed in August and January as: \$5,000 from the UArizona Graduate College, \$3,419 from Space Grant
- Department Award Disbursements: May be made as bi-weekly wages or semester stipends but must meet or exceed \$6,000 total during the award period

#### **Deliverables**

- Attend an orientation session at the start of the school year to meet your fellowship cohort.
- Provide a photo, signed media release form, and biographical information upon selection for the AZSGC website.
- Provide a 'highlight story' for the Space Grant website of 250 words or less, plus an original photo, explaining your research and/or outreach project.
- A Mid-Year Check-In Meeting with the Space Grant Committee: December 2024
- A Mid-Year NASA Written Report: February 2025
- A Year-End PowerPoint Presentation: April 2025
- A Year-End NASA Written Report: May 2025
- Attend the required science communication and outreach workshops.
- (Research track) complete at least 20 hours of outreach per semester, with documentation.
- (Research track) complete a public presentation or similar project before May 7, 2025.
- (Outreach track) complete your proposed outreach project before May 7, 2025.
- Provide your "next steps" information for our alumni database.

#### **Publications**

The Arizona Space Grant Consortium (AZSGC) should be cited as a source of funding in all publications, proposals, speaking engagements, web sites, or general dissemination of information resulting from any work produced with the support of this Fellowship. This can be acknowledge using the phrase "...supported in part through Arizona NASA Space Grant Consortium, cooperative agreement 80NSSC20M0041". For professional presentations, posters, etc., you may find AZSGC logos on our website (linked here).

Please let us know of your accomplishments by filling out our Publications and Presentations form (<u>linked here</u>) so that we can tell NASA of all of the amazing things that our Fellows do!

#### **SUBMISSION DETAILS & FORMAT GUIDELINES**

Proposals should use 12-point font with a minimum 1" margin on all sides of each page.

Proposals should use an easily readable font such as Times New Roman, Arial, Calibri or Helvetica.

Proposals should be organized beginning with the Cover Page, followed by response A-G and clearly labeled with headers.

Final applications should be submitted as <u>one</u> PDF document and the PDF file name should be the applicant's "LastName FirstName Track XX" with the track reading either "Research or Outreach".

Individual applicants or departments can submit the final PDF application.

Final applications are due by April 15, 2024, at 11:59 MST and are to be sent via email to Michelle Coe (macoe@arizona.edu) with the email header "Space Grant Fellowship Application".

#### **REVIEW AND SELECTION PROCESS**

The UArizona NASA Space Grant Steering Committee will select Graduate Fellows based on academic qualifications and the strength of their overall application. Applicants will be notified of awards by early May 2024 and must accept the award by the given deadline.

#### **FOR MORE INFORMATION**

For questions regarding the application process contact Michelle Coe, Arizona Space Grant Consortium / University of Arizona Program Manager, at <a href="macoe@arizona.edu">macoe@arizona.edu</a>.

Visit the University of Arizona Fellowship page: https://spacegrant.arizona.edu/students/fellowships

Visit the Arizona Space Grant Consortium website: <a href="https://spacegrant.arizona.edu/">https://spacegrant.arizona.edu/</a>

## **Research Track Application**

The UArizona NASA Space Grant Research Track application should include the following documents in this order:

- Cover Page: Including name, email, degree and major, and XX application track (research or outreach)
- A. Student Profile Information
- B. Department Nomination and Approval of Cost-Share
- C. Statement of Interest
- D. Science Communication & Outreach
- E. Description of Research Project
- F. Faculty Mentor Letter of Support
- G. Student CV

#### **SUBMISSION DETAILS & FORMAT GUIDELINES**

Proposals should use 12-point font with a minimum 1" margin on all sides of each page.

Proposals should use an easily readable font such as Times New Roman, Arial, Calibri or Helvetica.

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Individual applicants or departments can submit the final PDF application.

Final applications are due by April 15, 2024, at 11:59 MST and are to be sent via email to Michelle Coe (macoe@arizona.edu) with the email header "Space Grant Fellowship Application".

