

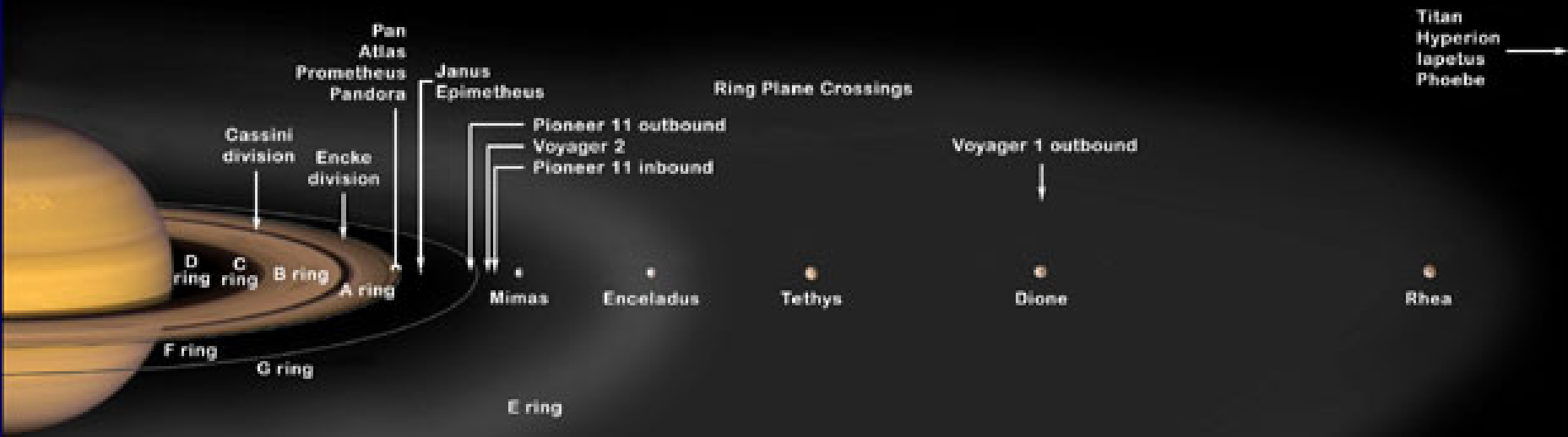
# The Rings of Saturn and Cassini Discoveries



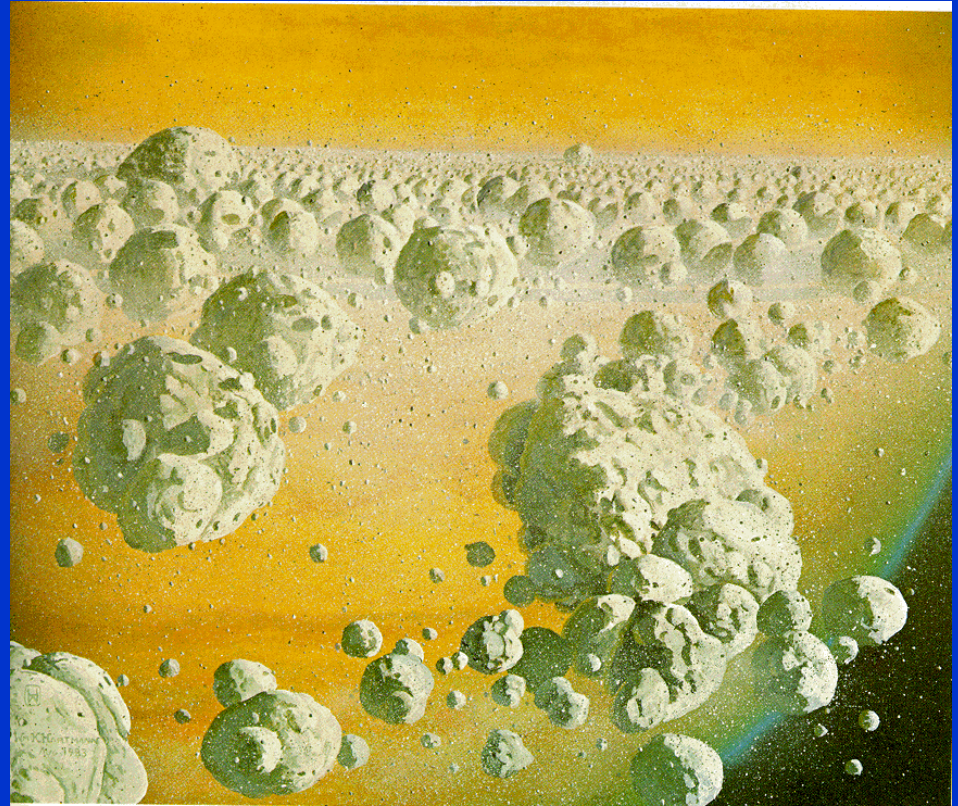
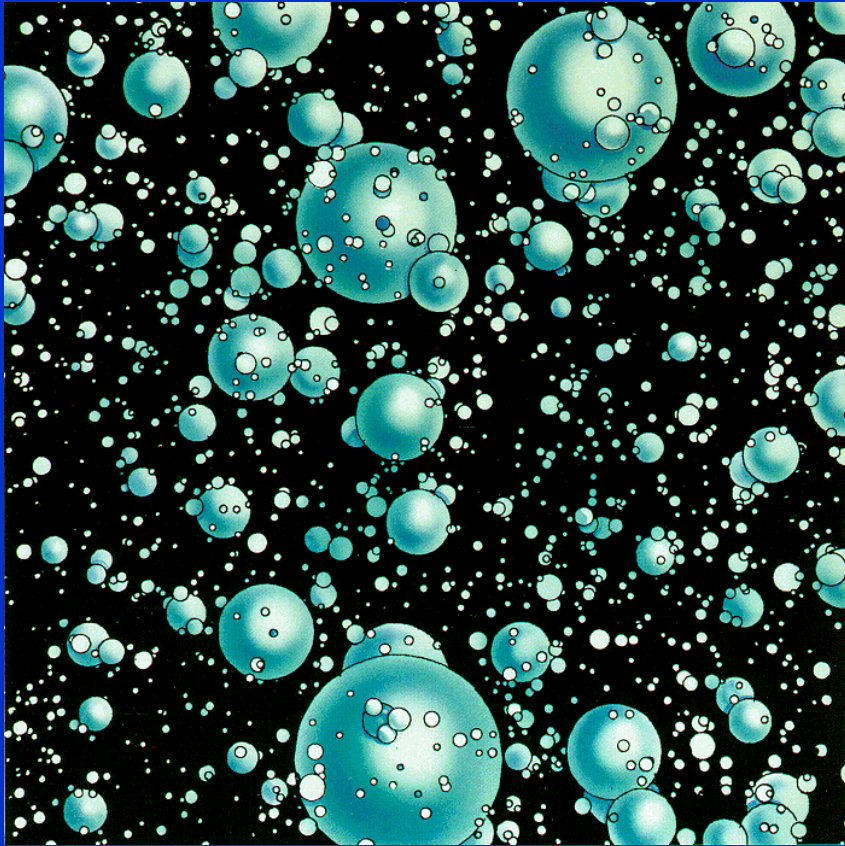
Dr. Linda J. Spilker

