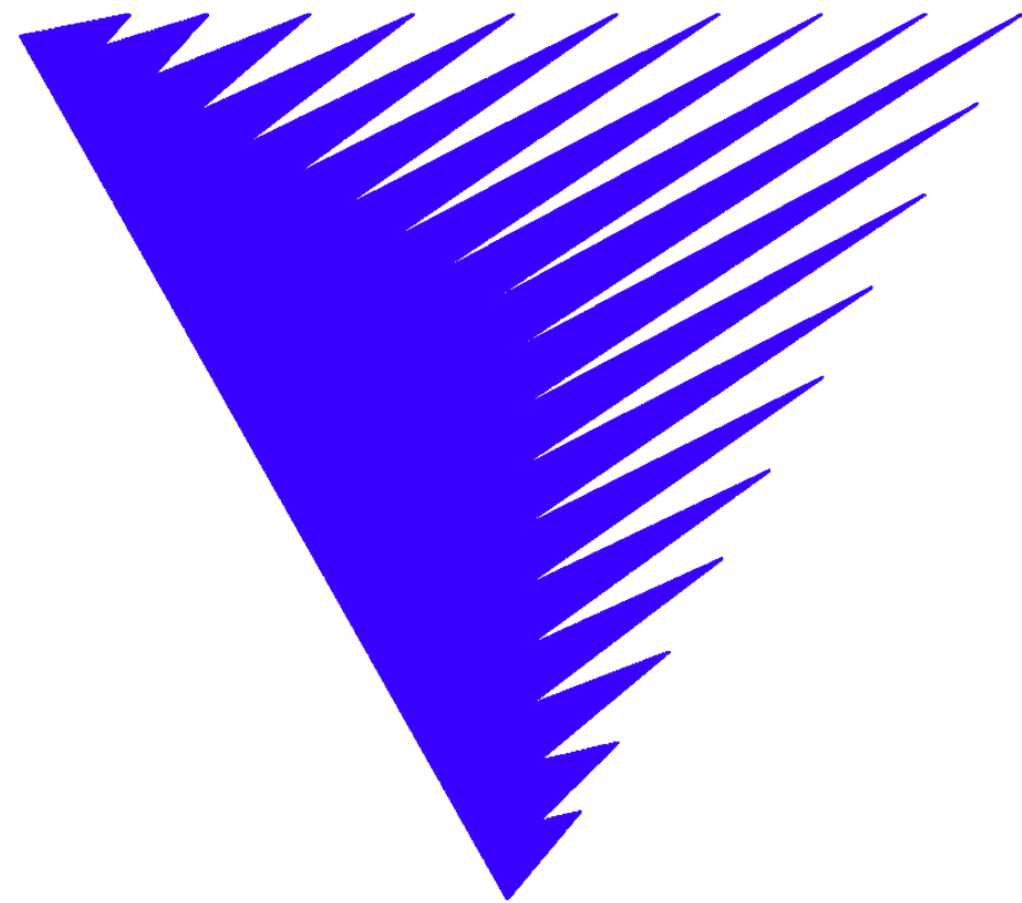


VIRGINIA SPACE GRANT CONSORTIUM

NASA Langley Alumni Association
January 14, 2025

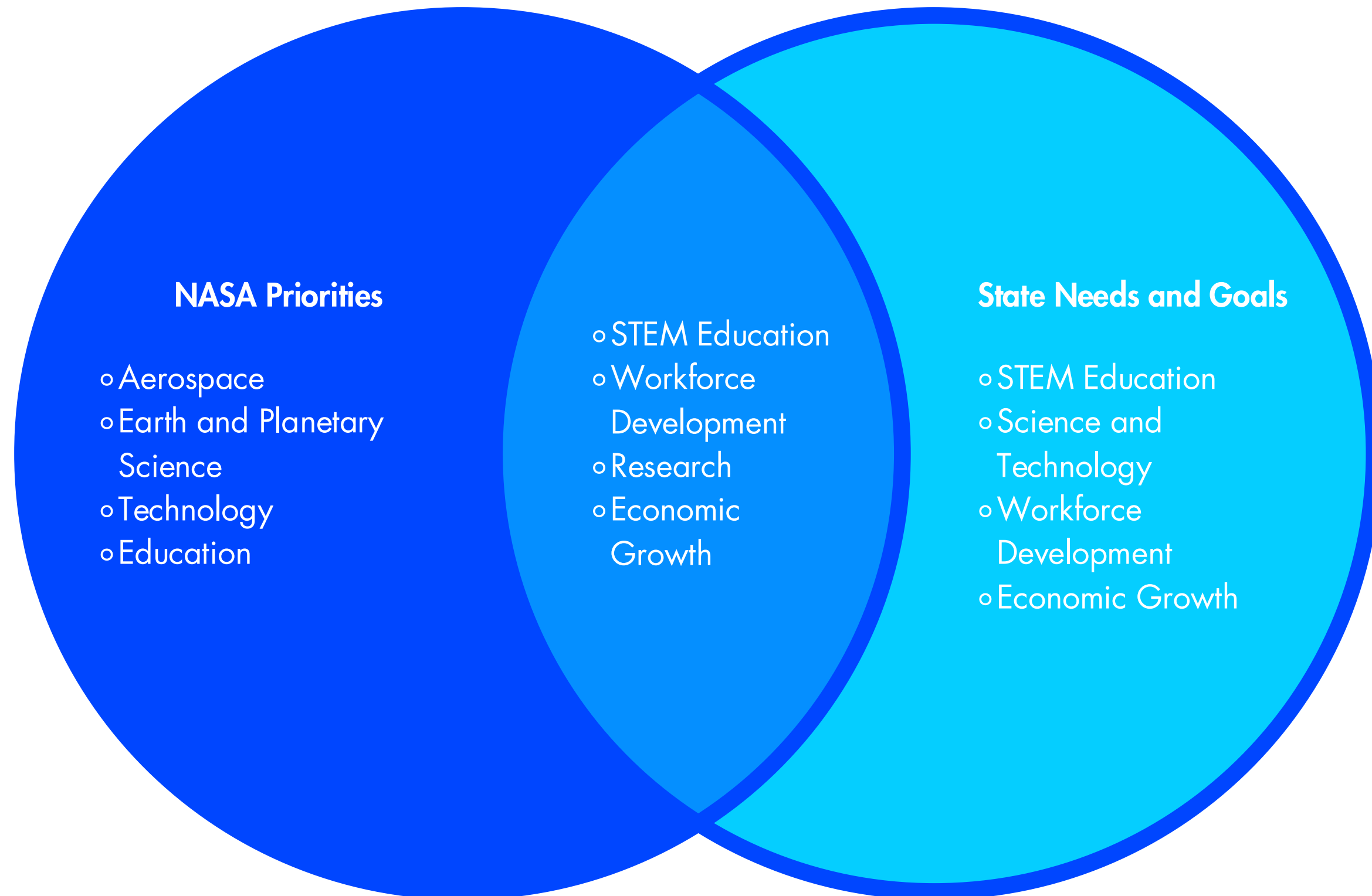
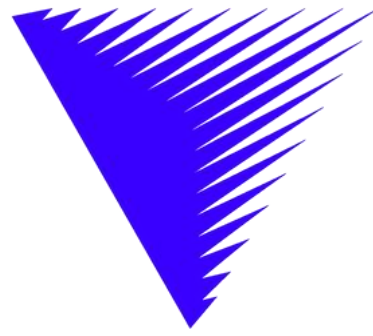




VIRGINIA SPACE GRANT CONSORTIUM

**Partnering with NASA, Industry, and Institutions to Provide STEM
Education, Promote STEM Research, and Prepare a Diverse STEM
Workforce**

National NASA Space Grant Program



History



- Established in 1989



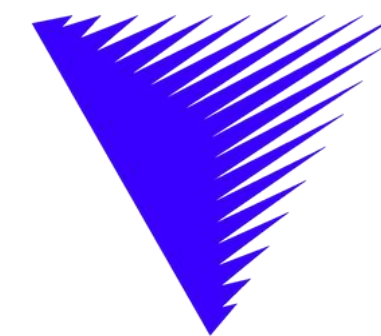
- More than 800 program partners to date
- Work with **all** Virginia universities, community colleges, and school systems



- Funding from NASA, Virginia, and other partners
- Each NASA Space Grant dollar typically leveraged by about \$4-6 in other support

