

PROFESSIONAL DEVELOPMENT FOR PLANETARY SCIENTISTS. C. Shupla¹, S. Buxner², J. Grier², B. Aponte Hernandez¹, E. G. Rivera-Valentín¹, A. Shaner¹, A. Smith Hackler¹, ¹Lunar and Planetary Institute (3600 Bay Area Blvd., Houston, TX 77058, shupla@lpi.usra.edu), ²Planetary Science Institute (1700 E Fort Lowell Rd # 106, Tucson, AZ 85719).

Introduction: Planetary scientists play a critical role in engaging audiences in solar system science and exploration, as they share their research and personal experiences. However, planetary scientists face challenges in effectively interacting with audiences, including the need for preparation and tools to engage diverse audiences, and incomplete knowledge of ways to participate.^{1,2,3,4} In addition, early career scientists may need preparation in presenting their science at conferences. Students considering a career in planetary science need preparation in these, as well as professionalism, ethics in planetary science, applying for graduate school, and other topics.

To help address these needs, the Lunar and Planetary Institute (LPI) has conducted trainings for these audiences. LPI has conducted seminars onsite and online, as well as during professional planetary science conferences.

Sharing Planetary Science Seminars: In 2017, LPI's Education and Public Engagement (E/PE) team began seminars for planetary scientists on communicating and engaging public audiences. After a 2 hour workshop in September 2017, the team was invited to conduct bi-monthly seminars, which began in February 2018. Seminars included current education research, and incorporated participants' own knowledge and experiences, through guided activities and facilitated discussions (Figure 1). Participants attended in-person or online. Each session focused on a particular topic, including (but not limited to):

- Addressing Controversial Topics
- Sharing Science with the News Media
- Common Planetary Misconceptions
- Getting the Audience's Attention.



Figure 1. Scientists enjoyed models for engaging audiences.

The number of participants varied for each session, averaging around a dozen. The largest session was on the topic of *Sharing Science with the News Media*, conducted during the 2018 LPSC conference and included approximately 30 participants. The number of online

participants increased as scientists became aware of the series.

An anonymous evaluation survey was conducted after each session. All responses (100%) indicated that at least one aspect of the seminars was valuable. The most useful aspects of the seminars ranged from the information presented, to discussions of the concepts, to discussing or practicing solutions to issues. Additional comments included requests for the information to be available online, and additional time for the topics. As a result, the presentations and handouts are available at www.lpi.usra.edu/education/scientist-engagement and the sessions were extended from 45 minutes to an hour.

New sessions will be scheduled for 2019, with input from LPI scientists.

Intern Seminars: In July-August 2018, LPI held five seminars for its summer interns, on topics including professional behavior, ethics in science, giving presentations (see Figure 2), marginalized communities, and applying to graduate school. The seminars included information as well as opportunities to discuss scenarios. LPI scientists presented information and gave examples from their own careers, while the E/PE team facilitated conversations, presented education research, and conducted activities to enable the interns to consider practical applications of the information.



Figure 2. Intern presentations intentionally demonstrating how not to give a presentation were particularly engaging.

Attendance at the seminars was strongly encouraged but not mandatory, and ranged from 10 to 13 interns. Ten scientists attended one or more of the seminars, often presenting or contributing to the conversations.

Evaluation surveys were collected after each session, and a summative survey was completed by a majority (9) of the interns who attended the sessions. All

(100%) indicated that the seminars were enjoyable, interesting, and useful, and recommended that they be continued in the future.

Several indicated that sessions were too short, and several suggested that there be more sessions next summer. A majority indicated a session on writing a scientific paper or abstract would be useful. Others suggested an overview of the variety of planetary science topics, assertiveness training, and additional content related to graduate school.

Multiple interns indicated that having LPI scientists share their opinions, professional experiences, and advice was the most valuable aspect of the seminars.



Figure 3. An LPSC presenter practices his delivery.

Early Career Presenters Review: LPI's E/PE team has led and partnered with education specialists from Planetary Science Institute to conduct presenters review sessions at LPSC and at the Division for Planetary Science conference for students and early career scientists. Review sessions allow early career scientists to practice poster, e-poster and oral presentations and receive feedback from mid-career and senior scientists (Figure 3). Each session relies heavily upon experienced planetary scientists volunteering their time to provide feedback and insights into ways to communicate effectively at a professional science conference.

Attendance at these sessions is limited to fit the allotted time and space, and varies greatly depending on conference needs. Sessions have varied from 5-20 participants, and 3-10 scientist reviewers. Early career scientists register online ahead of the meeting. Participants range from undergraduates to research scientists and from those presenting at their first scientific conference to their fifth scientific conference.

Sessions not only benefit participants, but also the scientists who conduct the reviews. Scientists become more aware of new people in the field, what they are studying, and the challenges that early career people face. Reviewers learn more effective ways to communicate science ideas to non-experts (or those just becoming experts), and find ways to improve their own posters and talks with the latest understandings of science communication.

Anonymous surveys are conducted online the week after the meeting. Results from a survey of participants from the 2018 meeting in Knoxville revealed that both those presenting and those giving feedback found the events worthwhile. Feedback is also helping make changes for future conferences including splitting sessions across the week to ensure more participants can get the most out of the event.

Conclusion: LPI will continue to conduct professional development for planetary scientists, with input from the community. These sessions will likely grow beyond those conducted so far.

LPI staff conducted a workshop at SACNAS (Society for Advancement of Chicanos/Hispanics and Native Americans in Science) in fall 2018, sharing best practices in applying for internships. Recently, LPI held a well-attended staff workshop on *Unconscious Bias*. All attendees who filled out the evaluation indicated that they found the workshop useful. Though the intent of the workshop was to train LPI Summer Intern Advisors on unconscious bias and other barriers faced by underrepresented minorities in STEM, all LPI staff were welcome to attend, and the session was webcast for remote attendees.

For more information on LPI's seminars for planetary scientists, students, and early career scientists, or to provide suggestions, please contact Christine Shupla (shupla@lpi.usra.edu).

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