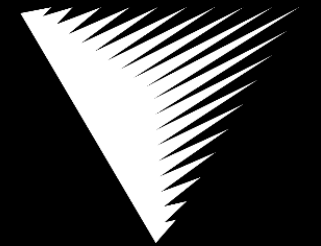


Mid-Atlantic Advanced Air Mobility Educator's Conference

May 24, 2023

Report from the VA Space Grant Consortium...

VIRGINIA
SPACE GRANT
CONSORTIUM



Scott Bellows
Technical Projects Coordinator, VSGC
Chair, Education & Outreach Comm., AUVSI



Virginia Space Grant Consortium

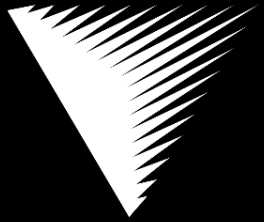
The Virginia Space Grant Consortium (VSGC) is a coalition of five Virginia colleges and universities, NASA, state educational agencies, Virginia Innovation Partnerships Corporation, and other institutions representing aerospace education and research.

The VSGC offers scholarships, fellowships, internships, teacher/faculty professional development, student flight programs, pre-college student programs, and informal educational programs.

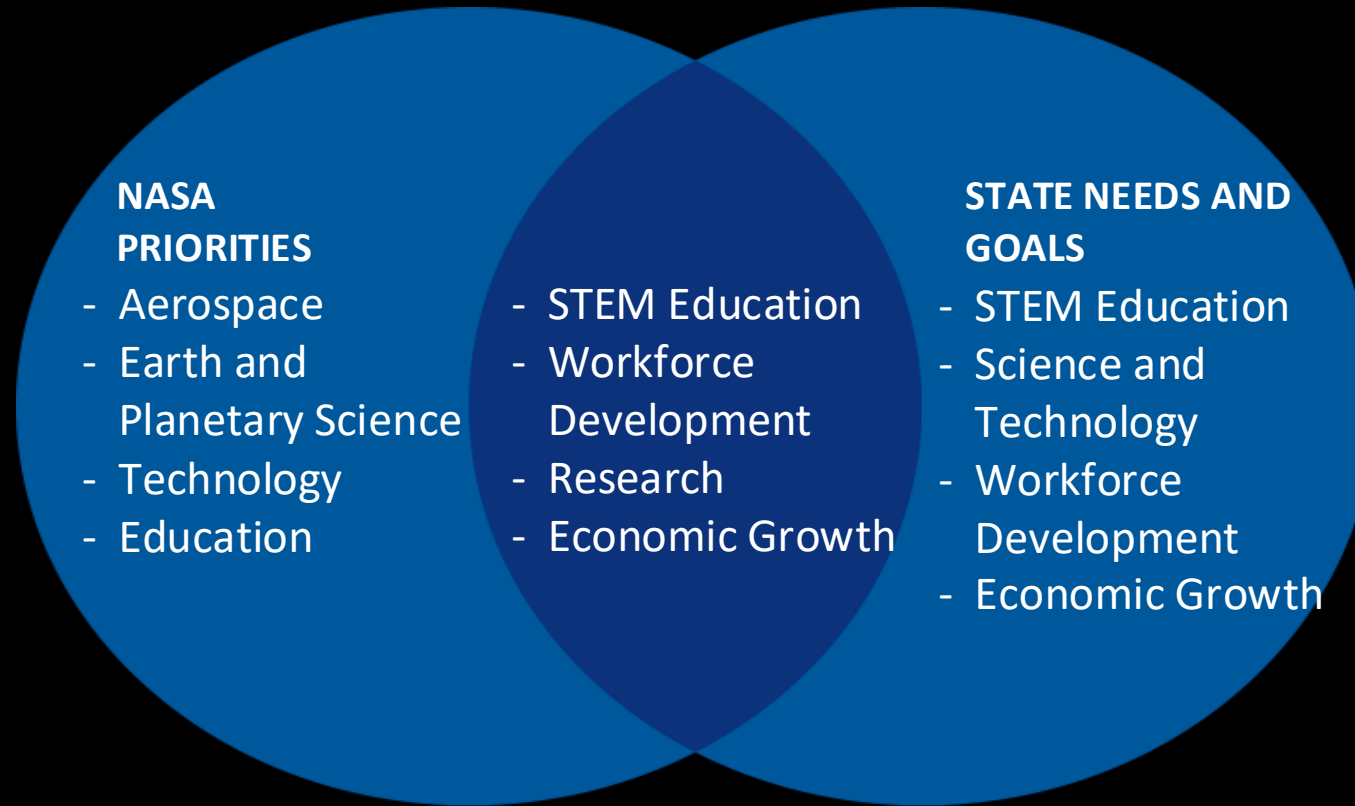
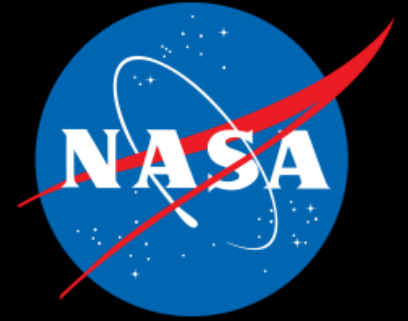
Visit www.vsgc.odu.edu



