



# **DRONES** **IN SPACE**



WISCONSIN SPACE GRANT CONSORTIUM

32ND ANNUAL WISCONSIN SPACE CONFERENCE

## **DRONES IN SPACE**

### **FRIDAY, AUGUST 12, 2022**

Hosted by the Carroll University College of Arts  
and Sciences

CARROLL  
UNIVERSITY





**The Wisconsin Space Grant Consortium (WSGC)** is a joint effort between NASA and organizations statewide. WSGC is dedicated to helping provide Wisconsin students, researchers, educators, businesses, not-for-profit organizations and other stakeholders with the tools, connections and resources needed to make the aerospace community in the state of Wisconsin thrive and grow.

#### **CONSORTIUM OFFICE/LEAD INSTITUTION**

Wisconsin Space Grant Consortium  
Carthage College  
2001 Alford Park Drive  
Kenosha, WI 53140  
262.551.6054  
www.spacegrant.carthage.edu  
[spacegrant@carthage.edu](mailto:spacegrant@carthage.edu)

University of Wisconsin – Superior  
University of Wisconsin – Whitewater  
Western Technical College  
Wisconsin Department of Transportation  
Wisconsin Lutheran College

#### **WSGC PARTNERS**

Aerogel Technologies, LLC  
Wisconsin Department of Public Instruction

#### **WSGC AFFILIATE MEMBERS**

Aerogel Technologies, LLC  
AIAA – Wisconsin Section  
Alverno College  
Biopharmaceutical Technology Center Institute  
Carroll University  
Carthage College  
College of Menominee Nation  
Fox Valley Technical College  
Gateway Technical College  
Lawrence University  
Marquette University  
Medical College of Wisconsin  
Milwaukee School of Engineering  
Ripon College  
St. Norbert College  
Sierra Space  
Spaceport Sheboygan  
University of Wisconsin – Green Bay  
University of Wisconsin – Green Bay,  
Sheboygan Campus  
University of Wisconsin – La Crosse  
University of Wisconsin – Madison  
University of Wisconsin – Milwaukee  
University of Wisconsin – Milwaukee at  
Washington County  
University of Wisconsin – Oshkosh  
University of Wisconsin – Oshkosh Fox Cities  
University of Wisconsin – Parkside  
University of Wisconsin – Platteville  
University of Wisconsin – River Falls  
University of Wisconsin – Stevens Point



Brochure Design by Sydni Villanueva,  
Student, Carroll University

## Schedule at a Glance

<b>PRE-SESSION</b>		
<b>7:30</b>	Registration	CC Stackner Ballroom: 150
	Presenter Check-in	CC Stackner Ballroom: 150
	Breakfast	Main Dining Room
	Individual Photos	CC MacAllister Boardroom: 28
<b>8:15</b>	Welcome & Introductions	CC Stackner Ballroom: 150
<b>SESSION 1</b>	<b>Plenary Speaker</b>	CC Stackner Ballroom: 150
<b>8:30</b>	Tim Canham	
<b>SESSION 2</b>	<b>Program Highlights</b>	CC Stackner Ballroom: 150
<b>9:15</b>		
<b>SESSION 3</b>	<b>Posters &amp; Networking</b>	PIT, Lower Level: 100
<b>10:00</b>		
<b>SESSION 4A</b>	<b>Higher Education Faculty Programs</b>	Hastad Hall 145: 100
<b>11:00</b>		
<b>SESSION 4B</b>	<b>Aerospace Outreach Programs</b>	Hastad Hall 160: 64
<b>11:00</b>		
<b>LUNCH</b>		Main Dining Room
<b>12:00</b>		
<b>GROUP PHOTO</b>		Main Lawn
<b>1:00</b>		
<b>SESSION 5A</b>	<b>Student Scholarship, Fellowship, and Internships Programs</b>	Hastad Hall 145: 100
<b>1:15</b>		
<b>SESSION 5B</b>	<b>Student Scholarship, Fellowship, and Internships Programs</b>	Hastad Hall 160: 64
<b>1:15</b>		
<b>BREAK</b>		
<b>3:00</b>		
<b>Session 6A</b>	<b>Research Infrastructure Faculty Programs</b>	Hastad Hall 145: 100
<b>3:15</b>		
<b>Session 6B</b>	<b>Special Initiatives Programs</b>	Hastad Hall 160: 64
<b>3:15</b>		
<b>SESSION 7</b>	<b>Posters &amp; Networking</b>	PIT, Lower Level: 100
<b>4:30</b>		
<b>Session 8</b>	<b>Plenary Speaker</b>	CC Stackner Ballroom: 150
	<b>DINNER</b>	
<b>5:30</b>	Christine Bolz	
<b>6:00</b>	Matthew Wallace	
<b>6:50</b>	Christopher Stockdale	
<b>6:55</b>	Kevin Crosby	

