Highlights on the Italian contribution to Space Science

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ASI Chief Scientist
Wien 9 February 2011

ASI has been created in 1988 merging two experiences: CNR-SAS and S. Marco program. Both organization basically devoted to research in space.

This heritage has been maintained although the programs devoted to the applications in space have gradually increased, playing today an important role.

The science programs in ASI follows 3 major branches :

High Energy Astrophisics and Astroparticles
Cosmology and Fundamental Physics
Exploration of the Solar System

Currently ASI has programs either within the mainframe of ESA, either in bilateral cooperation (NASA/RSA/JAXA) or at national level.

Of the more that 35 programs realised by ASI or with an important Italian contribution in this presentation with the intention to show the continuity of the science results over the last 20 years:

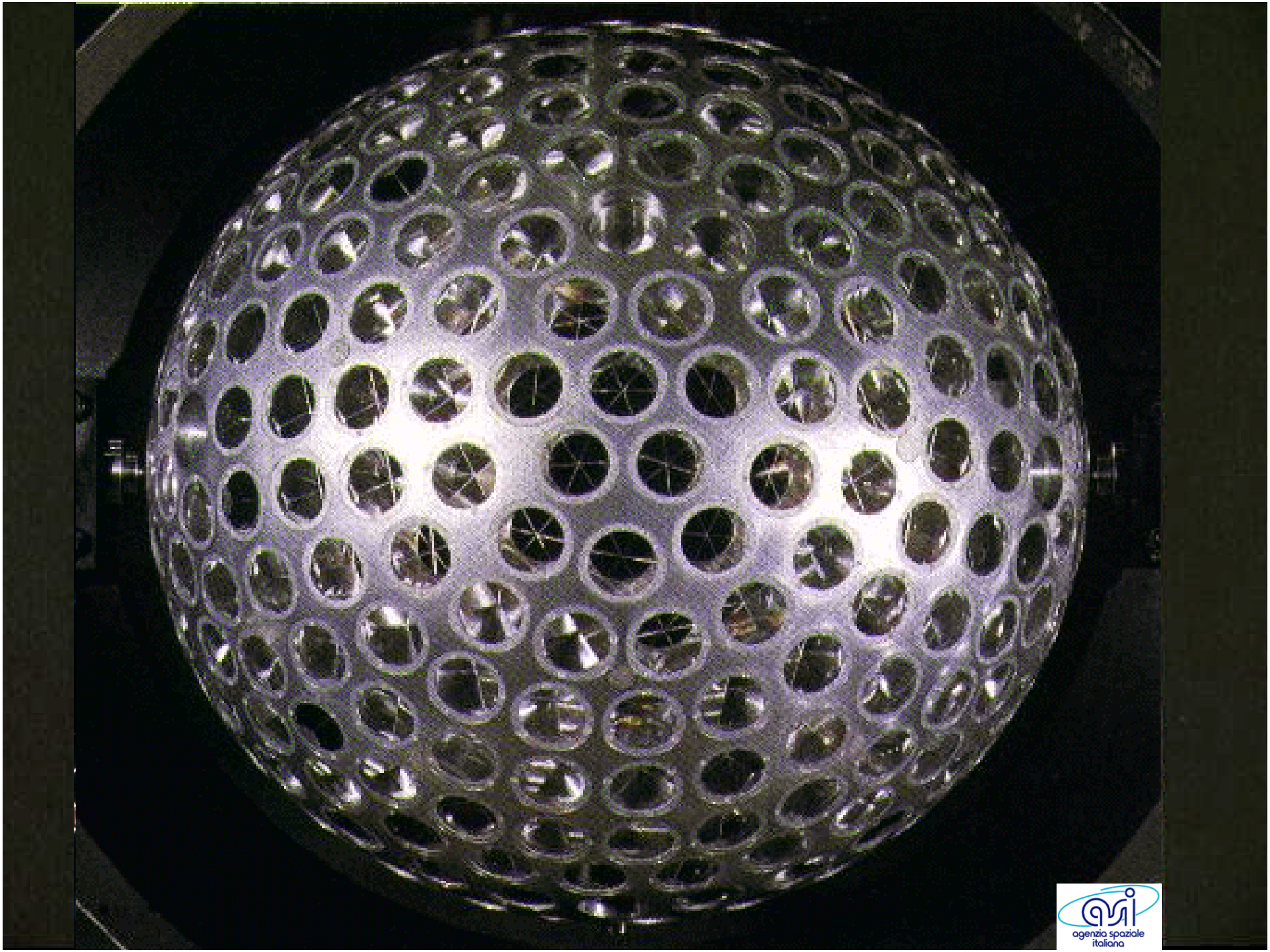
1992 Lageos II

1997 Cassini

2005 Mars Reconnaissance Orbiter

2009 Plank

All the above are large missions, however sometimes also a small mission may provide fantastic results as is the case of the ASI mission AGILE.


