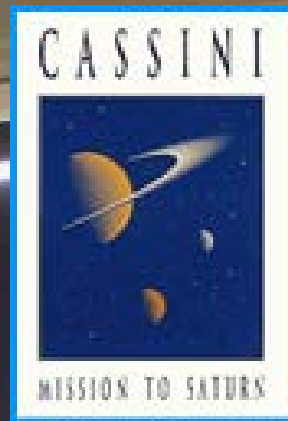


Cassini : the Grand Finale



Enrico Flamini
Agenzia Spaziale Italiana
Scientific and Technical Subcommittee
Vienna – 6 February 2017



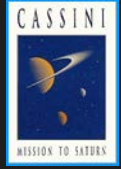


Cassini : the Grand Finale

The Cassini-Huygens Mission was launched on October 12, 1997 at 04.43 a.m. EDT from the Cape Canaveral launch base.

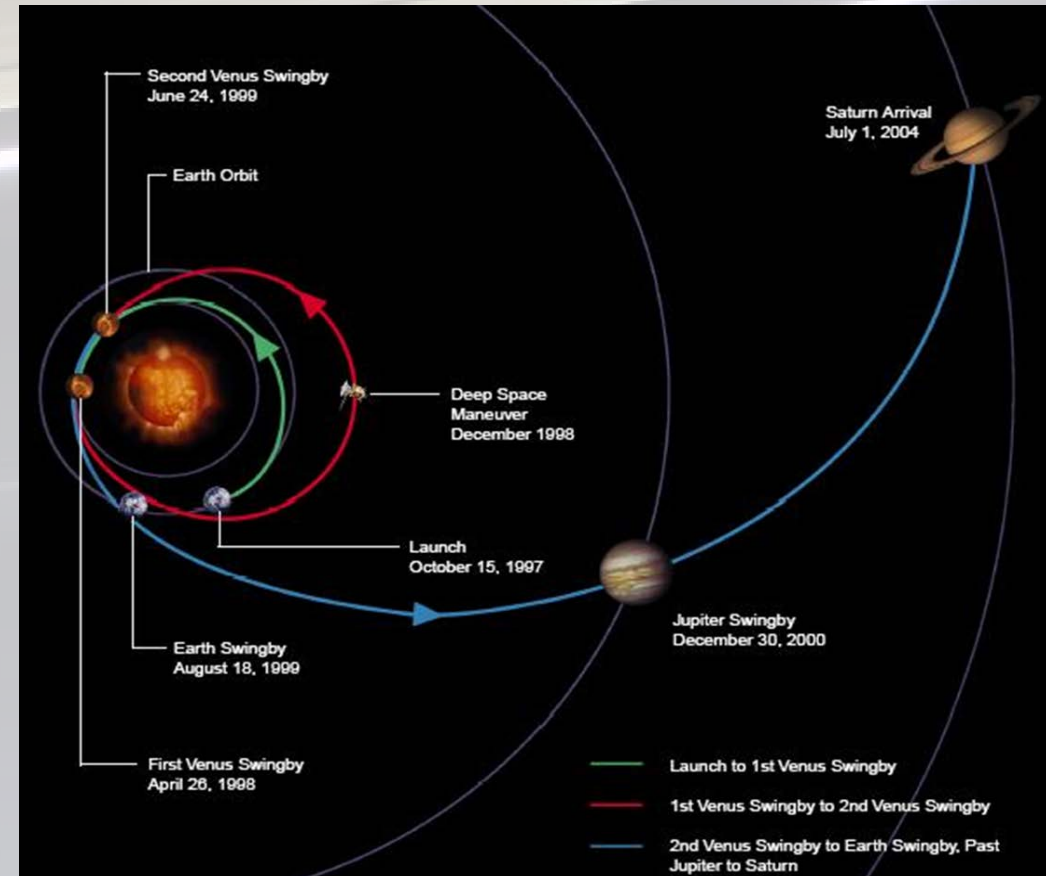
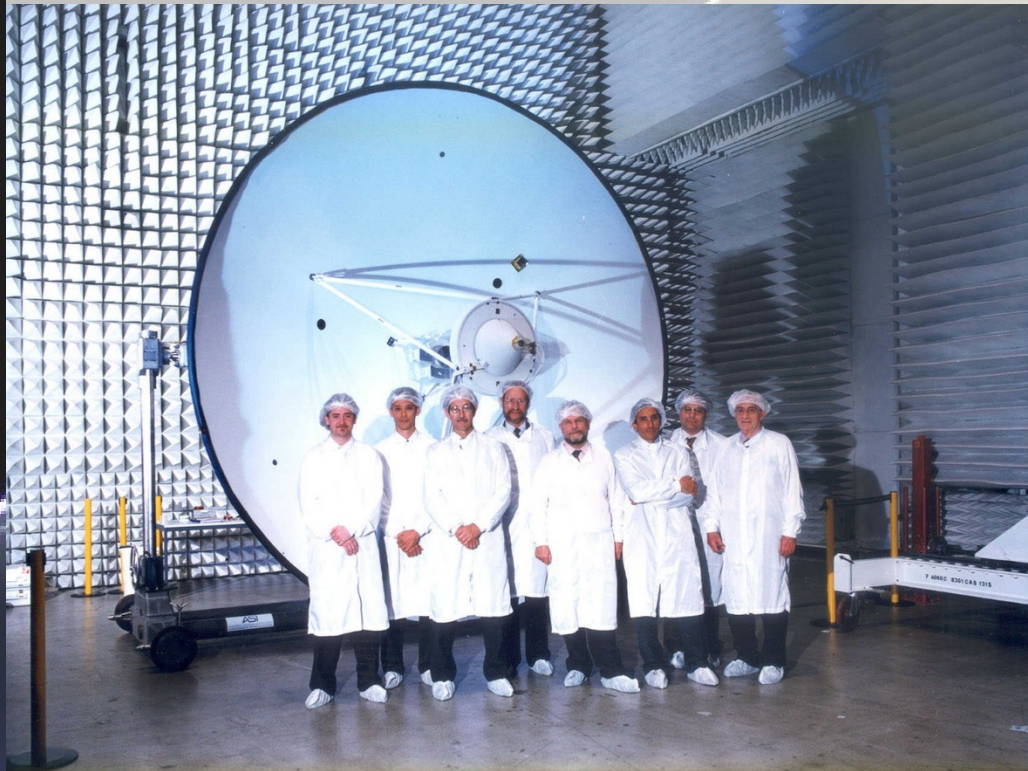


