UPDATES FROM PLANETARY SCIENCE DIVISION'S HERE TO OBSERVE (H2O) PROGRAM. D. J. Smith[1], N. P. Lang, L. Moore, C. Niebur, S. Rinehart, D. Santiago-Materese, M. Thompson, H. Throop, K. E. Vander Kaaden, [1] (all authors) NASA Headquarters, Planetary Science Division (david.j.smith-3@nasa.gov).

H2O Program Motivation & History:

NASA is committed to fostering an environment where Diversity, Equity, Inclusion, and Accessibility (DEIA) principles are fundamental ways of working and being. To achieve the greatest mission success, NASA embraces hiring, developing, and growing a diverse and inclusive workforce. [1]. Underrepresentation in the field of planetary science is a known issue, with low proportions of historically marginalized groups participating in NASA Planetary Science Division (PSD) funded activities. [2, 3].

In 2021, PSD established *Here to Observe (H2O)* for undergraduate students to observe NASA mission team meetings as part of a multipronged strategy addressing historically marginalized groups in planetary science. The H2O Program is, in its simplest form, a monthly, 1-hour opportunity for undergraduate students from institutions not typically participating in NASA activities to observe PSD mission team meetings during the 9-month academic year, alongside mentors and peers. By opening doors to PSD missions and sharing the excitement of planetary exploration, H2O's goal is to spark and maintain an interest for underrepresented students considering STEM careers.

We will present updates and preliminary outcomes from PSD's H2O Program and summarize opportunities for participation, including the open program element (C.24) in ROSES soliciting proposals from non-R1 institutions. We will provide a program overview, share examples of core & supplemental program activities (virtual and in-person events), and address questions about the proposal submission process or status of participating PSD missions.

Guiding Principles for H2O Program:

1. Providing access to NASA PSD missions for undergraduate student observers from historically marginalized groups
2. Encouraging a tailored, student-led program, aligned with students interests and needs
3. Facilitating meaningful mentoring relationships with NASA mission professionals
4. Supporting cohorts for students from participating institutions to foster a sense of community for pursuing STEM pathways

Virtual program activities include attending mission science team meetings, seminars, panel discussions (**Figure 1**), launch parties, and self-guided learning modules in solar system science and engineering. In-person program activities include mission-related site visits, field trips to nearby NASA facilities (**Figure 2**) and attending LPSC. Each participating institution and mission co-create a customized, 9-month annual calendar of activities (see below), based on the guiding H2O program principles.

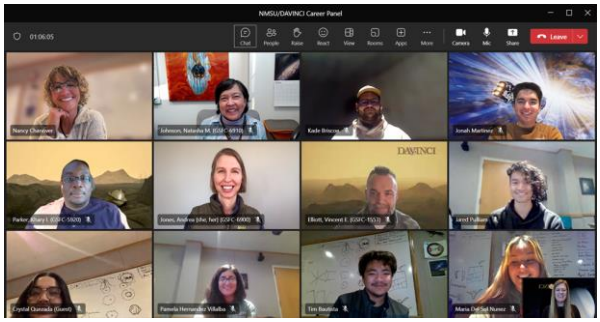

Figure 1. New Mexico State University's H2O cohort in 2023 during a virtual career panel discussion with DAVINCI team members (image courtesy of E. Kohler/NASA GSFC).

Funding for H2O Partner Institutions:

The H2O Program offers 5-year awards of up to $75,000 per year to competitively selected, eligible partner institutions through a No Due Date solicitation, C.24/Here to Observe in ROSES. Any U.S.-based, non-R1 institution may submit a proposal to participate in the H2O Program, though PSD strongly encourages proposals from Minority-serving Institutions such as Historically Black Colleges and Universities, Tribal Colleges and Universities, Predominantly Black Institutions, Hispanic Serving Institutions, as well as Primarily Undergraduate Institutions and Community Colleges. Proposals to H2O must be led by one primary faculty member. All Program participants (faculty and undergraduate students) must be U.S. citizens or green card holders.

After review, detailed budgets are requested for selectable proposals, and proposing institutions are paired to PSD missions for co-creating a revised Statement of Work and finalized budget (<$75,000/year) before award decisions are made. The co-creation period typically lasts 2-3 months during the summer, such that H2O activities can get underway at the onset of academic calendars (i.e., fall semester).

