Geology on Mars: Ongoing Results from Curiosity and Planning for the Next Mars Rover

The Curiosity rover has been exploring Gale Crater on Mars for almost five years. In that time it has discovered compelling geologic evidence for an ancient fluvio-lacustrine system, including a lake environment with all conditions necessary to support Earth-like microbial life. I will present some of the scientific highlights of the mission, including the first attempts to perform radiometric and cosmogenic surface exposure dating on another planet. Looking forward, JPL is now developing its next Mars rover, currently called Mars 2020. This mission will be launched in the summer of 2020, will undertake geological and astrobiological observations at a new location on Mars, and will prepare ~35 samples for possible Earth return as part of a multi-mission Mars sample return campaign. I will discuss opportunities and challenges associated with this new mission.

Ken Farley's research centers on development and application of geochemistry techniques, especially involving isotopes of the noble gases, to a wide range of terrestrial and solar system questions. Specific areas of interest include geochronology of both Earth and Mars, the geochemical evolution of Earth, and the behavior of noble gases in minerals. He is currently a participating scientist on the Mars Science Laboratory mission and is project scientist for the Mars 2020 Science Rover mission. Farley was born in Los Angeles, California, in 1964. He received a bachelor of science degree in chemistry from Yale University in 1986 and a doctorate in Earth science from the Scripps Institution of Oceanography, University of California, San Diego, in 1991. He joined the Caltech faculty in 1993. He was Chair of the Division of Geological and Planetary Sciences from 2004 to 2014.