VIRGINIA
SPACE GRANT
CONSORTIUM



Virginia Space Grant Consortium



A NASA Space Grant Program in Every State

<https://VA.spacegrant.org>

Virginia Space Grant Consortium

Hampton University

Old Dominion University

University of Virginia

Virginia Tech

William & Mary

NASA Langley Research Center

NASA Goddard Space Flight Center's Wallops Flight Facility

State Council of Higher Education for Virginia

Virginia Community College System

Virginia Department of Education

MathScience Innovation Center

Science Museum of Virginia

Virginia Air and Space Center

Virginia Innovative Partnership Corporation

Virginia Aerospace Business Association

Virginia Department of Aviation

Virginia
Space Grant
Consortium



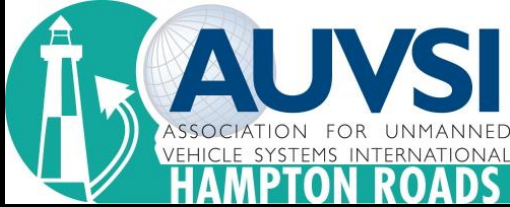


My primary responsibility @ VSGC

-  flagship internship program
- Provides insight to STEM Industry needs
- Began in 2013, with nearly 1,000 student placements (all paid)
- Year round (spring, summer and fall semesters)
- All accredited 2- and 4-year Virginia institutions
- 55 UMS placements since summer 2018

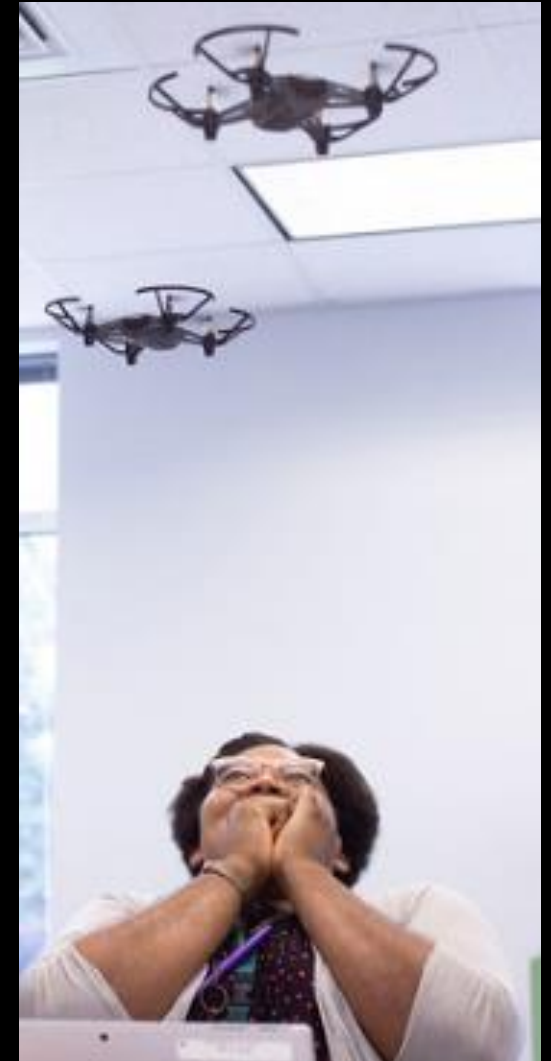
More later...





Education and Outreach Chair

- VSGC allows me direct access to
 - Teachers (Professional Development)
 - Integration of these technologies into curricula
 - Students
 - K-12 (Introduction to UAS) through various activities
 - College Students
 - Direct instruction
 - Internships
- AUVSI allows me direct access to UMS Professionals
 - Exposure (**what we are doing/how we can help**)
 - Internship opportunities
 - Employment





STEM TAKES FLIGHT
at Virginia's Community Colleges

TNCC GIS 295 (2016)...

