Clockwise from the upper left: Sarah Olderr and Jason Trader, Undergraduate Research Award, Whitworth University; Angela Kimber, WSGC Summer Undergraduate Research Program, UW; Seattle Central Rocket Team, Seattle Central College; Maren Mossman, WSGC Graduate Fellow, Washington State University; Kyle Roberts, WSGC Private Industry Internship, UW.
CONSORTIUM MEMBERS
University of Washington
Central Washington University
Heritage University
Museum of Flight
North Central Educational
Service District
Northwest Indian College
Pacific Science Center
Seattle Central College
Seattle University
University of Puget Sound
Washington State University
Western Washington University
Whitman College
Whitworth University

PARTNERS
Aerojet Rocketdyne
Eagle Harbor Technologies
M42 Technologies
MSNW
Tethers Unlimited
Woodruff Scientific Inc.
First Nations MESA
Olympic Educational Service District
Everett Community College
North Seattle College

OUR MISSION
The Washington NASA Space Grant Consortium is a statewide organization established and supported by NASA, with additional funds provided by state and private sources. The Consortium works to assure a productive future in space science and technology for Washington by providing space-related education and research opportunities for learners of all ages.
2016 Space Grant Awards Reception and Poster Session

wəłəb?altxʷ – Intellectual House
Poster viewing and refreshments 1-5 p.m.
Formal program 3 p.m.

WELCOME TO wəłəb?altxʷ – INTELLECTUAL HOUSE

INTRODUCTION
Robert Winglee
Director
Washington NASA Space Grant Consortium

WELCOME TO THE UNIVERSITY
Michael B. Bragg
Dean
College of Engineering

PRESENTATION OF CERTIFICATES
PRESENTATION OF AWARDS
Washington NASA Space Grant Consortium gratefully acknowledges the support of

The Mary Gates Endowment for Students
The Irving and Louise Donnergaard Endowment
The Sigurd Olsen Endowment
Lt. Col. Michael P. Anderson Memorial Diversity Endowment
Dovie Samuelson Endowment
Friends of Washington NASA Space Grant Consortium
The Pacific Northwest Louis Stokes Alliance for Minority Participation
Washington Sea Grant
Washington State Opportunity Scholarship
Aerojet Rocketdyne
Eagle Harbor Technologies
M42 Technologies
Mid-Mountain Materials, Inc.
TerraPower, LCC
Tethers Unlimited, Inc.
Woodruff Scientific, Inc.

and

The University of Washington
Undergraduate Academic Affairs
Office of the Provost
Office of Student Financial Aid
The Graduate School
Office of the Vice Provost for Student Life
College of Arts and Sciences
College of Engineering
College of the Environment
Research Institute for Space Exploration
2016
Space Grant Scholars
University of Washington Incoming Freshmen

Washington NASA Space Grant Consortium annually offers merit scholarships to incoming freshmen planning to study science, technology, engineering or mathematics at the University of Washington. The UW scholarship program is designed to create a supportive small college atmosphere within the larger university.

Olga Andreeva

Olga Andreeva graduated from Issaquah High School in Issaquah. She is interested in computer science and engineering. Olga is the recipient of the Dovie Samuelson Endowed Scholarship for women who plan to pursue careers in science and technology.

Ngozi Ezeokeke

Ngozi Ezeokeke graduated from Meadowdale High School in Lynnwood. She is interested in materials science and mechanical engineering. Ngozi is also the recipient of the Lt. Col. Michael P. Anderson Memorial Diversity Scholarship.

Lyle Gardner

Lyle Gardner graduated from Timberline High School in Lacey. He is interested in aerospace and mechanical engineering. Lyle’s scholarship is co-sponsored by the Mary Gates Endowment for Students.

