

NASA'S LUCY STUDENT PIPELINE ACCELERATOR AND COMPETENCY ENABLER (L'SPACE) PROGRAM: REIMAGINING WORKFORCE DEVELOPMENT FOR DIVERSE UNDERGRADUATE STUDENTS AT SCALE. S. Klug Boonstra¹, D. Garcia¹, K. Kretke², A. R. Acuna¹, H. Stickel¹, M. Storksdieck³, S. Buxner⁴, H. Fischer³. ¹Arizona State University, ASU Mars Space Flight Facility, 201 E. Orange Mall, Tempe, AZ 85287-6305, sklug@asu.edu; ²Southwest Research Institute, 1050 Walnut St. Suite 300, Boulder, CO 80302; ³Oregon State University, 254 Gilbert Hall, Corvallis, OR 97331; ⁴Planetary Science Institute, 1700 E Fort Lowell Rd STE 106, Tucson, AZ 85719.

The Need: With the advent of the Boomer Generation at or near retirement age, our nation finds itself experiencing a national STEM Workforce Challenge. In applying this situation to NASA, can NASA better attract and enable STEM students (especially diverse students who are not equally represented in STEM or the NASA workforce) to be better prepared as the emerging STEM workforce? In looking at current, traditional NASA undergraduate avenues (internships, fellowships, and scholarships) and the reach of those programs, there still is a large gap remaining when mapped to the need of the full exploration ecosystem (which includes all the commercial sectors and affiliates (aerospace, university partners, etc.) needed to fill the ongoing exploration-focused STEM pipeline. A new path forward was needed to reimagine how rigorous STEM workforce development preparation could be accomplished and, even more importantly, at scale.

The L'SPACE Program: The NASA Lucy Student Pipeline Accelerator and Pipeline Enabler (L'SPACE) Program is NASA's Lucy Mission's Student Collaboration and is funded by NASA's Science Mission Directorate. The L'SPACE Program is designed to attract and train diverse STEM students to help meet the growing needs of the Exploration Ecosystem's STEM workforce. The unique combination of a virtual 500-seat Zoom auditorium setting and the hands-on aspect of the L'SPACE Program expands the opportunity exponentially for students to gain NASA-based workforce experience by providing an opportunity for any undergraduate STEM students attending a US college or university to learn STEM workforce skills based on their interest in exploration and not dependent on who they know, where they live, or where they go to school.

L'SPACE provides a unique school to work bridge for undergraduate students where they have the ability to apply the technical coursework they are learning in their college and university disciplines to real-world challenges before they graduate. The L'SPACE Program consists of rigorous, 12-week virtual academies. Currently, there are two academies available

to students - Mission Concept Academy and the NASA Proposal Writing and Evaluation Experience (NPWEE) Academy. Both are team project-based and designed to be very interactive – both during the academy time and outside of the academy time. The L'SPACE Academy's curriculum is taught by NASA subject matter experts (SMEs) and provide *just-in-time* instruction to inform and enable their team's projects.

In addition to their instruction, L'SPACE participants are provided mentors to help with unpacking complex topics so they can acquire and master the knowledge, practices, and procedures that will map to the needs of the STEM workforce they are hoping to join. Each of the academies have a final team project deliverable: Mission Concept Academy – Preliminary Design Review and the NASA Proposal Writing Experience and Evaluation - a proposal based on a current NASA need and within the guidelines of a NPWEE unique solicitation. Teams are provided professional feedback on all their deliverables and are able to also gain extra skills by completing multi-hour skill modules outside of the regular academy requirements.

Outcomes: The L'SPACE Program is designed to be fast-track iterative so improvements can be made immediately as needed and able to flex to new needs as they arrive. As of Summer 2020, The L'SPACE Program numbers are: Completed a total of academies: 11; Total number of student participants: 2,579; Total of students complete the 12-week academies: 2,334 (92.29%); Total number of colleges and universities represented: 645; Total number of community colleges: 170; Total reach: All 50 states, Puerto Rico, and Guam; Total number of students of color: 1,321 (41.29%); Total number of students identifying as female: 1,395 (39.54%).

Future Work: The L'SPACE Program Team includes internal and external evaluators. We are working to improve our workforce development model through program data acquisition to look at long-term impacts of this program to see how the preparation of the STEM students is affecting their workforce preparation. In addition, we are following the students'

path of preparation as they finish their undergraduate work and transition to the STEM workforce.

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