

LEVERAGING PARTNERSHIPS, SCIENCE CONTENT, SPECIAL EVENTS, AND NASA ASSETS TO HELP GIRL SCOUTS EARN SPACE SCIENCE BADGES. P.V.Graff¹, S.Runco², S.Foxworth¹, K.Willis³, J.Fooshee⁴, K.Cavenah⁵, C.Shupla⁶, A.Shaner⁶, S.Webb⁶, P.Harmon⁷ ¹Jacobs JETS, NASA JSC, Houston, TX 77058, (paige.v.graff@nasa.gov), ²NASA JSC, ³Jacobs JETS/Oceanering Space Systems, ⁴Jacobs JETS/MTS, ⁵Girl Scouts of San Jacinto Council, ⁶Lunar and Planetary Institute, ⁷Seti Institute.

Introduction: Throughout 2019, NASA celebrated historic anniversaries and announced bold new programs generating excitement about earth and space exploration. One of the most notable events was the celebration of the 50th anniversary of Apollo 11 historic first steps on the Moon. Complementing this anniversary event were the additional activities and events conducted across the agency that highlighted the many science achievements that were attained across all of NASA's Science Mission Directorate (SMD) Divisions (earth, planetary, heliophysics, and astrophysics). Further excitement was generated through NASA's Artemis program which plans to send the first woman and next man to the surface of the Moon. NASA continues to inspire the public including learners of all ages around the world.

Building on this momentum, in October 2019, the Astromaterials Research and Exploration Science (ARES) Science Engagement team partnered with the Lunar and Planetary Institute (LPI) and the Girl Scouts of San Jacinto to host an event that enabled Girl Scouts to earn recently released space science badges developed by the Reach for the Stars: NASA Science for Girls Scouts Program. The event celebrated SMD science and highlighted Earth's Moon and International Observe the Moon Night (InOMN) while facilitating the earning of the NASA inspired space science badges. This event was coordinated and led by the ARES Science Engagement team as part of their collaborative work and involvement in NASA's SMD Science Activation Program.

NASA's SMD Science Activation Program: NASA's SMD Science Activation Program consists of twenty-four competitively-selected teams from across the nation that connect NASA science experts, authentic content and experiences with communities across the nation so they can engage in science in ways that activate minds and promote understanding [1]. One of the rich aspects of the SMD Science Activation Program is the partnerships and cross collaboration among teams, also referred to as the SciAct Collective. These strongly encouraged collaborations enable members of the SciAct Collective to broaden the reach of the work being facilitated by each team which represents the overall rich science and research accomplished across all SMD Divisions. These collaborations help the SciAct Collective efficiently and effectively communicate

and highlight the science being done as part of the NASA Science Mission Directorates, and NASA as a whole, to diverse audiences across the nation.

Leveraging Partnerships, Science Content, Special Events, and NASA Assets: As a member of NASA's SMD Science Activation Program, the Reach for the Stars: NASA Science for Girl Scouts Program [2], aiming to enhance STEM experiences for Girl Scouts in grades K-12, developed a number of space-related badges for the Girl Scouts. As part of a growing collaboration with the Girl Scouts, the Astromaterials Research and Exploration Science (ARES) [3] Science Engagement team at NASA's Johnson Space Center (JSC) evaluated the requirements for the badges in order to organize an event in which 100 girls (Cadettes, Seniors, and Ambassadors) would be exposed to ARES Astromaterials assets, science content, Subject Matter Experts (SMEs), and unique facilities, while also completing the requirements for the NASA inspired Girl Scout badges.

For this event, the ARES team worked with the Girl Scouts of San Jacinto [4], a Houston-based Girl Scout Council, and scheduled the event during the annual International Observe the Moon Night (InOMN) [5], leveraging the excitement of this world wide event celebrating Earth's Moon. We also partnered with the Lunar and Planetary Institute (LPI) [6] to facilitate selected activities including making observations in a portable planetarium set up at LPI's home institution near JSC.

