

Here to Observe (H2O)

Pilot Program Update



Logo designed by VSU student
leader MaKhaila Bentil



Logo designed by UPR student
leader Jorge Coppin-Massanet

NASA Planetary Science Advisory Committee Meeting

June 22, 2022

Today's Presenters



- H2O Pilot Program overview/highlights from NASA (5 min)
 - **David J. Smith**
- University of Puerto Rico (UPR) perspective (10 min)
 - **Jorge Coppin-Massanet, Andrea Ortiz Cana, Oscar Resto Hernandez, Gerardo Morell**
- Virginia State University (VSU) perspective (10 min)
 - **MaKhaila Bentil, Kailyn Haye, Nasser Ghariban, Dawit Haile**
- Q&A (5 min)
 - **From PAC**

Acknowledging our Mission Mentors

*Mission Liaison for H2O Program



Rachel Klima*	APL
Jennifer Scully	JPL
Julie Castillo-Rogez	JPL
Tracy Becker	SwRI
Geoff Collins	Wheaton College
Kristian Chan	UT Austin
Catherine Elder	JPL
Carolyn Ernst	APL
Wes Patterson	APL
Debarati Chattopadhyay	APL
Gregor Steinbruegge	JPL
Serina Diniega	JPL



Shannon MacKenzie*	APL
Zibi Turtle	APL
Jorge Nunez	APL
Sarah Horst	JHU
Catherine Neish	PSI/Western
Richard Margulieux	Honeybee
Lynnae Quick	Goddard
Brandon Haber	APL
Jojo Linden	APL
Betsy Congdon	APL
Alex Hayes	Cornell
Jake Strang	APL
Samalis Santini De Leon	APL
Becca Foust	APL



*Katherine Kretke	SwRI
Donya Douglas-Bradshaw	GSFC
Will Grundy	Lowell
Coralie Adam	GSFC

H2O Program Vision

- **H2O Goal**

Spark and maintain an interest for underrepresented students considering STEM careers.

- **H2O Approach**

Commit PSD to sustained, cultivated partnerships with nontraditional institutions paired with our NASA missions through:

- (1) Providing access for undergraduate student observers
- (2) Supporting meaningful mentorship activities
- (3) Encouraging peer cohort-building at the institution level

H2O Pilot Program Overview

- **Scope** = 3 missions (Clipper, Dragonfly, Lucy) + 3 partner institutions for 12-month pilot program
- **Learn as we go** = Before scaling up (more PSD missions, more institutions), refine what works during pilot program... based on survey feedback from students, faculty, and missions
- **Participants** = 3 partner institutions with undergraduate student observers



University of Puerto Rico

Prof. Oscar Resto

Dept. of Physics



Howard University

Prof. Sonya Smith

Dept. of Mechanical Engineering



Virginia State University

Prof. Nasser Ghariban

College of Engineering

- **Core activities** = Mission science team meetings, seminars, panel discussions, PSGs, site visits
- **Supplemental activities** = Icebreakers, social events (e.g. launch parties), coffee hours
- **Self-governance** = Majority of program activities & planning delegated to student participants (peer-to-peer leadership) with oversight by PSD and faculty advisors

A Metaphor for H2O

“Diversity is being invited to the party.” → Opening doors to PSD missions

Inclusion is being asked to dance.” → Mentoring relationships, peer learning community

- Verna Myers

“...and letting someone else choose the music.” → MSI partnerships, student self-governance

- Kecia Thomas

H2O Pilot Program: At a Glance

- **3 partner institutions:** Howard University, Virginia State University, University of Puerto Rico with a total of 6 faculty advisors and 22 student observers
- **3 NASA PSD missions:** Dragonfly, Clipper, Lucy, with ~30 mission mentors
- **Program start date:** July 2021
- **Program end date:** May 2022
- **Number of formal program activities during pilot:** UPR/Clipper (12), VSU/Dragonfly (8), Howard/Lucy (3)
- **Bright spots:**
 - Feedback/impact uniformly positive in student surveys
 - Commitment & dedication from mission mentors
 - Several H2O students pursued summer internships in planetary sciences
- **Challenges:**
 - Zoom burnout
 - Coordinating schedules with school/work conflicts