Topics in Service-Learning GIS Course Fieldwork at NASA Wallops Island





SERVICE LEARNING COURSE OPPORTUNITY AT NASA WALLOPS ISLAND

**HELP NASA INVESTIGATE SEA LEVEL RISE AND
INVASIVE SPECIES**

Thomas Nelson Community College is offering a three-credit Sea Level Rise Service Learning course. All expenses paid for course tuition and four days of fieldwork including travel, lodging, and food! Open to Virginia community college. Competitive application process, students from all disciplines are encouraged to apply. Sponsored by Virginia Space Grant Consortium (VSGC) and offered through the STEM Takes Flight Program in partnership with NASA Wallops Flight Facility and Thomas Nelson Community College.

GIS 295 - Topics in Service Learning in GIS.
This online course contains four days of outdoor fieldwork at NASA Wallops on Virginia's Eastern Shore. Field work will likely be completed over a weekend (Thursday-Sunday) in April 2016.

Faculty-led student teams will engage with NASA scientists to tackle the issue of sea level rise, invasive species and their impact on coastal communities and ecosystems including NASA Wallops. Using GIS, global positioning system (GPS), unmanned aircraft systems, and other technologies students will model various sea level rise scenarios and gauge their impacts to NASA infrastructure and habitats. Students will compare data with existing datasets and develop a report to be presented to NASA staff.

Application: <https://www.surveymonkey.com/r/9HXDL88>
Application Due Date: December 1, 2015
Notification of acceptance by December 5

<http://www.vsgc.edu/STEMtakesFlight/sealevelrise.html>










During the course you will

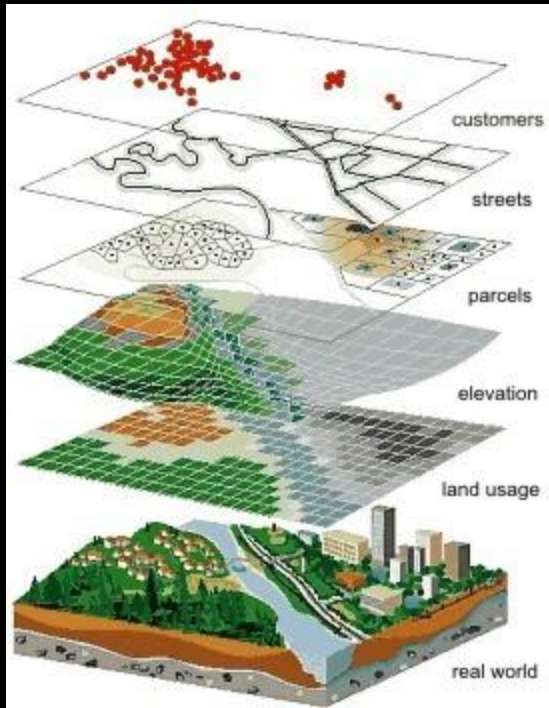
- Learn about service learning.
- How to use and operate an Unmanned Aircraft Systems (UAS) to collect data
- Develop or acquire geographic information system GIS skills in analyzing data collected with a UAS. (Prior GIS knowledge is not a pre-requisite for this cross-discipline course)
- Learn about remote sensing and how to use regular imagery, near infrared imagery and Lidar to answer questions using a GIS.
- Help NASA solve a problem, work side-by-side with NASA scientists
- Gain real world experience collecting and analyzing data
- Tour the facilities and observe the research being completed at the site.

Funded by



VSGC and Drone Education

- Five NSF Grants since 2007 to the present
- (2)GIS (GeoTEd) – (3)sUAS (GeoTEd-UAS)...natural transition
- GIS and sUAS grants have similar models (more in a minute)



Drones in Remote Sensing



- **In the past...**
 - **Satellite Imagery**
 - LANDSAT – 30m pixels, multispectral (industry standard), some better sensors (USGS)
 - **Digital OrthoPhotos (QQDs) actual photos that were geoprocessed (USGS)**
 - **Data Collected from a private airplane and geoprocessed. Extremely expensive**

Now...UAS technology—drones

- **Collect your own data, cheaply, determine your own extent, path and sensor—anytime**
- **FAA rules...constantly changing...**



