

Field camp for astronauts: NASA's geoscience training program for planetary exploration

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Fifty years ago Apollo astronauts walked on the Moon to explore the geology and collect samples for Earth return. Several authors have discussed the strategic planning and training that enabled the Apollo successes [Phinney, GAT-SAT,ref], and assembled recommendations regarding today's lunar science objectives [LEAG ref] and astronaut training required to achieve those science goals [GAT-SAT].

Since the 1980s, geoscience training for astronauts focused on observing the Earth from orbit. Today, we are building a geoscience training program to support informed Earth observations as well as the exploration culture for future human missions to the Moon and Mars. Our team partnered with JSC's crew training and astronaut offices to develop our 4-week geoscience program for the 2017 astronaut class [ref lpsc]. Because the astronauts have a variety of professional backgrounds, we provide a broad introduction to Earth and planetary sciences. But our prime focus is 2 weeks of intensive field work, a methodology introduced with the 2013 astronaut class [ref].

We completed the first half of the training – a field trip to observe hurricane deposits along Galveston Bay; keynotes by Apollo colleagues highlighting Apollo experiences; a tightly-integrated week of introductory geology in the classroom followed by a week of fieldwork in the Rio Grande del Norte National Monument. The classroom included interactive map exercises that allowed the students to progressively build a base map of the field area that they used as a starting point for their week-long mapping exercise. We divided the class into small mapping groups to conduct their observations, mapping and interpretation of the geology. In addition to learning geological field work, our field training provided the platform for practicing expeditionary leadership, a key skill set valued by NASA for astronaut crews.

Next summer the capstone fieldwork for the 2017 astronauts will include both mapping and rock sampling. Throughout the mapping, the class will collect additional data to help inform field and sampling decisions using diagnostic field instruments that are being tested in analog settings for their operational efficacy for future planetary exploration [ref].

Advancing the Science of the Moon, LEAG, 2018

[<https://www.lpi.usra.edu/leag/reports/ASM-SAT-Report-final.pdf>]

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