UPR + Clipper H2O Activities

“Co-Creation” Roles: **HQ led** Institution led Mission led

- Student leaders and faculty advertised program, made selections – August-September 2021
- Student-led program orientation after selections – October 5, 2021
- Student personal statements received and NDAs signed – October 8, 2021
- Lucy launch watch party – October 16, 2021
- Clipper “Favorite Things” seminar – October 29, 2021
- Slack channel established for program and mentor communications – November 15, 2021
- DART launch watch party – November 24, 2021
- Clipper welcome packet (mission overview seminar, Rules of the Road) – November 30, 2021
- Gathertown Meet & Greet with mission mentors – December 3, 2021
- Mentor matching (with intro meetings) – January 2022
- Clipper science lecture series (most Fridays) – January 2022+
- Rachel Klima science overview seminar – January 14, 2022
- Trina Ray mission lifecycle seminar – February 4, 2022
- Clipper PSG-11 – March 28-April 1, 2022
- Participated in 3 H2O program surveys – Oct 2021, Dec 2021, Feb 2022
- Post-PSG-11 coffee hour – May 6, 2022

Mission Science Overview Seminar from Rachel Klima on January 14, 2022

GOV You are viewing Rachel Klima's screen View Options

NASA National Aeronautics and Space Administration

NASA EUROPA CLIPPER
JOURNEY TO AN OCEAN WORLD

Europa Clipper:
Mission to an Ocean World

Rachel Klima
Europa Clipper Project Staff Scientist
Johns Hopkins Applied Physics Laboratory

Unmute Start Video Participants 16 Share Screen Chat Reactions Settings More

JORGE Y COPPIN-MASSANET

David J. Smith

Karla M. RV

Rachel Klima (She/her)

