NASA’s Cassini probe captures wave structure in Saturn rings

NASA’s Cassini spacecraft has beamed back a stunning close-up image revealing the wave structure of Saturn’s rings.

The image was taken on June 4 with the Cassini spacecraft narrow-angle camera.

It was acquired on the sunlit side of the rings from a distance of 76,000 kilometres away from the area pictured.

The spacecraft currently is closing in on the end of its epic 20-year-long journey in space, as it prepares to take the final plunge into the atmosphere of Saturn.

A gravitational kick in April from Saturn’s moon Titan placed the two-and-a-half tonne space probe on its path for impending destruction on September 15.

Resulting from the same process that creates spiral galaxies, spiral density waves in Saturn’s rings are much more tightly wound.

In this case, every second wave crest is actually the same spiral arm which has encircled the entire planet multiple times.

The wave known as the Janus 2:1 spiral density wave is the only major density wave visible in Saturn’s B ring, NASA said.

Most of the B ring is characterised by structures that dominate the areas where density waves might otherwise occur, but this innermost portion of the B ring is different.

The radius from Saturn at which the wave originates is 96,233 kilometres from the planet. At this location, ring particles orbit Saturn twice for every time the moon Janus orbits once, creating an orbital resonance.

The wave is remarkable because Janus, the moon that generates it, is in a strange orbital configuration.

Janus and Epimetheus share practically the same orbit and trade places every four years. Every time one of those orbit swaps takes place, the ring at this location responds, spawning a new crest in the wave.

The distance between any pair of crests corresponds to four years’ worth of the wave propagating downstream from the resonance, which means the wave seen here encodes many decades’ worth of the orbital history of Janus and Epimetheus.

A study of nearly 300 people living in different parts of India found that nine single-base variants (single-nucleotide polymorphisms or SNPs) account

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