# A. STUDENT PROFILE INFORMATION

Affiliate: University of Arizona*		Track: Research Track
First Name:		Last Name:
Date of Birth:		Student ID:
Major:		Minor:
UArizona Department:		Pursuing MS or PhD:
Current GPA:		Anticipated Graduation Date:
Advisor/Mentor Name:		Advisor/Mentor Email:
he following questions are viewed by	Space Grant staff only and ar	re required for our NASA (federal) reporting.
Do you identify as:  African American or Black American Indian or Alaskan Native Asian Hispanic Native Hawaiian or other Pacific Islander White Prefer to self-identify below:	Do you identify as:  Male Female Non-binary Prefer not to say  Do you identify as a person with a disability?  No Yes Prefer not to say	Are you considered an in-state student (AZ Resident) by UArizona?:  No, out-of-state student Yes, in-state student  Military Service?  No Yes  Confirming U.S. Citizenship:  U.SU.S. citizenship required due to NASA (Federal) funds used.
Local Address:		
City:	State:	Zip:
Permanent Address (if different):		
City:	State:	Zip:
Cell Phone:		
Primary Email:	Seco	ondary Email:

#### B. DEPARTMENT NOMINATION AND APPROVAL OF COST SHARE

Overview: The UArizona NASA Space Grant Program, in collaboration with the UArizona Graduate College and the applicant's nominating department, funds up to six graduate fellowships per year. Space Grant fellowships are offered to those pursuing STEM degrees at the University of Arizona. Competitively awarded, UArizona Space Grant Graduate Fellowships are based on merit to recognize high academic achievement while promoting NASA-related research to the public and encouraging students to pursue careers in STEM. Your nominated student is applying for a UArizona Space Grant "research track" fellowship. Research track applicants must demonstrate their research project's relevance to NASA's top research priorities and strong alignment with NASA Mission Directorates.

Applicants must be enrolled in a STEM discipline and work on a faculty-mentored research project that aligns with a current NASA mission or topic of interest. Awardees will participate in 20 hours of STEM outreach per semester and complete a science communication and outreach project (conference presentation, paper, etc.) by the end of the award. Faculty advisors must be affiliated with the University of Arizona and must provide a letter of support on behalf of the applicant.

Award: In AY24- 25, awards will include full in- and out-of-state tuition coverage and a stipend of at least \$22,838. These awards are funded with Space Grant and UArizona Graduate College monies, plus a required department cost-share from the applying student's faculty advisor or home department. Specifically, awarded fellows will receive a \$10,000 stipend from the UArizona Graduate College, a \$6,838 stipend from the Space Grant Program, and a department commitment of at least \$6,000 as stipend or wages (wages can come in the form of TA/RA/GA appointments) for a total of at least \$22,838. In-state tuition is covered by the student's home department, and out-of-state tuition costs are covered by the UArizona Graduate College (if needed).

The required cost-share on this award can be obtained through a TA/RA/GA appointment of the student, as long as the student is receiving at least \$6,000 in wages over the course of the academic year fellowship.

(please print signatory name)	(Official Department Signature)
from the Department of name)	nominates(applicant's full
for a UArizona NASA Space Grant	
	(Department)
provide the cost-share noted above(date)	(Department) esearch Track Fellowship in AY24-25 and agrees to

#### C. Statement of Interest (Limit: 1 page including figures)

- a. Describe your interest in STEM and your desire to pursue a career in a STEM field.
- b. Describe how outreach and scientific communication workshops could enhance your current research and outreach skills. What are your outreach interests; do you have any experience in outreach and science communication at present?
- a. Describe how receiving this fellowship would benefit you and contribute to your academic and career goals. You may want to discuss your background and motivation for pursuing a STEM degree, your long-term career goals, and how this experience will prepare you for a career that allows you to contribute to one of the NASA Mission Directorates in the future.

#### D. Science Communication & Outreach (Limit: 1 page including figures)

- c. What types of outreach events are you interested in and/or plan to participate in to reach the 20 hour per semester outreach requirement (not binding)?
- d. Include a statement on what your tentative science communication and/or outreach project deliverable will be (not binding). Why are you personally qualified to address this science communication and/or outreach project, and why it is important? If known, please include the general target audience and outreach affiliates you would like to work with.
  - a. Note that the Research Track application does not require you to have a clearly defined outreach plan in place at the time of application, but you should be able to provide a general description of what you plan to pursue.