H2O Program's Current Partners:

- ***Virginia State University***, Dr. Dawit Haile (PI) paired with ***Curiosity*** and Dr. Ashwin Vasavada (Curiosity mission liaison).

- ***New Mexico Institute of Mining & Technology***, Dr. Raúl Morales Juberías (PI), paired with ***LRO*** and Mr. John Van Eepoel (LRO mission liaison).
- ***University of Arkansas at Pine Bluff***, Dr. Miah Adel (PI), paired with ***Lucy*** and Dr. Katherine Kretke (Lucy mission liaison).
- ***New Mexico State University***, Dr. Nancy Chanover (PI), paired with ***DAVINCI*** and Dr. Erika Kohler (DAVINCI mission liaison).
- ***Kingsborough Community College***, Dr. Steven Jaret (PI), paired with ***Dragonfly*** and Dr. Alexandra Pontefract (Dragonfly mission liaison).
- ***Ohio and Puerto Rico Space Grant Consortia***, Mr. Robert Romero (Ohio Aerospace Institute) and Dr. Gerardo Morell (University of Puerto Rico), paired with ***Clipper*** and Dr. Rachel Klima (Clipper mission liaison).

Ongoing Work and New Program Initiatives:

Mentor Training

To help ensure a positive mentor-mentee experience in the H2O Program, PSD is offering the *Intent to Impact (I2I)* course for mission mentors, starting in January 2024. Led by Movement Consulting, LLC, the course is intended to help participants identify the beliefs they bring to their mentoring relationships, understand the context of their mentoring, and reimagine what mentoring can look like for the H2O Program.

Program Evaluation

PSD has a Program Evaluator in place for monitoring the progress of H2O over the next five years, allowing for in-year refinement & feedback, as well as measuring longer term outcomes for Student Observers (e.g. STEM majors, STEM graduates, internships, grad school, STEM related careers, etc). The Program Evaluator can be contacted at any time by H2O participants and community members: marcia.n.higgins@nasa.gov.

Solar System Exploration Modules

Developed by Dr. Britney Schmidt at Cornell University and H2O alum/current graduate student Mr. Jorge Coppin Massanet, PSD is offering optional, online, self-guided exploration packages for Student Observers to receive an introduction to planetary science and NASA systems engineering. The solar system science modules, in-development, are being produced for students who seek additional context in planetary science but do not have astronomy courses available at their institution. One module will be released each month and planned content includes:

- *Module 1: Meet the Planets*
- *Module 2: Exciting Earth*
- *Module 3: Marvelous Moon & Magnetic Mercury*
- *Module 4: Visualizing Venus*
- *Module 5: Making it to Mars*
- *Module 6: Asteroids & Comets*
- *Module 7: Jumping Giants: Jupiter, Saturn, Uranus and Neptune*
- *Module 8: Wonderous Ocean Worlds*
- *Module 9: Pluto and Friends*

Future Outlook

NASA PSD is fully committed to sustaining and cultivating partnerships with underrepresented institutions. To that end, we anticipate continuing to expand H2O to include more partner institutions and PSD missions (potentially up to 10 total for the 2024–2025 program year ahead). Our aim is to establish a reproducible, scalable H2O program with broader mission involvement, and one that will yield improved DEIA outcomes for the planetary science research community and missions of the future [4].

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References: [1] NASA Strategic Plan for Diversity, Equity, Inclusion, & Accessibility, Fiscal Years 2022-26. [2] 2020 Survey of the Planetary Science Workforce, Division for Planetary Sciences of the AAS. [3] ROSES-2021 Research and Analysis Yearbook https://science.nasa.gov/roses2021yearbook/ [4] NASEM 2022. Advancing Diversity, Equity, Inclusion, and Accessibility in the Leadership of Competed Missions. Washington, DC.

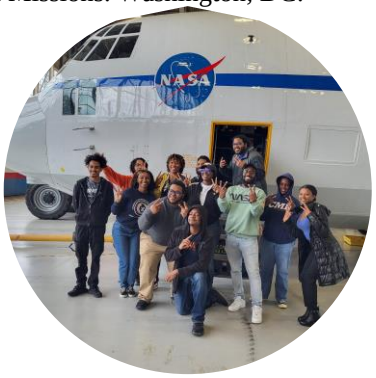

Figure 2. *H2O Program Student Observers from Virginia State University during a field trip to NASA Wallops Flight Facility in November 2022.*