Jonathan Santiago

Andrea M. Ortiz-Cana

Laura Massó

Xaymara Lasheras Muñiz

ENID G FERNANDEZ-GUZMAN

Mission Lifecycle Seminar from Trina Ray on February 4, 2022

The Lifecycle of a
NASA Mission

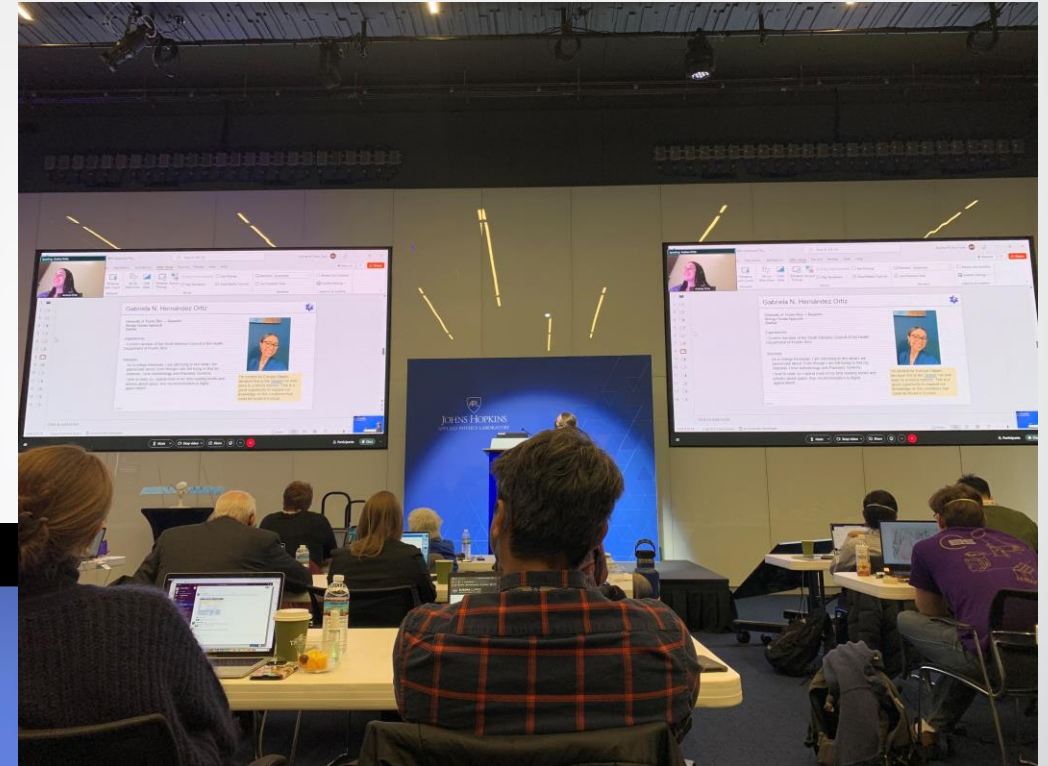
Trina L. Ray
@trinajpl

Jet Propulsion Laboratory, California Institute of Technology
Voyager General Science Data Team
Galileo Near Real-time Operations
Cassini Titan Orbiter Science Team (TOST) Co-Chair
Cassini Science Planning and Sequencing Team Deputy
Europa Clipper REASON Investigation Scientist
Europa Clipper Deputy Science Manager
Unless otherwise noted, images courtesy NASA/JPL-Caltech

David Smith (Me)