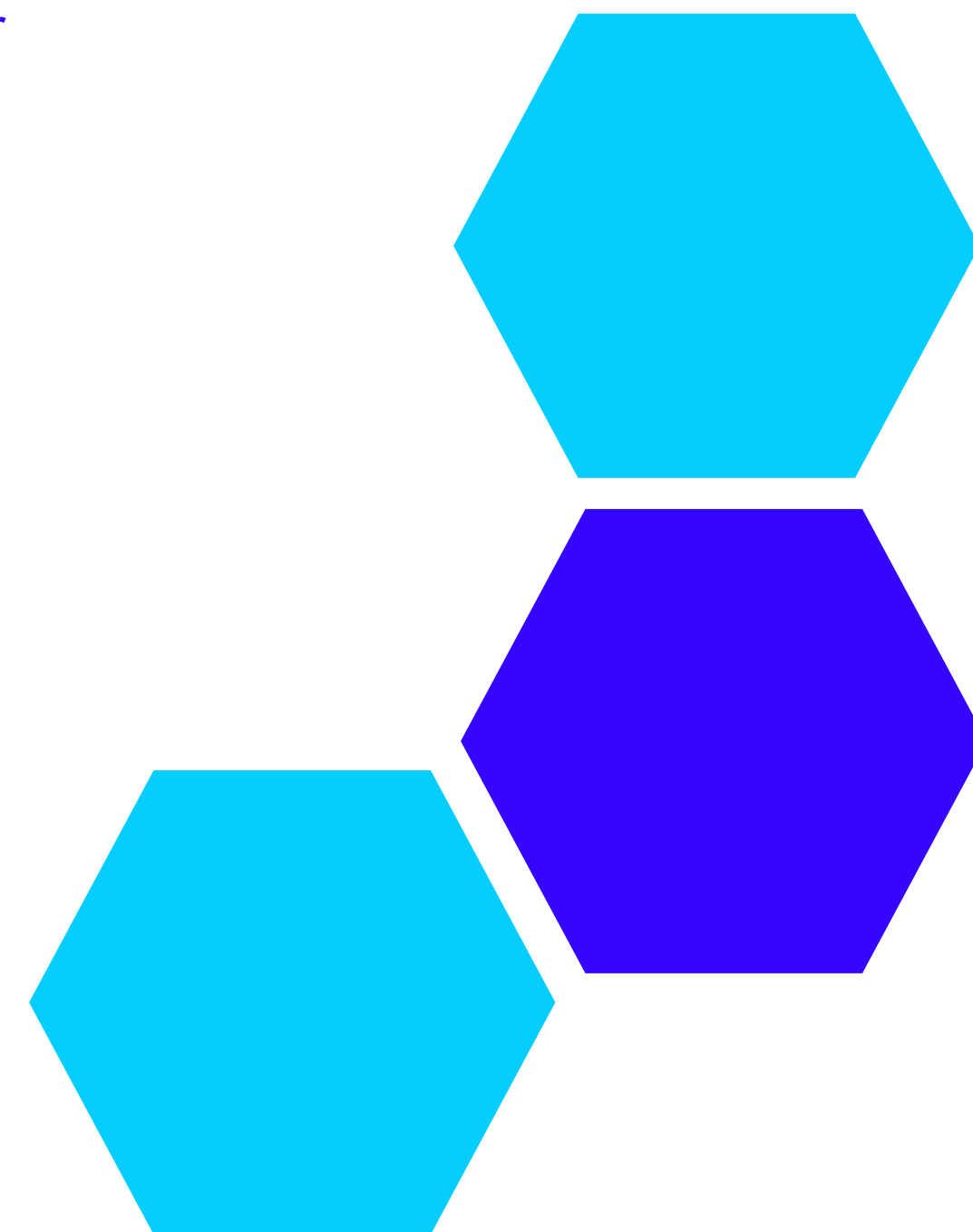


- Regional, state, national, and international programs



Consortium Members

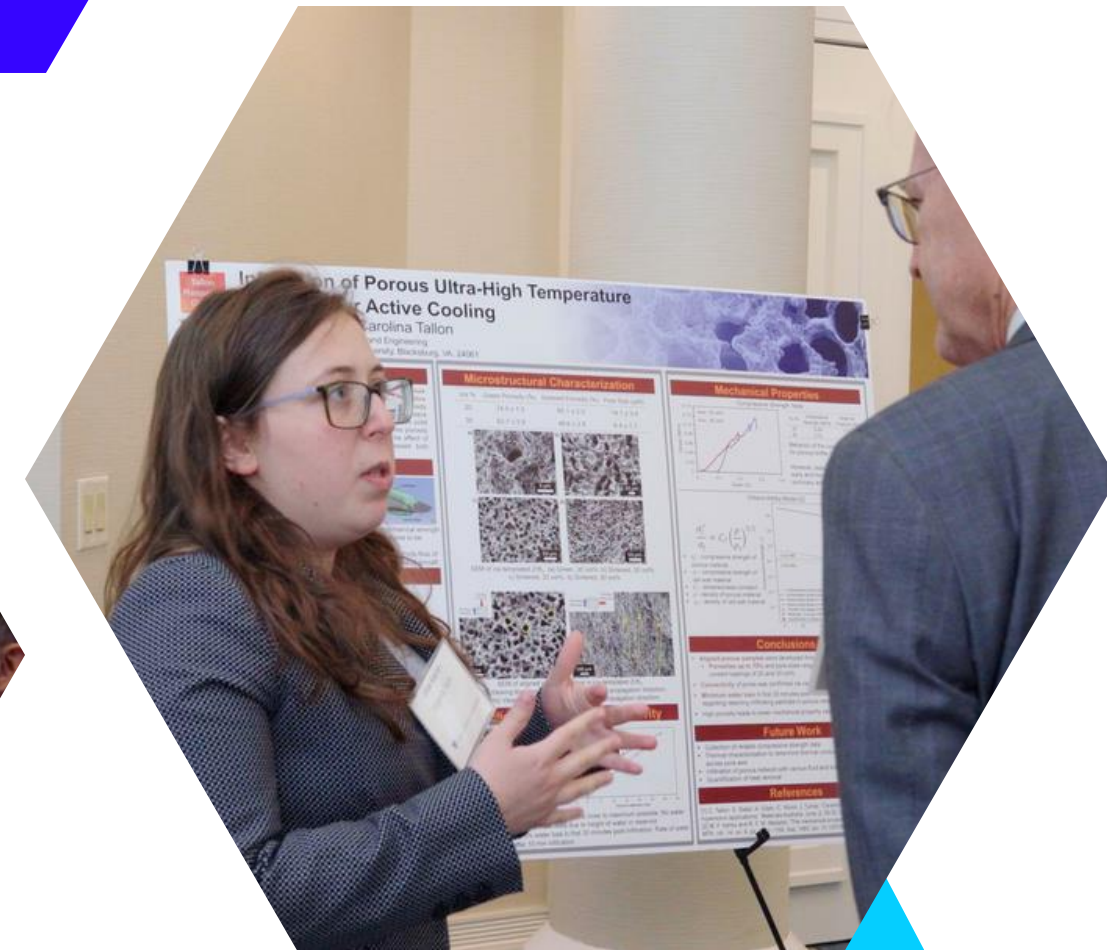
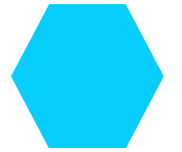
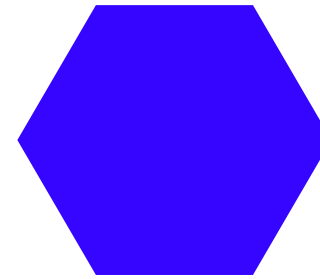
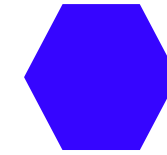
- NASA Langley Research Center
- NASA Wallops Flight Facility
- Old Dominion University
- Hampton University
- William and Mary
- University of Virginia
- Virginia Tech
- Virginia Innovation Partnership Corporation
- State Council of Higher Education Virginia
- Science Museum of Virginia
- Virginia Air and Space Science Center
- Virginia Department of Education
- Virginia Aerospace Business Association
- Virginia Department of Aviation
- Virginia Community College System
- MathScience Innovation Center