31 August 2004

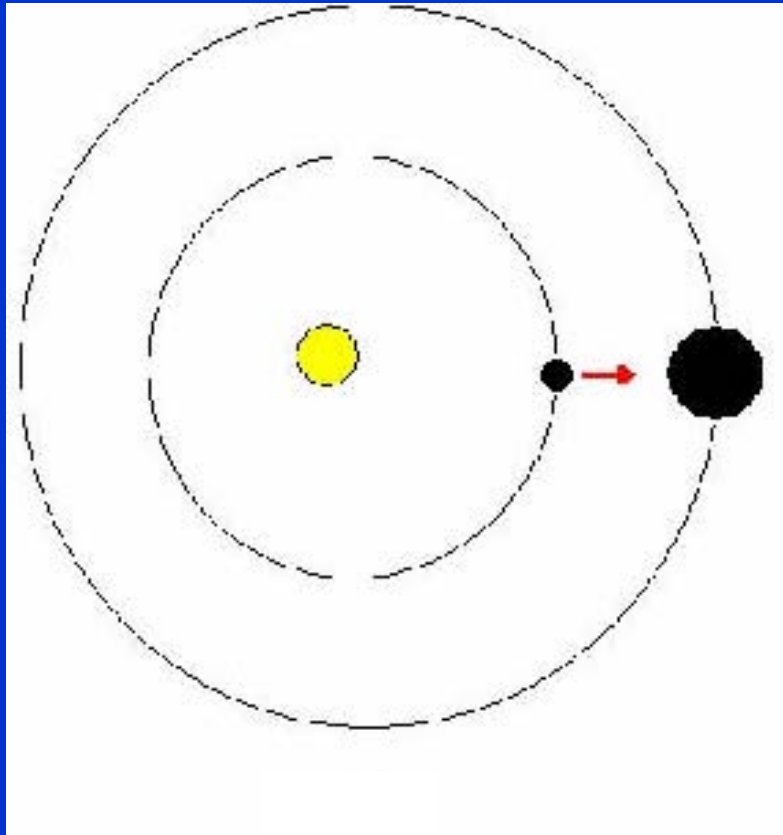
# Saturn's Satellites and Ring Structure



