

## The Cassini RADAR Investigation

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The NASA-ESA Cassini mission features a Saturn Orbiter spacecraft that will make over 40 close flybys of Titan. With Titan's optically-thick hazy atmosphere in mind, Cassini was equipped with a RADAR instrument. This multimode instrument is fundamentally designed as a Titan radar mapper, to use Synthetic Aperture Radar (SAR) techniques to image the surface at 300-1000m resolution. The flybys allocated to RADAR should allow about 20% of Titan's surface to be mapped this way.

Additionally the instrument (with 5 beams, operating at Ku Band, 2.2cm wavelength) will be used in a nadir-looking altimetry mode to accurately constrain topography and Titan's overall shape, and in an oblique scatterometry mode to measure surface roughness, of particular interest for oceanography studies. The instrument also operates as a passive radiometer, which will permit the determination of surface temperatures and dielectric constant (constraining composition)

The radar will be used in scatterometry and radiometry modes at several other satellites, including Phoebe and Iapetus.