## KEYNOTE SPEAKERS



### **TIM CANHAM**

Tim Canham is the Software and Operations Lead for Mars Helicopter for NASA/JPL, which was deployed as part of the Perseverance Rover project. Tim has 30 years of software experience at JPL with a number of projects including the Deep Space Network, Cassini, Curiosity, and the VITAL COVID ventilator. Tim is also the architect for the Prime flight software framework available on GitHub.

### **MATTHEW WALLACE**

Matt Wallace is the Deputy Director for Planetary Science at NASA's Jet Propulsion Laboratory. Prior to this role, he served as the Mars 2020 Project Manager. He initiated the concept work for the Mars 2020 mission, and has led the development and implementation team since 2013. The spacecraft and Perseverance rover launched in July of 2020 and landed in February 2021, beginning its surface mission of in-situ science and technology experiments, and collecting samples for return to Earth by a future mission.





**WSC 2022 Presentation Schedule**

**August 12, 2022**

<b>PRE-SESSION</b>					
7:30	Registration				CC Stackner Ballroom: 150
	Presenter Check-in				CC Stackner Ballroom: 150
	Breakfast				Main Dining Room
	Individual Photos				CC MacAllister Boardroom: 28
8:15	Welcome & Introductions				CC Stackner Ballroom: 150
		Kareem Muhammad	Welcome		
		Kevin Crosby/Christine Bolz	WSGC Opportunities Highlighted		
<b>SESSION 1</b>	<b>Plenary Speaker</b>	<b>Michael Mortensen</b>			CC Stackner Ballroom: 150
8:30		Tim Canham	Drones on Mars: The Ingenuity Mars Helicopter		
<b>SESSION 2</b>	<b>Program Highlights</b>	<b>William Farrow</b>			<b>CC Stackner Ballroom: 150</b>
9:15	<b>Special Initiatives Program:</b>	Amy Prevost	Launching a Career in Biotechnology: A Laboratory-Based Introduction to the Field	Molecular Biology	BTC Institute
9:30	<b>Women in Aviation:</b>	Laurel Lindemann, Emily Rose Yank	Women in Aviation Experience	Aviation	Fox Valley Technical College, Gateway Technical College
9:45	<b>Industry Internship Program:</b>	Bryce Vieth	Test Engineering at Sierra Space	Engineering	University of Wisconsin - Madison
10:00	<b>Undergraduate Research/Aerospace Outreach Programs:</b>	Deborah Houts	Zero-Gravity		Zero-Gravity

SESSION 3	Posters & Networking	Christopher Stockdale			PIT, Lower Level: 100
10:15	Individual Awardee Photos				
Poster #1	<b>Collegiate Rocket Launch:</b>	Nicole Schilder	Predicting Performance and Roll Rate Minimization of a High Powered Model Rocket	Engineering	Marquette University
Poster #2	<b>Collegiate Rocket Launch:</b>	Jordan Cioni, Ellyssa Purdy	Phantastic Pheonoms	Engineering	University of Wisconsin – Green Bay
Poster #3	<b>Collegiate Rocket Launch:</b>	Alexander Hornung	Roll Stabilized Rocket – Sialia	Engineering	University of Wisconsin – Platteville
Poster #4	<b>Midwest Rocket Launch:</b>	Sam Conway, Jack Gomez, Avery Kendall, Camden Schultz, Violet Suhler	UW Madison Midwest Rocket Launch Team	Engineering	University of Wisconsin – Madison
Poster #5	<b>Midwest Rocket Launch:</b>	Elizabeth Bohlman, Brian Lee, Jacqueline Muller	Pioneer Rocketry MRL 2022 Competition	Engineering	University of Wisconsin – Platteville
Poster #6	<b>NASA Competition:</b>	<b>Emmett Marinic, Jillian Stinehart</b>	<b>MARS: NASA Lunabotics Competition</b>	<b>Engineering</b>	<b>Marquette University</b>
Poster #7	<b>Unmanned Aerial Vehicle Research:</b>	Addison DeShambo, Ellie Stewart, , Sophie Ulik, Johanna Williams	Delineating wetland vegetation species using a UAV- mounted multi- spectral camera and computer-aided classification	Geoscience	Lawrence University, University of Wisconsin – La Crosse, University of Wisconsin – Whitewater
Poster #8	<b>STEM Bridge Scholarship:</b>	Ellyssa Purdy	Promoting STEM to the Greater Green Bay Area	Engineering	University of Wisconsin – Green Bay
Poster #9	<b>Undergraduate Research Scholarship:</b>	Caleb Collar, Angelica Cuevas, Riley Johnson, Carissa Kiehl	Carthage Space Sciences: Canopy Near-IR Observing Project	Engineering	Carthage College
Poster #10	<b>Undergraduate Research Scholarship:</b>	Kevin Totts, Sydney Pelnar, Caleb Collar, Andrew Valentini, Hector Rauda	Carthage Space Sciences: Fiber Optic Sensing System	Engineering	Carthage College
Poster #11	<b>Undergraduate Research Scholarship:</b>	Justin Wheeler, Gabriela Carranza	Carthage Space Sciences: Microgravity Ullage Detection	<b>Engineering</b>	<b>Carthage College</b>
Poster #12	<b>Undergraduate Research Scholarship:</b>	Callie Koenig	Carthage Space Sciences: MPG-ISS	Engineering	Carthage College