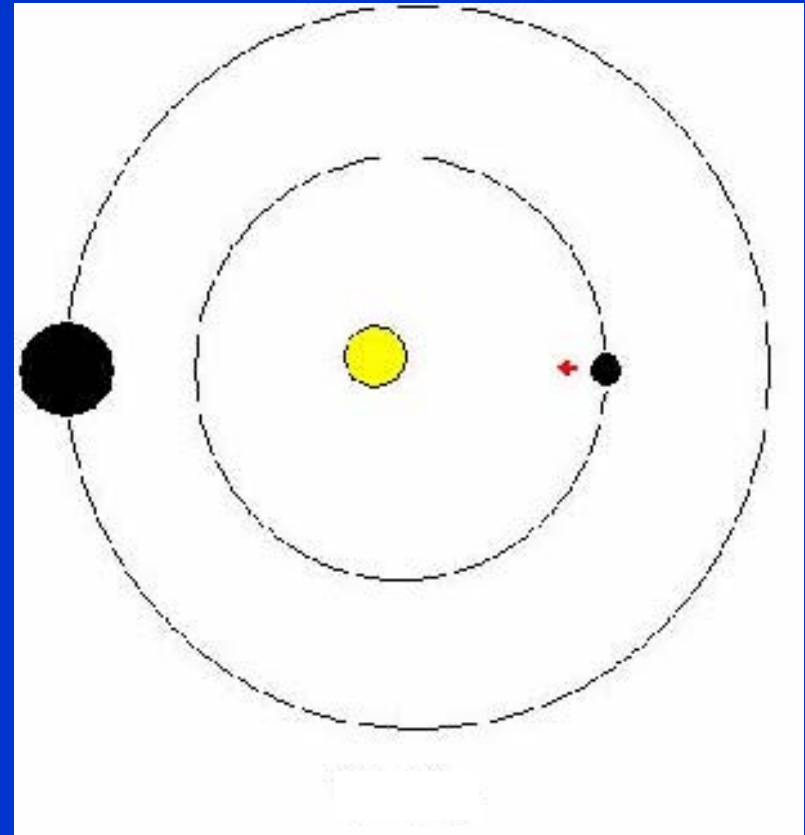
# Ring Particle Models



# Satellite Influence on Ring Particle

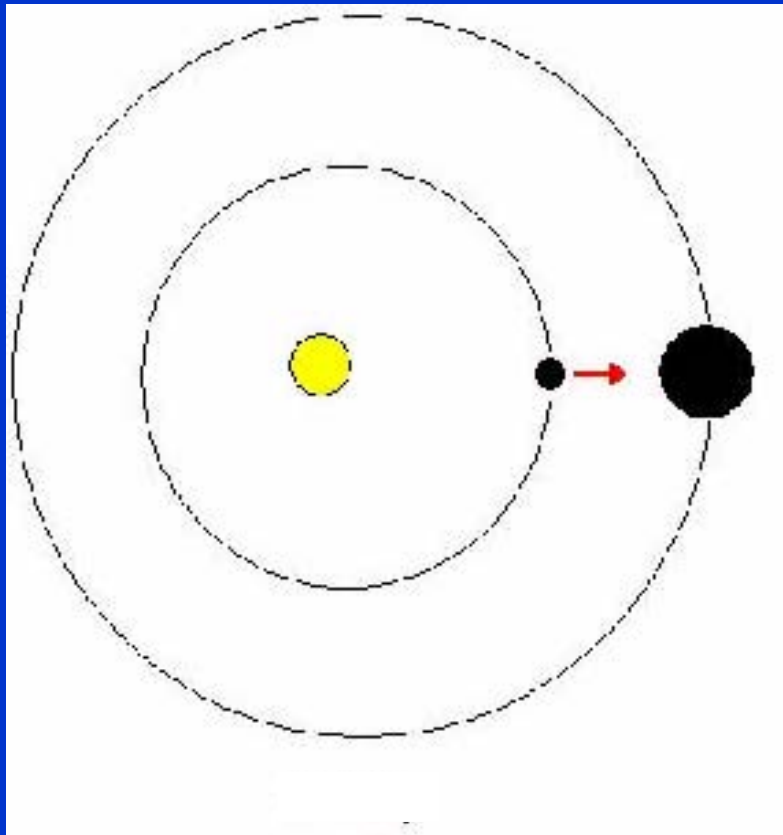


$T = 0$

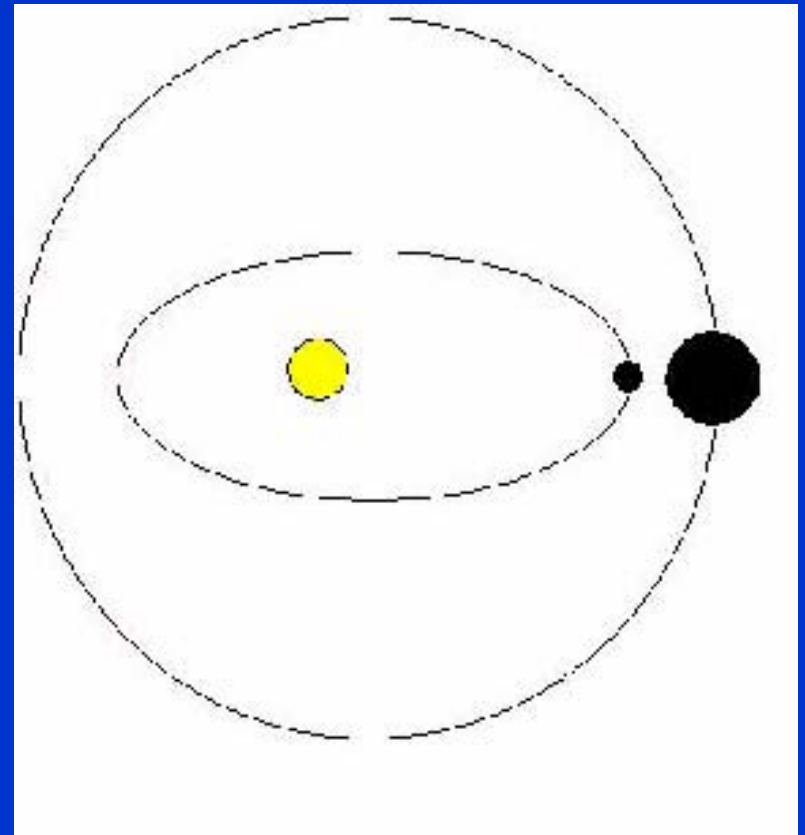


$T = 1/2$  orbit

# Satellite Influence -- II

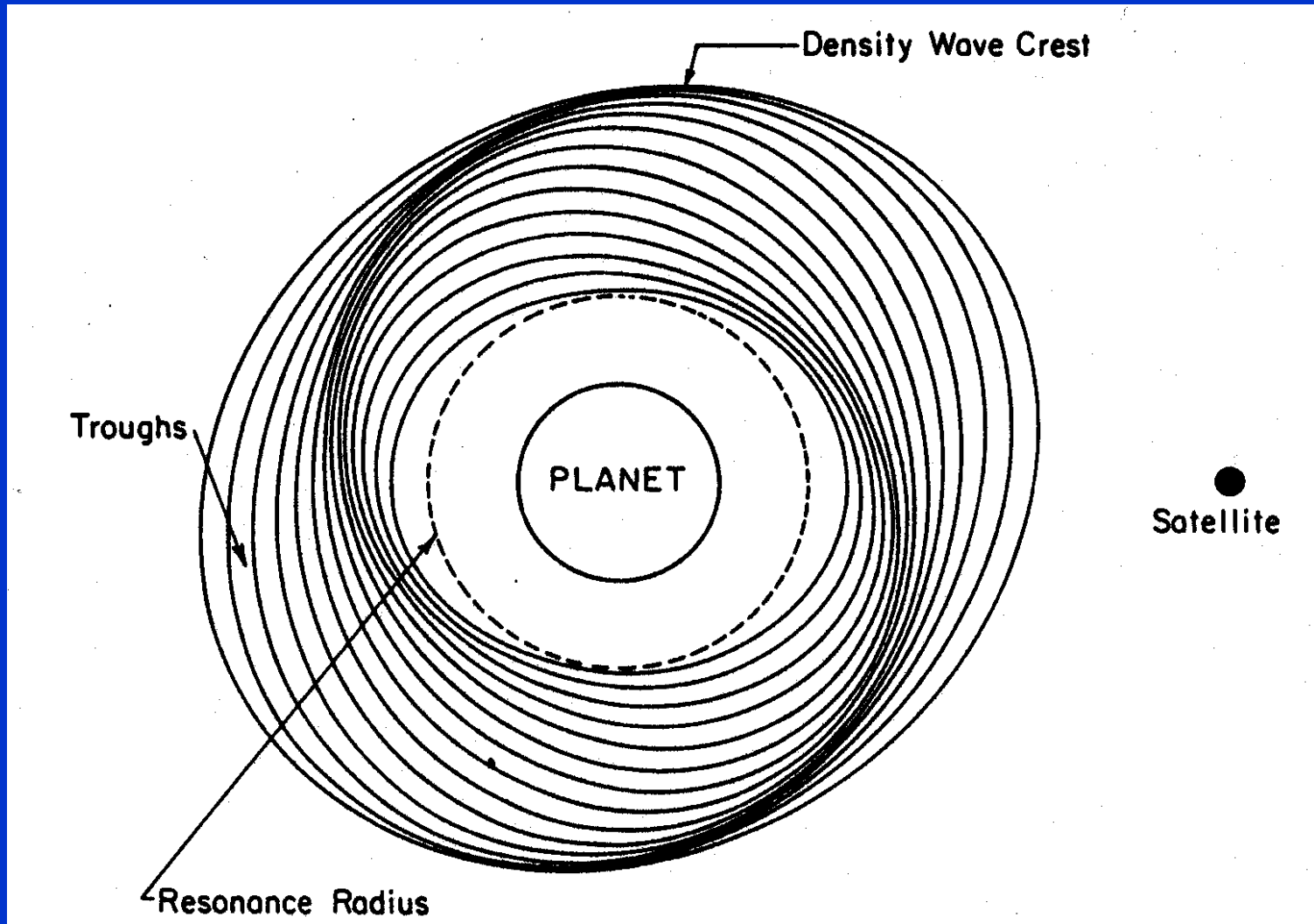


$T = 1$  orbit



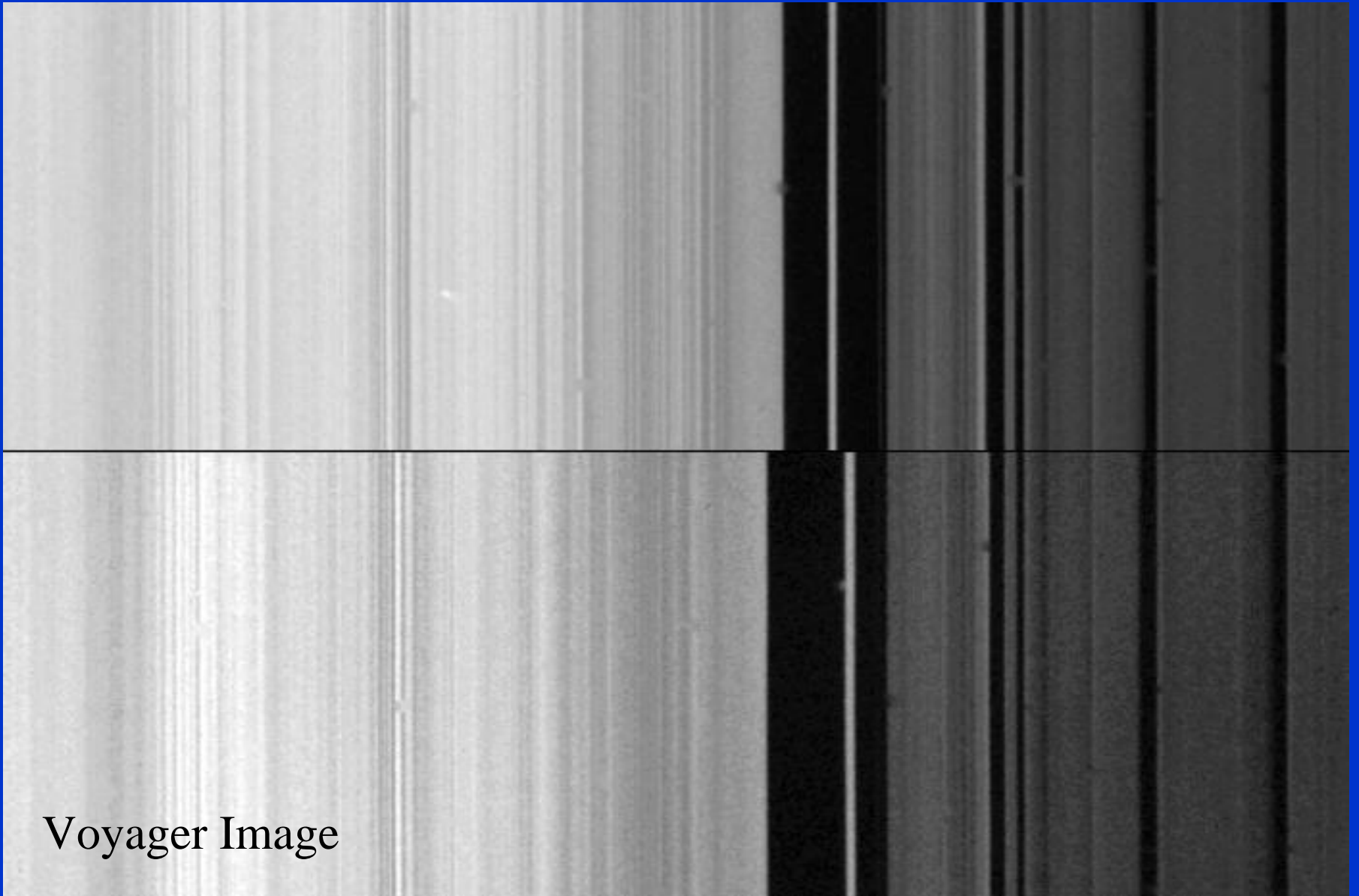
Pull on ring particle  
after many orbits

