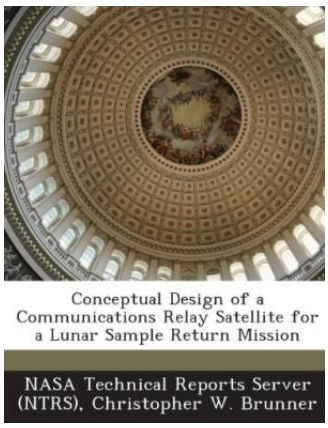


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# Conceptual Design of a Communications Relay Satellite for a Lunar Sample Return Mission

By Christopher W Brunner

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.In 2003, NASA solicited proposals for a robotic exploration of the lunar surface. Submissions were requested for a lunar sample return mission from the South Pole-Aitken Basin. The basin is of interest because it is thought to contain some of the oldest accessible rocks on the lunar surface. A mission is under study that will land a spacecraft in the basin, collect a sample of rock fragments, and return the sample to Earth. Because the Aitken Basin is on the far side of the Moon, the lander will require a communications relay satellite (CRS) to maintain contact with the Earth during its surface operation. Design of the CRS s orbit is therefore critical. This paper describes a mission design which includes potential transfer and mission orbits, required changes in velocity, orbital parameters, and mission dates. Several different low lunar polar orbits are examined to compare their availability to the lander versus the distance over which they must communicate. In addition, polar orbits are compared to a halo orbit about the Earth-Moon L2 point, which would permit continuous communication...

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