Poster #13	<b>Undergraduate Research Scholarship:</b>	Kassia Schraufnagel, Gabriela Carranza, Dalton Callow, Ayushi Chandel, Angelica Cuevas, Alec DiGirolamo, Callie Koenig	Carthage Space Sciences: MPG-Propellant Refueling and On-Orbit Transfer Operations	Engineering	Carthage College
Poster #14	<b>Research Fellowship:</b>	Faizah Siddique	EXCLAIM – Novel line intensity mapping on a balloon-borne telescope	Physics	University of Wisconsin – Madison
Poster #15	<b>Undergraduate Research Fellowship:</b>	Lucas Bauer	SOApp (Simple Online Automated Plant Phenomics): Application for measuring plant vegetative phenotypes	Biological Sciences/Medicine	University of Wisconsin – Madison
Poster #16	<b>Higher Education Initiative:</b>	Keegan Mencke, Andrew Shanahan	Microscopy of Brownian Motion	Physics	Lawrence University
Poster #17	<b>Research Infrastructure Program:</b>	Elijah Behnke	Synthesis of Nanofluidic Suspensions With High Solid Loading and Low Viscosity For Energy Storage and Conversion Applications	Chemistry	University of Wisconsin – La Crosse
Poster #18	<b>Early-Stage Investigator:</b>	Eric Jahns	Towards Machine Learning (ML)-based Modeling of Wireless Signal Degradation while Transmitting from Base-stations to LEO Satellites and Vice-versa.	Computer Sciences/Physics	University of Wisconsin – La Crosse
Poster #19	<b>Research Infrastructure Program:</b>	Jorge Acosta	Extended, high-temperature cooling of lava tube interiors: Analog for Venus	Geoscience	University of Wisconsin – Milwaukee
Poster #20	<b>NASA Internship Program:</b>	Amanda Strebe	Modal Propellant Gauging at Johnson Space Center	Physics / Computer Science	Carthage College
Poster #22	<b>NASA Internship Program:</b>	Rohan Ramachandran	Satellite-HAND dataset to predict accurate flood inundations	Data Science	University of Wisconsin – Madison
Poster #21	<b>NASA Internship Program:</b>	Caitlin Kitchen	AI/ML Transformation Thrust Initiative	Computer Science	University of Wisconsin – Milwaukee

Poster #23	<b>NASA Internship Program:</b>	Laura Jones	Migration Misadventures: The Challenges of Creating an Inter-Institutional Migration Plan	Archival Science/Information Technology	University of Wisconsin – Milwaukee
Poster #24	<b>Dr. Laurel Salton Clark Memorial Research Fellowship:</b>	Lucia White	The effects of <i>Trichoderma harzianum</i> volatile organic compounds on gravitropism and the oxidative stress response of <i>Arabidopsis thaliana</i> for space agriculture	Biological Sciences/Medicine	University of Wisconsin – Madison
Poster #25	<b>WSGC Graduate &amp; Professional Research Fellowship:</b>	Daniel Rybarczyk	From atomic to molecular gas in the diffuse interstellar medium: the role of multi-phase neutral hydrogen	Astronomy	University of Wisconsin – Madison
Poster #26	<b>Special Initiatives Program:</b>	Chelsea Cook, Olivia Smithmier	Revitalizing the SDSS Spectroscopic Plug Plate for Further Learning	Astronomy	GLAS Education