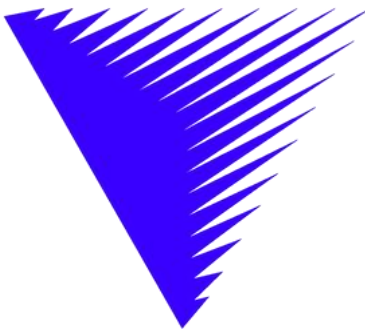
Board of Directors

- Dr. Tim Sands - Chair, Virginia Tech
- Dr. Brian Hemphill, Old Dominion University
- Darrell K. Williams, Hampton University
- Dr. Katherine A. Rowe, William & Mary
- Mr. James E. Ryan, University of Virginia
- Dr. David Doré, Virginia Community College System
- Mr. Scott Fleming, State Council of Higher Education for Virginia
- Mr. Joe Benevento, Center for Innovative Technology

Meets twice yearly typically in April and October



Our Team



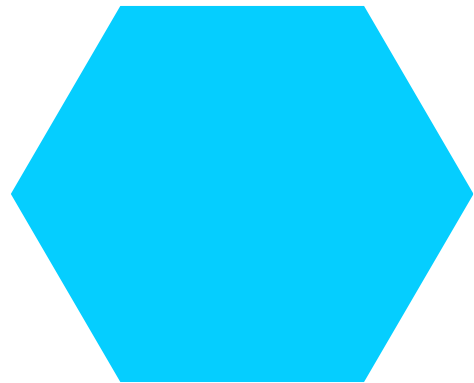
Chris Carter
Director



Mary Sandy
Director
Emerita



Rudo Kashiri
Senior Education
Programs Manager



Debbie Baggett
STEM Education
Specialist



Ian Cawthray
Education Program
Coordinator



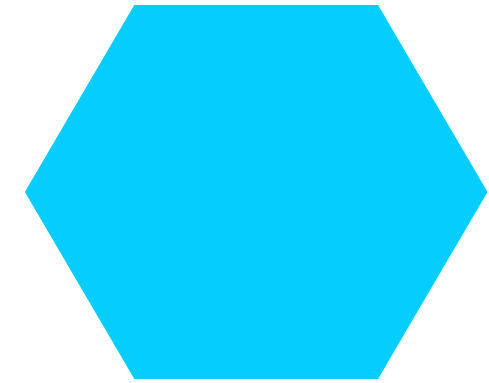
Dr. Jenniter Penland
STEM Education
Specialist



Kristyn Damadeo
Communications
Manager



Emmanuel Jimenez
Media Specialist



Phoenix Williams
STEM Education
Specialist



Dr. Scott Bellows
Technical Programs
Coordinator



Nicole Shaw
Programs Specialist



Sarah Pauls
Program Specialist



Priscilla Hill
Program Specialist



Debbie Ross
Program Specialist



Abram Boyer
Accountant



Kelly Chao
Assistant to the
Director

Virginia Space Grant Consortium

VIRGINIA
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The Virginia Space Grant Consortium (VSGC): Partnering with **NASA**, Industry, and Institutions to Provide STEM Education, Promote **STEM** Research, and Prepare a Diverse **STEM** Workforce.

We provide **FREE** scholarships, fellowships, STEM (Science, Technology, Engineering, Math) courses and programs, internships with NASA and industry, **NASA** summer academies, educator professional development, and **STEM** research.

Program Areas

- Scholarships and Fellowships
- Free, Award-winning STEM Courses and Programs
- Internships with NASA and Industry
- NASA Summer Academies
- Educator Professional Development
- STEM Research Opportunities
- Uncrewed Aircraft Systems Education
- Cybersecurity Education
- Pilot Training



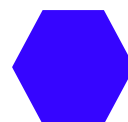
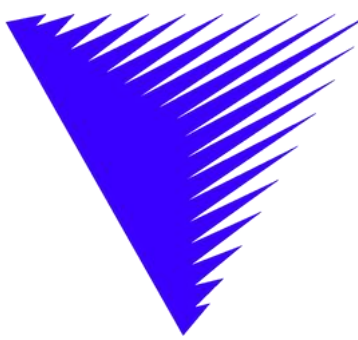
Building the STEM Workforce Pipeline

A progression of middle school, secondary school, and higher education programs to engage and sustain students in STEM (**more than 2,000 students per year**)

- Recruit students statewide
- All **FREE** of cost to participants
- Most have won best practice awards
- Immerse students in real-world projects, hands-on learning, service-learning projects, dual-enrollment credit, and with faculty/industry/NASA mentors