agenzia spaziale
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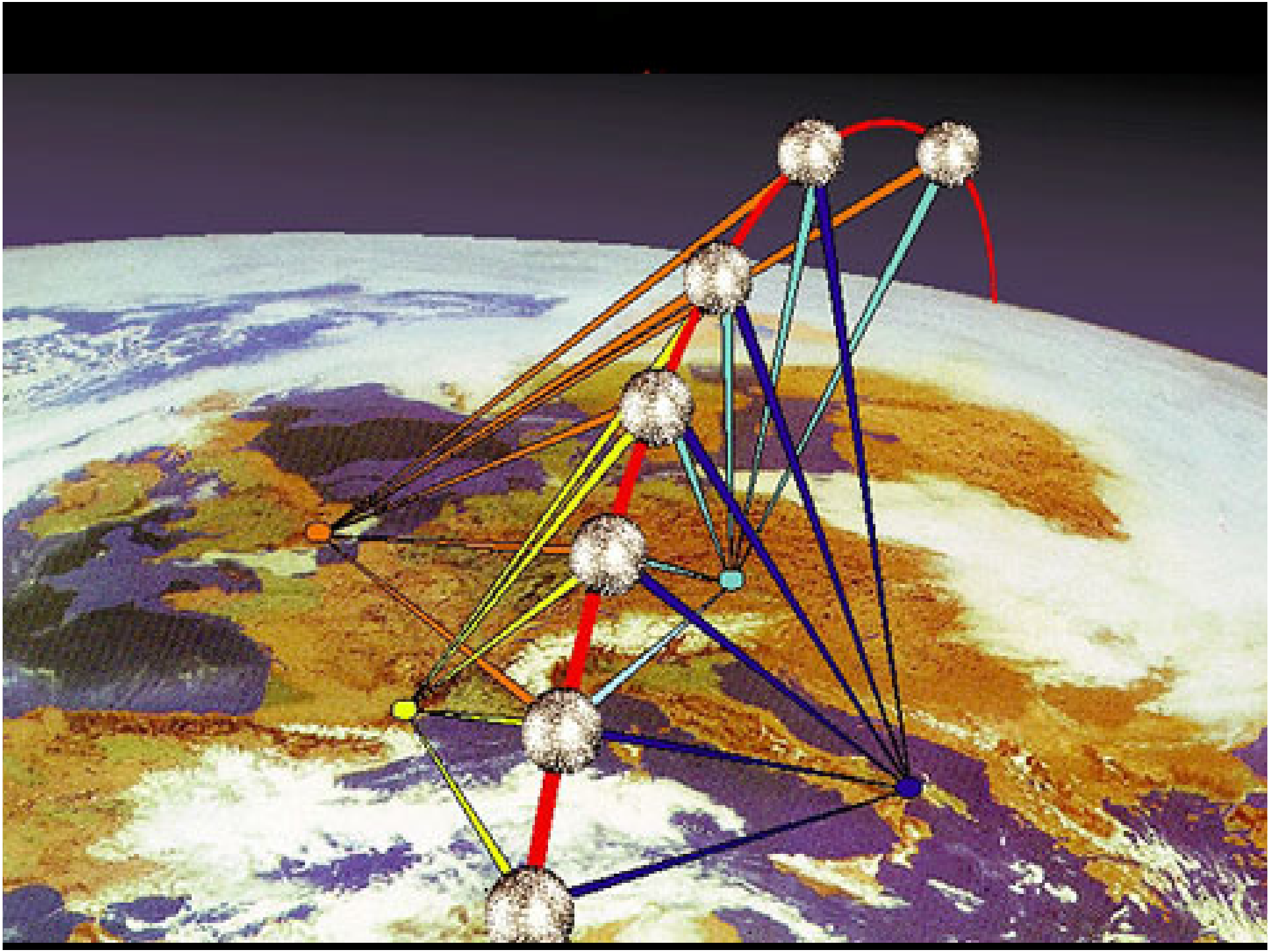