# Density Wave– 2:1 Resonance



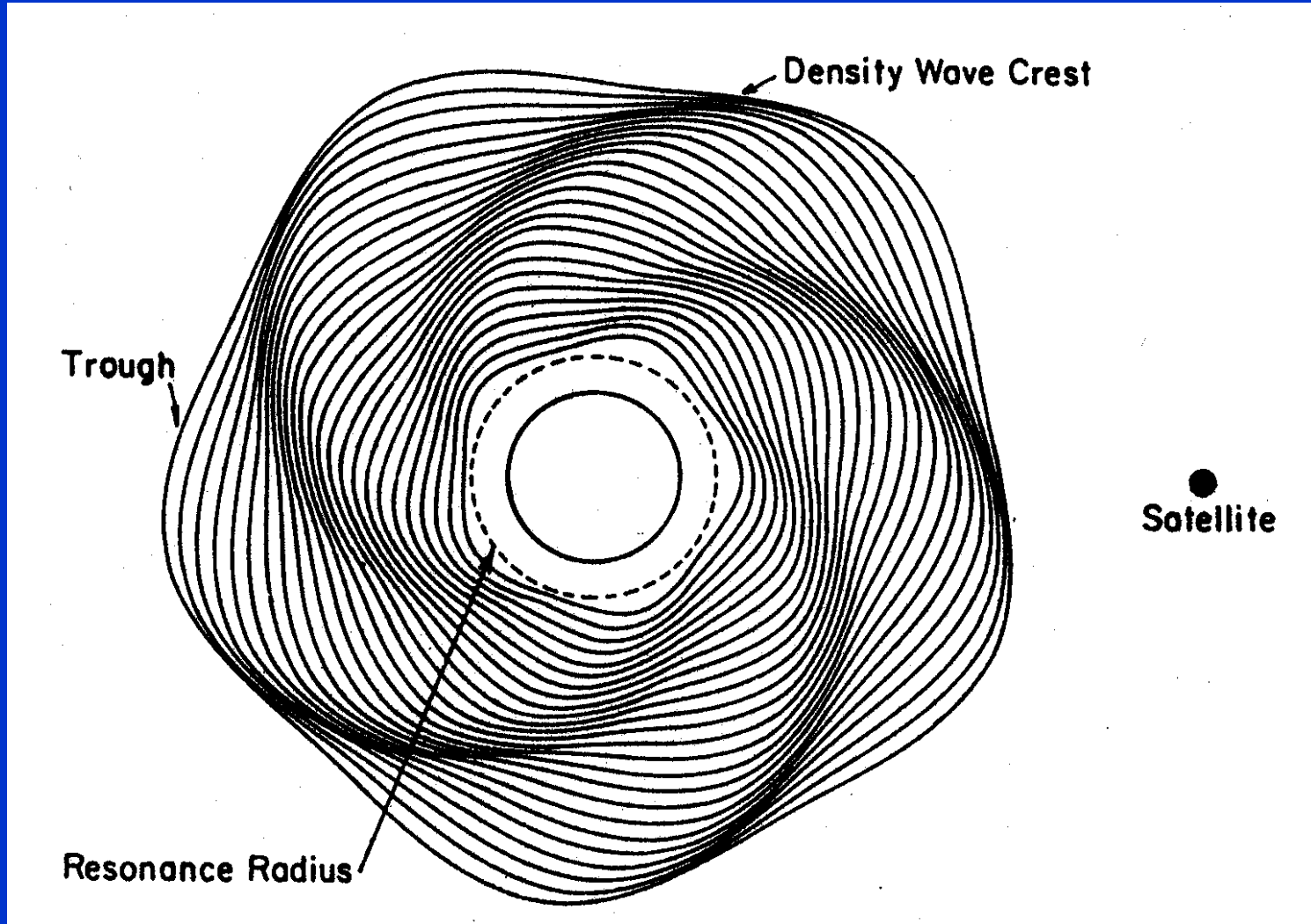
\* B ring outer edge is at Mimas 2:1 Resonance

