USING EFFECTIVE PRACTICES IN INCLUSION, DIVERSITY, EQUITY, AND ACCESSIBILITY TO ENGAGE WITH UNDERREPRESENTED AUDIENCES IN STEM. A. J. Shaner[1], S. Buxner[2], K. L. Lynch[1], A. Matiella Novak[3], A. W. Merkel[4], E. G. Rivera-Valentín[1], L. Rubino-Hare[5], S. Shebby[6], C. Shupla[1], [1]Lunar and Planetary Institute, USRA (shaner@lpi.usra.edu), [2]Planetary Science Institute, [3]Johns Hopkins University–Applied Physics Laboratory, [4]Laboratory for Atmospheric and Space Physics, UC-Boulder, [5]Northern Arizona University, [6]McREL International.

Introduction: Multiple studies since 2010 support the fact that Black and Latinx populations are underrepresented in STEM and extremely underrepresented in planetary science [1-3]. As a result, several initiatives are underway across SMD to ameliorate the situation. While many initiatives focus on higher education students, Native American communities, the neurodiverse community, women and girls, and students with disabilities, the Planetary Resources and Content Heroes (ReaCH) project is taking deliberate steps to enhance the planetary community's ability to engage with Black and Latinx children (Fig. 1) and their families.

Though the focus of ReaCH is to identify effective practices for audience engagement in out-of-school or informal education settings, the lessons learned by the ReaCH team may, by extension, aid in the development of the future workforce. Specifically, the findings of the ReaCH effort may be utilized by scientists to increase their comfort in approaching and working with students from Black and Latinx communities.

Fig. 1 *The ReaCH logo reflects the team's desire to help planetary scientists more effectively engage diverse audiences, particularly Black and Latinx communities, in planetary science and exploration.*

The ReaCH Model: Throughout the lifetime of the project, ReaCH will develop and continuously refine a model of effective practices for training planetary scientists to better engage Black and Latinx families based on principles of inclusion, diversity, equity, and accessibility (IDEA). The development of this model is being informed by 1) needs assessments, 2) research literature, 3) input from Black and Latinx communities across the country and 4) input from IDEA experts. ReaCH is collating data to design and implement *Planetary Engagement Workshops* across the United States for planetary scientists and informal educators. These workshops will be piloted in 2022.

Needs Assessments. In fall 2021, ReaCH collaborated with other projects in SMD's Science Activation (SciAct) program to develop and distribute a survey to SMD-funded scientists. Out of all SMD divisions, the planetary science community stepped-up, accounting for approximately 40% (100) of respondents! Results of this survey have demonstrated that SMD funded scientists are keenly interested in learning more about ways to effectively engage with underserved audiences, learning more about how to communicate to specific age groups, and learning about and practicing activities to use in outreach.

A survey was also sent to informal educators to understand their needs in collaborating with scientists and their experience with planetary science. Results of this survey indicate their desire for scientists to have experience working with their specific audiences and training for working with youth. The results of both surveys are being integrated into the design of the Planetary ReaCH workshops.

Research Literature. At the time of writing, a literature review is underway to inform workshop design. This literature review includes research into effective practices for engaging Black and Latinx communities in STEM and, in acknowledgement of the opportunity gaps faced by these communities, effective practices for professional development in engaging Black and Latinx communities in STEM.

Input from Black and Latinx Communities. A pillar of IDEA principles is the importance of communicating and collaborating with members of the local community. ReaCH will also collaborate with members of Black and/or Latinx communities in workshop locales working with children and their families in the design of the local workshop. These community members will also participate in the workshop. Their interactions with participating scientists will provide valuable insight into their community.

Input from IDEA Experts Input is also being sought from IDEA researchers to complement information obtained from educators and others, including ReaCH team educators and scientists, with lived experiences engaging Black and Latinx communities.

