

NORTHERN ARIZONA PLANETARY SCIENCE ALLIANCE (NAPSA): A COLLABORATIVE INITIATIVE TO EXPAND PLANETARY SCIENCE RESEARCH AND EDUCATION EFFORTS IN NORTHERN ARIZONA. J. J. Hagerty¹, T. N. Titus¹, N. Barlow², D. Dye³, ¹U.S. Geological Survey, Astrogeology Science Center, Flagstaff, AZ (jjhagerty@usgs.gov); ²Department of Physics and Astronomy, Northern Arizona University, Flagstaff, AZ; ³U.S. Geological Survey, Western Geographic Science Center, Flagstaff, AZ.

Introduction: Research institutions in Northern Arizona, and Flagstaff in particular, have a long history of conducting high level planetary science research. Scientists and educators at the Lowell Observatory, Northern Arizona University (NAU), the US Geological Survey (USGS), and the US Naval Observatory (USNO), have made invaluable contributions to understanding the origin and evolution of the Solar System; however, collaborations among these institutions have been rare even though their experience and capabilities are complementary and synergistic. Recognizing the potential benefit of a formalized framework for promoting research and education collaboration, representatives from each of these institutions established in 2014 the Northern Arizona Planetary Science Alliance (NAPSA). This alliance consists of the following specific entities: NAU (Department of Physics and Astronomy, School of Earth Science and Environmental Sustainability, Department of Electrical Engineering and Computer Science, Department of Mechanical Engineering, and Department of Mathematics and Statistics), Lowell Observatory, USGS (Astrogeology Science Center, Western Geographic Science Center, Arizona Water Science Center, and Geology, Minerals, Energy, and Geophysics Science Center), and the US Naval Observatory (see **Table 1** for steering committee members). One of the main objectives of this initiative is to provide a singular portal for members of the planetary science community, the regional school systems, and the general public to access information and resources associated with the cutting edge planetary research being conducted in Northern Arizona.

Rationale and Goals: Northern Arizona has many unique characteristics that make it a nexus of planetary science research. From the abundance of terrestrial analog sites (e.g., Meteor Crater, the Grand Canyon, the San Francisco Volcanic Field, the Colorado Plateau, and the Verde Valley) to the designation of Flagstaff as the first “International Dark Sky City” ideal for telescopic observations at Lowell, NAU, and USNO, to Flagstaff being named America’s first STEM community, it is clear that Northern Arizona has much to offer to the planetary science community. However, the NAPSA initiative seeks to further increase the reach and impact of Northern Arizona’s planetary research efforts by combining experience, knowledge, and facilities to create a one-stop research and educa-

tional resource for anyone interested in planetary science.

Workshops and Seminars: One of the major objectives of NAPSA is to increase communication between each institution via workshops and seminars. A kickoff workshop was held in May 2014 that was focused on educating scientists, staff, and students about the research being done and the resources that are available at each institution. The first half of the workshop was focused on identifying road blocks that hamper collaboration and the second half of the workshop was focused on breakout discussion sessions addressing student training, research collaborations, and community outreach. A follow-up poster session was held in September 2014 that allowed individual scientists to present research projects that could benefit from collaborations with students at NAU as well as researchers at other institutions. Researchers from USGS and Lowell have been giving presentations in engineering, computer science, and physical science classes to inform students about careers that are available in the field of planetary science.

Student Involvement and Training: Working with the NAU Center for Science Teaching and Learning (CSTL), NAPSA is developing new opportunities for students of all ages to become involved in the planetary sciences. Curriculum support and development is a major component of the NAPSA initiative, with one potential benefit being a degree program in planetary photogrammetry and cartography. Until then, we will strive to involve NAU undergraduate and graduate students in the cutting-edge planetary science projects at Lowell, USGS, and USNO through grant funding and programs such as the NAU/NASA Space Grant Internship program, while also creating opportunities for scientists and research staff to contribute to classes and seminars at NAU. The ultimate goal is to help train the next generation of planetary scientists in a variety of fields.

Future Efforts: In February 2015 NAPSA will host a workshop focused on mapping of small bodies in the Solar System. NAPSA will also hold its second annual poster session in the fall of 2015 that will focus on student education and employment opportunities in the planetary sciences. By the end of 2015 NAPSA will have a public webpage that will provide access to all of the planetary science resources in Northern Ari-

zona. In 2016 the NAPSAs steering committee will reach out to other planetary science institutions within Arizona to further expand the impact and reach of planetary science.

Table 1. NAPSAs Steering Committee Members.

Representative	Institution/Department
Omar Badreddin	NAU Computer Science
Nadine Barlow	NAU Physics and Astronomy
Tim Becker	NAU Mechanical Engineering
Dennis Dye	USGS Western Geographic Science Center
Will Grundy	Lowell Observatory
Justin Hagerty (Chair)	USGS Astrogeology Science Center
Bob Hart	USGS Arizona Water Science Center
Julie Heynssens	NAU Electrical Engineering
Marc Murison	US Naval Observatory
Mary Reid	NAU School of Earth Science and Environmental Sustainability
Jim Swift	NAU Mathematics and Statistics
Tim Titus (Co-chair)	USGS Astrogeology Science Center
Paul Umhoefer	NAU School of Earth Science and Environmental Sustainability



Figure 1. NAPSAs poster session at the USGS Flagstaff Science Campus, September 2014. Scientists from each NAPSAs institution presented current and future research affiliated with planetary science.