# Outer Edge of B Ring



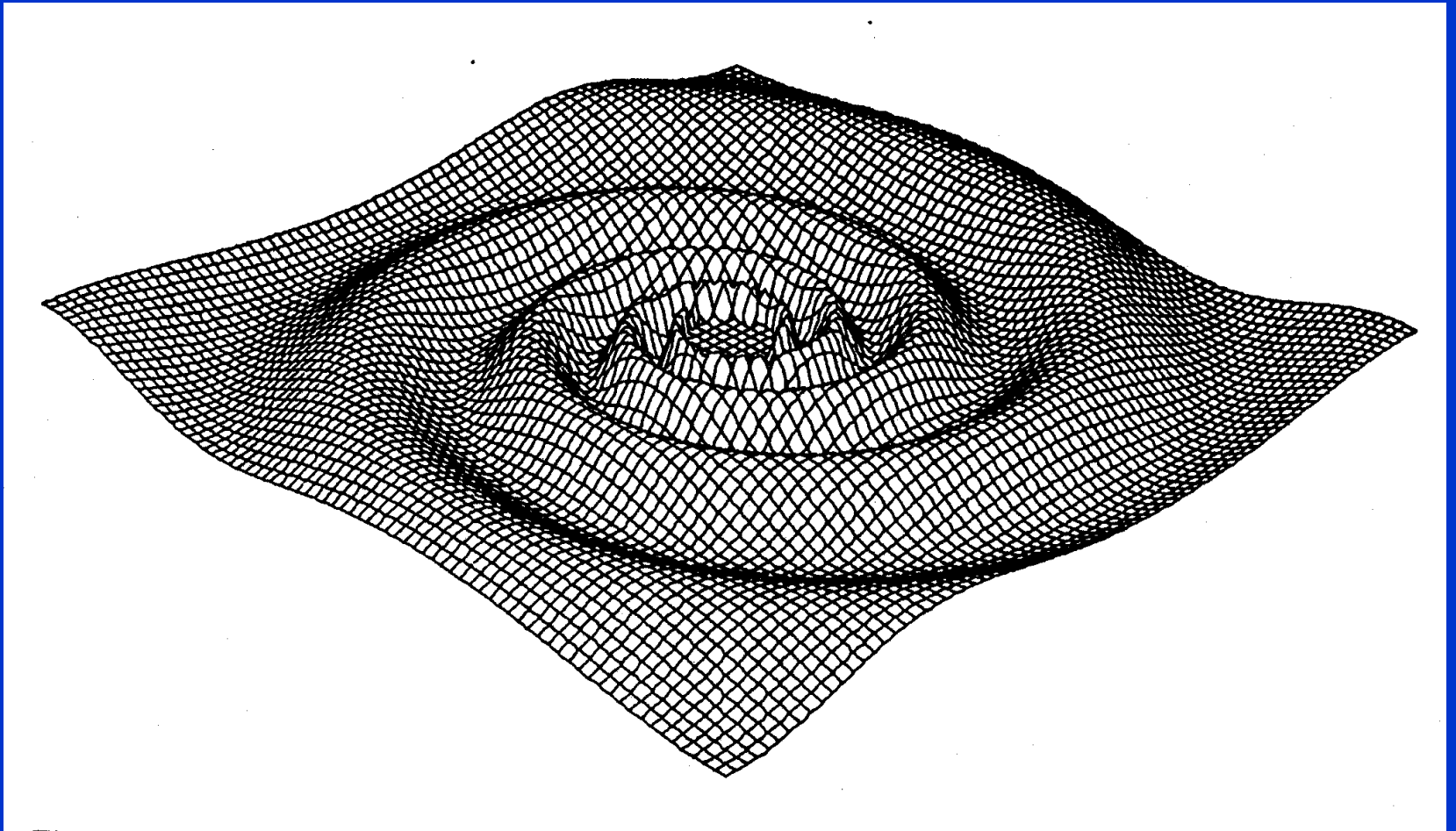
Voyager Image

# Density Wave– 5:4 Resonance



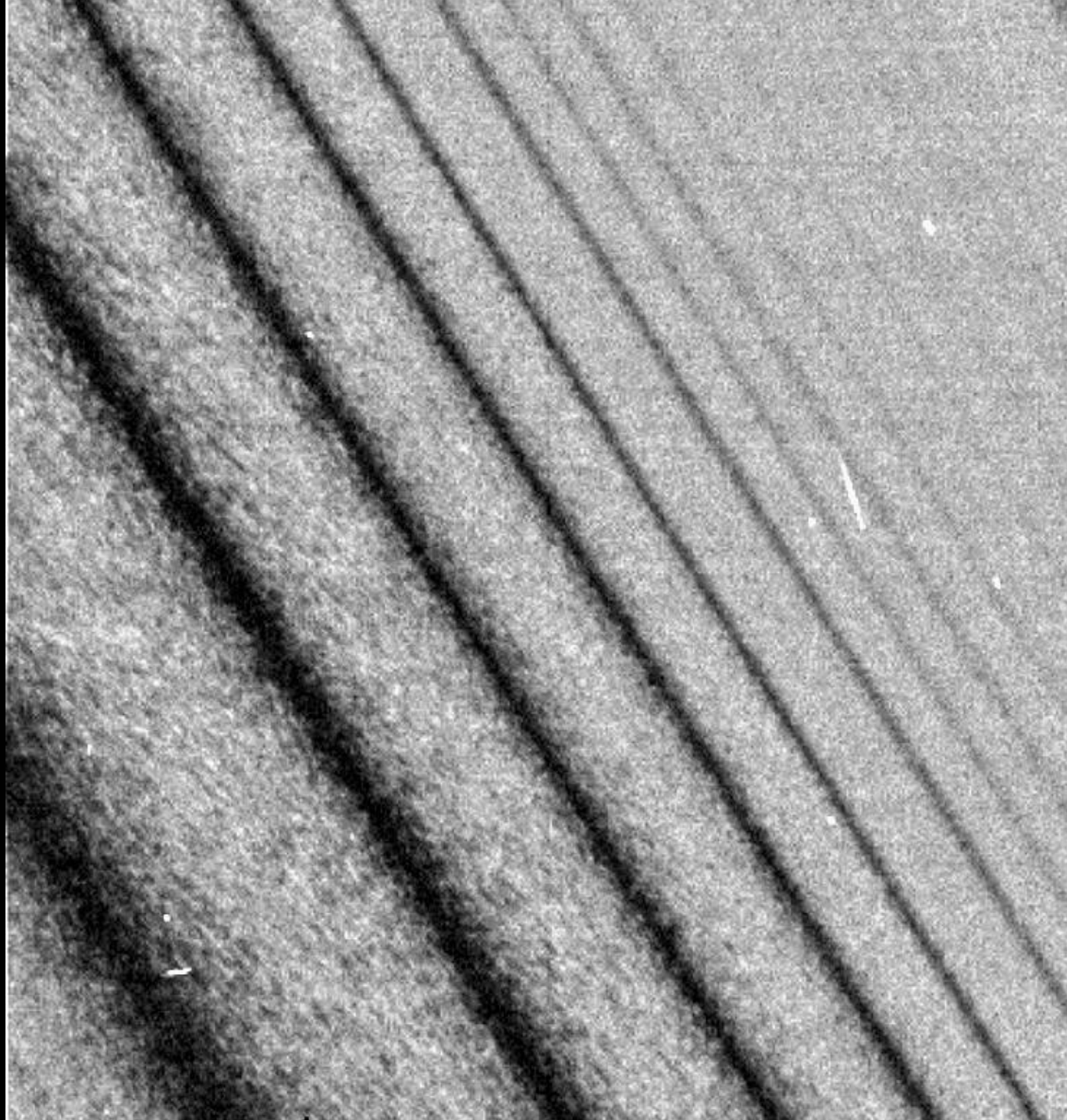