Model Summary



- Industry panel → DACUM
- DACUM → curriculum & career pathways development
- Summer Institutes for CC faculty → integration of sUAS technology into CC curricula
- Student Recruitment/Teacher Professional Development
 - Scholarships
 - Outreach
 - Service learning
 - Teacher Workshops
 - Student Workshops

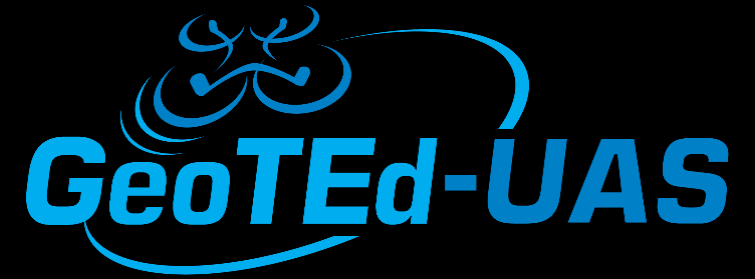




Geospatial Technician Education-Unmanned Aircraft Systems

GeoTEd-UAS is supported by National Science Foundation grants to develop and implement GIS/UAS academic courses and pathways at Virginia's Community Colleges





3 DACUM Charts
(GIS Technician, Small UAS Operator Technician,
Unmanned Systems Technician)

VCCS, New UMS Prefix
Seven new sUAS-focused courses

Faculty Institutes
More than 75 Educators Trained
(All Obtained FAA Remote Pilot Certificate)

**10 Community Colleges Offering Courses, 1,014
Students Completed UMS Courses since fall of 2017.**

**UAS PROFESSIONAL
DEVELOPMENT**

NSF-ATE PROJECT

**OUTCOMES AND IMPACTS
TO DATE**

UMS

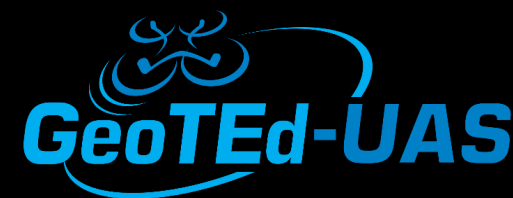
coursework/pathways

Four original sUAS Courses developed from DACUM results by TNCC and MECC (there are now seven)

Courses approved by VCCS (2016)

Pathways vary among participating community colleges

Julie Young VPCC to discuss



Recruitment and Outreach



Recruitment and Outreach



The following is an overview of VSGC's activities in sUAS

- High School Teacher PDs/Institutes
- Precollege Student Workshops
- Service-learning
- Internships



3-day Workshop HCS (Transp Academy BHS)



Day 1: Geographic Information Science (ArcGIS Online and ArcGIS-Pro)

Day 2: Flying drones 101, mapping

Day 3: Drones in the classroom (programming)



1st LAANC flight, and everyone fly the P-4 manually



High School UAS Teacher PD

- ▶ **20 CTE teachers completed 4-Day PD hosted by VT, coordinated and led by VSGC.**
- ▶ **All 20 got FAA Part 107 Remote Pilot Certificate.**
- ▶ **Teachers receive up to \$2,500 in Mini-Grant for program equipment.**
- ▶ **12 Teachers are Teaching 'Intro to UAS' (VDOE CTE Course) During upcoming Academic Year. 8 Teachers are Integrating UAS into Instruction.**
- ▶ **VSGC on VDOE Curriculum Committee: now contributing to an 'Advanced UAS' Course.**

Pre-college Student Pipeline for UAS Careers



- High School & Middle School UAS events at partnering colleges
- Student Scholarships and Internship Support
- Dual-Enrollment, Transfer, and Articulation Agreements
- Service-learning opportunities



Middle School Technology Saturdays



1.20.2018_TechSaturdays_358

by Virginia Space Grant Consortium



90 students/three hours....

- Introduction to drones and demos
- Various topics
 - Applications
 - Sensors
 - FAA Regulations
- Anatomy of a drone
- Learning to fly a drone
- Drone obstacle course competition



Summer 2022 DARS Drone Camps

Cooperative effort (reup to two more years (2023 - 2025)...



VIRGINIA DEPARTMENT FOR AGING
AND REHABILITATIVE SERVICES

DARS' mission: to improve the employment, quality of life, security, & independence of older Virginians, Virginians with disabilities, & their families.