#### E. Description of Research Project (Limit: 1 page including figures)

- a. A statement of your current or planned NASA-related research describing the overall goals, objectives, and intended outcomes while pursuing your graduate degree.
  - a. Please try to describe this research to a layperson audience as much as possible. References are not included in the 1-page limit. Note that the research conducted must be NASA-related, but does not have to be funded by a NASA grant.
- b. What are your objectives, methods, and a tentative timeline that you will carry out for this project?
- c. Identify how this research relates to NASA's top research priorities and has strong alignment with NASA Mission Directorates (refer to Appendix A. NASA Mission Directorates).

#### F. Faculty Mentor Letter of Support (Limit: 1 page)

The applicant's current faculty mentor for the proposed research must provide a letter of support acknowledging the proposal submission to the University of Arizona Space Graduate Fellowship program and the requirements and deliverables associated with the award. The letter of support must be signed by the mentor. The letter should address the following questions:

- 1. How long and in what capacity have you known the applicant?
- 2. Why do you believe this applicant is a good fit for the research track Space Grant Fellowship program.
  - a. How can this applicant, and the research project, benefit from the applicant attending scientific outreach and communication workshops and completing a public presentation.
- 3. Please very briefly comment on the applicant's self-reliance and independence, academic abilities, and professional goals as they relate to the proposed outreach goals.
- 4. A statement that you have reviewed this project, the time commitment, and the cost-share requirement and are in full support of the student applying to this program.

#### G. Student CV (Limit: 1 page)

A summary of your career and qualifications, including relevant employment, education, extracurricular activities, and significant accomplishments.

## **Outreach Track Application**

The UArizona NASA Space Grant Outreach Track application should include the following documents in this order:

- Cover Page: Including name, email, degree and major, and XX application track (research or outreach)
- A. Student Profile Information
- B. Department Nomination and Approval of Cost-Share
- C. Statement of Interest
- D. Technical Approach & Expected Outcomes
- E. Milestone Chart
- F. Outreach Advisor Letter of Support
- G. Student CV

#### SUBMISSION DETAILS & FORMAT GUIDELINES

Proposals should use 12-point font with a minimum 1" margin on all sides of each page.

Proposals should use an easily readable font such as Times New Roman, Arial, Calibri or Helvetica.

Proposals should be organized beginning with the Cover Page, followed by response A-G and clearly labeled with headers.

Final applications should be submitted as <u>one</u> PDF document and the PDF file name should be the applicant's "LastName\_FirstName\_Track XX" with the track reading either "Research or Outreach".

Individual applicants or departments can submit the final PDF application.

Final applications are due by April 15, 2024, at 11:59 MST and are to be sent via email to Michelle Coe (macoe@arizona.edu) with the email header "Space Grant Fellowship Application".

# A. STUDENT PROFILE INFORMATION

Affiliate: University of Arizona*		Track: Outreach Track
First Name:		Last Name:
Date of Birth:		Student ID:
Major:		Minor:
UArizona Department:		Pursuing MS or PhD:
Current GPA:		Anticipated Graduation Date:
Advisor/Mentor Name:		Advisor/Mentor Email:
Primary Outreach Partner:		Name   Email:
The following questions are viewed by	Space Grant staff only and ar	e required for our NASA (federal) reporting.
Do you identify as: African American or Black American Indian or Alaskan Native Asian Hispanic Native Hawaiian or other Pacific Islander White Prefer to self-identify below:	Do you identify as:  Male Female Non-binary Prefer not to say  Do you identify as a person with a disability?  No Yes	Are you considered an in-state student (AZ Resident) by UArizona?:  No, out-of-state student Yes, in-state student  Military Service?  No Yes  Confirming U.S. Citizenship:  U.SU.S. citizenship required due to NASA (Federal) funds used.
Local Address:		
City:	State:	Zip:
Permanent Address (if different):		
City:	State:	Zip:
Cell Phone:		
Primary Email:	Seco	ondary Email:

#### B. DEPARTMENT NOMINATION AND APPROVAL OF COST SHARE

Overview: The UArizona NASA Space Grant Program, in collaboration with the UArizona Graduate College and the applicant's nominating department, funds up to six graduate fellowships per year. Space Grant fellowships are offered to those pursuing STEM degrees at the University of Arizona. Competitively awarded, UArizona Space Grant Graduate Fellowships are based on merit to recognize high academic achievement while promoting NASA-related research to the public and encouraging students to pursue careers in STEM. Outreach track applicants must propose an academic-year project focused on educational outreach, knowledge transfer, technology transfer, science for society, and/or the promotion of science, technology, engineering, and mathematics (STEM) to those traditionally underrepresented in STEM.

In keeping with National Space Grant College and Fellowship Program goals, Space Grant Fellows will develop a project that promotes the understanding of NASA-related research to the public through original research and outreach efforts. Successful applications tend to partner with existing educational programs (e.g. primary/secondary schools, science museums, parks/forests/reserves, 4-H and other Cooperative Extension agents, etc.) on projects such as curricular and/or educational outreach materials, web applications, educational materials for existing programs, new program development, etc.

Award: In AY24- 25, awards will include full in- and out-of-state tuition coverage and a stipend of at least \$22,838. These awards are funded with Space Grant and UArizona Graduate College monies, plus a required department cost-share from the applying student's faculty advisor or home department. Specifically, awarded fellows will receive a \$10,000 stipend from the UArizona Graduate College, a \$6,838 stipend from the Space Grant Program, and a department commitment of at least \$6,000 as stipend or wages (wages can come in the form of TA/RA/GA appointments) for a total of at least \$22,838. In-state tuition is covered by the student's home department, and out-of-state tuition costs are covered by the UArizona Graduate College (if needed).

The required cost-share on this award can be obtained through a TA/RA/GA appointment of the student, as long as the student is receiving at least \$6,000 in wages over the course of the academic year fellowship.

(Official Department Signature)	(please print signatory name)
ominates	from the Department of
(applicar	nt's full name)
	for a 2024-2025 UArizona NASA Space Grant
(Department)	<u> </u>

#### C. Statement of Interest (Limit: 1 page including figures)

- a. What is the science communication and/or outreach project you propose and why is it important?
- b. How does this outreach project align with NASA's missions and priorities? For more information on the NASA Mission Directorates, please review Appendix A.
- c. Describe your target audience (numbers, demographics, etc.) for this outreach.
- d. Who are/will be your outreach affiliates?
- e. Briefly mention why you personally are qualified to address this science communication and/or outreach project (i.e., your personal, academic, research and/or professional experience, goals and/or philosophy).
- f. Describe how receiving this fellowship would benefit you and contribute to your academic and career goals. You may want to discuss your background and motivation for pursuing a STEM degree, your long-term career goals, and how this experience will prepare you for a career in STEM.

#### D. Technical Approach & Expected Outcomes (Limit: 1 page including figures)

- a. What are your methods and how will you address the proposed communication and outreach project? You may want to include the type of educational materials, data, and/or technology you plan to use.
- b. Why is this approach appropriate? (e.g., proven track record and/or grounding in an accepted education/knowledge transfer/pedagogic theory).
- c. Estimate/quantify the perceived impact of your proposed project.
- d. For activities and/or materials created for this proposed project, how will learning or effectiveness be assessed? How will the overall project's impact be measured?
- e. What steps will you take to help ensure that your work can continue to be used, viewed, and/or referenced beyond the award period?

#### E. Milestone Chart (Limit: 1 page including figures)

a. Very briefly summarize the major tasks / phases of the project in a chart with column headers "Month",
 "Task", and "Short Description of Task". Note that this is an academic year (August – May) award.
 Therefore, the "Month" column header should depict most of the work is to be completed between August to May of the award year.