SESSION 4A	Higher Education Faculty Programs	Lindsay McHenry			Hastad Hall 145: 100
11:00	<b>Higher Education Incentives:</b>	Somesh Roy	A Community of Practice Focusing on Grit and Self-regulation in Engineering Education	Engineering	Marquette University
11:15	<b>Higher Education Incentives:</b>	Andrea Henle	Taking Zebrafish for a Spin: Establishing Experimental Parameters for Simulated Microgravity with Zebrafish	Biological Sciences/Medicine	Carthage College
11:30	<b>Higher Education Incentives:</b>	Steven Girard	Nanostructured Zinc Oxide Gas Sensors for Space Travel: Development of a Course-Based Undergraduate Research Experience (CURE)	Chemistry	University of Wisconsin – Whitewater
11:45	<b>NASA Competition:</b>	John Moore	Student Design of a 10,000 ft Altitude Commercial Off-The-Shelf Rocket	Engineering	Marquette University

SESSION 4B	Aerospace Outreach Programs	Brian Ewenson			Hastad Hall 160: 64
11:00	<b>Aerospace Outreach Program:</b>	James Senft	Youth In Aviation	Aviation	Central High School
11:15	<b>Aerospace Outreach Program:</b>	Coggin Heeringa	Bringing Back the "Oh, Wows!"	Astronomy	Crossroads at Big Creek, Inc.
11:30	<b>Aerospace Outreach Program:</b>	Stephen Myers	Getting an aviation scholarship program off the ground.	Aviation Careers	EAA Chapter 838 Foundation Aviation Scholarships
11:45	<b>Aerospace Outreach Program:</b>	Todd Treichel	Rocket Science for Future Engineers	Engineering	AIAA
<b>Lunch</b>					<b>Main Dining Hall</b>
12:00- 1:00	<b>Table Talks:</b>				
		Cassi Bassong	Conducting Research in Micro-gravity		
		Nathan Salowitz	Leveraging Local Industry for Fundamental Research through WSGC		
		Lindsay McHenry	Planetary Geology		
		Robert Morrow	Plants in Space,Advanced Life Support, Environmental Systems		
		Beth Johnson	Things to consider when thinking about graduate school		
		Brian Ewenson	Training Space Shuttle Astronauts		
		William Farrow	WSGC Team and Summer Project Opportunities		
1:00	<b>Group Photo</b>				<b>Main Lawn</b>

SESSION 5A	Student Scholarship, Fellowship, and Internships Programs	Beth Johnson			Hastad Hall 145: 100
1:15	<b>Undergraduate Scholarship:</b>	Justin Wheeler, Callie Koenig, Kassia Schraufnagel, Carrisa Kiehl, Andrew Valentini	Carthage Space Sciences: Modal Propellant Gauging	Engineering	Carthage College
1:30	<b>Industry Internship Program:</b>	Conner Bellile	External Testing for the Dream Chaser® Program – EMC/EMI and Pyroshock	Engineering	University of Wisconsin – Madison
1:45	<b>Early Stage Investigator:</b>	Amber Newman, Madeline Taylor	Exploring rhizosphere microbial communities in hydroponically grown leafy greens	Geoscience	Lawrence University
2:00	<b>Research Infrastructure Program:</b>	Ella Mack	Studying the Corrosion Characteristics of Electrogalvanized Carbon Steel Substrates Using Simplified Plating Chemistry	Chemistry	University of Wisconsin – La Crosse
2:15	<b>WSGC Graduate &amp; Professional Research Fellowship:</b>	Gabiella Agazie	Timing Pulsars with CHIME and the NANOGrav 15yr Dataset	Physics	University of Wisconsin – Milwaukee
2:30	<b>WSGC Graduate &amp; Professional Research Fellowship:</b>	John Podczerwinski	Robust Foreground Removal for 21cm Intensity Mapping Experiments	Physics	University of Wisconsin – Madison
2:45	<b>WSGC Graduate &amp; Professional Research Fellowship:</b>	Johnny Johns	Spaceflight Changes Ion Transport: The Role of the Cyclic Nucleotide Gated Channels in Rapid Plant Signaling	Biological Sciences/Medicine	University of Wisconsin – Madison

