

## CASSINI-HUYGENS

## Shadows of Saturn's B ring

As a ring scientist I've been studying Saturn's rings since the early 1980s, and the long shadows in this particular image fascinated me! By observing the rings at equinox, with the Sun edge-on, for the first time we could search for three-dimensional regions in the rings, and we found them. Equinoxes occur only once every 15 years at Saturn, so we were lucky to have had Cassini in orbit during this special time. This image from Cassini's narrow-angle camera was obtained on 26 July 2009, just two weeks before the equinox.

The bright outer edge of Saturn's B ring is at the top of the image, just below the Cassini division, the black area depleted in ring particles. The Sun is shining downward from the top. For the first time we saw the shadows of the largest ring particles towering 1–2 miles above the 10-metre-thick rings. Imagine yourself flying in the space station, looking down on the ancient pyramids in Egypt. If the Sun were overhead, the pyramids would be hard to pick out as they blend into the desert floor. Now imagine looking down again at the pyramids, but near sunset, the equivalent of equinox. Their large shadows stretch for miles across the desert, making them obvious. In the same way, Saturn's large ring particles cast their shadows on the rings, revealing themselves to Cassini's cameras for the first time. These large chunks — possibly agglomerations of smaller particles — at

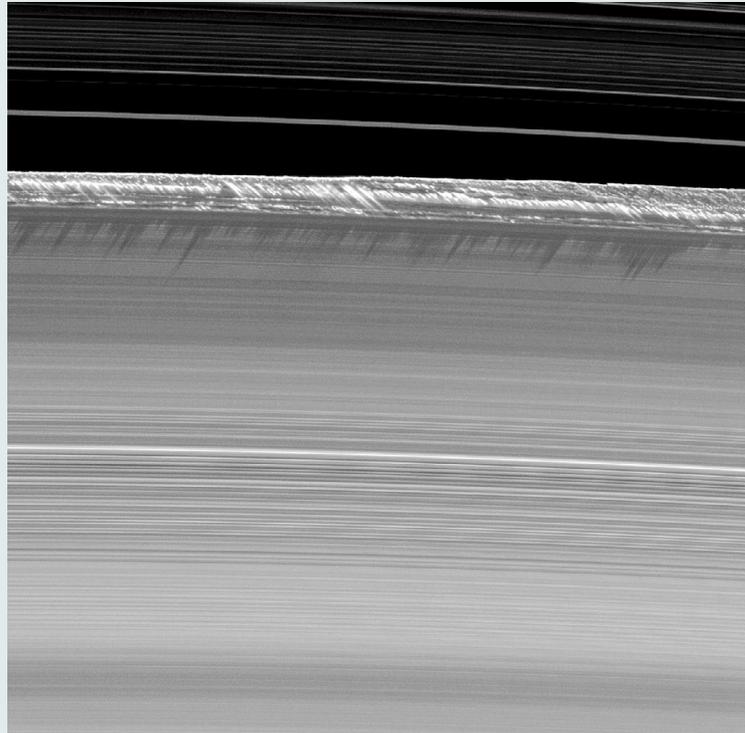


Image credit: NASA/JPL/Space Science Institute

the outer edge of Saturn's B ring can tell us a great deal about how our Solar System's planets may have accreted. Saturn's ring disk is an excellent natural laboratory for studying processes that might have occurred in the early Solar System.

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