The majority of activities were facilitated at Rocket Park, around the Saturn V rocket at NASA JSC in Houston, TX. This unique facility enabled the Girl Scouts to have access to one of only three Saturn V rockets on display across the nation. Hosting the event at this location also helped highlight the 50th anniversary of the Apollo 11 landing on the Moon, brought the Girl Scouts to a NASA site, and also enabled the Girl Scouts and the ~50 adults that accompanied them, to interact with numerous SMEs who work at NASA JSC. We also shared unique NASA Astromaterials assets including a touchable Moon rock, a Martian meteorite, and more!

The event and activities also highlighted other NASA Science Activation team projects and content including citizen science projects available through the GLOBE Program [7], content developed by NASA's

Universe of Learning [8], and more. The overall event and activities were enriched by the leveraging of partnerships, access to NASA assets, and the opportunity to showcase special events and rich SMD science content. The opportunity not only enabled the Girl Scouts to earn NASA inspired badges, but it generated excitement for them and their accompanying adults and enhanced the knowledge and awareness of NASA science and exploration for all.

Girl Scout Badging Event: The Girl Scout badging event was held on October 5, 2019. There were 100 girls (Cadettes, Seniors, and Ambassadors) plus ~50 adults who registered to attend the event. The event and activities focused on enabling the Cadettes to earn the Space Science Researcher and Night Owl Badges; the Seniors to earn the Sky and Space Science Expert Badges, and the Ambassadors to earn the Space Science Master Badge.

To kick off the evening, the Girl Scouts first went to the Lunar and Planetary Institute (LPI) to register and participate in a handful of activities including making observations during demonstrations led by LPI staff in a portable planetarium. The participants also received field guides, designed by ARES Science Engagement staff specifically for the event, that provided information on the badges they would be earning, information related to the activities they would be completing during the evening, and space for participants to reflect on and log their badge earning journey.

After the initial hour at the LPI, participants then went to Rocket Park at NASA JSC where they completed the remainder of the activities and badge requirements. While at Rocket Park, the Girl Scouts had the opportunity to interact with SMEs who facilitated activities at the activity stations, viewed the night sky through telescopes brought in by local volunteer astronomers, and also interacted with a wildlife expert who brought a rescued owl to the event to assist with the Cadettes Night Owl Badge. Participants also had the opportunity to interview people from a variety of careers at NASA such as scientists, engineers, security officers, and mission control personnel. At the end of the night, the event came to a close with the Girl Scouts Friendship Circle singing and sharing traditional Girl Scout mission declarations.

Surveys were sent to the Girl Scout Council of Jacinto to obtain input about the event from participants. Data received will be used to improve on events like this facilitated in the future.

Conclusions: Engaging the Girl Scouts with SMD content, subject matter experts, and unique NASA assets, while celebrating the Apollo 50th anniversary and International Observe the Moon Night was successful due to the leveraging of partnerships, the use of rich

engaging content developed in part through the NASA Science Activation Teams, and the recently released NASA inspired space science Girl Scout Badges. As this was a first-time event, we will take the lessons learned and input provided by the participants to further improve and enhance this experience at future events.

References: [1] NASA Science Mission Directorate (SMD) Science Activation Program, <https://science.nasa.gov/learners> [2] Girl Scouts: Reach for the Stars Science Mission Directorate (SMD) Science Activation Team, <https://science.nasa.gov/science-activation-team/girl-scouts-reach-for-the-stars> [3] Astromaterials Research and Exploration Science (ARES) at NASA JSC, <https://ares.jsc.nasa.gov/> [4] Girl Scouts of San Jacinto, <https://www.gssjc.org/en/about-girl-scouts/who-we-are.html> [5] International Observe the Moon Night, <https://moon.nasa.gov/observe-the-moon/annual-event/overview/> [6] Lunar and Planetary Institute, <https://www.lpi.usra.edu/> [7] GLOBE Mission Earth, <https://science.nasa.gov/science-activation-team/globe-mission-earth> [8] NASA's Universe of Learning, <https://science.nasa.gov/science-activation-team/universe-of-learning>

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