SESSION 5B	Student Scholarship, Fellowship, and Internships Programs	John Borg			Hastad Hall 160: 64
1:15	<b>Research Infrastructure Program:</b>	Md Tanzil Shahria	Developing Vision-based Object Detection and Localization System for Robot Object Manipulation	Engineering	University of Wisconsin - Milwaukee
1:30	<b>WSGC Graduate &amp; Professional Research Fellowship:</b>	Amanda Baylor	Low-Latency Searches for Gravitational Waves using the GstLAL Data Analysis Pipeline	Physics	University of Wisconsin - Milwaukee
1:45	<b>WSGC Graduate &amp; Professional Research Fellowship:</b>	Sinead Humphrey	Numerical Simulations of White Dwarf Tidal Disruption Events	Astronomy	University of Wisconsin - Milwaukee
2:00	<b>Industry Internship Program:</b>	Benjamin Chapel	Sierra Space Propulsion Engineering	Engineering	University of Wisconsin - Madison
2:15	<b>Early Research Initiative:</b>	Madeline Taylor, Amber Newman	Exploring rhizosphere microbial communities in hydroponically grown leafy greens	Geoscience	Lawrence University
2:30	<b>Undergraduate Scholarship:</b>	Angelica Cuevas, Riley Johnson, Sydney Pelnar, Héctor Rauda, Joey Sachtleben	Carthage Space Sciences: Canopy Near-IR Observing Project Revival & Progress	Engineering	Carthage College
2:45	<b>Undergraduate Research Fellowship:</b>	Miranda Gorsuch	A Detailed Photometric Analysis of Early-Type Spiral Galaxies in Pairs	Astronomy	University of Wisconsin - Steven's Point
Session 6A	Research Infrastructure Faculty Programs	Robert Morrow			Hastad Hall 145: 100
3:00	Break				
3:15	<b>Research Infrastructure Program:</b>	Nathan Salowitz	Analysis of shape-memory-alloy fiber interface strength for optimization of self-healing composites	Engineering	University of Wisconsin - Milwaukee
3:30	<b>Research Infrastructure Program:</b>	Rocio Duchesne	Spectral characterization of urban trees in Southern Wisconsin	Geoscience	University of Wisconsin - Whitewater
3:45	<b>Research Infrastructure Program:</b>	Alder Yu	Effect of X-Ray and Neutron Radiation Exposure on Circadian Rhythms	Biological Sciences/Medicine	University of Wisconsin - La Crosse

4:00	<b>Research Infrastructure Program:</b>	Nathan Salowitz	Ultrasonic Inspection of Liquid Filled Pressure Vessels	Engineering	University of Wisconsin - Milwaukee
4:15	<b>Research Infrastructure Program:</b>	Gargi Chaudhuri	Detection of Aquatic Invasive Plants Using Deep Learning Based Semantic Segmentation Approach	Geoscience	University of Wisconsin - La Crosse
<b>Session 6B</b>	<b>Special Initiatives Programs</b>	<b>Daniel Rust</b>			<b>Hastad Hall 160: 64</b>
3:00	Break				
3:15	<b>Special Initiatives Program:</b>	Amy Prevost	Engaging Young Learners and Teachers with Active Learning for STEM Literacy	Biological Sciences/Medicine	BTC Institute
3:30	<b>Special Initiatives Program:</b>	Meredith Alt	Madison Youth Aviation Club Filling STEM pipeline	Youth education outreach	Women in Aviation International & Partners
3:45	<b>Special Initiatives Program:</b>	Chelsea Cook, Olivia Smithmier	Revitalizing the SDSS Spectroscopic Plug Plate for Further Learning	Astronomy	GLAS Education
4:00	<b>Special Initiatives Program:</b>	Fareed Guyot	Willa Flies Again: Connecting Underserved Youth to Aviation	Youth education outreach	Willa Brown Aviation Academy
4:15	<b>Special Initiatives Program:</b>	Wayne Vohnoutka	Planetarium Curriculum Alignment and Dual Language	Astronomy	Horwitz-DeRemer Planetarium
<b>SESSION 7</b>	<b>Posters &amp; Networking</b>	<b>Christopher Stockdale</b>			<b>PIT, Lower Level: 100</b>
4:30	Poster				
Poster #1	<b>Collegiate Rocket Launch:</b>	Nicole Schilder	Predicting Performance and Roll Rate Minimization of a High Powered Model Rocket	Engineering	Marquette University
Poster #2	<b>Collegiate Rocket Launch:</b>	Jordan Cioni, Ellyssa Purdy	Phantastic Pheonoms	Engineering	University of Wisconsin - Green Bay
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Poster #17	<b>Research Infrastructure Program:</b>	Elijah Behnke	Synthesis of Nanofluidic Suspensions With High Solid Loading and Low Viscosity For Energy Storage and Conversion Applications	Chemistry	University of Wisconsin - La Crosse
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Poster #21	<b>NASA Internship Program:</b>	Caitlin Kitchen	AI/ML Transformation Thrust Initiative	Computer Science	University of Wisconsin - Milwaukee
Poster #23	<b>NASA Internship Program:</b>	Laura Jones	Migration Misadventures: The Challenges of Creating an Inter-Institutional Migration Plan	Archival Science/Information Technology	University of Wisconsin - Milwaukee
Poster #24	<b>Dr. Laurel Salton Clark Memorial Research Fellowship:</b>	Lucia White	The effects of Trichoderma harzianum volatile organic compounds on gravitropism and the oxidative stress response of Arabidopsis thaliana for space agriculture	Biological Sciences/Medicine	University of Wisconsin - Madison
Poster #25	<b>WSGC Graduate &amp; Professional Research Fellowship:</b>	Daniel Rybarczyk	From atomic to molecular gas in the diffuse interstellar medium: the role of multi-phase neutral hydrogen	Astronomy	University of Wisconsin - Madison
Poster #26	<b>Special Initiatives Program:</b>	Chelsea Cook, Olivia Smithmier	Revitalizing the SDSS Spectroscopic Plug Plate for Further Learning	Astronomy	GLAS Education