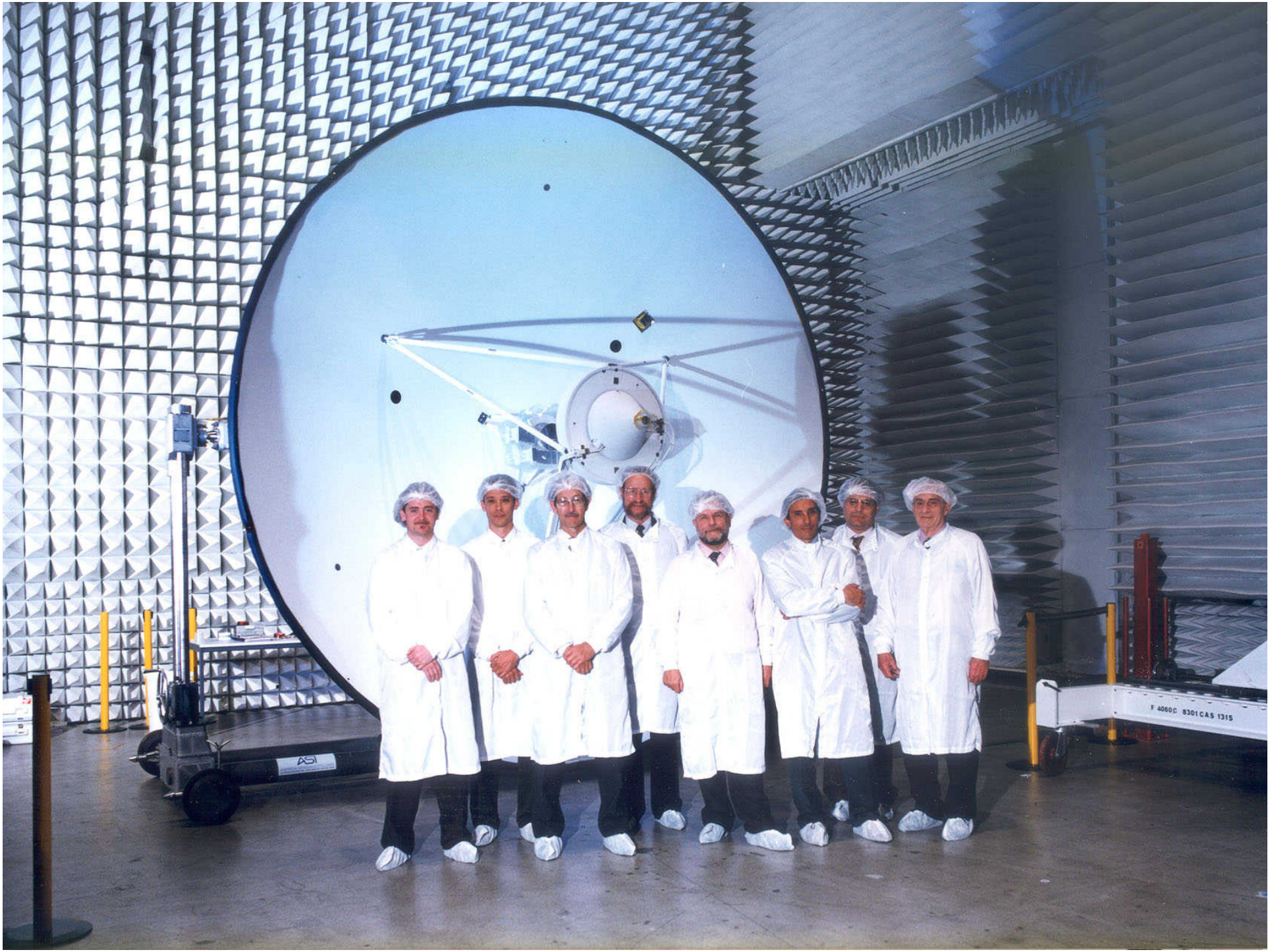
Recently, using 13 years of data from LAGEOS II, two Italian scientist have published:

"Accurate Measurement in the field of the general-Relativistic precession of the LAGEOS II Pericenter and new Constraints on Non Newtonian Gravity."