Washington State University

Space Grant Fellowships
Wyatt Brege, Physics
Marshall Crenshaw, Mechanical Engineering
William Dupree, Physics
Sakun Duwal, Chemistry
Rebecca Evans, Biology
Jedidiah McCoy, Materials Science and Engineering
Maren Mossman, Physics
Brandt Pedrow, Mechanical Engineering
Ian Richardson, Materials Science and Engineering
Elijah Shoemake, Mechanical Engineering

Space Grant Scholarships
Aaron Ferrell, Chemistry
Bryan Heer, Materials Science and Engineering
Michael Kindle, Materials Science and Engineering
Russell Moser, Mechanical Engineering
Cassandra Phillips, Physics
Carson Schlect, Mechanical Engineering
Allegra Sundstrom, Ecology and Evolutionary Biology
Bineeta Veach, Zoology

Whitman College

Undergraduate Research Awards
Hallie Barker, Physics and Astronomy
Faculty Adviser: Nathaniel Paust

Whitworth University

Undergraduate Research Awards
Sarah Olderr, Applied Physics and Mathematics
Jason Trader, Mathematics, Physics, and Computer Science
Faculty Adviser: Kamesh Sankaran
Numerical Simulation of Plasma Flows in Electronegative Thrusters
**Seattle University**

*Undergraduate Research Awards*

Colleen Den Abel  
Zena-Marie Husler  
Faculty Mentor: Yen-Lin Han, Mechanical Engineering  
*Design of a Novel Radio Frequency Ablation Probe for Tumor Treatment*

*Travel Awards*

Each year, student researchers are eligible to receive travel funds to allow them to present the results of their work at professional conferences. The following students received awards to present at the American Society for Biochemistry and Molecular Biology conference: **Evelyn Bordeaux**, **My-Anh Doan**, **Samantha Freese** and **Saveeta Rampur**. Awards to present at the Washington Teachers of Teachers of Mathematics meeting were given to **Annie Goodrich**, **Kendra Jozwiak**, **Vanessa Lam** and **Kaley Westby**. **Sherilynn Soo** received an award to present at ExpoBio.

**University of Puget Sound**

*Undergraduate Research Awards*

Samuel Berling  
Faculty Mentor: Rand Worland  
*Physics Of The Musical Saw: An Investigation of the Factors Affecting the Confinement of Vibrational Modes in Stressed Double-Curved Metal Plates*

Andrew Brandt  
Faculty Mentor: Courtney Thatcher  
*Simplifying the Inclusion-Exclusion Principle with Planar Graphs*

Samantha Burch  
Faculty Mentor: Mark Martin  
*Ability of the Bacterial Predator bdellovibrio bacteriovorus to Catabolize Prey Derived Alanine*

Angelica Calderon  
Faculty Mentor: Jeff Tepper  
*Controls on the Distribution of Asarco Heavy Metals in Tacoma-Area Lakes*

Juliana Echternach  
Faculty Mentor: Rachel Pepper  
*Splashing Dispersal on Wet Splash-Cups*

Lauren Ulbricht  
Faculty Mentor: Peter Wimberger  
*Mmercury Accumulation in the Red-Tailed Hawk (Buteo jamaicensis) in the Pacific Northwest*

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**Ian Good**

Ian Good graduated from Glacier Peak High School in Snohomish. He is interested in bioengineering. Ian's scholarship is co-sponsored by the Mary Gates Endowment for Students.

**Anika Hidayat**

Anika Hidayat completed her high school studies through the UW Early Entrance Program. She is interested in mechanical engineering.

**Alexander Le**

Alexander Le graduated from Liberty High School in Renton. He is interested in biomedical engineering. Alexander's scholarship is co-sponsored by the Mary Gates Endowment for Students.

**Sarah Lunnen**

Sarah Lunnen graduated from North Central High School in Spokane. She is interested in biomedical engineering. Sarah’s scholarship is co-sponsored by the Mary Gates Endowment for Students.
Aishwarya Manoharan

Aishwarya Manoharan graduated from Woodinville High School in Woodinville. She is interested in computer science and engineering. Aishwarya’s scholarship is co-sponsored by the Mary Gates Endowment for Students.

Elizabeth McKinnie

Elizabeth McKinnie graduated from Juanita High School in Kirkland. She is interested in applied mathematics and astrophysics. Elizabeth is also a recipient of the Sigurd Olsen Endowed Scholarship.