<b>Session 8</b>	<b>Plenary Speaker</b>	<b>Michael Mortenson</b>			
<b>NETWORKING/RECEPTION</b>					<b>CC Stackner Ballroom: 150</b>
5:30		Christine Bolz	Welcome/Dinner Served		
6:00		Matthew Wallace	The Search for Ancient Life: Getting the Perseverance Rover and Ingenuity Helicopter to Mars		
6:50		Christopher Stockdale	Poster Session Award Winner		
6:55		Kevin Crosby	Closing Remark		



## 2022-2023 Funding Calendar

[spacegrant.carthage.edu](http://spacegrant.carthage.edu)

CREATE a WSGC account [spacegrant.carthage.edu/about/login/](http://spacegrant.carthage.edu/about/login/)  
APPLY to WSGC programs of interest prior to application deadline [spacegrant.carthage.edu/apps/account/login/](http://spacegrant.carthage.edu/apps/account/login/)

### STUDENT PROGRAMS

#### SCHOLARSHIPS

##### Undergraduate Scholarship (UGS)

*Two-year Academic Institutions*

##### STEM Bridge Scholarship (SBS)

##### Women in Aviation Scholarship (WAI)

**Application Deadline: October 3, 2022**

##### Undergraduate Scholarship (UGS)

##### Undergraduate Research Scholarship (UGR)

**Application Deadline: March 6, 2023**

#### FELLOWSHIPS

##### Dr. Laurel Salton Clark Graduate & Professional

Research Fellowship (LSC)

##### WSGC Graduate & Professional

Research Fellowship (GPP)

**Application Deadline: March 13, 2023**

#### SUMMER RESEARCH PROGRAMS

##### Undergraduate Aerospace Design Program (UAD)

Work period: June 1, 2023 – September 15, 2023

**Application Deadline: February 13, 2023**

##### Unmanned Aerial Vehicle Program (UAV)

Work period: June 12, 2023 – September 15, 2023

**Application Deadline: February 20, 2023**

#### ROCKET PROGRAMS

##### Collegiate Rocket Launch (CRL)

First Nations Launch (FNL)

*WSGC Notice of Intent (NOI) to compete due:*

**Application Deadline: October 21, 2022**

**Launch Competition: April 29, 2023**

##### Midwest Rocket Launch (MRL)

*WSGC Notice of Intent (NOI) to compete due:*

**Application Deadline: (TBD)**

### FACULTY PROGRAMS

##### Early Stage Investigator Program (ESI)

##### Higher Education Incentives (HEI)

##### Research Infrastructure Program (RIP)

**Application Deadline: December 12, 2022**

##### NASA Sponsored Competitions (OPP)

**Fall Application Deadline: November 14, 2022**

**Spring Application Deadline: February 6, 2023**

### OUTREACH & INDUSTRY PROGRAMS

##### Aerospace Outreach Program (AOP)

Special Initiatives Program (SIP)

**Application Deadline: October 10, 2022**