Oregon NASA Space Grant Consortium
Announcement of Opportunity

2022-23 SCORE Program

STEM **C**ommunity College **O**pportunity for
Research **E**xperience

Call for Proposals

Proposals Due: **December 21, 2022**

Partner

OVERVIEW

- Awards of $1,000 are available to community college students who complete a mentor-guided research project that aligns with NASA's interests and research priorities.
- Students interested in STEM (science, technology, engineering, and mathematics) may apply, as well as those interested in STEM education.
- This document provides students and mentors with information about eligibility, deadlines, and other aspects that will guide you through the application process and should be read in its entirety.
- If you have questions, you may contact your campus representative for the Oregon NASA Space Grant Consortium (OSGC) or OSGC staff.

INTRODUCTION

The Oregon NASA Space Grant Consortium (OSGC) is pleased to provide students attending our member community colleges an opportunity to apply for a one-time (non-renewable), research award that supports their academic study in science, technology, engineering, and mathematics (STEM), or STEM education. The STEM Community-College Opportunity for Research Experience (SCORE) program awards community college student-researchers a stipend upon completion of an academic, term-long research project and oral presentation at the OSGC Student Symposium. Students are guided in their project by faculty members at community colleges or universities who have active research opportunities available for students or have an interest in supporting student research. These awards also serve to recognize the student's achievements in the STEM fields.

The SCORE Program supports the National Aeronautics and Space Administration (NASA) objectives of fostering and encouraging careers in STEM and STEM education and developing a diverse and capable next-generation workforce in space science, aerospace, and technology through unique, experiential learning opportunities. Women, individuals from underrepresented and underserved groups in the STEM fields, and persons with disabilities are strongly encouraged to apply.

The NASA Office of STEM Engagement develops student programs and opportunities that are driven by the research priorities of the NASA Mission Directorates. To this end, applicants are required to demonstrate how their project relates to NASA's Vision/Mission and substantively aligns with the research priorities of at least one of the NASA Mission Directorates (see *Appendix A. Agency Information and Strategic Framework for NASA*).

Awards are open to a broad range of STEM disciplines, including but not limited to, Biological and Life Sciences, Chemistry, Geological and Planetary Sciences, Physics and Astronomy, Mathematics, Mechanical Engineering, Chemical Engineering, Electrical Engineering, Computer Engineering, Computer Sciences, Civil Engineering, and STEM Education. Students should contact OSGC if they have questions regarding the suitability of their field of study for SCORE.

ELIGIBLE INSTITUTIONS

Applicants must be currently enrolled and in good academic standing at one of OSGC community college member institutions. Go to https://spacegrant.oregonstate.edu/members-oregon-nasa-space-grant-consortium for a complete list of member institutions and representative contact information.

AWARD INFORMATION

SCORE awards are designed to provide community college students a unique learning opportunity to work together with a faculty mentor on an academic, term-long research project in STEM or STEM education that goes beyond what is taught in the classroom. Projects may be mentor recommended or a unique, student-driven idea. Projects may be individual projects or part of a team project. Multiple students may submit individual applications associated with a single team project, but not all individual applications associated with a single team project are guaranteed funding. Proposed projects must be stand-alone and not dependent upon other components for completion. Proposals must primarily be the work of the student.

Projects may vary in scope as long as proposed projects align with NASA Mission Directorates. Students interested in gaining additional hands-on experience should discuss potential projects with their OSGC representative. SCORE projects from previous years are listed on Page 5.