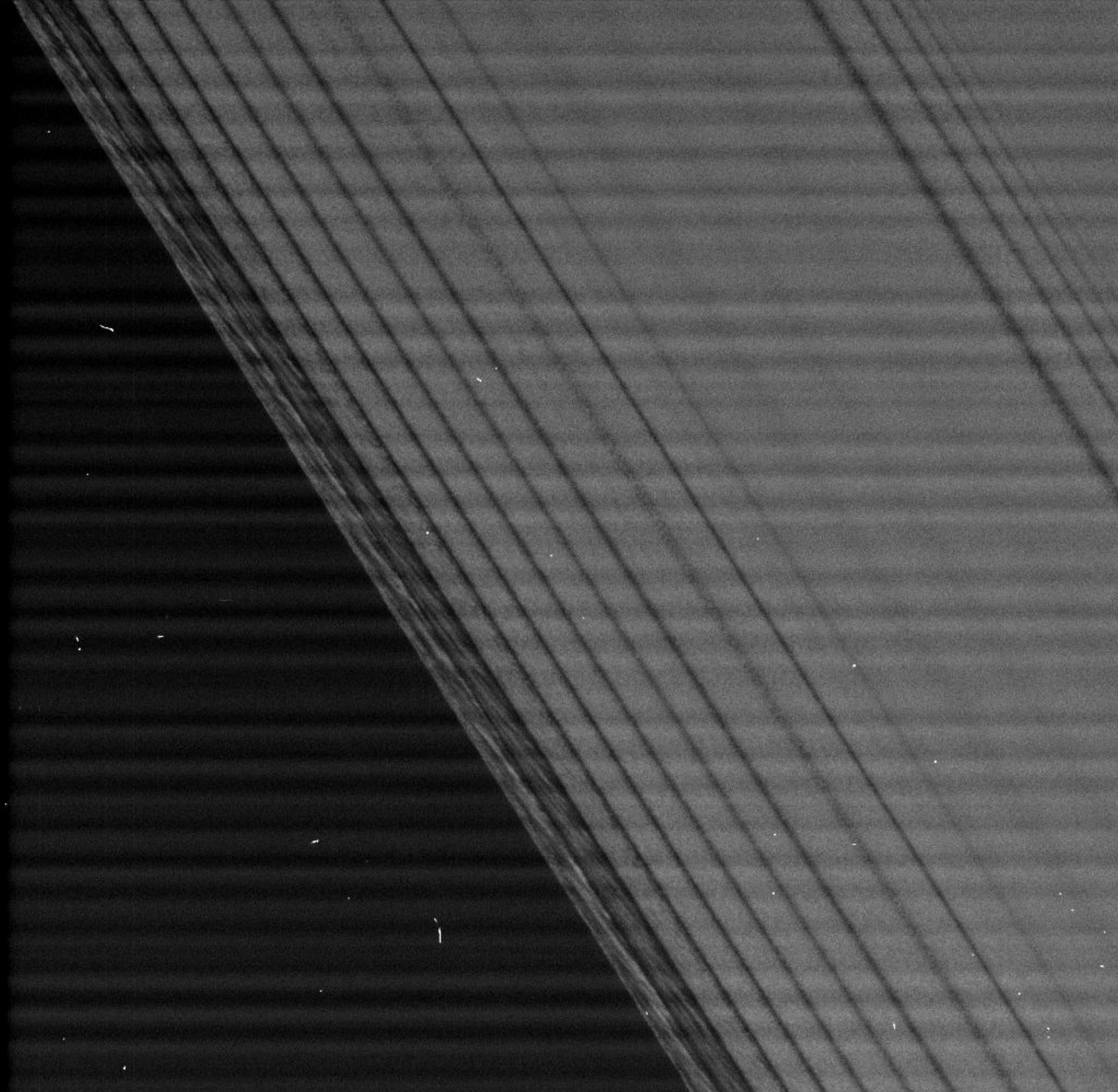
# Bending Wave Graphic



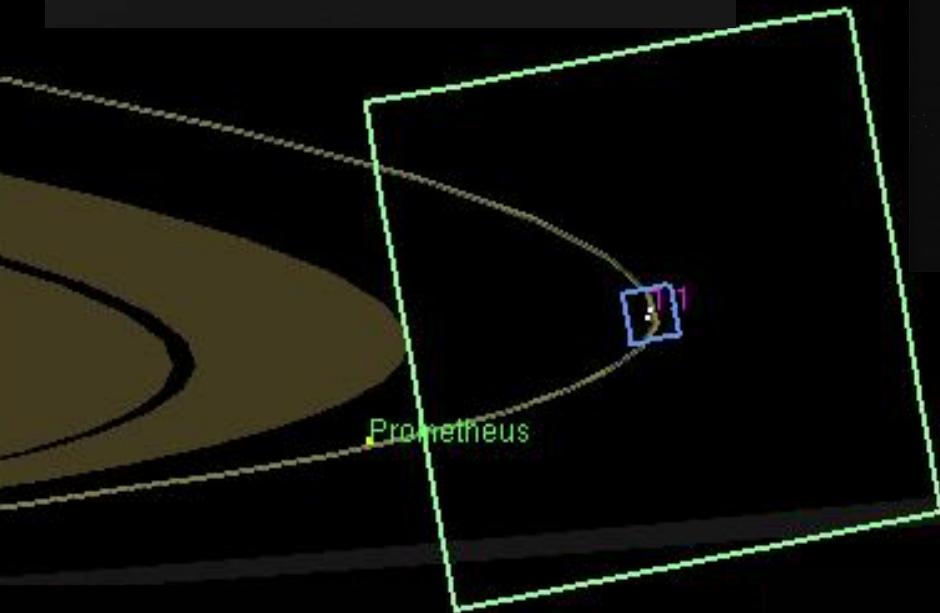
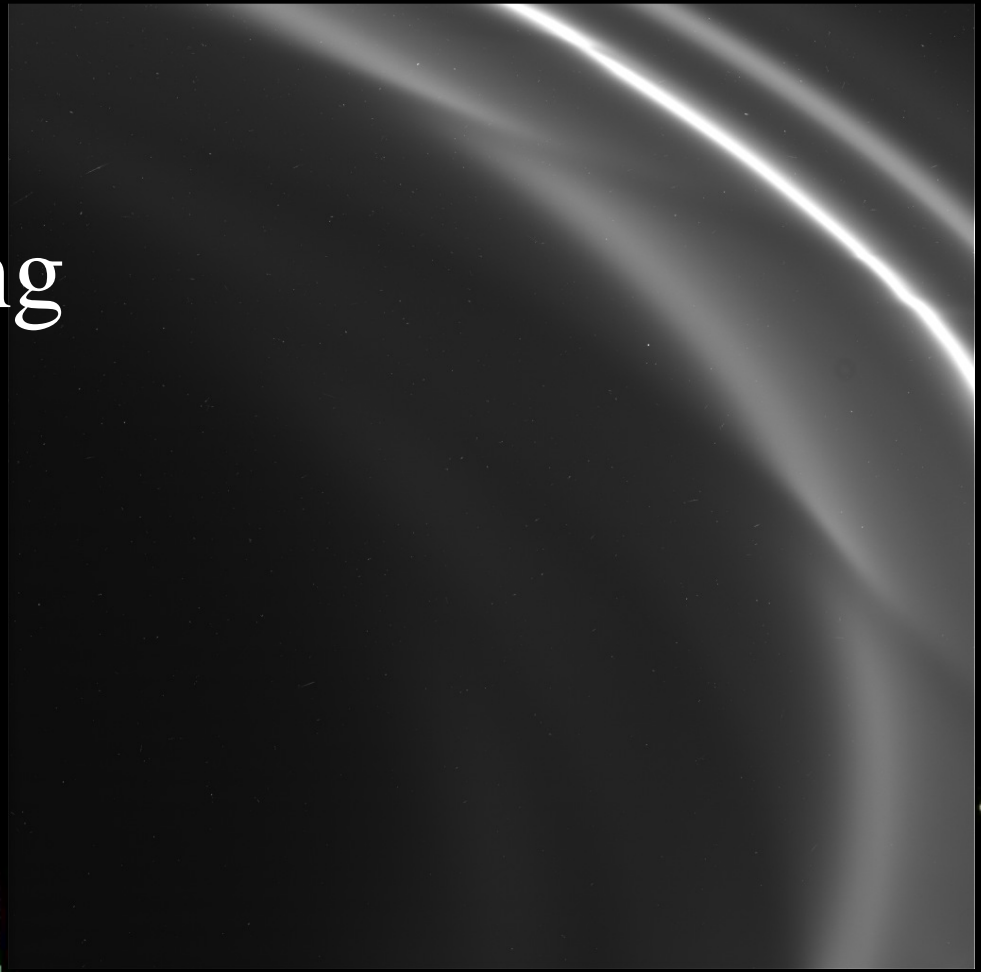