David M. Lucchesi and Roberto Peron
Physical Review Letters – PRL 105 231103(2010)

A new satellite of the same class, called LARES, is now under construction as payload on the first Vega launch. It is conceived mainly to determine the Lens-Thirring effect but it will complement the LAGEOS constellation


Cassini-Huygens is a joint
NASA-ESA-ASI mission
devoted to the extended exploration of
Saturn and Titan
INTERNATIONAL
PARTICIPATION IN
CASSINI
SATURN ORBITER AND
HUYGENS TITAN
PROBE
BELGIUM
UNITED STATES
FRANCE
GERMANY
ITALY
DENMARK
UNITED KINGDOM
SWITZERLAND
NETHERLANDS
CZECH REPUBLIC
AUSTRIA
SPAIN
FINLAND
IRELAND
HUNGARY
SWEDEN
NORWAY


ASI
F 4060C 8301 CAS 1315

B.Bertotti, L.Iess, P.Tortora:

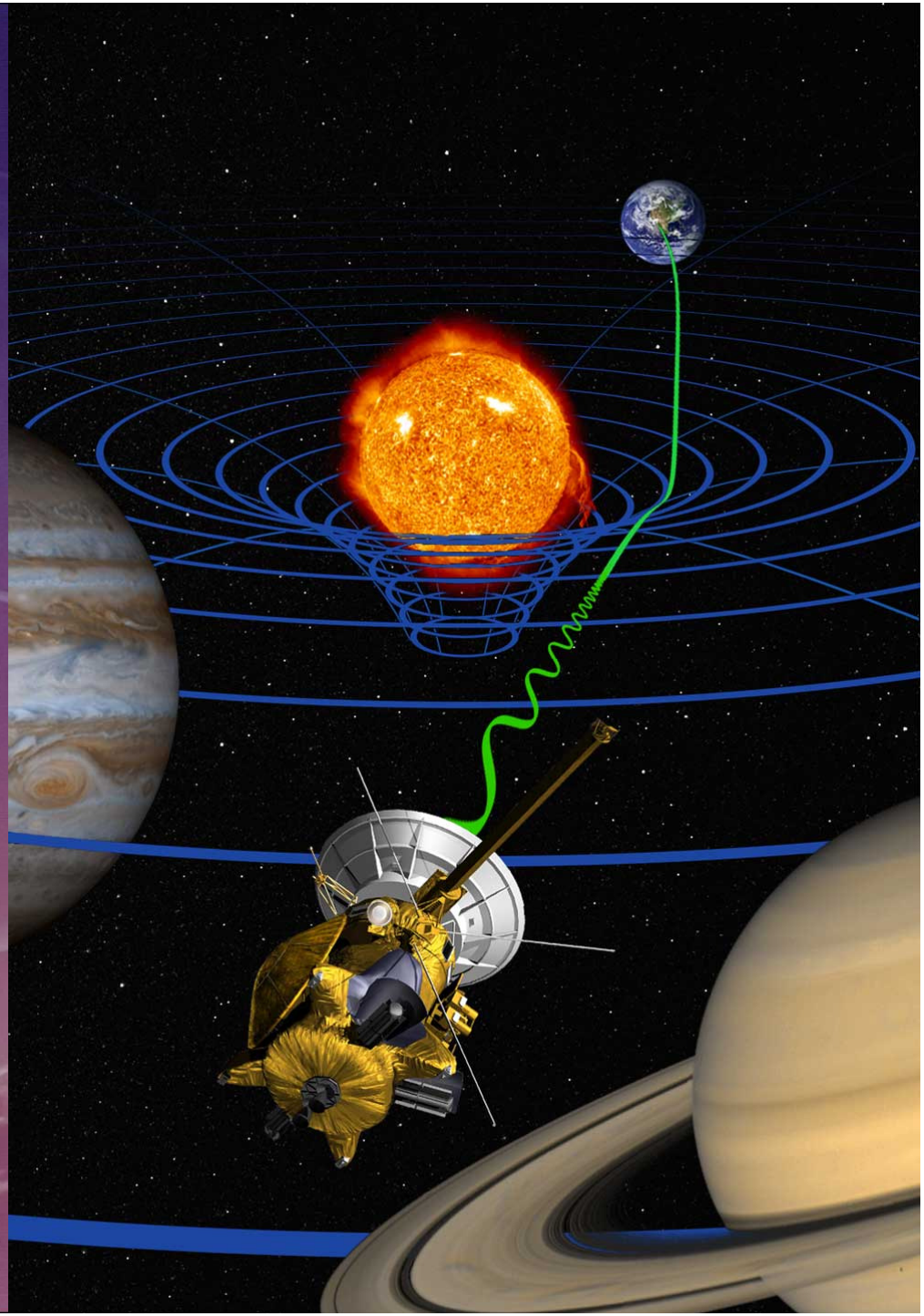
"A test of general relativity using radio links with the Cassini radio spacecraft"