Andrea Ortiz

UPR Observers Participating in PSG-11 March 28-April 1, 2022

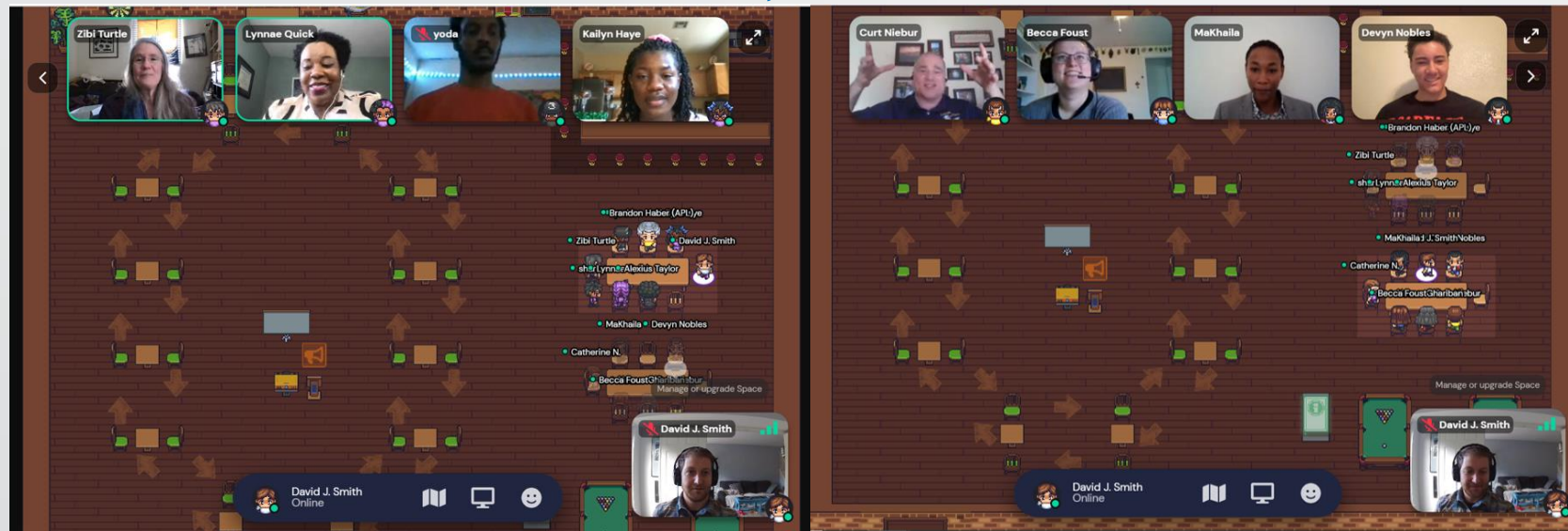


VSU + Dragonfly H2O Activities

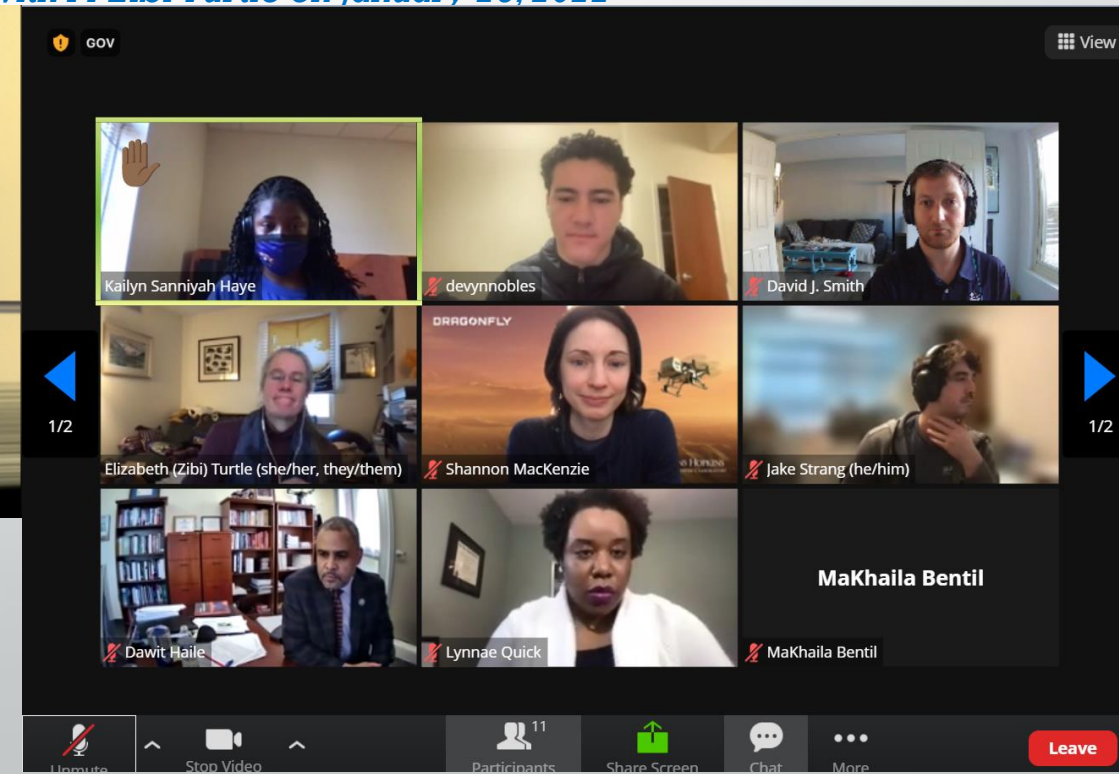
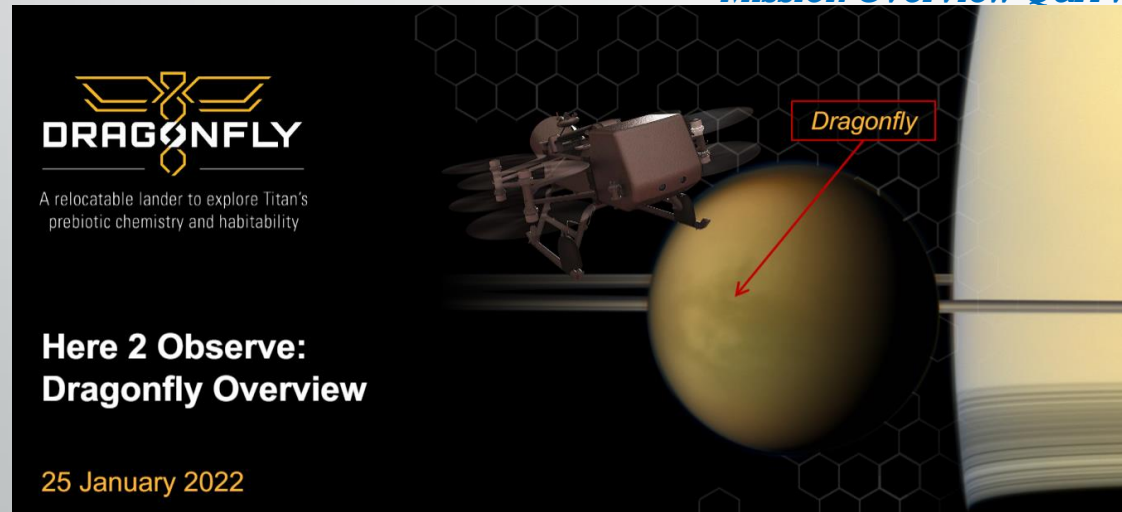
“Co-Creation” Roles: **HQ led** Institution led Mission led