Saba Noorassa

Saba Noorassa graduated from Olympia High School in Olympia. He is interested in computer science. Saba’s scholarship is co-sponsored by the Mary Gates Endowment for Students.

Xitlalit Sanchez

Xitlalit Sanchez graduated from Mount Vernon High School in Mount Vernon. She is interested in aeronautics and astronautics.

Seattle Central College

Scholarships for STEM Students
Camden Ball, Engineering
Sharon Chan, Engineering
Ethan Cheng, Civil/Env. Engineering
Colleen Collins, Geology
Gabriel Finertie, Engineering
Jezabel Garcia, Eng/Computer Sci.
Shannon Gatta, Science
Jacob Harvey, Computer Science
Courtney Matzke, Biology

Seattle Central College, 2016

SCC Rocket Club
With WSGC support and technical assistance, Seattle Central College traveled to the Black Rock Desert last spring to launch the rockets they built over the previous several months and attempt to break the sound barrier. This was the first year that Seattle Central students were invited to join their UW peers from the annual expedition to Nevada. Seattle Central’s Rocketry program was established in 2014 and now has over 40 active students. Students majoring in science, engineering or mathematics can join at any point in their academic career.

Team members at Black Rock were Alexa Antalan, Yassin Bahid, Shanika Davis, Gabriel Finertie, An Vinh Hoang, Adonay Lebeneh, Tri Luu, Nam Nguyen, David Shay and Lindsay Tardiff. Faculty advisors are Rebecca Hartzler and Michael Harrell.
Northwest Indian College

Scholarships in Science, Technology, Engineering and Math
Christian Cultee, Information Technology
Lisa Redsteer, Native Environmental Science
Thomas Fantasia, Information Technology

Research Experiences for Undergraduates
Twelve NWIC students spent their summer working research projects on local campuses. Interns on the NWIC campus were Matilda Brooks, Christian Cultee, Sarah Finkbonner, Phavion Gorman, Kevin Hunter, Lavine John, Allen Julius, Murray Phair, Raven Redhorn, Lisa Redsteer, Renae Stanley, and Jessica Williams. Thomas Fantasia, an information technology major, participated in the Space Grant Summer Undergraduate Research Program on the UW campus, working in the Advanced Propulsion Laboratory.

2016 NWIC Rocket Teams
Last spring, the NWIC rocket teams again traveled to the First Nations Launch Competition in Milwaukee, Wisconsin. NWIC teams have dominated the competition for the past six years. The team took first place in Tribal Division and in the American Indian Science & Engineering Society (AISES) Division. At the competition, the NWIC teams received the aesthetic award, for most innovative and professional appearance, and the team spirit award for interactive spirit, helpfulness, and cooperation. In recognition of the achievements, the team received a travel award to take part in a VIP tour of NASA Kennedy Space Center. NWIC team members are Matilda Brooks, Christian Cultee, Sarah Finkbonner, Kevin Hunter, Chris Lane, Murray Phair, Raven Redhorn, Lisa Redsteer, Renae Stanley, Andrea Williams, and Jessica Williams. Team advisors are Rachel Arnold and Gary Brandt, the NWIC computer science instructor.

Lucky Singh
Lucky Singh graduated from Raisbeck Aviation High School in Tukwila. He is interested in computer science. His scholarship is co-sponsored by the Mary Gates Endowment for Students.

Maxine St. Pierre Nelson
Maxine St. Pierre Nelson completed her high school studies through the UW Early Entrance Program. She is interested in physics and engineering. Maxine is also a recipient of the Louise and Irving R. Donnergaard Endowed Scholarship.

Jeffrey Taylor-Kantz
Jeffrey Taylor-Kantz graduated from Auburn High School in Auburn. He is interested in computer science and physics. Jeffrey is also a recipient of the Sigurd Olsen Endowed Scholarship and the Louise and Irving R. Donnergaard Endowed Scholarship.