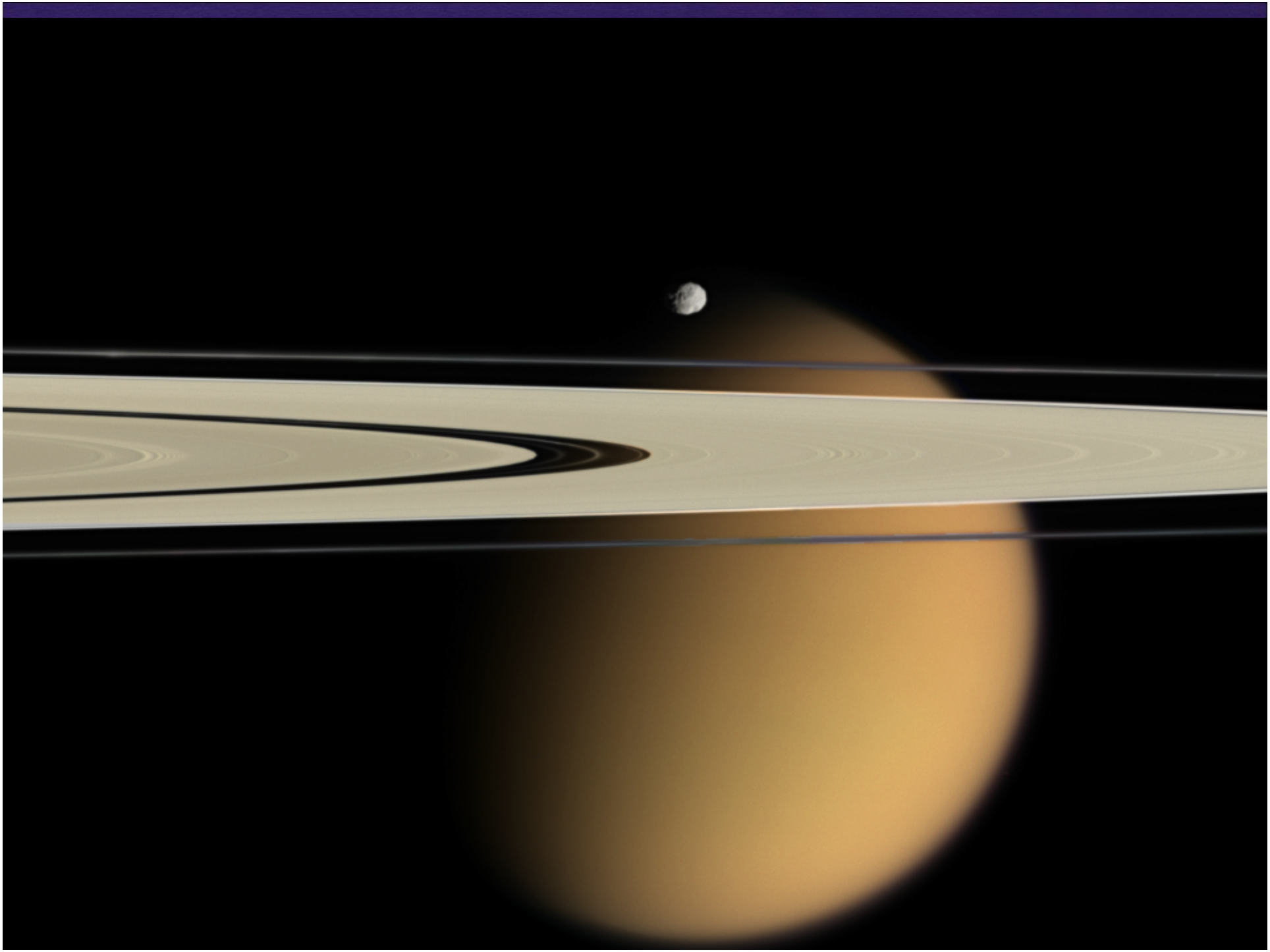
Nature, 425, 374 (2003)