Awards are competitively awarded to students enrolled at OSGC-affiliated community colleges. Students who are dual-enrolled in a community college and a 4-year institution are eligible to apply, as long as minimum enrollment eligibility is met. Community college students may work with mentors from 4-year institutions or with someone other than the affiliate representative at the student's home institution. Projects should be completed within the winter term after award selections are made. **Projects and mentors must be approved by the OSGC representative from the student's home institution.**

AWARD AMOUNT AND DURATION

Awards in the amount of $1,000 per student are competitively awarded to community college students during the 2022-23 academic year. If awarded, all work must be completed by end of winter term 2023, prior to the Spring Student Symposium in May 2023. **Funding is compensation for a student's time and costs associated with printing a poster/travel to the Student Symposium. Funds are NOT intended for supplies used to complete the research project. Funds for supplies related to the project should be provided by the mentor and/or department.**

Awards of $1,000 are made in two equal disbursements, the first $500 when accepted and the second upon completion of the research project, submission of accepted final deliverables, and participation in the Spring Student Symposium in May 2023. This is a non-renewable award, paid

in two disbursements, over one academic term only. Previous SCORE recipients are eligible to apply.

NOTE: Oregon NASA Space Grant Consortium's obligation to make awards is contingent upon availability of funds from NASA Office of STEM Engagement.

DATES AND DEADLINES

- Application Deadline: **Wednesday, December 21, 2022**
- Award Selections: By **Friday, December 30, 2022**
- Duration: **Winter Term 2023** - work must be completed by end of Winter Term, prior to the Spring Student Symposium in May 2023
- Participation in Spring Student Symposium: **Friday, May 19, 2023** in person at the OSU LaSells Stewart Center in Corvallis, OR
- Award Disbursement: **$1,000** - students will receive the first disbursement of **$500** at the beginning of the award and **$500** upon completion of the research project, submission of final deliverables, and participation in the Spring Symposium

NOTE: Dates and deadlines for specific deliverables are listed under ***Deliverables If Awarded***.

ELIGIBILITY

- All students participating in the project must be U.S. citizens.
- Student is enrolled in a minimum of 6 credit hours per term in **STEM-related coursework** at an **OSGC affiliated Community College** at the time of application (fall 2022) and remains enrolled for the duration of the award (through winter 2023). Student may be dual-enrolled in an OSGC affiliated Community College and 4-year institution through the duration of the award, as long as minimum requirements are met.
- For STEM students not currently enrolled in STEM-related coursework, supplemental information must be provided, including but not limited to:
    - Documentation declaring a STEM-related major or degree path.
    - Documentation of degree plan provided by adviser (general or degree-specific), which includes STEM-related coursework.
    - Letter of recommendation from past STEM faculty member or mentor.

  Please discuss options with your OSGC affiliate representative to ensure criteria are adequately met.
- Student must maintain good academic standing.
- Projects and mentors must be approved by the OSGC Affiliate Representative.
- Students from underserved groups and groups underrepresented in STEM fields, specifically Native American, African American, Latino, Hispanic, and Pacific Islander, women, and persons with disabilities are strongly encouraged to apply. OSGC seeks to recruit applicants from a variety of member institutions and disciplines.
- The OSGC Cooperative Agreement stipulates no human subject work can be conducted under the award. Hence, Human Subject Research—including surveys—is prohibited from inclusion in this or any OSGC program.

REQUIRED APPLICATION MATERIAL

Application Questions

On the on-line application form, you will be prompted to answer the following questions:

- What are your interests in STEM and what areas would you like to explore in your academic career?
- How do your academic interests **substantively** align with the research priorities of one or more of the NASA Mission Directorates (see *Appendix A*)? Please be as specific as possible.
- Explain the motivation for your unique research idea or describe specific aspects of your mentor-recommended project that interested you.
- For many community college students, participating in research is a new experience that can help shape your expectations of a STEM career. Briefly describe what research experiences you may have already participated in or what insights you hope to gain by participating in your first research experience with the SCORE program.