- Student leaders and faculty advertised program, made selections – August-September 2021
- Lucy launch watch party – October 16, 2021
- Student-led program orientation after selections – October 26, 2021
- Established GroupMe channel for internal communications – October 27, 2021
- Student personal statements received and NDAs signed – November 22, 2021
- Dragonfly welcome packet (mission overview seminar, Rules of Road) – November 23, 2021
- Gathertown Meet & Greet with mission mentors – December 15, 2021
- Slack channel established for program and mentor communications – December 16, 2021
- Mentor matching – January 7, 2022
- Mission overview Q&A seminar with PI Dr. Zibi Turtle – January 25, 2022
- VSU faculty discussion with HQ on pilot progress – February 1, 2022
- VSU student recruitment/renewal seminar – February 11, 2022
- Life cycle of mission seminar – March 7, 2022
- Software engineers of Dragonfly panel – March 30, 2022
- VSU Student Observers visit to APL – April 11, 2022

Gathertown Meet & Greet on December 15, 2021



Mission Overview Q&A with PI Zibi Turtle on January 25, 2022



APL Site Visit on April 11, 2022



Software Engineering Panel on March 30, 2022



Mission Life Cycle Seminar on March 7, 2022



Here to Observe (H₂O) Program Updates: University of Puerto Rico Student and Faculty Perspectives

NASA PLANETARY SCIENCE ADVISORY COMMITTEE (PAC)
MEETING JUNE 21-23, 2022

ANDREA MIA ORTIZ-CANA

JORGE Y. COPPIN-MASSANET

DR. GERARDO MORELL

OSCAR RESTO



Goals and Achievements

- **Self-governance-** Student Leaders were encouraged to program and plan the supplemental activities with their team.
 - UPR cohort had multiple meetings to follow up, discuss and introduce concepts to the group.
 - Organized launch parties (Lucy Launch), coffee hours and stayed connected during all program developments.
- **Flexibility, Surveys and Data Collection-** These allowed for mid-course corrections.
 - H2O and UPR conducted a total of three formal surveys and an informal team meeting to share additional comments.
- **Student Retention-** 12 of the original 13 students completed the program.
 - One student dropped out due to personal commitments and was substituted with a student on the waiting list who completed the program.
 - Another student indicated plans of career change from a non-STEM field to a STEM field because of the program.

What Worked

- Student Leaders fulfilled mentorship roles to freshmen and sophomores who participated.
- Selecting students with little to no experience in previous NASA or STEM programs provided good feedback.
- Surveys after important activities allowed for fresh opinions and engagement.
- A Greet and Meet to give the students the chance to choose their mentor, depending on their interests.
- A Slack Channel to maintain communication between team members and the Clipper mentors.