Realized by the Partnership of NASA, ESA and ASI it has been so far one of the most successful deep space missions ever realized and a most prominent example of international cooperation in space.



Cassini : the Grand Finale

The journey to Saturn lasted almost 7 years including 2 fly-bys at Venus, one fly-by at the Earth, one at Jupiter in the 2000 Millennium, finally reaching Saturn orbit on July 1, 2004. A great challenge for the S/C design.



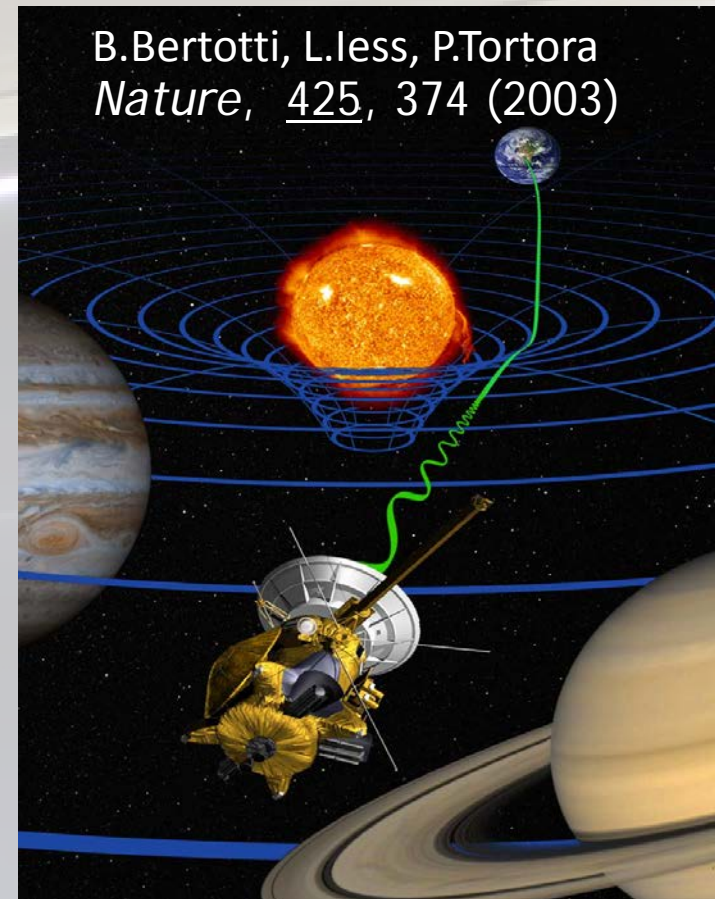
Cassini : the Grand Finale