Relativistic frequency shift

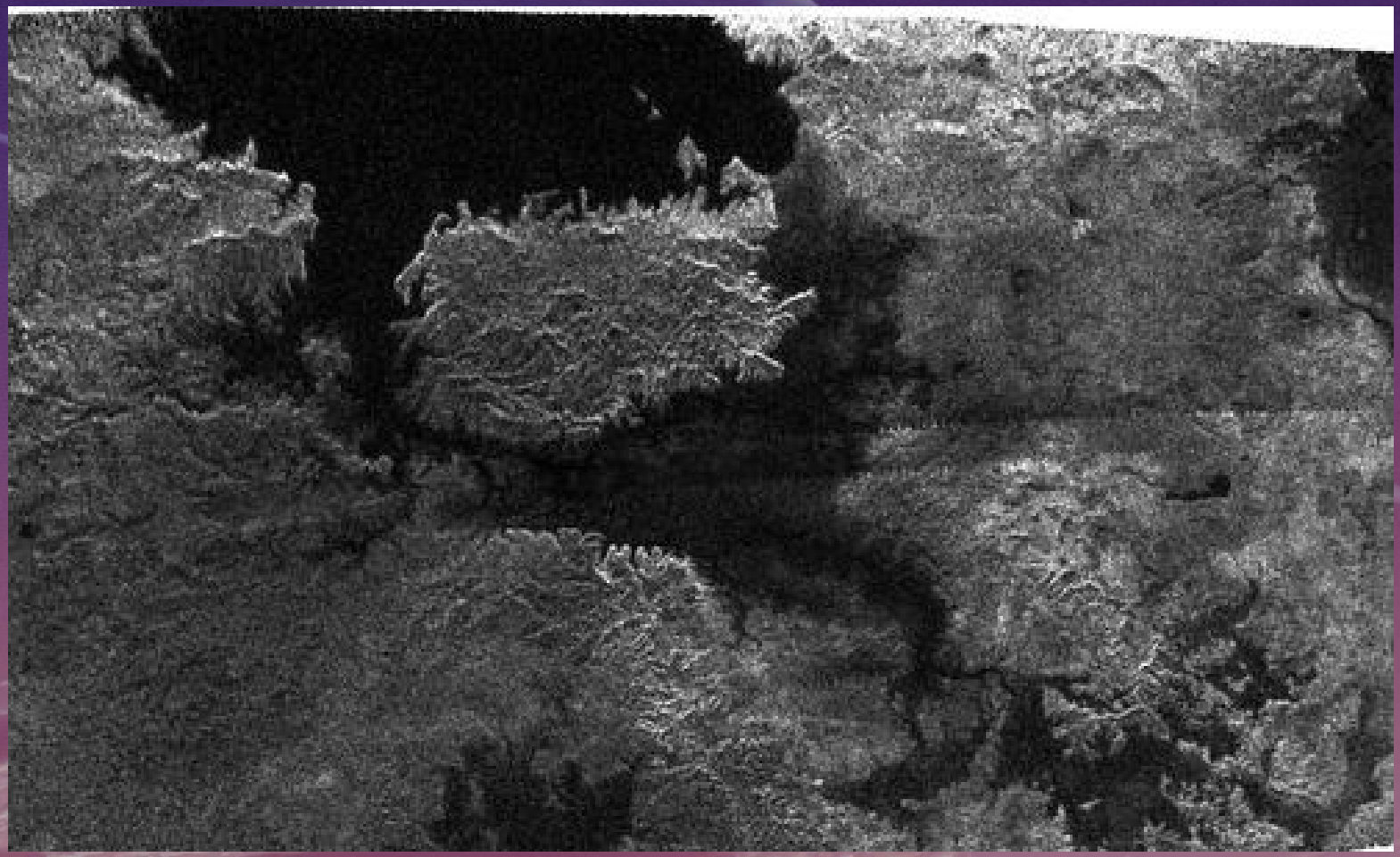
$$y_{gr} = 1\times10^{-5}(1+\gamma)\frac{1}{b}\frac{\mathrm{d}b}{\mathrm{d}t}$$