Summer 2022 DARS Drone Camps for students with disabilities

Two Camps (August 2022)

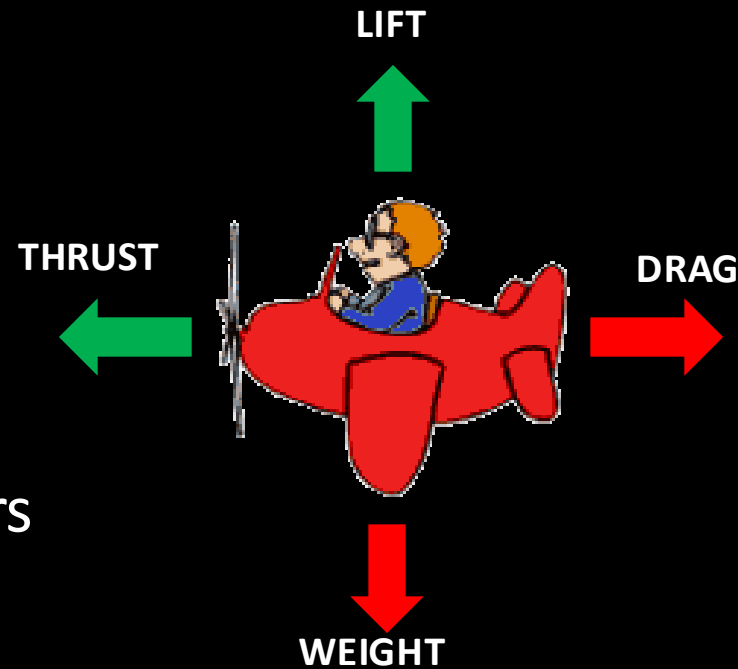
14–18-year-olds (3 days [Tuesday through Thursday; 9:00-2:00])

18–21-year-olds (4 days [Monday through Thursday; 9:00-2:00])

- Younger HS Students with Disabilities with an open DARS PE (Potentially Eligible), typically 14-, 15- and 16-year-olds
- VR (Vocational Rehabilitation), typically 16,17, 18-year-olds—can be up to age 21 depending on their diploma type

What did we do?

- Physics of flight
- Drone Safety
- TRUST Certificate
- UMS applications and careers
- Flight instruction
- Field experience
- Competitive obstacle course race
- Drone Drop
- Nauticus Museum trip
- Received their own drone



Applications/careers (salaries) in UMS



Field Trip to Anderson Park (Newport News)





Featuring the
Battleship *Wisconsin*



DRONES: IS THE SKY THE LIMIT?

Photo Finish...



SERVICE-LEARNING PARTNERSHIPS

The Nature Conservancy

- Multiple Projects in Shoreline Mapping, Shoreline and Invasive Species ID
- Property Inspections / Change Over Time

NASA Langley Research Center

- Student Internships
- Tree Mapping and Monitoring

NASA Wallops Flight Facility

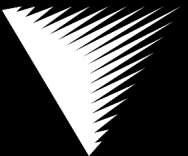
- Mapping invasive plant species
- Vegetation and Shoreline mapping

Virginia Tech

- Imagery and 3D modeling of Lane Stadium

US Forest Service

- Mapping Golden-Winged Warbler and other species habitats



Service Learning (mapping)