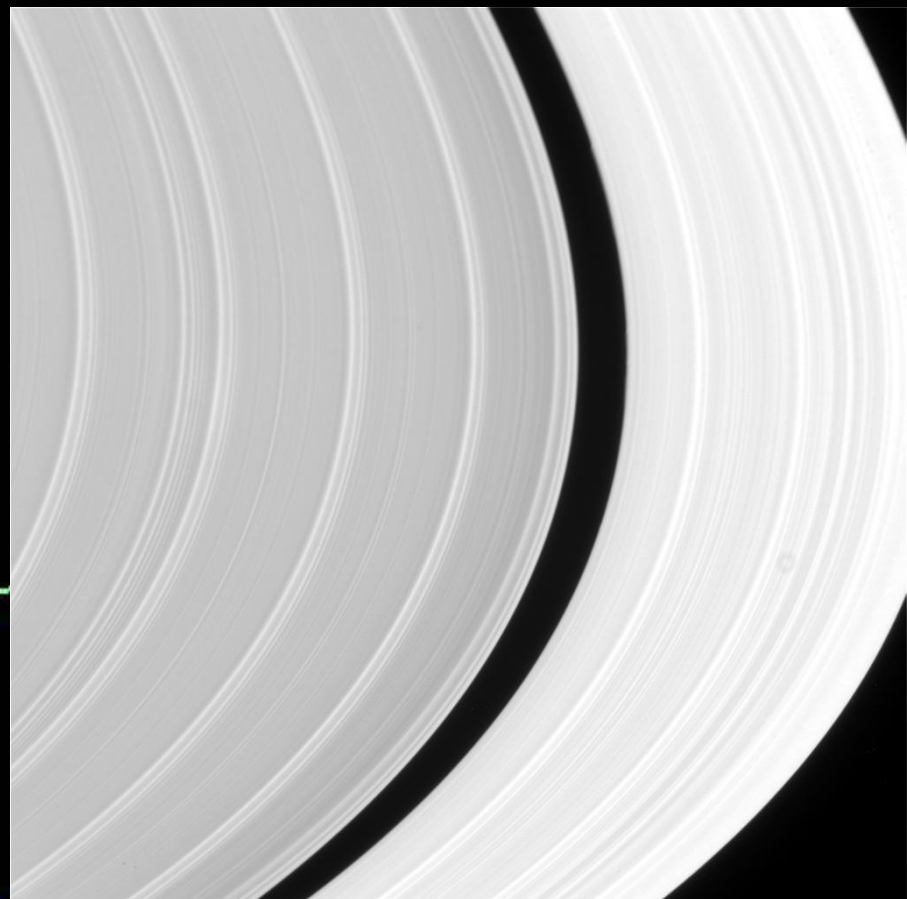
Density and  
Bending Waves





# F Ring





# Keeler Gap

12  
Prometheus

Target RA Dec: 295.32 4.05

Spacecraft-Target Distance: 182967 km

Sub SC Lat Lon: -2.481 313.370

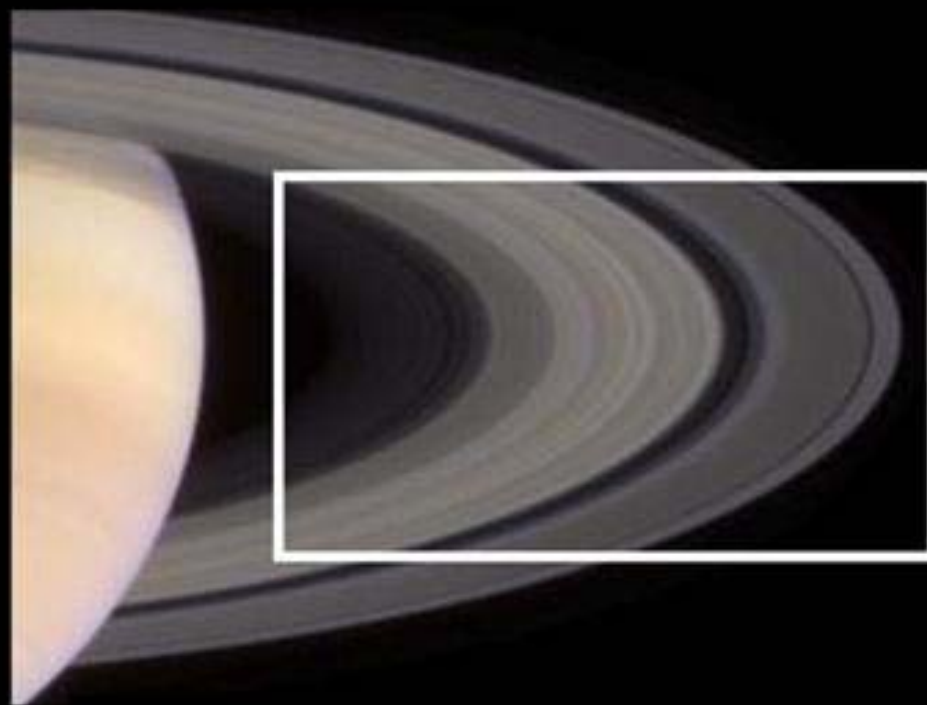
Sub Solar Lat Lon: -24.480 137.897

Created by ODD (MSS D10.3.1d)

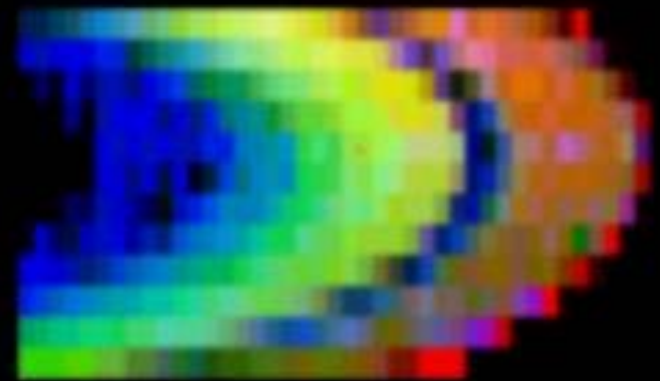
A black and white photograph of Saturn's rings, showing a prominent dark gap (the Encke Gap) between the rings. The rings are composed of numerous thin, parallel bands of varying widths and brightness. The central gap is a dark, well-defined region. The text "Encke Gap" is overlaid in white serif font on the dark gap.

Encke Gap

# Cassini Visual and Infrared Mapping Spectrometer



grain-size composite



small  large





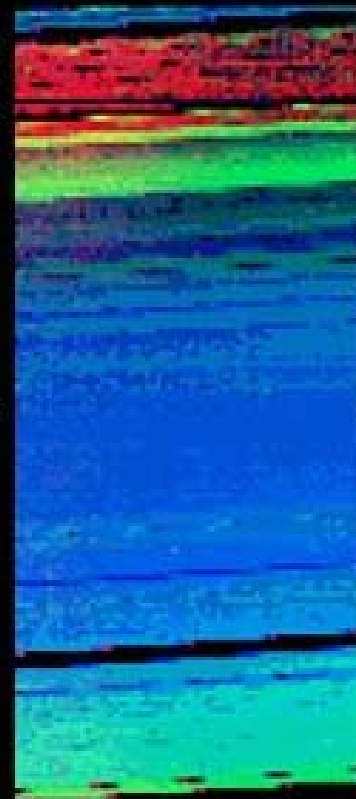
Infrared  
Reflectance



Water Ice  
Strength



"Dirt"