University of Washington
Community College Transfer Scholars
Washington NASA Space Grant Consortium annually offers merit scholarships to promising community college students planning to study science, technology, engineering or mathematics at the University of Washington. Applications are open to students beginning their UW studies in Autumn Quarter, as well as those who entered UW during Winter and Spring Quarters of this year.
Julianna Bethune

Julianna Bethune graduated from Everett Community College in Everett, where she also received a Washington NASA Space Grant scholarship. She is majoring in aeronautics and astronautics. Julianna’s scholarship is co-sponsored by the Mary Gates Endowment for Students.

Andre Bland

Andre Bland completed his associate degree at North Seattle College in Seattle. He is majoring in electrical engineering. Andre’s scholarship is co-sponsored by the Mary Gates Endowment for Students.

Michael Choquer

Michael Choquer graduated from Clark College in Vancouver. He is majoring in electrical engineering. Michael’s scholarship is co-sponsored by the Mary Gates Endowment for Students.

Courtney Matzke

Courtney Matzke graduated from Seattle Central College in Seattle. She is majoring in plant biology.

Research Experiences for Undergraduates

Three EvCC students spent their summer working research projects on local campuses. Julianna Bethune, an aeronautics and astronautics major, participated in the Space Grant Summer Undergraduate Research Program on the UW campus, working in the Advanced Propulsion Laboratory. Erin Crum, a premajor in astronomy and physics, spent her summer working with UW Professor Joseph Huehnerhoff on the fiber fed spectrograph currently under development for Manastash Ridge Observatory. Alexandra Bethune, a mechanical engineering major, worked with college faculty and NASA engineers on the EvCC campus and at NASA Marshall Space Flight Center, to set up an EvCC laboratory to conduct JANNAF Class C dogbone testing of solid propellant samples, provided by NASA.

Everett Engineering Club

Everett Engineering Club continued their work on their first big rocket project, under faculty advisor Matthew Parsons. The students designed the entire propulsion system themselves and will be testing the motor at Paine Field in Everett later this year. After that, their goal is to build and launch the full scale rocket, currently slated to be over 20 feet long.

North Seattle College

Space Grant Scholarships for Community College Students

Kenneth Hamilton, Engineering
Rachael Huffman, Electrical Engineering
Leah Lackey, Mechanical Engineering
Matthew Sissel, Electrical Engineering

North Seattle College Rocket Team

This year Space Grant Scholars Leah Lackey, Rachael Huffman, Nicholas Greenwood, Kenneth Hamilton and Matthew Sissel, working under NSC faculty member Tracy Furutani, successfully repaired, launched and recovered telemetry from a faulty electronics package on a previously-constructed high-powered rocket. During the year, Matthew Sissel also successfully launched, recovered and captured video and data from a high-altitude balloon over Arizona. By the end of spring 2016, all of the Space Grant Scholars, along with a dozen members of the rocketry club, completed their Level 1 certification from the National Association of Rocketry.
Amy Stegmann

Amy Stegmann graduated from North Seattle College in Seattle. She is majoring in materials science and engineering.

Central Washington University

Research Experiences for Undergraduates in Physics & Astronomy
Skylier Jones, Everett Community College
Mentor: Darci Snowden, Central Washington University
Oxygen Density in Saturn’s Magnetosphere Near Titan’s Orbit

Everett Community College

Space Grant Scholarships for Community College Students
Megan Stanavitch, Mechanical Engineering
Katelyn Brower, Geophysics
Julianna Bethune, Aeronautics & Astronautics
Kristie Williams, Computer Science
Nathaniel Herbert, Engineering (Plastics & Composites)

Private Industry Internships for Everett Community College Students
EvCC has strong ties to our state’s aerospace and manufacturing companies. Bachelor degrees in electrical and mechanical engineering are offered on the campus through Washington State University. In 2016, EvCC awarded two private industry summer internships. Ryan Christensen, a mechanical engineering major, received a summer internship at TerraPower, LLC in Bellevue. Eric Kopicky, a mechanical engineering major, spent his summer as an intern with Mid-Mountain Materials, Inc. on Mercer Island.

