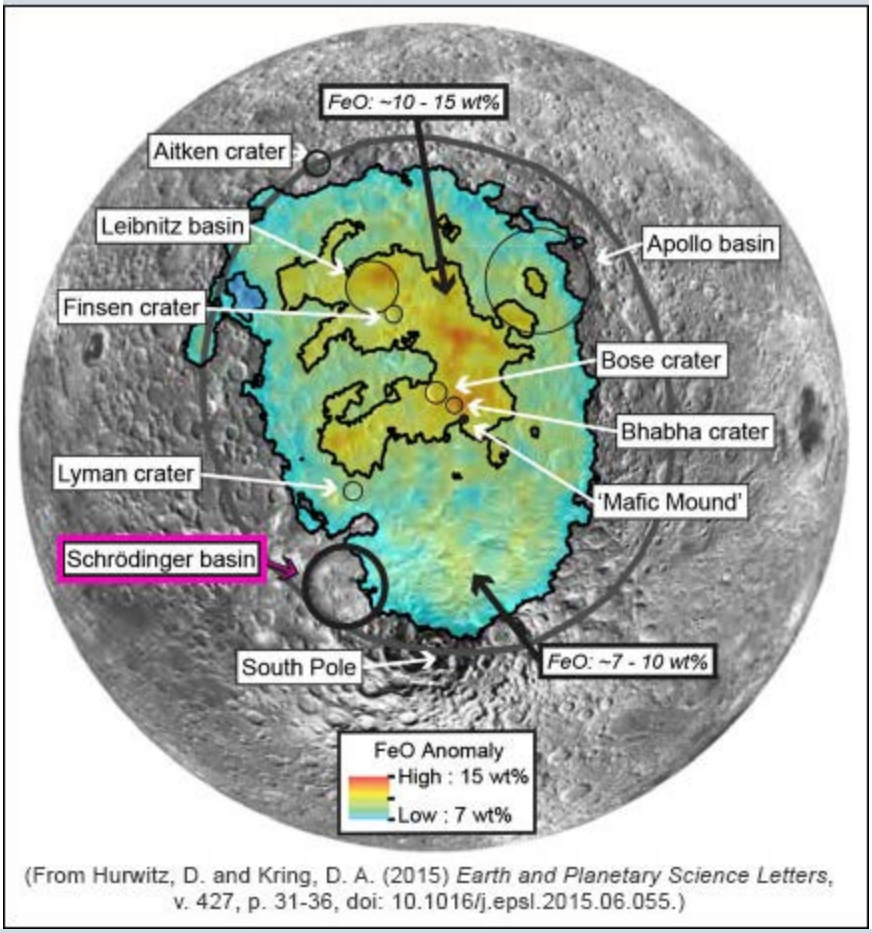
PLANETARY SCIENCE RESEARCH DISCOVERIES
CosmoSparks

Quick Views of Big Advances

Target: Schrödinger Basin

The impact melt pool generated during the formation of the South Pole-Aitken (SPA) basin, the Moon's oldest and largest basin, is left behind as FeO-enriched material distributed in the basin (see map). Determining the age of this material would tell us the age of the SPA impact, cited by the National Research Council as a high science priority, but as yet unknown.

Iron Abundance Map of South Pole-Aitken Basin



(From Hurwitz, D. and Kring, D. A. (2015) *Earth and Planetary Science Letters*, v. 427, p. 31-36, doi: 10.1016/j.epsl.2015.06.055.)

The Moon's southern farside boasts its oldest and largest basin, South Pole-Aitken (SPA) basin, outlined with grey border. The distribution of FeO-enriched material within SPA basin was mapped previously by Paul Lucey and colleagues using global multispectral data provided by the ***Clementine*** mission. Within the younger Schrödinger basin (see pink arrow pointing to the 320-kilometer-diameter basin) are areas mapped with ~7.5 wt% FeO, which Hurwitz and Kring target as good sites to collect samples of quenched SPA impact melt.

Set at the southern margin of the mapped FeO-enrichment, the younger Schrödinger basin has received attention as a target for future robotic or human missions to collect samples of the residual, quenched SPA impact melt. Petrologic modeling and orbital remote sensing analyses indicate the mineralogical signatures of the SPA impact melt within Schrödinger basin include low- and high-Ca pyroxenes and plagioclase-bearning rocks. Debra Hurwitz and David

Kring (Lunar and Planetary Institute; Hurwitz now at Oak Ridge Associated Universities-NASA Goddard Space Flight Center) have outlined a plan to traverse five kilometers along a southern wall terrace of Schrödinger basin where rock outcrops and boulders likely match SPA impact melt rock signatures. Their work suggests rocks collected here could contain ~20–30% quenched SPA impact melt. Returning these samples to laboratories on Earth for ***radiometric age dating*** would be a boon to lunar science.

The significance of knowing the age of the Moon's SPA basin extends beyond the Moon to Earth and the history of the early Solar System. If SPA basin formed during the late heavy bombardment (~3.8-4.1 billion years ago) such an event would have affected conditions on nearby Earth about the time life was beginning.

See Reference:

· Hurwitz, D. and Kring, D. A. (2015) Potential Sample Sites for South Pole-Aitken Basin Impact Melt Within the Schrödinger Basin, *Earth and Planetary Science Letters,* v. 427, p. 31-36, doi: 10.1016/j.epsl.2015.06.055. [***abstract***]

See Also:

· National Research Council (2007) The Scientific Context for Exploration of the Moon, Final Report. *National Academies Press,* Washington D. C., 120 p. [***Book download/viewing options***]

Written by Linda M. V. Martel, Hawai'i Institute of Geophysics and Planetology, for ***PSRD***.