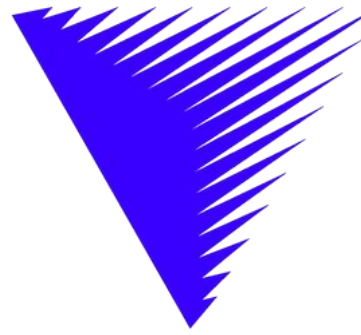
Technology Exploration Saturdays



- Since 2008, impacted **2,886 students** and **2,611 parents**
- Three **FREE** themed events for 75 students in **grades 7-8** and their parents from **Peninsula school districts**
- Topics: mechatronics, creating networks, scribble bots, electrical circuits, automation on the manufacturing floor, unmanned aircraft systems, penny hauling derby, build a robot, STEM careers, financial aid, planning for college
- Partners: Virginia Peninsula Community College, NASA Langley, Canon, Virginia Air and Space Science Center

March 1, 2025 – Hosted by NASA Langley

BLAST



Building Leaders for Advancing Science and Technology



- Engages rising **9th and 10th graders** in fun, problem-based STEM activities to foster curiosity and inspire career exploration.
- Summer residential experience at **ODU, VT, UVA, William & Mary, and Radford**
- 3 STEM-packed days: immersive activities, tours, guest speakers
- Self-assessment to discover and clarify career interests
- Five sessions for 80 students each
- **3,151 participants** since 2013 inception

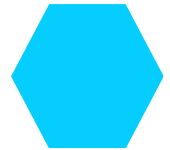
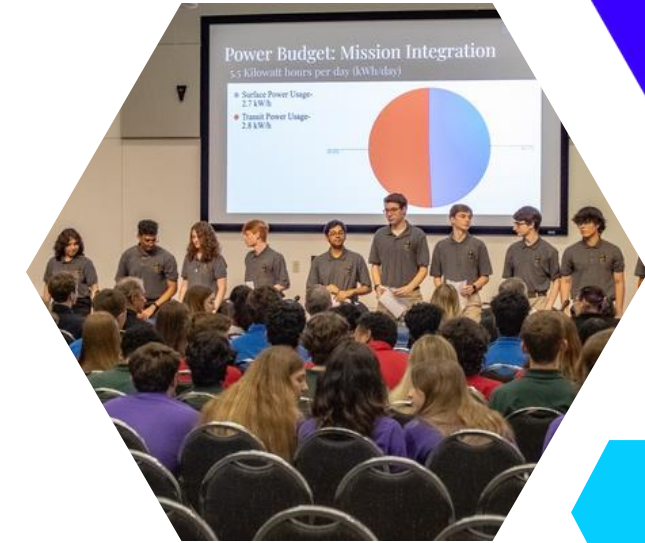
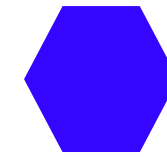
Virginia Aerospace Science and Technology Scholars

Promotes STEM concepts using a space exploration theme and NASA missions.

- Virginia **11th and 12th grade** students
- Online course for over 500 students each year
- 180 students each year attend one of three summer academies at NASA Langley with 60 students in each academy
- Over 7,000 students online and nearly 3,000 students at NASA Langley since 2008.

- Summer academy challenges students to work in collaborative teams to design a human mission to Mars:
 - Students mentored by NASA engineers, scientists, and technologists

- Partners: Sierra Lobo, Lockheed Martin, Boeing, VASBA, NIA, SAME



Virginia Aerospace Science and Technology Scholars

2025 VASTS Academies

Week 1: June 21st – June 27th

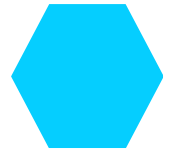
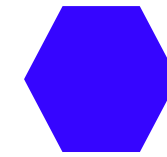
Week 2: July 12th – July 18th

Week 3: July 26th – August 1st

Subject Matter Expertise Mentoring

Attend Panel Presentations

Attend Closing Ceremony



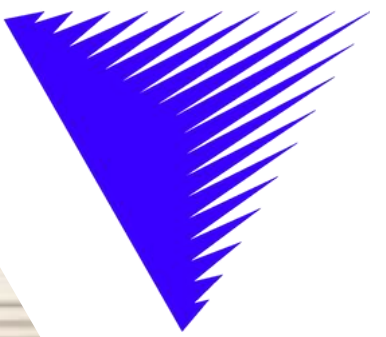
Virginia Earth System Science Scholars

- Students develop an understanding of the Earth's responses to both natural and man-made changes to climate, weather, and natural hazards
- **11th – 12th grade** students
- Online course from December through April – 200 students
- 120 students attend one of two residential academy at NASA Langley Research Center:
- Students receive up to 5 transferable college credits
- Focus on the National Academies Decadal Survey:
 - Hydrosphere - sea level change
 - Biosphere - habitat shifting (ecosystem changes)
 - Lithosphere - ground subsidence (surface dynamics)
 - Atmosphere - clouds/precipitation (improving weather and air quality)
 - Cryosphere - snow, ice, glaciers, permafrost
- About **1,500 students** to date
- Partners: Hampton University, SAME, VASBA



Virginia Earth System Science Scholars

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2025 VESSS Academies

Week 1: July 5th – July 11th

Week 2: July 19th – July 25th

Subject Matter Expertise Mentoring

Attend Panel Presentations

Attend Closing Ceremony



Plant the Moon Challenge

- NASA Space Grant funded expansion of Institute of Competition Science's international competition
- Led by VSGC: West Virginia, North Carolina, South Carolina, Florida, and Puerto Rico
- Focus on underrepresented and underserved students in STEM
- Five professional development sessions around the Challenge, the NASA Artemis program, and related education resources
- \$100 stipend per kit for educators to cover materials costs
- Top state winners receive experiential awards; Top regional winners get trip to Kennedy Space Center



Build the Moon Challenge

- BTMC is a pilot program with ICS
- Nine states are represented: Alabama, Florida, Idaho, Iowa, Mississippi, South Carolina, Texas, Wyoming, and Virginia.