Cassini was designed to operate in Saturn orbit, however provided excellent science also during the cruise, one example:

In summer 2002, a test of General Relativity using radio links with the Cassini spacecraft took place when the spacecraft and Earth were on opposite sides of the Sun separated by a distance of more than 1 billion kilometers.

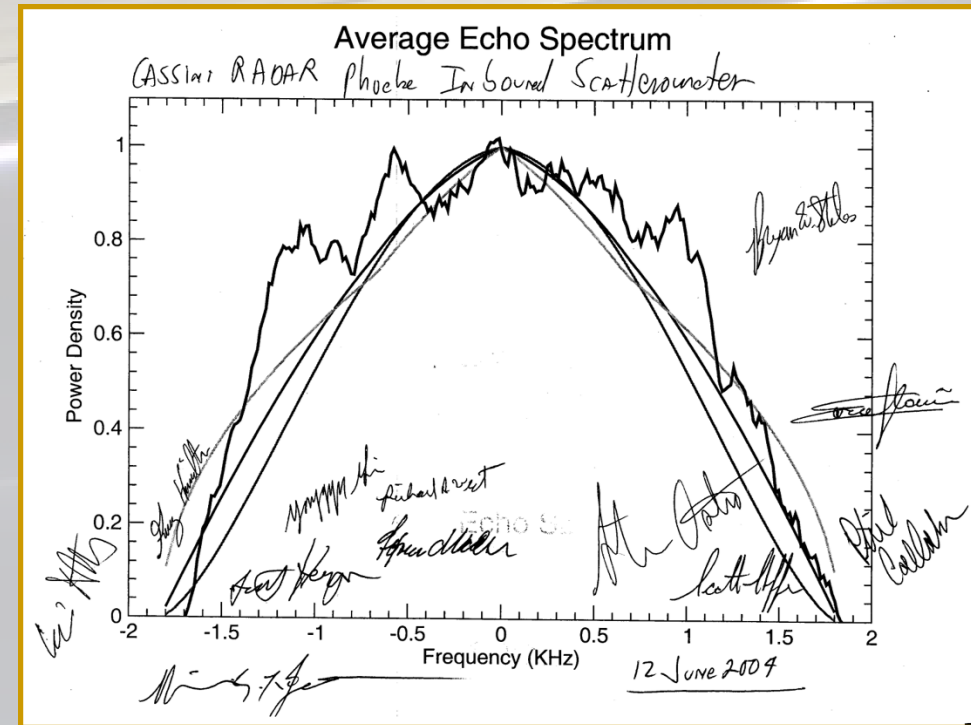
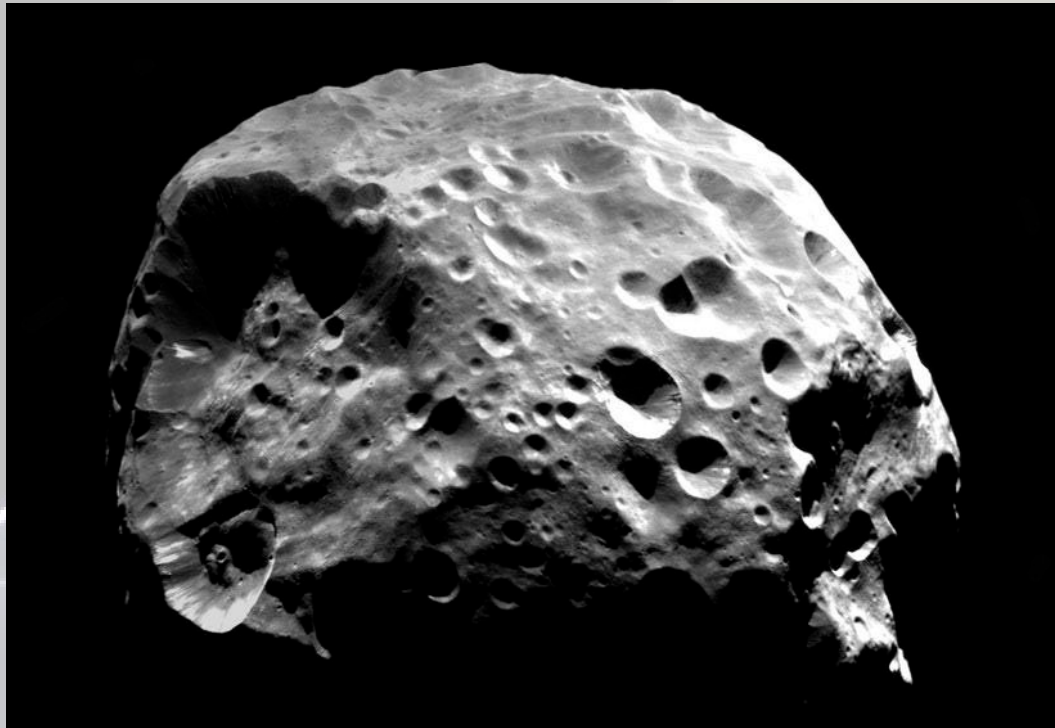
The test confirmed Einstein's theory of General Relativity with a precision that is 50 times greater than previous measurements.

