

# Astrogeology Committee Annual Report

Objectives: The primary objective of the AAPG Astrogeology Committee is to present potential benefits and issues in space exploration for the AAPG membership. Other objectives include organizing symposia at AAPG and professional meetings, recommending speakers for distinguished lectures, publications, technical sessions, and astrogeology field trips, and acting as liaison with groups having similar interests such as NASA. All who are interested in astrogeology, planetary science, and their applications to energy and resource issues are invited to join the Astrogeology Committee.

Relevance: The Astrogeology Committee supports the development of space resources. Comet composition provides a starting point for understanding the origin and evolution of Earth's oceans. Recent interest in mining rare earth elements and platinum group metals from asteroids and helium-3 on the moon is facilitated by our understanding of the origin and economics of terrestrial ore deposits.

Major Goal in 2017-2018: This goal is to establish partnerships with the private space industry to promote exploration and development of space energy resources. Institutional and private space-related products and services are estimated to include 120,000 full-time-equivalent positions, generating \$150 Billion annually. Private space companies comprise a \$10 to 17B industry per year with 8-15% annual growth rates. SpaceX is developing the Falcon 9 and Dragon launch systems. Other prominent firms involved in resource development, human-habitation facilities and transportation systems include Lockheed Martin and Bigelow Aerospace.

Other activities include:

- (1) Arranging symposia at AAPG conventions that emphasize astrogeology and exploration for energy resources.

- Douglas Cook and William Ambrose gave presentations in the Astrogeology Technical Session “Future of Energy: New Discoveries in the Solar System: Implications for Energy and Mineral Resources” at the 2017 ACE in Houston, Texas. Topics included proposed missions to the Moon as a stepping-stone to Mars, future exploitation of asteroid resources was discussed, as well as ongoing exploration missions to asteroids Vesta, Ceres, and Bennu. The session included a panel discussion between audience and session presenters. Attendance for these presentations exceeded 150 persons.
- Additional activities for the 2017 ACE meeting in Houston included a field trip to Houston Space Center on April 1. The event was hosted by VIP Astrogeology Committee Liaison Dr. James F. Reilly (NASA astronaut-geologist on shuttle missions STS-89 in 1998, STS-104 in 2001 and STS-117 in 2007).
- Planned activities after the 2017 ACE in Houston include a field seminar associated with the total solar eclipse of August 21, 2017 in Casper, Wyoming. This seminar will include sessions on solar system resources, feasibility of humans working in deep space, and local petroleum geology. Harrison Schmitt and James Reilly will attend as Astronaut/Geologists (ret.) Liaisons A Hedberg Conference on space exploration, transportation, and resource-development technology is being organized and tentatively scheduled for 2018.
- The Astrogeology Committee has a technical session scheduled at ACE 2018 in Salt Lake City. The technical session is titled “Future of Energy: New Discoveries in the Solar System: Implications for Energy and Mineral Resources.”

(2) Establishing a series of AAPG Astrogeology student chapters in conjunction with the AAPG Student Chapter. Their goal is to link interested students with professionals in the aerospace and planetary science community. Activities include technical meetings with guest speakers and astrogeology projects. Darwin Boardman, Astrogeology Committee Student Chapter Vice Chair, leads these efforts.

Astrogeology Committee Membership and Leadership: Douglas Cook and William Ambrose are serving as new Chair and Vice Chair, respectively, for 2017-2018. Harrison Schmitt and James Reilly serve as Astronaut/Geologist (ret.) Liaisons. Darwin Boardman III is Student Chapter Vice Chair, Laura Zahm is Committee Manager, and Heather LaReau is AAPG EC Liaison.

Website: The Astrogeology Committee's website includes mission statement, goals, business plan, committee member information, calendar of events, convention activities, abstracts, presentations, calls for papers, and PowerPoint presentations. We appreciate the services of Janet Brister at AAPG who designed, created, and updates the website:

<http://www.aapg.org/about/aapg/overview/committees/details/articleid/564/committee-astrogeology>.

Respectfully submitted,

Douglas J. Cook, Chair

William A. Ambrose, Vice-Chair