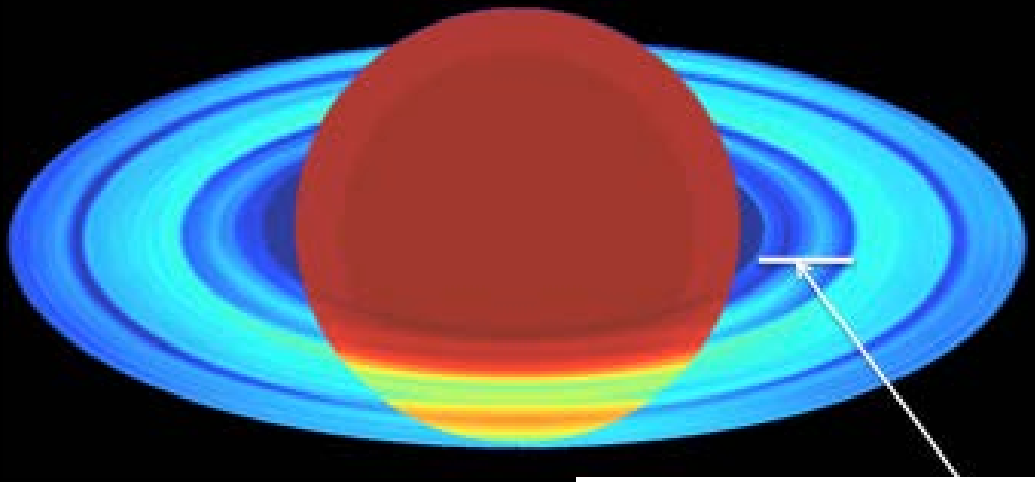
# A Shattered "Centaur" Buried in the Icy Rings?

The center of Saturn's C ring may be the final resting place for a broken-up minor planet captured and torn apart by Saturn's gravity, according to recent measurements from the Cassini spacecraft.

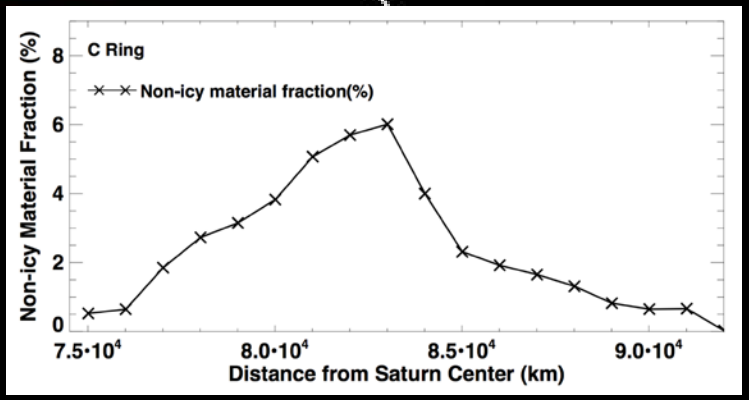
To study this rocky material, Cassini scientists used the RADAR instrument to penetrate the mostly-icy ring particles to reveal the fraction of silicates inside. They found that the C ring contains 1 to 2 percent silicates, most likely due to meteoroid bombardment over the last 15 to 90 million years.



The output brightness temperature map generated from Cassini RADAR data. Red is hotter temperature, blue is colder.

More of this rocky material was found in the center of the C ring than at the ring edges. The best theory to explain this unusual distribution is that an incoming Centaur (a type of minor planet that orbits the Sun between Jupiter and Neptune) was captured by Saturn and deposited in the rings around 10 to 20 million years ago. Over time this rocky planet would have been broken into pieces, spreading out and forming the silicate-rich center of the C ring we see today.

Such discoveries reveal that Saturn may have had a more colorful history than previously believed, and may also inform new missions such as Lucy that will explore rocky bodies like Trojan asteroids.




The non-icy material fraction is highest in the middle of the C ring.

"Cassini microwave observations provide clues to the origin of Saturn's C ring", Z. Zhang, *et al.*, *Icarus*, **281**, 297-321, 2017.