Huong Vo

A physics and electrical engineering major, Huong Vo has engaged in glaciology research since her freshman year, presenting her work on firn models at two international meetings and a major national meeting. She has also interned at NASA Goddard Space Flight Center and Blue Origin. She plans to pursue a doctorate in computer engineering.

University of Washington Continuing SG Scholars

Student Name | Rank  | Major
---|---|---
Jesse Ashworth-Marin | Senior | Math/Physics
Michael Barsamian | Senior | Mechanical Engineering
Signe Bergman | Sophomore | Envir/Marine Sciences
Evan Brossard | Junior | Computer Science
Clare Campbell | Junior | Chemical Engineering
Jessica Carr | Senior | Mechanical Engineering

Rank is based on the year of UW attendance, not accumulated credit hours.

° pre-major
<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Major</th>
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<tbody>
<tr>
<td>John Chaffee</td>
<td>Senior</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Rakchanok Chavanachat</td>
<td>Junior</td>
<td>Bioengineering</td>
</tr>
<tr>
<td>Everett Cheng</td>
<td>Sophomore</td>
<td>Earth &amp; Space Sciences</td>
</tr>
<tr>
<td>Donovan Cordova</td>
<td>Junior</td>
<td>Civil Engineering</td>
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<tr>
<td>John Correy</td>
<td>Sophomore</td>
<td>Aero/Astronautics</td>
</tr>
<tr>
<td>Rachel Crow</td>
<td>Junior</td>
<td>Civil Engineering*</td>
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<tr>
<td>Nathan Dreschsler</td>
<td>Junior</td>
<td>Aero/Astronautics</td>
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<tr>
<td>Chikodinaka Ezeokeke</td>
<td>Junior</td>
<td>Bioresource Sci/Engineering</td>
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<tr>
<td>Zachary Frohardt</td>
<td>Junior</td>
<td>Computer Science</td>
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<tr>
<td>Jasmine Fuerte-Stone</td>
<td>Senior</td>
<td>Bioengineering</td>
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<tr>
<td>Marissa Gelms</td>
<td>Senior</td>
<td>Civil Engineering</td>
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<tr>
<td>Devin Gerboth</td>
<td>Senior</td>
<td>Bioengineering</td>
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<tr>
<td>Max Glass</td>
<td>Senior</td>
<td>Computer Science</td>
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<tr>
<td>Spencer Grayston</td>
<td>Sophomore</td>
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<tr>
<td>Francesca Green</td>
<td>Sophomore</td>
<td>Materials Sci/Engineering</td>
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<td>Brian Harr</td>
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<td>Computer Sci/Engineering*</td>
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<td>Jasmine Hawkins</td>
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<tr>
<td>Cody Hotchkiss</td>
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<td>Mechanical Engineering</td>
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<tr>
<td>Ritiika Jain</td>
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<tr>
<td>Melissa Khaut</td>
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<td>Jerusalem Kifelew</td>
<td>Senior</td>
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<tr>
<td>Angela Kimber</td>
<td>Junior</td>
<td>Chemical Engineering</td>
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<tr>
<td>Lillian Lang</td>
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<tr>
<td>Elaina Larson</td>
<td>Senior</td>
<td>Neuro/Microbiology</td>
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<tr>
<td>Zachary Larson</td>
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<td>Lynsey Liu</td>
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<td>Selina Lui</td>
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<td>Carly Marshall</td>
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<td>Lisa Nguyen</td>
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<td>Jamal Nurdin</td>
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<tr>
<td>James O’Neil</td>
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Rockets and Instrumentation (ESS 472/575) offers UW students a chance to design, build and launch a high-powered rocket aimed at investigating various technologies for the exploration of space. In 2016, the course also formed the basis for rocketry efforts at three community colleges and a rocketry outreach program geared to inspiring K-12 students attending schools throughout the Pacific Northwest, with an emphasis on the needs of underserved and underrepresented communities.