Planetary Engagement Workshops: Workshops will build on the Lunar and Planetary Institute's (LPI) and Applied Physics Laboratory's past, highly successful workshops (the Solar System Exploration Planetary Engagement Institutes (Fig. 2) as well as the Planetary

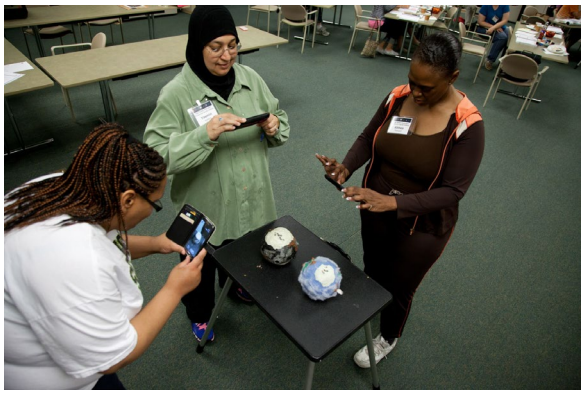

Fig. 2 *Participants in a Solar System Exploration Public Engagement Institute observe a "Strange New Planet."*

Scientist Engagement Institute) and LPI's ongoing Sharing Planetary Science seminars. Evaluation results indicated that all (100%) participants found these past workshops met their goals well; surveys of seminar participants indicate that all participants find aspects valuable [4]. All planetary subject matter experts (SMEs) are invited to register for a workshop. SciAct teams and informal educators who serve minority communities are also invited to participate in these workshops alongside planetary SMEs.

Workshop participants will explore strategies to reduce barriers and increase relevance to engage Black and Latinx audiences and will allow participants to form authentic partnerships for future collaborations. Each workshop will be followed by a public event at a local institution to give workshop participants an opportunity to utilize the best practices discussed in the workshop.

Three pilot workshops will be held in 2022 in Phoenix, Boulder, and Baltimore to help further inform the design of future workshops as well as the Planetary ReaCH model. Between 2023 and 2025, fifteen workshops will be held in locations determined by proximity to planetary research and mission facilities, and locations with high percentages of Black and/or Latinx communities (Fig. 3). Stipends will be available for participating U.S. planetary scientists.

Evaluation: The ReaCH project is externally evaluated by McREL International. Evaluation is not the final phase of implementation, but rather, part of a cycle that helps stakeholders monitor implementation, test and re-test hypotheses expressed in logic models, and make informed mid-course corrections, increasing the likelihood that measures for success and impacts are achieved.

Formative evaluation, which provides actionable feedback throughout the project lifecycle, will support the timely identification of implementation successes and inform improvements to project activities to ensure measures for success are achieved. Summative evaluation, implemented to understand the overall impact of the project, will build on the formative evaluation and determine the extent to which outcomes and impacts were accomplished.

Bottom Line: The Planetary ReaCH model is based on the foundation that an evidence-based approach to planetary scientist and audience engagement, supported by authentic partnerships and IDEA-aligned resources, will build planetary scientists' capacity to engage Black and Latinx communities with planetary science content to bridge opportunity gaps faced by Black and Latinx communities in their pursuit of careers in planetary science.

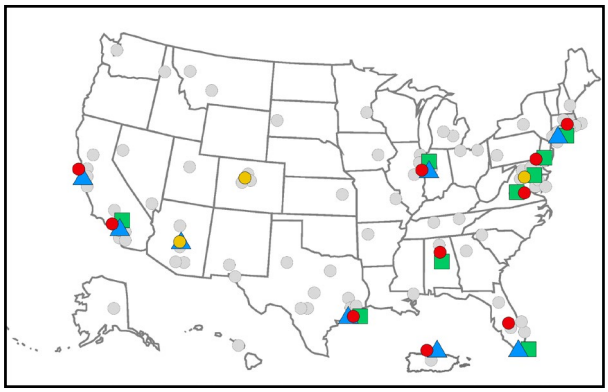

Fig 3. *Possible locations for Planetary Engagement Workshops (red dots). Locations are near concentrations of planetary research facilities (gray dots) and/or Latinx/Black communities (blue triangles/green squares). Black/Latinx community locales shown here have the highest populations based on 2010 census data. Yellow dots mark the locations of 2022 pilot workshops.*

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Additional Information: If you have any questions or would like additional information regarding the Planetary ReaCH project, please visit www.lpi.usra.edu/planetary-reach or contact Andy Shaner at shaner@lpi.usra.edu.