VSGC is sponsoring:

- 11 Teachers/13 Teams / 160 students
- February 12, 2025 - ICS Virtual Opening Symposium
- February 12-March 15, 2025 - Projects & Activities Conducted with TEAMS
- March 16, 2025 - Submissions Due
- March 17-25, 2025 - Judging
- April 2, 2025 - Closing & Awards Ceremony (Virtual)

Virginia Space Grant Consortium is supporting a new signature competition from the Institute of Competition Sciences (ICS) to help engage, inspire, and motivate students to learn through real-world entrepreneurial programming in the burgeoning space industry.

Teams

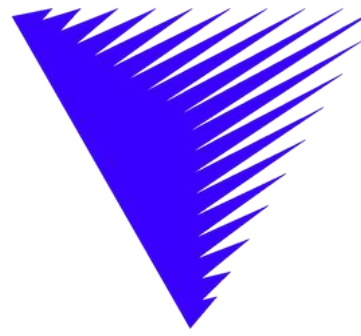
- ✓ Develop a Regolith Concrete Mixture
- ✓ Demonstrate Construction Capabilities of Concrete
- ✓ Use Concrete to Design a Lunar Habitat

Participating teachers receive a free kit, a stipend, and support/mentoring.

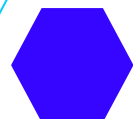
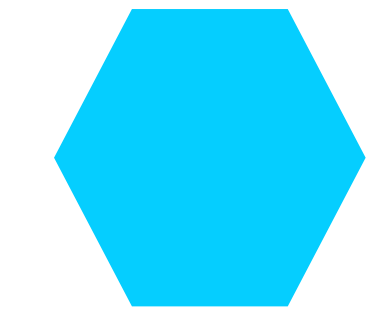
Contact Us:

✉ jpenland@odu.edu

🌐 <https://vsgc.odu.edu/build-the-moon-challenge>

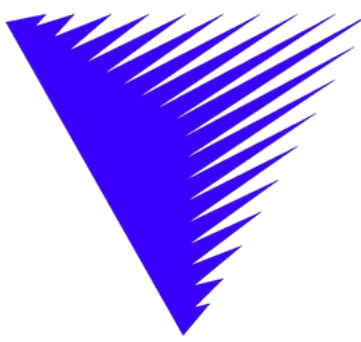


Virginia Space Coast Scholars

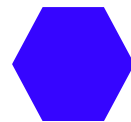


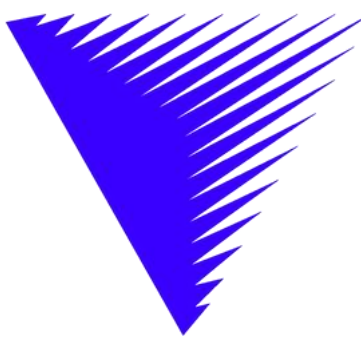
- **NASA Wallops Flight Facility**
- Virginia **10th grade** students
- **Phase 1:** Online course with four modules and a final project
- **Phase 2:** Three residential Summer academy sessions at NASA Wallops (selected students)
- Mentored by WFF engineers, scientists, and technologists
- Final mission design presentation
- Mid-Atlantic Regional Spaceport tour plus tours of NASA Wallops labs and facilities
- More than **3,000** students to date

Virginia Pathways Flight Academies



- High school students who want to be pilots.
- Ground school and flight training, including their first solo flight and 15 flight hours
- 20 high school students each year
- 12-day residential program in partnership with Flight Schools:
 - Rick Aviation (Newport News)
 - Averett University (Danville)
- Funding from Commonwealth of Virginia and Howmet Aerospace Foundation
- **149** students to date





Aviation Career Pathways Portal

Virginia Aviation Pathways

The aviation industry is an integral part of the U.S. economy. Boeing's 2022 Pilot and Technician Outlook projects 602,000 new pilots and 610,000 new technicians needed to fly and maintain the global commercial aviation fleet during the next 20 years.

According to the U.S. Bureau of Labor Statistics Occupational Outlook, Commercial Pilots earn an average of \$148,900 per year and about 18,100 openings for commercial pilots are projected each year, on average, over the next decade. Aircraft and Avionics Equipment Mechanics and Technicians earn an average of \$70,7400 per year and about 13,100 openings are projected each year, on average, over the next decade.