Access to Space (ESS 205) provides science and non-science majors with an opportunity to fully appreciate Earth's upper atmosphere and near space environment by building and launching high-altitude balloon experiments such as the Cricket Sat, which collects temperature measurements as it moves up through the atmosphere.

Rocks & Stars (ESS 495) is a lecture series designed to provide UW undergraduate and graduate students from all fields with an opportunity to learn about space exploration, stellar evolution and planetary geology directly from researchers working in those areas.

Space & Space Travel (ESS 102/ASTR 102) explores the science and technology required for space travel, previous investigations of planets and moons within our solar system and the requirements for tooling up for manned exploration. The course is offered at UW, North Seattle College, and remotely to high school juniors through the NASA-designed engineering program, Washington Aerospace Scholars. The curriculum is available free to instructors statewide through an online repository. Space & Space Travel concludes with the construction and launch of water rockets with payloads.

2016 Space Grant Courses
Developed and/or supported by Washington NASA Space Grant

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Chester Pham
Natalie Poffert
Karolina Pyszkieiwicz
Shannon Ren
Dylan Reynolds
Naveena Sathayamoorthy
Nicholas Saunders
Caitlin Schaefer
Aakash Sethi
Pooja Sethi
Cheyenne Sokkappa
Guadalupe Tovar
Carina Tran
Cleo-Kiu Tsang
Matthew Turner
Huong Vo
Aislynn Wallach
Justin Warner
Shen Yuan Yao

Junior
Senior
Senior
Senior
Junior
Senior
Senior
Senior
Junior
Senior
Sophomore
Senior
Sophomore
Sophomore
Senior
Sophomore
Sophomore

Chemical/Molecular Eng.
Biology
Computer Science
Computer Science
Civil Engineering
Computer Science
Physics
Electrical Engineering
Computer Engineering
Computer Engineering
HC Design and Engineering
Astronomy
Mathematics
Chemical Engineering
Molecular/Cellular Biology
Physics
Astronomy/Astropysics/Math
Computer Engineering
Electrical Engineering
Two internships were awarded at Eagle Harbor Technologies, a Seattle company dedicated to producing innovative solutions to technological problems relating to plasma science. The interns were Caleb Schmidt, a physics major at Seattle University, and Leanne Su, a UW aeronautics & astronautics major.

Michael Barsamian, a UW mechanical engineering major, received a Space Grant internship with M42 Technologies. Kyle Roberts, a UW physics major, interned with MSNW. Both companies are dedicated to the development of advanced space technologies.

Tyler Mundt and Keegan Jones, both UW aeronautics & astronautics majors, were awarded internships at Tethers Unlimited, Inc., a Bothell-based research and development company that specializes in advanced space technologies and scientific computing solutions.

Katherine Chun, a UW mechanical engineering major, was awarded an internship at Woodruff Scientific Inc., a Seattle company conducting experimental and computational research in fusion energy science.

**2016 Student Bridge Competition**

The Society for the Advancement of Material and Process Engineering challenges students to design, build, and test a structural model of a bridge at its annual SAMPE International Symposium and Exhibition.

UW team members were Shawn Baker, Connor Basch, Timothy Carlson, Brandon Chen, Chloe Choe, Dylan Faherty, Seth Nichols, Stefanie Roesli, William Smoot, Matthew Suarez, Davis Tran, Raymond Vital, and Taisheng Yeager. Their faculty advisor was Brian Flynn, UW professor of materials science and engineering.
**NASA Internship Opportunities**

Each year Washington NASA Space Grant Consortium directly supports undergraduate and graduate students statewide who have been selected to experience the excitement of working directly at NASA centers and on cutting-edge NASA research at academic institutions and commercial aerospace companies around the country.

**Wyatt Curtis**, a UW senior majoring in chemical engineering, was selected for an internship at NASA AMES Research Center. **Andrew Eberhardt**, a UW senior majoring in physics, was selected for an internship at NASA Goddard Space Flight Center.

**Kelsey Herrmann**, a UW graduate student in aeronautics and astronautics, was selected as a research associate for the 2016 NASA Academy at the NASA Marshall Space Flight Center, working on carbon dioxide removal system sorbents.

