

Observation by **Clementine** of a Huge Opposition Surge on the Moon at Very Small Solar Phase Angles

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The **Clementine** mission enabled the first quantitative observations of the Moon at very small solar phase angles. It is well established from Earth-based observations that the Moon exhibits a non-linear increase in brightness as its face becomes fully illuminated to a terrestrial **observer**. Because models of the opposition effect are sensitive indicators of **surficial** compaction state and particle size (Hapke, 1986, Icarus 67, 246), **observations** at small solar phase angles are important to obtain. A recent model for optical coherent backscatter (Hapke, 1990, Icarus 88, 407) seeks to explain a **narrow** opposition spike at very small phase angles (< 1 degree) seen on several icy satellites, including Europa (Domingue et al., 1991, Icarus 90, 30.), and Oberon (Buratti et al., 1992, A.J. 104, 1618). Over 90 images of the Moon's surface at phase angles less than 0.5° (the minimum phase angle observable from Earth due to the Moon's angular size) were obtained by the **Clementine** spacecraft. Our analysis of these images shows the Moon exhibits a surge in brightness of -20% below 0.25°, comparable to the values **observed** on icy satellites. No color dependence was detected in the lunar phase curve below 2 degrees.

1. 1994 Fall Meeting
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