CASSINI-HUYGENS

Ring ripples

This mosaic of the inner part of Saturn's rings shows a variety of structures, including narrow gaps, sharp edges and a few ringlets that can be seen in many high-resolution images of the rings. However, unlike most of those images, this mosaic also shows fine-scale periodic variations in the ring's brightness that extend across this entire region. This pattern was only visible during a period of time around 2009 when the Sun was illuminating the ring from almost exactly edge-on. This unusual lighting geometry highlights vertical structures in the rings and so the periodic brightness variations seen here by Cassini likely represent a corrugation or 'ripple' extending across the rings.

Detailed studies of these ripples show that they are not static features, but slowly evolve over time. Extrapolating the observed trends in these structures backwards in time reveals that they were probably created in the early 1980s, when something, probably a cometary impact, disturbed a wide swathe of the rings. The rings therefore contain echoes of events that happened decades ago, and so preserve a record of the recent history of the outer Solar System.

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