Applications for NASA summer internships open in early fall. For more information on these unique opportunities, visit intern.nasa.gov

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**Undergraduate Student Instrument Project**

The University of Washington’s HuskySat I team received a NASA Undergraduate Student Instrument Project award to develop a CubeSat flight project to demonstrate a pulsed plasma propulsion system and a radio using a reflectarray antenna.

Undergraduate team members are **Chayse Aubuchon, Nicolas Gutierrez, Nicolas Mavriplis, Hunter Mellema, David Olson, Camila Palacio, Marissa Reid, Melisa Soltau, Tyler Valentine. Paul Sturmer**, a graduate student in physics, is also a team member. Students from Raisbeck Aviation High School (RAHS) in Seattle are developing an onboard diagnostic camera that will provide images of the operation of the plasma thruster.

Advisors are Michael McCarthy and Robert Winglee, UW professors of Earth and space sciences. Principal Bruce Kelly serves as RAHS advisor.
# 2016 Space Grant Summer Undergraduate Research Program

<table>
<thead>
<tr>
<th>Student</th>
<th>Advisor</th>
<th>Department</th>
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<tr>
<td>Damian Banki</td>
<td>Brent Lagesse</td>
<td>STEM/CSS Bothell</td>
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<tr>
<td>Julianna Bethune</td>
<td>Robert Winglee</td>
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<td>Payam Farahani</td>
<td>Cole DeForest</td>
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<tr>
<td>Elizabeth Farrell</td>
<td>Tim Elam</td>
<td>Applied Physics Lab</td>
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<td>Paul Hage</td>
<td>S. Roy Chowdhury</td>
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<td>Dee Boersma</td>
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<td>Kayla Hogan</td>
<td>Wendy Thomas</td>
<td>Bioengineering</td>
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<tr>
<td>Kimia Imani</td>
<td>Lisa Maves</td>
<td>Pediatrics</td>
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<tr>
<td>Ritika Jain</td>
<td>Suzie Pun</td>
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<td>Angela Kimber</td>
<td>Robert Winglee</td>
<td>Earth/Space Sciences</td>
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<tr>
<td>Zachary Kirwan</td>
<td>Hassan Arbab</td>
<td>Applied Physics Lab</td>
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<tr>
<td>Moritz Lange</td>
<td>Peter Cavanagh</td>
<td>Orthopaedics</td>
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## Project

- **Stability and Adaptation of Vestibulo-ocular Reflex after Implantation of a Vestibular Prosthesis**
- **The Synthesis and Characterization of Crystalline Materials**

2016 Space Grant Summer Undergraduate Research Program

Student | Advisor | Department
--- | --- | ---
Victoria Wahlstrom | James Phillips | Otolaryngology
Preston Went | Jiun-Haw Chu | Physics

**2016 SURP in the High School**

The Space Grant Summer Undergraduate Research Program in the High School (SURP in the High School) gives high-achieving high school students hands-on research experience by working for the summer in laboratories on University of Washington campus in Seattle.

Participants work on NASA-related projects with undergraduate and faculty mentors for nine weeks. They also attend weekly research seminars where their undergraduate classmates present talks on their work. The pilot program is intended to complement their academic studies and introduce them to a broad range of opportunities in science, technology, engineering and math.

This year’s student researchers were Victor Current, Tea Freedman-Susskind, Kayla Hoang and Sara Reyes from Raisbeck Aviation High School in Tukwila. All worked in the Advanced Propulsion Laboratory under the direction of Space Grant Director Robert Winglee.

Funding for SURP in the High School was provided by the Northwest Earth and Space Sciences Pipeline, a regional STEM education network funded through the NASA Science Mission Directorate.