The best estimate so far!



Cassini : the Grand Finale

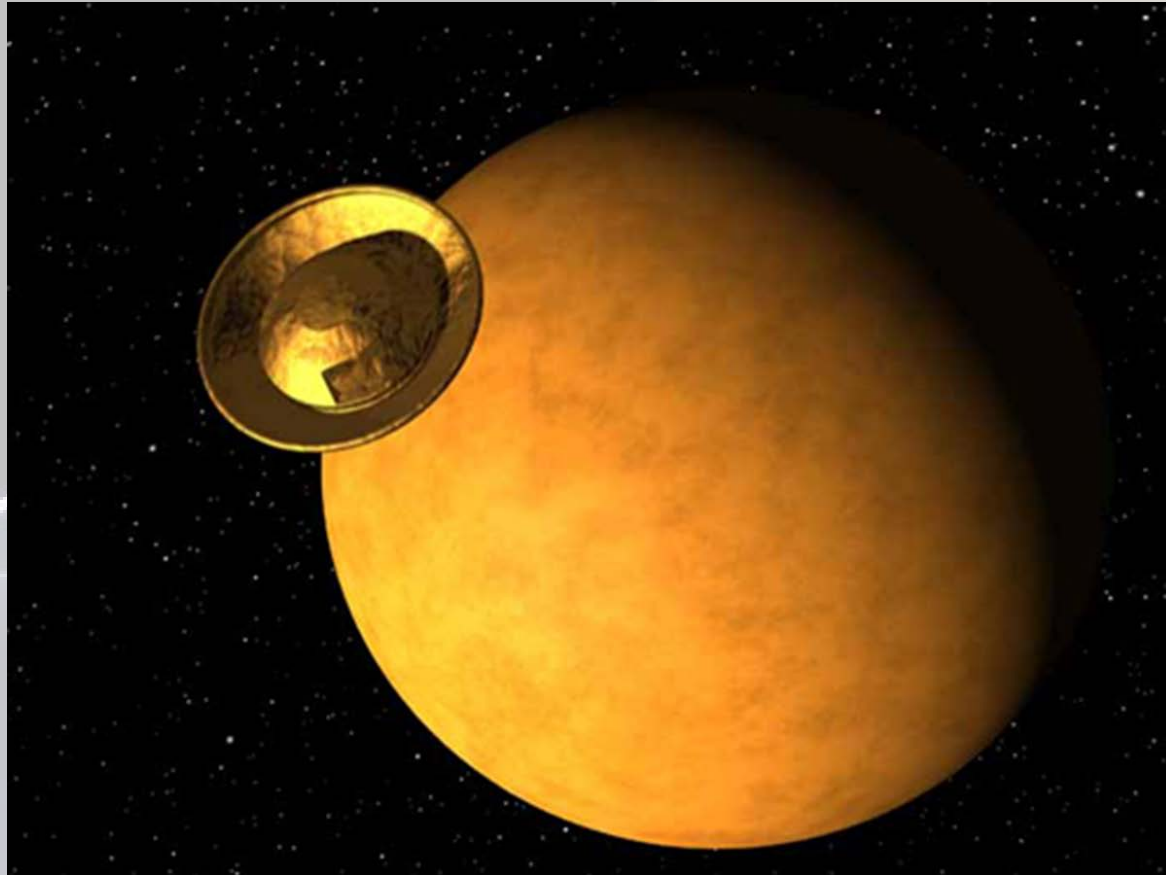
The first close observation of one of the Saturn moons occurred on June, 2004 passing at only 2.000 km from Phoebe surface, on the 12th we received the first radar echo.