What Needs Work

- Earlier student selections and mentor matching to maximize exposure time students have to mission and mentor resources.
 - Students expressed how much more they understood the Clipper Mission and respective goals after their one-on-one meetings with mentors which occurred about half-way in the program.
- Our team suggested an official Europa Clipper Instagram page to interact with, having identified the lack of one.
- A full program calendar did not exist due to the nature of the pilot program responding in real time to student feedback.
 - To maximize the number of activities a predetermined program calendar with dates that students have available from day one will help students better understand the nature of the program and set aside dates for attendance.
 - A proposed calendar of activities without any set dates was given to the Program managers for consideration in future iterations of the program.
 - Some of these activities include science and career seminars and student suggested activities such as “A day in the life of a _____ scientist”.

Proposed Activities for H2O 2022-2023

- Late July 2022: Student Selections and Notifications (Sign NDAs and Get Personal Statements for Mentor Matching)
- First Semester
 - Early August 2022: Introduction to Program/Review of Mission Q&A
 - Mid-August 2022: Gathertown (or in Person) Meet & Greet
 - Early September 2022: Identifying Harassment/Anti-Discrimination in STEM Workshop
 - Mid-September 2022: Mentor Matching and One-One Meetings
 - October 2022: Writing Proposals and How Science is Funded Seminar
 - November 2022: Lifecycle of a NASA Mission Seminar
 - Early December 2022: How to Write/Read Scientific Papers Workshop (w/ Optional Journal Club for Next Semester),
 - Late December 2022: End of Semester Gathertown (or in Person) Social
- Second Semester
 - January 2023: Pre-PSG Q&A and Social
 - February 2023: PSG-12 + Post-PSG Gathertown Social
 - March 2023: CV and Resume Workshop
 - April 2023: A Day in the Life of ____ Activity
 - May 2023: Planetary Science Career Panel
 - June 2023: Applying to Grad School and Internships/REUs Workshop
 - Early July 2023: End of Program Gathertown (or in Person) Social

Student Highlights

From surveys and team meetings we gathered from most students that:

- Interaction with Clipper Mentors has been inspiring and the most important aspect of the program.
- Observing the mentors and other scientists present at the PSG-11 furthered their understanding of the Clipper Mission, mission planning and development, and the variety of STEM work fields.
- Direction by their mentors in looking and applying for internships was appreciated.
- They enjoyed the Slack channel because it provided immediate access to communications and had all materials accessible. This channel proved useful during the PSG-11 for Q&A of the presentations.

Conclusions: Andrea Ortiz-Cana

To have the opportunity to guide younger students in their development of social and professional skills and observing as they became comfortable with their contributions to the program, mission and their participation was a fulfilling experience. Moreover, actively becoming part of an ongoing NASA mission by observing its members and contributing with questions, ideas and their development of outreach strategies adds milestones to our career paths.

This program projects to be of great value by empowering students in the STEAM fields through leadership, improved communication skills and professional outlook. As a first step in a STEM career, H2O opens the door to aspire belonging and builds a sense of community.

Conclusions: Jorge Coppin-Massanet

This program is not only one with incredible growth potential, but I also believe it is a necessary step for inclusion, diversity, equity and accessibility and one of many steps NASA leadership can take to make right what has been a problem in planetary sciences for a long time when it came to how diverse the field was. I hope the students that participated in this pilot program can trace H₂O back as the stepping stone to their successful scientific careers in planetary missions.

It was an honor and the highlight of my academic career to lead this pilot program so that the correct pipelines are established to allow students of Puerto Rico, with otherwise no access to NASA centers or R1 research institutions to get involved in this field.

