

TOWARDS A SUSTAINABLE LUNAR SCIENCE COMMUNITY: DEVELOPING THE NEXT GENERATIONS OF LUNAR SCIENTISTS AND ENGINEERS. N.Petro¹, L. Bleacher^{1,2}, J. Bleacher¹, S. Noble³, K.R.S. Cahill⁴, A. Fagan⁵, M. Mader⁶, B. Shankar⁶; ¹NASA\GSFC, ²SSAI, ³NASA\MSFC, ⁴HIGP, ⁵Notre Dame, ⁶U.W.Ontario; Noah.E.Petro@nasa.gov

Building a Community: The Lunar Exploration Roadmap (LER) as developed by LEAG contains a sustainability theme that focuses on “Extend Sustained Human Presence to the Moon to Enable Eventual Settlement.” Any sustainable human presence on the Moon will require, in addition to commercial partnerships, a long-term investment in future generations of lunar scientists and engineers. Fortunately, due to the recent lunar missions and increase in funding opportunities for lunar science, the number of early career lunar scientists and engineers has grown substantially in the last few years.

With plans for future US and international orbital and landed spacecraft, the Moon will become a place of intense scientific scrutiny. But who will build the instruments and spacecraft and analyze data from these missions? Certainly the current generation of established scientists and engineers will play a major role in these endeavors, but who will follow them? The Next Generation Lunar Scientists and Engineers (NGLSE) is a grass-roots effort at fostering the growing community of early career lunar scientists and engineers. We are fortunate to be in a position to develop the next generation of lunar enthusiasts with the support of the first generation of lunar scientists and engineers, ensuring continuity of a base of lunar knowledge.

The need to foster the next generation of lunar scientists is recognized within NASA, is acknowledged by the NASA Lunar Science Institute (NLSI), and is recognized by the international community (e.g., [ILEWG](#), [Lunar Explorers Society](#), and the [Canadian Lunar Research Network](#)). A primary goal of the NLSI is to support “...the development of the lunar science community and training the next generation of lunar science researchers.” Additionally, the NASA HQ (OSEWG), which is composed of representatives from the SMD, the ESMD, and SOMD, is tasked with the integration of science and engineering for the successful exploration of the Moon. The NGLSE aims to bring early career scientists and engineers together and help in creating, fostering and supporting the next generation of lunar scientists and engineers.

Currently with over 150 members from academia, industry, and NASA, the NGLSE is building a representative cross-section of the lunar science and engineering communities. The NGLSE has and will meet twice a year in conjunction with the annual LPSC as well as the NLSI Lunar Science Forum. The NGLSE provides opportunities for social and professional networking among our members and across generations. We provide opportunities to give and receive feedback on research in a small setting, and will provide a forum to allow members to suggest and hold

topical workshops. Ultimately, the NGLSE will provide communication to the larger community via a website, in addition to our existing Facebook group and [email list-serve](#). Feedback from previous workshops indicates that meeting with community leaders has been beneficial to the NGLSE members. We encourage leaders in the lunar science and engineering field to participate in future workshops as a critical step in sustaining the next and future generations.

Sustaining A Community: In order to maintain a science/engineering community capable of sustaining a long-term presence on the Moon, regardless of when that presence begins, a continuing lunar funding program is required. Should funding for lunar science continue and increase over the next few decades, a lunar science and engineering community should evolve and grow simultaneously, with new community members continually being brought into the fold.

However, if there is a decrease in near-term lunar missions and/or funding over the next few years, maintaining a lunar community should be a top priority. Without the financial support or the promise of upcoming lunar missions, the recent growth of the domestic lunar community would likely wane. Coupled with a potential decline in a lunar community through attrition and age, postponing a lunar program without sustained funding opportunities could lead to a near depletion of the ranks and a loss of the inherited lunar knowledge base, while the international community may continue its growth. While a total depletion of a lunar science community is unlikely, losing members from the recent increase in lunar scientists and engineers would certainly be a setback for the community.

Apart from a sustained lunar funding program, regardless of the near-term future of lunar exploration, what else can be done to sustain a developing lunar community? With the possibility of future commercial lunar exploration, commercial partners should develop relationships with members of the next generation; likely the generation who will be leading the way back to the Moon.

The lunar science and engineering communities need to also begin fostering future generations of scientists and engineers. This generation is currently in grade school and can be reached and engaged through effective, sustained education and public outreach efforts. Building a community of active participants who are dedicated to, and trained in, effective education and public outreach efforts to engage students, policy makers, and the general public is fundamentally important in building a sustainable, long-lived, and publicly supported lunar science program.