Research/Project Proposal

A 2-4 page proposal is required, and must include:

1) **Cover Page (not included in page count)**: Include project title and contact information—including phone number and email address—for both student and faculty mentor.
2) **Research Problem or Project Overview:** Provide a clear description of your research problem or a detailed overview of the project you are proposing.
3) **Relationship to NASA's Mission:** Describe how your problem or project substantively relates to NASA's overall mission (see *Appendix A*).
4) **Goals:** Describe the goals you plan to achieve with your research project.
5) **Experimental Design or Project Plan:** Clearly explain the design of the experiment or plan of the project you are proposing.
6) **References:** Cite sources for project-related information.
7) **Project Timeline:** Provide a realistic and attainable timeline for completion of your proposed project. Project must be completed within one academic term.
8) **Estimate of Weekly Time Commitment:** Provide an estimate of how many hours you anticipate working on your project per week and an explanation of how this will fit into your personal schedule.

Proposals should be single-spaced, using standard 8½ x 11 paper, in font not smaller than 12-point with a minimum of 1" margins. All pages must be numbered sequentially. **Proposals must be signed by the OSGC Affiliate Representative from the student's home institution.** See *Appendix B. Sample Template for Project Proposal* for the proposal template.

Mentor Statement of Support

The faculty mentor must write a supporting letter, describing how the student will contribute to the research or project, indicating support for the proposal, and demonstrating clear understanding of the role of SCORE Mentor (see *SCORE Faculty Mentors* section below). The statement of support must be included with the student's application packet.

Academic Transcript

A PDF version of your academic transcript must be submitted with your online application. Unofficial transcripts from your college or university website are acceptable.

Online Application Website

Students will answer the four online application questions and upload a complete submission packet including Proposal, Mentor Statement of Support, and Academic Transcripts. Apply online at https://spacegrant.net/apps/ors4.

REVIEW CRITERIA

Applications are ranked based on the following criteria:

- Academic Achievement
- Direct relation to NASA vision and substantive alignment with research priorities of one or more of NASA Mission Directorates
- Strength of student essay
- Strength of mentor statement of support/commitment of mentor
- Strength and feasibility of research/project proposal

DELIVERABLES IF AWARDED

- **Student Profile Form:** Students agree to complete an online Student Profile Form when they accept the award. This information is used for reporting to NASA Office of STEM Engagement and for longitudinal tracking purposes to evaluate the effectiveness of NASA's higher education programs. **Due: Wednesday, January 11, 2023**
- **Abstract:** A project abstract provides a summary of the material that will be covered in the final report including 1) research project purpose and objectives, 2) methods, 3) key results or arguments, and 4) conclusions. **Due: Friday, April 21, 2023**
- **Transcripts:** Winter Term 2023 transcripts are required to confirm enrollment in the student's home institution to meet the minimum SCORE requirements. **Due: Friday, May 5, 2023**
- **Final Report:** A final report between 2-4 pages in length should describe the execution and outcome of the project, and the evaluation and analysis of the results. Also include what you personally gained from the experience and how it supported or modified your perspective on research. **Due: Friday, May 5, 2023**
- **Poster:** An illustrated summary of your project, includes the same elements as the abstract: purpose, methodology, results, and conclusions. Posters will be virtual and printed for display at the Spring Symposium. Virtual posers will be posted on the OSGC symposium website. **Virtual Posters Due: Friday, May 12, 2023**
- **Presentation at the OSGC Spring Symposium:** Students agree to present their poster and make an oral presentation about their SCORE research experience for the OSGC Spring Symposium. **Spring Symposium: Friday, May 19, 2023**
- **Recognition of Funding Source:** OSGC must be cited as a source of funding in all publications resulting from the student's work, including the final report, using the phrase "…supported in part through NASA and Oregon Space Grant Consortium, cooperative agreement 80NSSC20M0035".
- **Contact Information:** The student agrees to notify OSGC of any changes in mailing address, email, and telephone number for contact purposes.

- **Information Release:** The student grants permission to release and/or publish requested recipient information to NASA or other appropriate parties. Students submit a signed Media Release Form, granting OSGC permission to release information and utilize any submitted photos for publications and/or social media.