The Nature Conservancy 



TNC, Oyster Shoreline



ster Slip

Sunmyside Rd

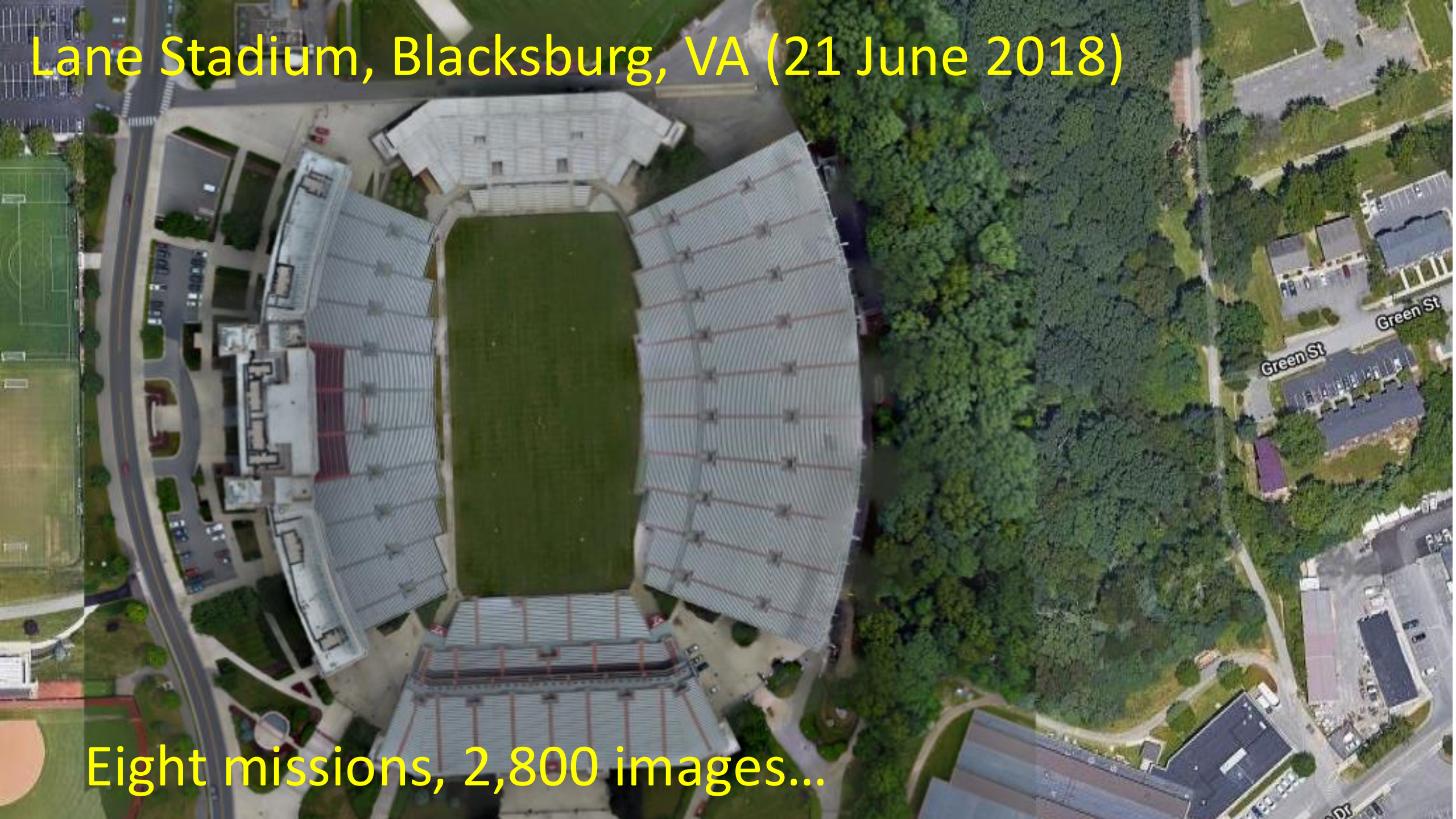
ter Cir

Broadwater Cir

© 2018 Google

Lane Stadium, Blacksburg, VA (21 June 2018)

Eight missions, 2,800 images...



Lane Stadium, Blacksburg, VA



Commonwealth STEM Industry Internship Program

CSIIP



**COMMONWEALTH STEM INDUSTRY
INTERNSHIP PROGRAM**

**Developed and Managed by the
Virginia Space Grant Consortium**

Financial Support Currently Available...

**VIRGINIA
SPACE GRANT
CONSORTIUM**



What is CSIIP?

A statewide one stop, centralized, searchable online database system. 131 students placed this year

Nearly 1,000 placed since inception (2013)

CSIIP matches **STEM** students to VA companies offering paid STEM internship positions.

CSIIP FREE to use for students, companies, colleges and universities.



CSIIP works with all Virginia community colleges, colleges and universities.

CSIIP offers spring, summer, and fall internship opportunities.

55 UMS-related interns placed since 2018 (~25 more this summer)

My first AUVSI meeting...

Companies

Advanced Aircraft Co.

Casper Drones

DroneUp

Express Drone Parts

Longbow Grp

ODU ICAR

Sentinel Robotic Solutions

Spatial Integrated Systems Inc.

Universal Solutions International Inc



Funding Available (see flyers)



- We place interns in all STEM fields, we can be of financial assistance to you with aerospace and aviation (including unmanned systems), and cyber related internship positions:
 - We can support 50% of each internship, up to \$5000
- Go to CSIIP's website and click on the 'Companies' tab to start the process.
- CSIIP is state funded and free to companies and students
- Registered companies have access to hundreds of prequalified applications in our student database, and we can even do the searching for you.



<http://csiip.spacegrant.org>

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