Cassini data supported the idea that Phoebe is a primordial TransNeptunian object, lately captured by Saturn gravity.

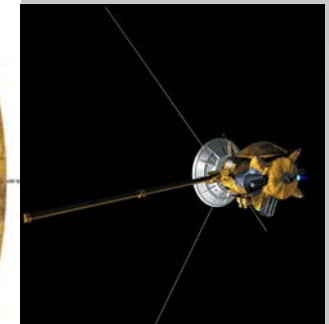
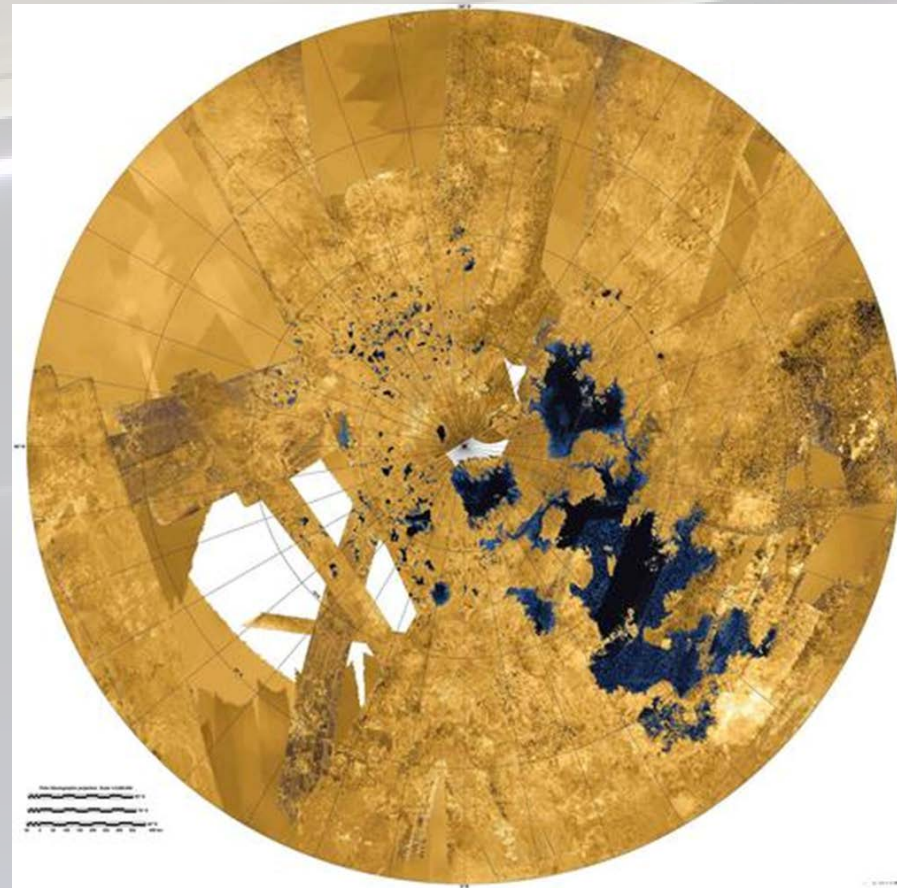
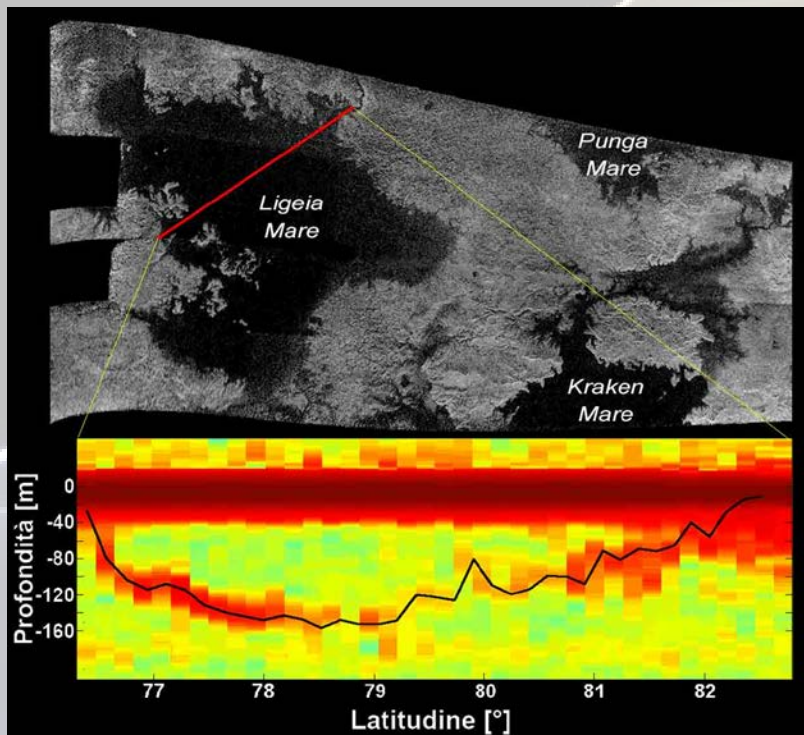
Cassini : the Grand Finale