PAST SCORE PROJECTS & HOST INSTITUION

- *Alternative End Cap Designs for Isogrid Propellent Tanks on Low Cost Launch Vehicles* | Portland Community College, Southeast
- *The Application of Radiation Challenges in Simulated Martian Regolith and Diazotropic Cyanobacteria for Selective Breeding of Cold-, Drought-, and Radiation-tolerant Food and Grain Crop Amaranthus Hypochondricus for Human Spaceflight Exploration and Operations to Mars* | Southwestern Oregon Community College
- *Applications of Mycology to Space Travel, Astrobiology, and NASA's Artemis Mission* | Portland Community College, Southeast
- *Custom Tool for Aircraft Sheet Metal Repair Using Consumer-Grade 3D Printer and PLA* | Portland Community College, Sylvania
- *The Effect of Ionizing Radiation on Radiotrophic Fungi in the Context of Space Travel* | Portland Community College, Southeast
- *Investigating the Performance of Electronics Within a Satellite's Radiometer* | Portland Community College, Southeast
- *Pedestrian Evacuation Travel Times to Tsunami Safety Zones in Seaside, OR* | Portland Community College, Rock Creek
- *Project Stardust South Coast Extension: Classification and Characterization of Micrometeorites found on the Southern Oregon Coast* | Southwestern Oregon Community College
- *Radon Levels and their Relationship to the Depth of Portland's Water Table* | Portland Community College, Southeast
- *Studying the Factors that Affect the Orbital Decay of Satellites* | Portland Community College, Rock Creak

See the OSGC SCORE program website at https://spacegrant.oregonstate.edu/stem-community-college-opportunity-research-experience-score-program for additional past projects.

SCORE FACULTY MENTORS

Who can be a mentor? As an affiliate member of the Oregon NASA Space Grant Consortium, faculty at your institution are eligible to serve as a mentor for the SCORE program to support community college students engaging in a potentially life-changing research experience.

What is the role of a mentor? As a participant of the program, you are asked to provide ongoing guidance and resources to support successful completion of a term-long project. The duration of this commitment will vary and is dependent on the type of project and student engagement. This may include, but is not limited to:

- Identifying a student and/or encouraging a student to apply.

- Offering support in completion of the application process.
- Identifying potential projects for students to explore (where applicable).
- Assessing if it is realistic and feasible for the project to be completed in one term.
- Providing guidance regarding experimental design, literature reviews, data collection, and other fundamental research elements. Supporting student researcher in identifying resources in support of research elements.
- Collaboration with your institution's affiliate member and/or administration to identify resources and support materials for a project.
- Providing ongoing communication and encouragement during project duration.
- Providing feedback and edits for student proposal, abstract, final report, and poster.
- Attending student's presentation at OSGC Spring Symposium, May 2023.

Is there assistance for mentors? OSGC will provide support and assistance for mentors to successfully complete their role as a SCORE mentor. Support is identified on a case-by-case basis and may include but is not limited to:

- Toolkits or online resources (i.e. webinars) outlining the basics of research and experimental/engineering design; help with identifying resources.
- Identifying collaborators within the OSGC network to support specialized work or expertise needed to complete a given project.
- Providing guidance on how to access supplies if it presents a barrier to success of the project.

If you are interested in becoming a SCORE mentor, please contact your institution's affiliate representative. See the *Eligible Institutions* section for more information.

FOR MORE INFORMATION

Direct questions to Catherine Lanier, OSGC Interim Director, via email to Catherine.lanier@oregonstate.edu or by phone at 541.829.9065.

Visit the Oregon Space Grant Consortium website: http://spacegrant.oregonstate.edu.

SCORE Award Program details: https://spacegrant.oregonstate.edu/stem-community-college-opportunity-research-experience-score-program

APPENDIX A: AGENCY INFORMATION AND STRATEGIC FRAMEWORK

NASA's current topics and relevant missions are listed below. Students should use these priorities to guide them in the selection of a STARR research review topic.