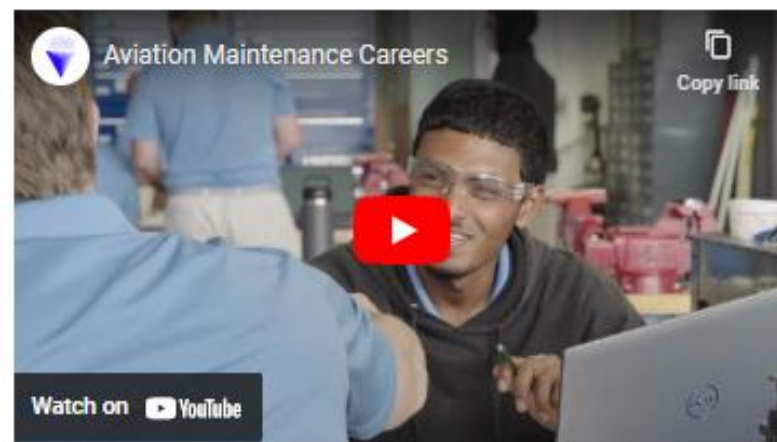
Choose Your Career Path

Pilot



Pilot Careers Infographic

Maintenance Technician



Maintenance Technician Infographic

- Career guidance, aviation career videos, pathway infographics
- Aviation academic and training opportunities in Virginia
- Financial aid, and other aviation career resources for students, parents and counselors
- <https://vsgc.odu.edu/aviationpathways>

Pre-College Aviation Opportunities

College and University Aviation Programs

Airport Flight Schools

Aviation Scholarships

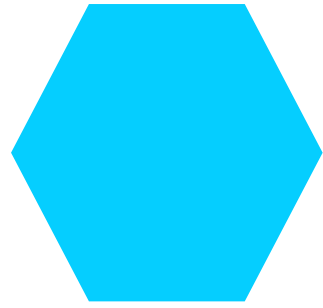
Aviation Organizations

Other Resources

Virginia Space Grant Consortium Pathways Flight Academies

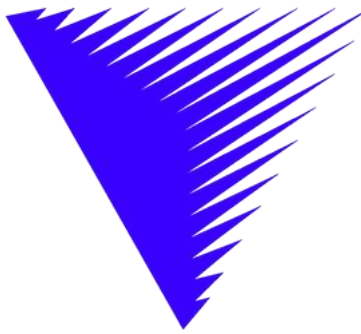
Virginia Space Grant Consortium GeoTEd-UAS

Dynamic Aviation's NEXTGEN Aviators



NASA Aerial Drone Competition

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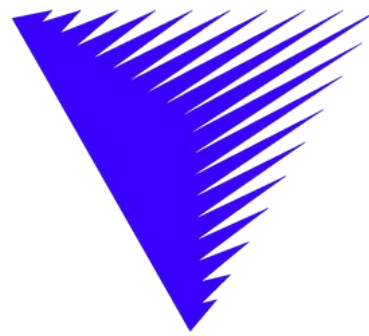


- NASA Langley Research Center
- December 2023, January and December 2024
- Educator Network
- Promote
 - Marketing
 - Recruitment
- Sponsorship
 - Luncheon
 - Volunteers



Uncrewed Aerial Systems (UAS), or Drone Course Development and Faculty Training

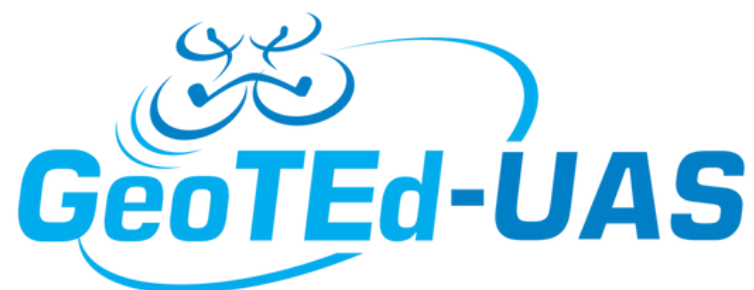
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- VSGC has led 5 NSF Advanced Technological Education (ATE) awards (2007 – current)
 - More than \$3.6M awarded
 - Partnership with Virginia's Community Colleges
- **Mission:** Build community college and educator capacity to educate and train the geospatial and small UAS operations technician (sUAS-OT, or drone) workforce.
- Components and Deliverables:
 - New Course Prefix
 - New UAS and GIS Courses
 - Faculty Professional Development
 - Student Outreach
 - Service-Learning Projects

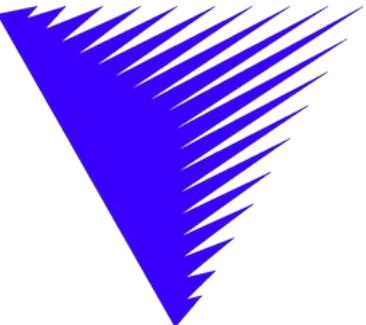


COLLEGE OF NATURAL
RESOURCES AND ENVIRONMENT
VIRGINIA TECH.