On December 24, 2004 the Huygens probe was separated by Cassini and began its trajectory toward its final target descending on January 14, 2005 in the Titan atmosphere up to landing its previously unknown icy surface.



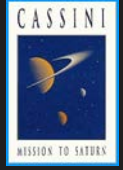
Cassini : the Grand Finale

For eleven years Cassini radar and VIMS imaging spectrometer have observed the Titan surface characterizing the morphology and discovering lakes and seas of methane and ethane up to be capable of determining the bathymetry.



Cassini : the Grand Finale

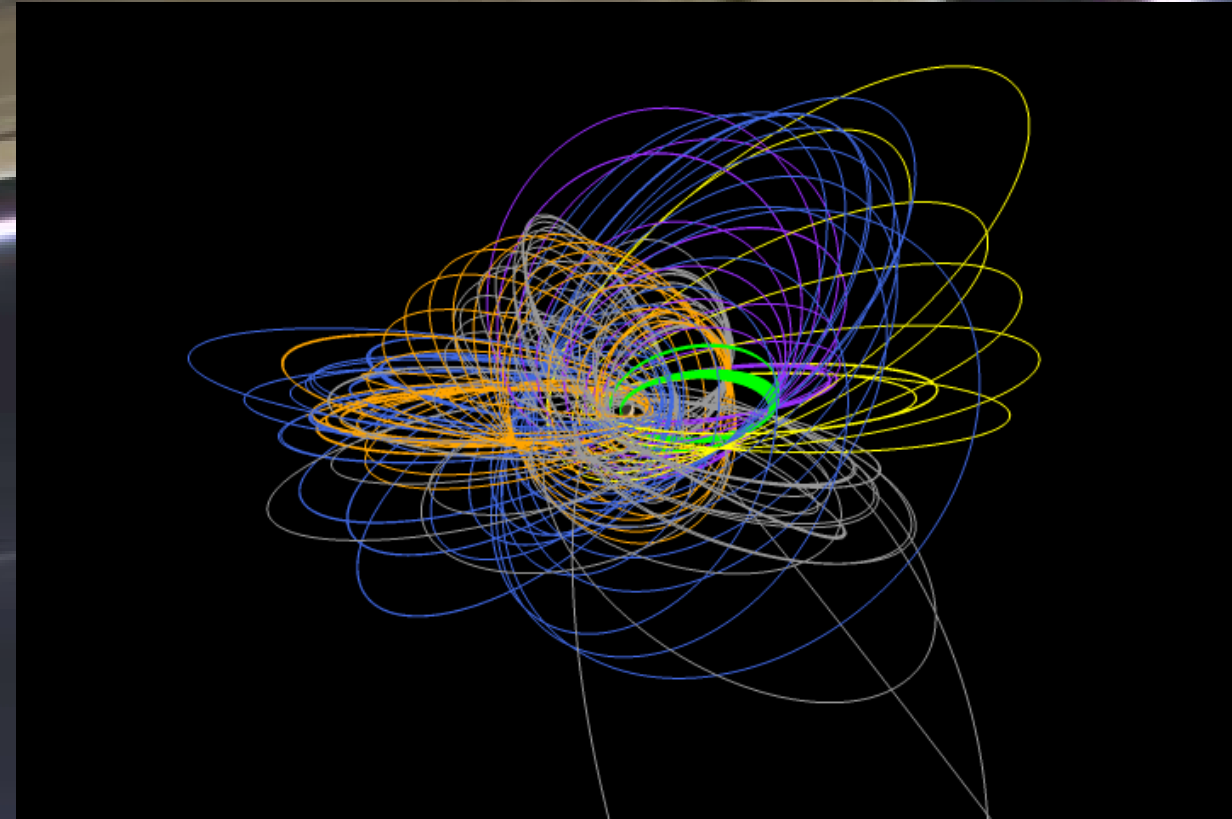


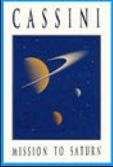


Cassini : the Grand Finale

Enceladus and Titan, after the past decades of Cassini data, had been identified as planetary bodies with the potential to contain habitable – or at least "pre-biotic" – environments.

This led to the decision to choose to safely dispose of the spacecraft in the atmosphere of Saturn in order to avoid the unlikely possibility of Cassini someday colliding with one of these moons and contaminating them with any hardy Earth microbes that might have survived on the spacecraft. New orbits have been designed: **The Grand Finale**

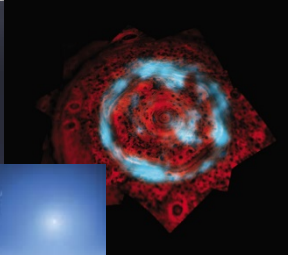
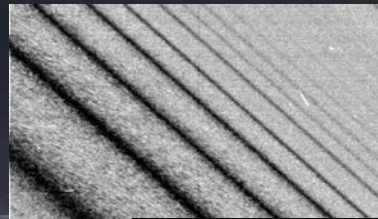
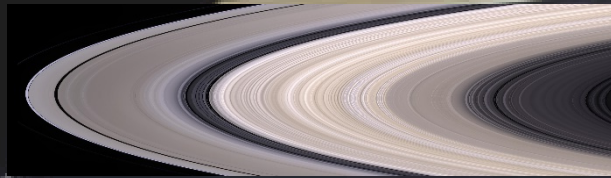




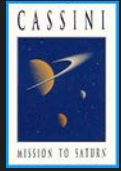
Cassini : the Grand Finale

After almost 20 years in space, the Cassini mission will end on September 15, 2017 at 5:07 a.m. PDT (8:07 a.m. EDT).

But, also with this last act Cassini will provide fantastic new information that we might never have imagined when conceived the mission:



- **First ever direct measurements of ring particle composition**
- **Highest resolution main ring observations**
 - Radio occultation, imaging
 - First active Radar
- **Highest resolution Saturn polar observations and aurora**
- **Direct sampling of Saturn's atmosphere** Final five periapses



Cassini : the Grand Finale

Cassini has revealed in its lifetime a new world leaving an incredible amount of data to the future scientist leaving to the humankind a long lasting and rich legacy.

The Grand Finale is approaching and still new activities are in progress to support Cassini: as the upgrading the 64 meters dish of Sardinia Radio Telescope to become Sardinia Deep Space Antenna, when operating as a tracking station.

ASI and all the Italian mission scientists are proud to have contributed and continue to contribute to this great adventure.



Thanks
and stay tuned on
September 15



↑ We are here !!