Humans in Space
International Space Station (ISS) - Commercial Crew Program (CCP) - NASA Astronauts - Low Earth Orbit (LEO) Economy

Moon to Mars
Commercial Lunar Payload Series (CLPS) Initiative - Lunar Gateway - Artemis Mission - Space Launch System (SLS)

Earth
Air – Climate - Hazards - Water, Oceans, and Ice - Land

Space Tech
Space Travel - Living in Space - Manufacturing, Materials, and 3-D Printing - Robotics - Science Instruments - High-Tech Computing

Flight
Green Aviation - Future Aircraft - Supersonic Flight - Reducing Flight Delays - Unmanned Aircraft

Solar System and Beyond
Planets, Moons, and Dwarf Planets - The Search for Life and Exoplanets - The Sun - Stars and Galaxies - Black Holes - Dark Energy and Dark Matter

Current High-Profile NASA Missions
- Artemis Program
- Commercial Crew Program
- Curiosity Mars Rover
- Hubble Space Telescope
- InSight Mars Lander
- International Space Station
- James Webb Space Telescope
- Juno: Mission of Jupiter
- Lunar Reconnaissance Orbiter
- Mars Perseverance Rover
- New Horizons: Pluto and Beyond
- OSIRIS-Rex Asteroid Mission
- Parker Solar Probe

NASA Vision
To discover and expand knowledge for the benefit of humanity

NASA Mission
Lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and bring new knowledge and opportunities back to Earth. Support growth of the Nation's economy in space and aeronautics, increase understanding of the universe and our place in it, work with industry to improve America's aerospace technologies, and advance American leadership.

Strategic themes that make up the foundation of the 2018 Strategic Plan and NASA's goals
- **DISCOVER** - Expand human knowledge through new scientific discoveries

- **EXPLORE** - Extend human presence deeper into space and to the Moon for sustainable long-term exploration and utilization
- **DEVELOP** - Address national challenges and catalyze economic growth
- **ENABLE** – Optimize capabilities and operations

NASA 2018 Strategic Plan

https://www.nasa.gov/sites/default/files/atoms/files/nasa_2018_strategic_plan.pdf

NASA's vision and mission draw support from the organizational structure of the Mission Directorates, each with a specific responsibility.

NASA's Mission Directorates

- Aeronautics Research Mission Directorate (ARMD): transforms aviation with research to dramatically reduce the environmental impact of flight, and improves aircraft and operations efficiency while maintaining safety in increasingly crowded skies. ARMD also generates innovative aviation concepts, tools, and technologies for development and maturation by the aviation community. https://www.nasa.gov/aeroresearch

- Exploration Systems Development Mission Directorate (ESDMD): 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 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.

- Science Mission Directorate (SMD): expands the frontiers of Earth science, heliophysics, planetary science, and astrophysics. Using robotic observatories, explorer craft, ground-based instruments, and a peer-reviewed portfolio of sponsored research, SMD seeks knowledge about our solar system, the farthest reaches of space and time, and our changing Earth. http://science.nasa.gov/

- Space Operations Mission Directorate (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.

- Space Technology Mission Directorate (STMD): pursues transformational technologies that have high potential for offsetting future mission risk, reducing cost, and advancing existing capabilities. STMD uses merit-based competition to conduct research and technology development, demonstration, and infusion of these technologies into NASA's missions and American industry. This mission directorate is being refocused as a new Exploration Research & Technology (ER&T) organization to support exploration as a primary customer. http://www.nasa.gov/directorates/spacetech/home/index.html.

- The Mission Support Directorate (MSD): enables the Agency's missions by managing institutional services and capabilities. MSD is actively reducing institutional risk to NASA's current and future missions by improving processes, stimulating efficiency, and providing consistency and uniformity across institutional standards and practices. https://www.nasa.gov/msd.

APPENDIX B. SAMPLE TEMPLATE FOR PROJECT PROPOSAL

PROJECT TITLE

Student: Name and Contact Info

Name of College

Faculty Mentor: Name and Contact Info

Research Problem or Project Overview:

Relationship to NASA's Mission and Research Priorities

Goals

Experimental Design or Project Plan

References

Project Timeline

Estimate of Weekly Time Commitment