**Mentor Educators and VSGC Team

Virginia Community College Courses



Instructional
Materials

New and
Incumbent
Workforce

Service-Learning
Projects

Accelerated
Courses

Transfer
Opportunities



UMS 111
Introduction to
Manual
Flights



UMS 177
sUAS
Components
and
Maintenance



UMS 120 -
Drone
Imaging for
Immersive
Media



UMS 211
Advanced
Autonomous
Flights

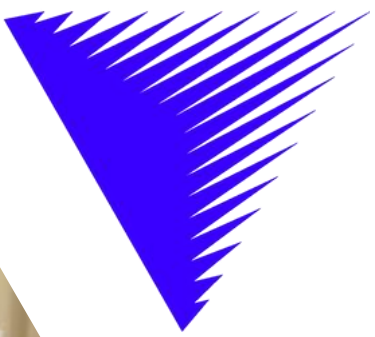


UMS 112
Program and
Flight Data
Management



UMS 290
Coordinated
Internship





Scholarships and Fellowships

- More than \$9 million awarded to more than 2,500 students
- \$2000 community college scholarship
- \$1,000 STEM Bridge scholarship
 - Sophomore or Junior
- Undergraduate research scholarship
 - Up to \$8,500 for faculty-mentored, NASA-related research
- Graduate Research Fellowship
 - \$6,000 for faculty-mentored, NASA-related research
 - Requires \$6,000 in matching funds from member institution

**Mentor Awardees, Connections to NASA



Student Research Conference

2025 Conference Hosted by Hampton
University (tentative)

- Graduate Fellows give a short technical talk
- Undergraduate Scholars give a poster presentation
- Luncheon with keynote by invitation

** Attend and Interact with Students



Student Flight and Design Projects

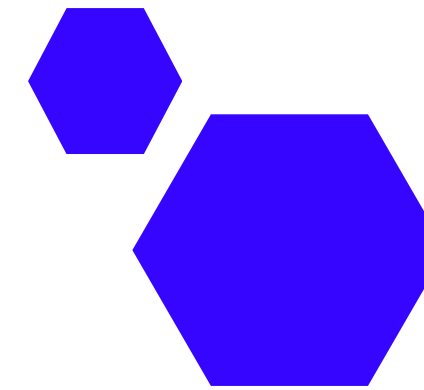
- Funding is available to support flight and design projects
- Previous projects include:
 - Rocketry
 - Small satellites
 - High-altitude balloon projects

**Mentor Project Teams

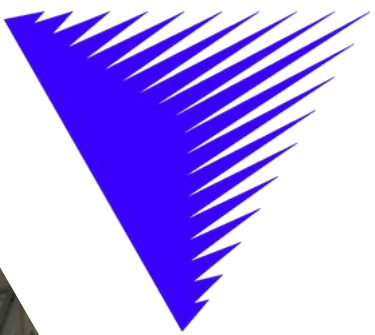


Commonwealth STEM Industry Internship Program

- State funded program supported by the Governor's Office
- Connects Virginia undergraduate students with paid STEM internships with business/industry in Virginia
- No deadlines, apply once to reach more than 200 companies across Virginia, full and part-time opportunities
- Companies hire and pay students
- Year-round support to companies to customize experience and ensure connections to the right interns
- Recognition from the Governor and hometown press release



STEM Takes Flight



FREE NASA research experience for students

- \$6,000 stipend for 10-week summer placement
- Engineering software tools, fabrication of aerospace composite models, flight dynamics simulation development, entry, descent, and landing simulation software, unmanned aerial system building and flight testing, test facility support, machine learning, balloon science, and more
- Open to all Virginia community college students with a STEM major
- 25 placements per year
- **Lunch and Learn Guest Speakers

Faculty 3-day workshop at NASA's Wallops Flight Facility

- Model importance of teamwork and communications in 21st century workforce skills
- Helps faculty see how skills are applied in real-world workplace situations

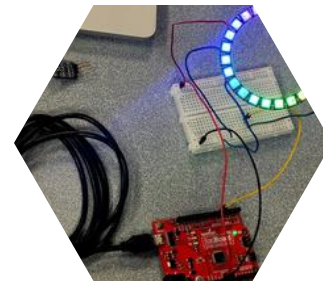
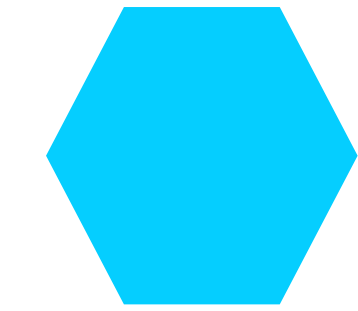


Middle Grades Career and Technical Education

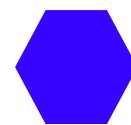
- Space-themed middle grades CTE professional development program offered in partnership with Old Dominion University
- 15 teachers from across the state
- \$2000 stipend
- Immersive two-week program at Old Dominion University with engaging activities, lessons plans, tours and speakers
- Tours of NASA Langley Research Center, NASA Wallops Flight Facility and Mid-Atlantic Regional Spaceport
- Short professional development sessions during the academic year
- **Mentor Teachers



STEM Innovative Project Proposals



- VSGC supports innovative project awards
- Projects are member-led, including all 23 Virginia community colleges
- Innovative projects where a small grant would make a difference
- Areas of interest:
 - Activities related to NASA's Artemis mission Programs
 - related to NASA Earth system science data
 - Research experiences for undergraduate students
 - Service-learning experiences for students
 - Teacher professional development
- Calls for proposals are typically made in January of each year
- **Mentor Project Leaders, Connections to NASA



Here to Help

- VSGC is a FREE resource for you
 - Connection to NASA and other key resources
 - Partnership on proposals
 - Advisement and mentorship
 - Help with aviation and aerospace school





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