

Abstract Submitted  
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**Planetary System Occultation from Lunar Halo Orbit (PSOLHO)**

THOMAS CLARKE, UCF — The author has suggested that planetary systems including terrestrial planets may be rare because they are the result of the injection of radionuclides from a supernova nearby in space and time to the condensation of the system nebula. Absent such a supernova, the norm would be a planetary system where the inner system comprises an asteroid belt formed from material, unmelted by radiogenic heat, which failed to condense into terrestrial planets. To test this theory, observations of the statistics of planetary systems that include terrestrial planets are required. Direct or even indirect detection of terrestrial planets is currently impossible and likely to remain difficult with current techniques. This paper discusses a Discovery mission concept that would utilize occultations by the Moon to enable detection of terrestrial planets. Earth orbiting spacecraft utilizing lunar occultations for observations such as planet detection have been proposed; but sky coverage from Earth orbit is limited and there are problems with Earthshine on the Moon. A low altitude lunar orbit would produce occultations by the farside of the moon over much of the sky, but they would be too rapid for optimum detection of faint objects. A better spacecraft location is a halo orbit around the Earth-Moon L2 point, which can be referred to as PSOLHO (Planetary System Occultation from Lunar Halo Orbit.) The portion of the Moon that impinges on the telescope field will be largely un-Earth-lit and occultations will occur at rate determined by lunar sidereal period.

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