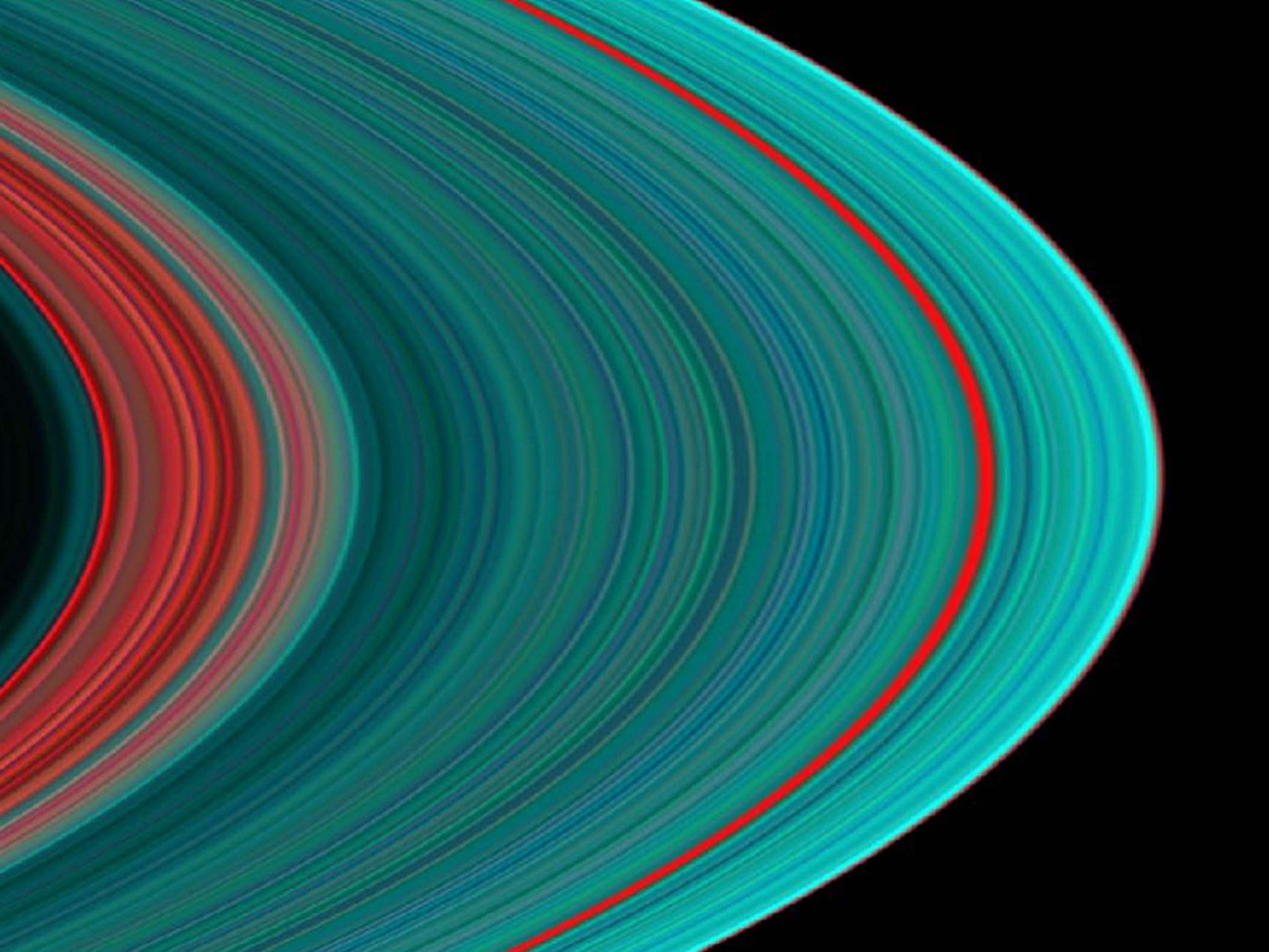


Color  
Composite

Cassini  
Division

A-Ring

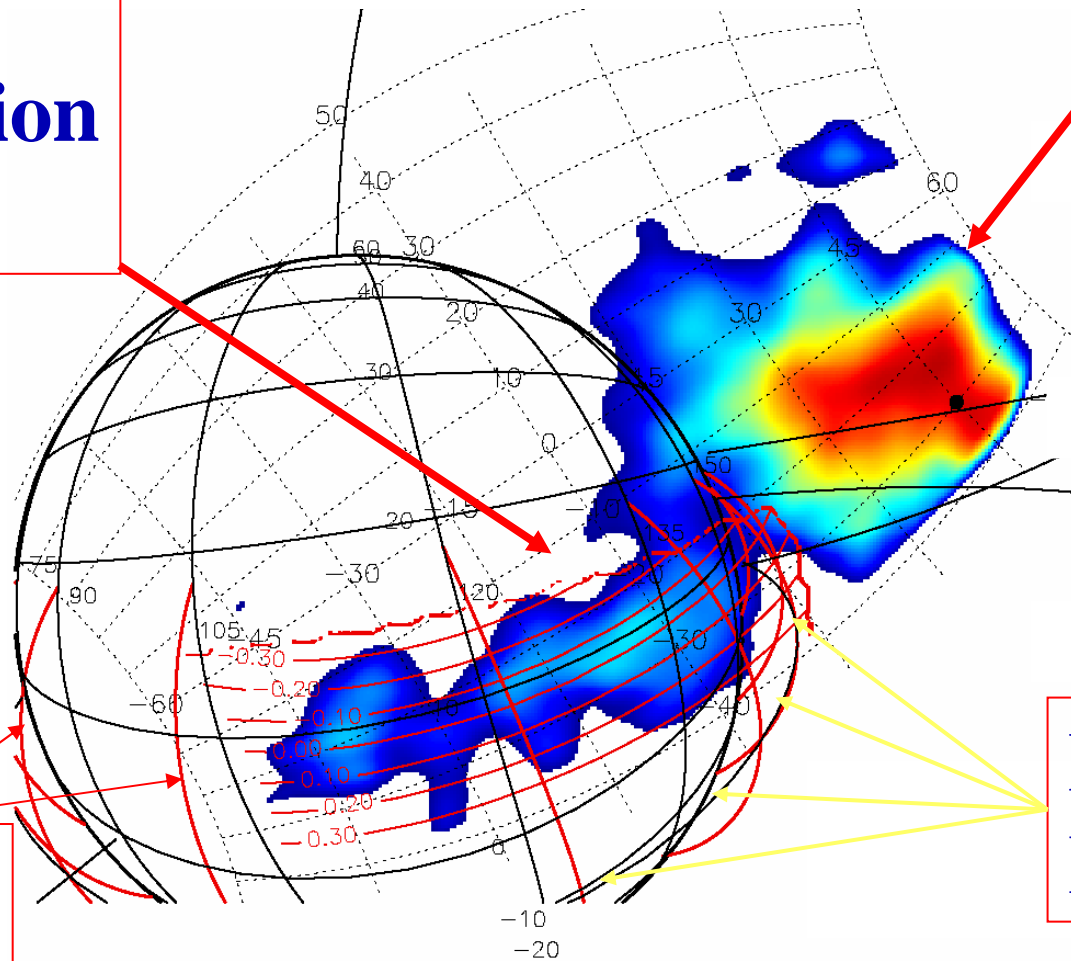
Encke  
Gap



# Cassini Magnetospheric Imager Discovers Radiation Belt Inside Saturn's Rings

**New  
Radiation  
Belt**

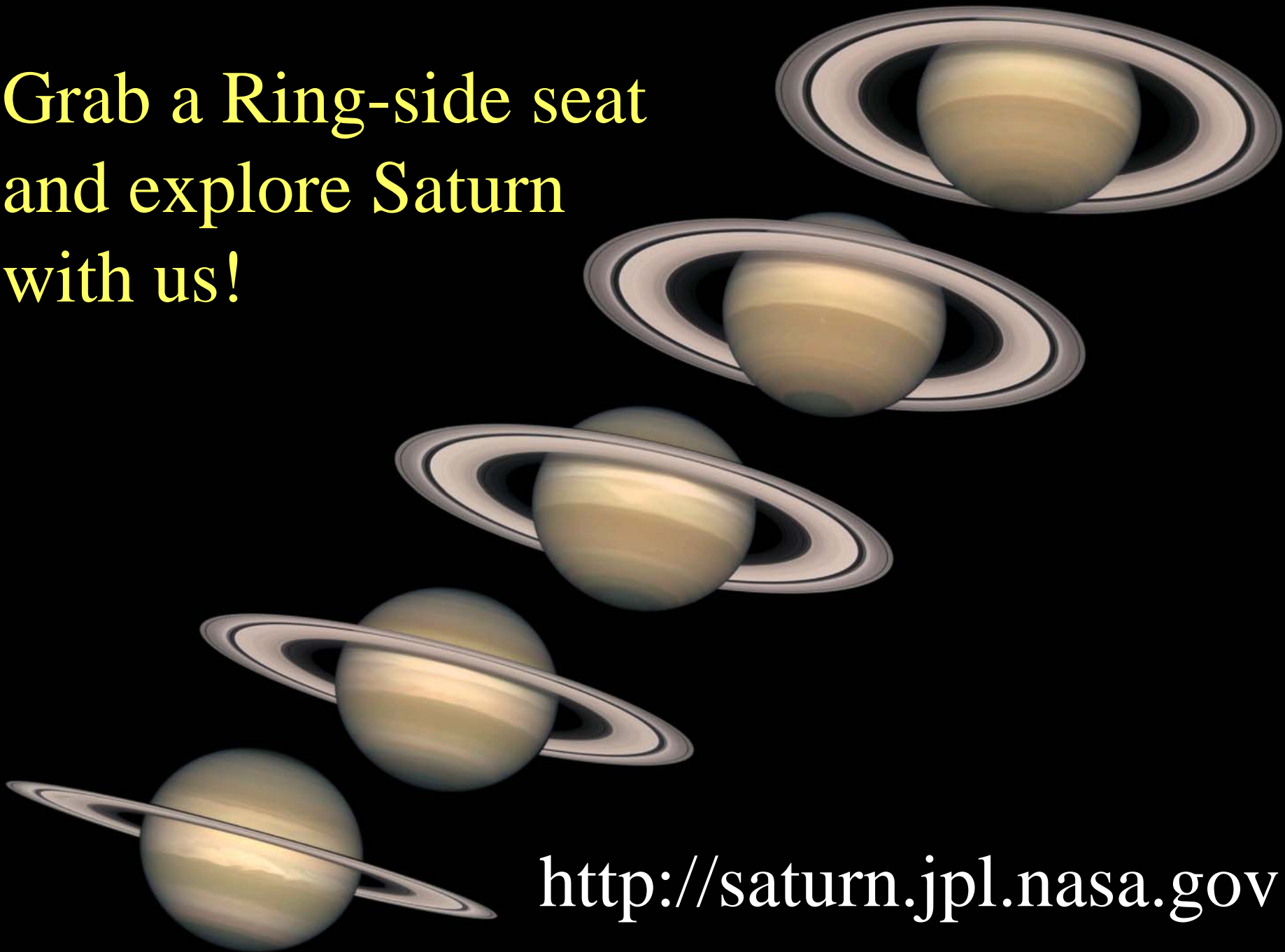
**Main  
Radiation  
Belt**



**Magnetic  
field lines**

**D-ring  
Inner Edge**

Grab a Ring-side seat  
and explore Saturn  
with us!



<http://saturn.jpl.nasa.gov>