#### F. Outreach Advisor Letter of Support (Limit: 1 page)

Outreach track fellows have a clearly defined educational outreach project that they would like to pursue during the award period. Space Grant Fellows in the outreach track are interested in promoting the understanding of NASA-related research to the public. Applicants may establish a relationship with an organization or institution (i.e. a school, museum, park/forest, or an existing educational program) for their outreach project. Applicants should identify an "outreach advisor" representing this organization or program who will provide a signed letter of support on behalf of the applicant. The letter should address the following questions:

- 1. How long and in what capacity have you known the applicant?
- 2. What are your impressions of the applicant's interest/motivation in promoting the understanding of science, technology, engineering and/or mathematics to the public?
- 3. What are your impressions of the applicant's proposed outreach project?
- a. Are the applicant's objectives compelling and are the methods appropriate?
- b. Is the project feasible and is it achievable while the applicant pursues their graduate degree?
- 4. Please very briefly comment on the applicant's self-reliance and independence, academic abilities, and professional goals as they relate to proposed outreach project.

#### G. Student CV (Limit: 1 page)

A summary of your career and qualifications, including relevant employment, education, extracurricular activities, and significant accomplishments.

#### APPENDIX A: NASA MISSION DIRECTORATES

Please click on the links below for more details about each NASA mission directorate and their research priority areas.

#### **NASA's Mission Directorates**

Aeronautics Research Mission Directorate (ARMD): NASA's aeronautics programs focus on six areas of research that develop solutions to the major challenges and opportunities for aviation: a growing demand for mobility, the sustainability of energy, the sustainability of the environment, and technology advances in information, communications and automation. ARMD conducts high-quality, cutting-edge research that generates innovative concepts, tools, and technologies to enable revolutionary advances in our Nation's future aircraft, as well as in the airspace in which they will fly. ARMD programs will facilitate a safer, more environmentally friendly, and more efficient national air transportation system. <a href="http://www.aeronautics.nasa.gov">http://www.aeronautics.nasa.gov</a>

Exploration Systems Development Mission Directorate (ESDMD): The Exploration Systems Development Mission Directorate defines and manages systems development for programs critical to the NASA's Artemis program and planning for NASA's Moon to Mars exploration approach in an integrated manner. ESDMD manages the human exploration system development for lunar orbital, lunar surface, and Mars exploration. ESDMD leads the human aspects of the Artemis activities as well as the integration of science into the human system elements. ESDMD is responsible for the development of the lunar and Mars architectures. Programs in the mission directorate include Orion, Space Launch System, Exploration Ground Systems, Gateway, Human Landing System, and Extravehicular Activity (xEVA) and Human Surface Mobility. https://www.nasa.gov/directorates/exploration-systems-development

**Space Operations Mission Directorate (SOMD):** SOMD manages NASA's current and future space operations in and beyond low-Earth orbit (LEO), including commercial launch services to the International Space Station. SOMD operates and maintains exploration systems, develops and operates space transportation systems, and performs broad scientific research on orbit. In addition, SOMD is responsible for managing the space transportation services for NASA and NASA-sponsored payloads that require orbital launch, and the agency's space communications and navigation services supporting all NASA's space systems currently in orbit. <a href="https://www.nasa.gov/directorates/space-operations-mission-directorate">https://www.nasa.gov/directorates/space-operations-mission-directorate</a>

Science Mission Directorate (SMD): The Science Mission Directorate (SMD) is responsible for directing and overseeing the nation's space research program in Earth and space science. The Directorate engages the external and internal science community to define and prioritize science questions and seeks to expand the frontiers of five broad scientific pursuits: Earth Science, Planetary Science, Biological and Physical Sciences, Heliophysics, and Astrophysics. <a href="http://science.nasa.gov/">http://science.nasa.gov/</a>

**Space Technology Mission Directorate (STMD):** NASA's Space Technology Mission Directorate (STMD) aims to transform future missions while ensuring American leadership in aerospace. As NASA embarks on the next era of space exploration with Artemis, STMD is advancing technologies and testing new capabilities at the Moon. Many of the same systems will prove critical at Mars. STMD's portfolio spans a range of discipline areas and technology readiness levels. STMD bolsters and funds diverse ideas from entrepreneurs, researchers, and innovators across the country. Space technology research and development occurs at NASA centers, universities, national labs, and small businesses. STMD leverages partnerships with other government agencies and commercial partners to quickly advance and demonstrate cross-cutting capabilities. http://www.nasa.gov/directorates/spacetech/home/index.html.