**Project**

- Applying Reputation Systems to Machine Learning
- Testing of the Electronics Payload for a Europe Ice Penetrator
- Strain Sensing in Insect Wings and Sensor Placement Optimization
- Machine Learning Security Framework
- Characterizing High Power Helicon Thrusters
- Dust as Fuel for In-Space Electric Propulsion
- Inflatable Solar Concentrating Systems
- Photo-Mediated Oxime Ligation as a Tool for Spatiotemporal Hydrogel Formation and Modification
- Effects of Target Surface Tilt on the Planetary Instrument for X-ray Lithochemistry
- RNA-associated CRISPR Cas9 to Visualize RNA Trafficking in Differentiating Fibroblasts in Response to Cardiac Disease Stimuli
- Terahertz Spectroscopy in Medical Imaging
- Wave Propagation in Ellipsoidal Cylinder Arrays for Impact Mitigation
- Front-end Design for Smart Screening Applications Using Cloud Platforms: A Pallor Detection Project
- Security in Emerging Environments
- Are Departure Times of Magellanic Penguins Influenced by Daily Temperature
- Correcting for the Systematic Error Introduced by Mass Transport Effects in Bacterial Adhesion Studies
- Engineering Zebrafish to Model Human Disease: Discovering Genes Related to Congenital Heart Defects
- Optimizing Aptamer Particle Display Techniques to Identify Targeting Ligands
- Chemical Characterization of Pulsed Plasma Thrusters (PPTs) for CubeSat Propulsion Systems
- Burn Wound Assessment Using Terahertz Spectroscopy
- Monitoring Post-Operative Total Knee Arthroplasty Patients via External Knee Sensor
<table>
<thead>
<tr>
<th>Student</th>
<th>Advisor</th>
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<tr>
<td>Zachary Larson</td>
<td>James Girton</td>
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<td>Alexander Le</td>
<td>Ed Waddington</td>
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<td>Brittany Lydon</td>
<td>Nicholas Boechler</td>
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<td>Jinkyu Yang</td>
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<td>Haseeb Malik</td>
<td>Michael Regnier</td>
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<td>Boris Blinov</td>
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<td>Taylor Monroe-Jones</td>
<td>Daniel Ratner</td>
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<td>Ron Kwon</td>
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<td>Patrick Old</td>
<td>Susan Hautala</td>
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<td>Renata Bura</td>
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<td>Liam Potocsnak</td>
<td>Nicholas Boechler</td>
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<td>Julie Overbaugh</td>
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<td>Zoha Syed</td>
<td>Karen Goldberg</td>
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<td>Tyler Valentine</td>
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<td>ADCP Processing with Wave Glider Autonomous Surface Vehicle</td>
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<td>South Pole Firn Dynamics</td>
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<tr>
<td>Surface Instabilities in a Dynamic Loading Scenario</td>
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<tr>
<td>Design, Fabrication and Testing of Mechanical Metamaterials</td>
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<td>Protocol Development for Gap Junction Detection in Cardiomyocytes</td>
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<td>Microfluidic Chamber Array</td>
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<td>Toward Ion-Trap Quantum Computation using Yb-171</td>
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<td>Macrophage Mannose Receptor-Mediated Uptake of Targeted Antibiotic Polymers</td>
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<td>Investigating Neuronal Regulation of De-differentiation in the Blastoembryo</td>
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<td>Following Amputation in the Zebrafish Fin</td>
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<td>Differences in Water Column Stratification in Climate Model Oceans and Their Impact on the Vertical Distribution of Freshwater Forcing</td>
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<tr>
<td>A New Method for Wastewater Treatment in Biorefineries</td>
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<tr>
<td>Dynamics of Surface Instabilities in Soft Materials</td>
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<td>Origami Based Metamaterials with Impact Mitigation Applications</td>
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<td>Activation Mechanism of a Pain-Sensing Ion Channel</td>
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<td>Fast Pyrolysis of Hybrid Poplar into Bio-oil</td>
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<td>Mapping the binding properties of an HIV-specific antibody that mediates Antibody-dependent Cellular Virus Inhibition (ACVI) activity</td>
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<td>Developing Terahertz-Mimicking Tissue Phantoms for Diagnosis of Burn Severity</td>
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<td>Alkane Oxidation with (Phebox)IrIII and O2</td>
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