Student Selection Process

- A total of 119 students applied to participate in the program from all Puerto Rico Space Grant Affiliated Undergraduate institutions.
 - 13 students selected, with an additional 4 back-up students. All non-selected students contact info was maintained for future activities and opportunities.
- Factors considered included Year of Study, and previous NASA or space related program experience.
 - Priority was given to freshmen and sophomores with little to no previous experience.
 - About half of selected students had zero previous program participation, in which their experiences in the program were compared to more senior students which were also selected.
 - Students from across STEM and non-STEM fields were considered.
 - Looked for a balance of 50/50 female and male selections.

H2O UPR 2021 Cohort



Jorge Coppin-
Massanet



Camila Escudero



Xaymara Lasheras
Muñiz



Carlos Roig Blay



Carolyn Ruiz Rivera



Laura Massó Quiñones



Andrea Ortiz-Cana



Enid Fernández
Guzmán



Jonathan Santiago
Figueroa



Gabriela González
Rodríguez



Gabriela Hernández
Ortiz



Janiel Echavarría
Cirino



Karla Rodríguez Vega



VIRGINIA STATE UNIVERSITY

NASA H2O PROGRAM UPDATE

Student Leaders: MaKhaila Bentil & Kailyn Haye

Faculty Advisor: Nasser Ghariban



STUDENT LEADER:

MAKHAILA BENTIL

- Computer Engineering Major with a Minor in Mathematics
- Junior
- Vice President of the Virginia State University Chapter of the National Society of Black Engineers
- Theta Tau
- Society of Women Engineers (SWE)



STUDENT LEADER:

KAILYN HAYE

- Computer Engineering and Mathematics Double Major
- Junior
- President of the Virginia State University Chapter of the National Society of Black Engineers
- Society of Women Engineers (SWE) Executive Secretary
- White House 2022 HBCU Scholar

FACULTY ADVISOR:

NASSER GHARIBAN

- Nasser Ghariban, Ph.D.
- Professor
- Coordinator of Manufacturing Program
- Department of Engineering
- Engineering and Technology Building, Room 300D



Experience

- New world experience and world given
- Gave a greater sense of scientific and engineering application in various capacities
- Better understanding of ins and outs of funding, process planning, and development of a NASA project

Communication methods

- Virtually
- In-Person
- Hybrid



- **Pro's points of 2021-2022 program:**
 - Networking opportunities
 - Mentorship opportunities
 - Johns Hopkins Applied Physics Lab (APL) student visit
 - Engagement of NASA and APL staff
 - Comprehension of NASA Planetary Science Division
- **What can be improved for NASA H2O 2022 - 2023:**
 - Further expansion of the program
 - Increased number of in person field trips
 - Opportunities to visit different NASA facilities
 - Conference Engagements
 - Opportunities to research with scientists and engineers
 - Funding for Scholarships, Co-OPs and, Grant Work
 - Assistance and accommodation for internship programs



- **Who?**

- Various different NASA scientists, engineers & APL faculty from a multitude of backgrounds introduced us to:

- **What?**

- An engaged rocket launch experience
- The detailed process of a NASA space mission
- Various different available roles within a space mission and its supplemental research
- Introduction to graduate school opportunities and paths
- Leadership development
- Internship opportunities
- Increased networking opportunities
- An in-person Johns Hopkins APL tour
- Mentorship
- Expanding technical interests in space exploration



- **When?**

- Introductory NASA H2O Meeting: where students met some participating Dragonfly personnel and learned more about the general mission
- Mentor Meet and Greet: students engaged in an online speed dating platform that allowed for them to connect with many different potential mentors
- Connected with mentors on an individual level to further allow students networking opportunities
- Panel discussion with Dragonfly software developers



- **Why?**

- This program was a great opportunity for engineering students to introduce them to the technical components within a collaborative space mission
- Students also received several opportunities to network and explore this sector of technology and project-based work





THANK YOU !



What's Next for H2O?

- NASA PSD studying participant surveys, feedback, and scoping a sustainable program for the future ("H2.O")
- Student leader travel awards (\$5,000 per student) have been established and will be used this summer as a thank you from NASA PSD
- We are so grateful to our partner institutions and participating missions, and we warmly welcome additional suggestions