≈ 8×10^{-10} for a grazing beam



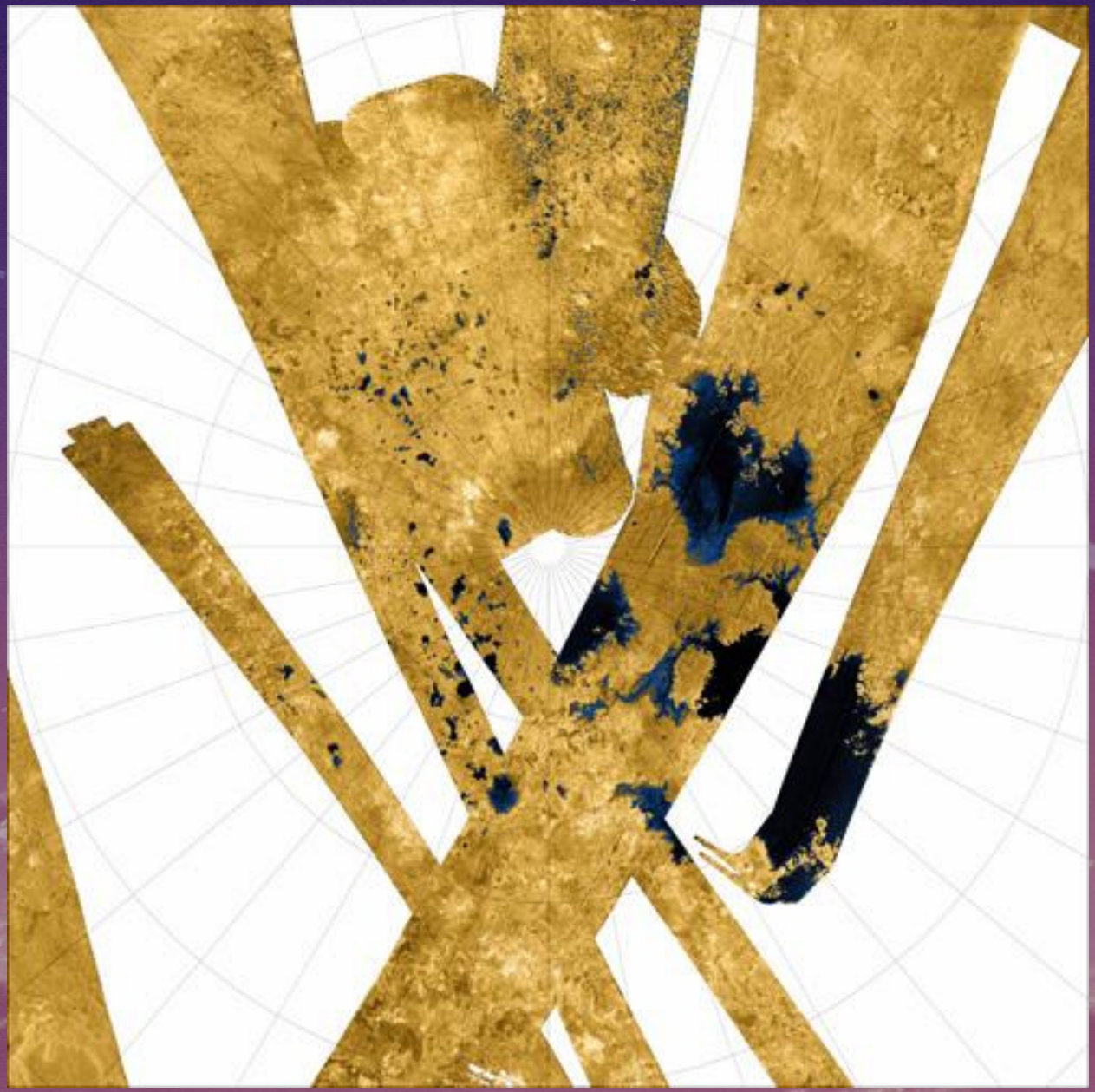


Encounters T25 and T28

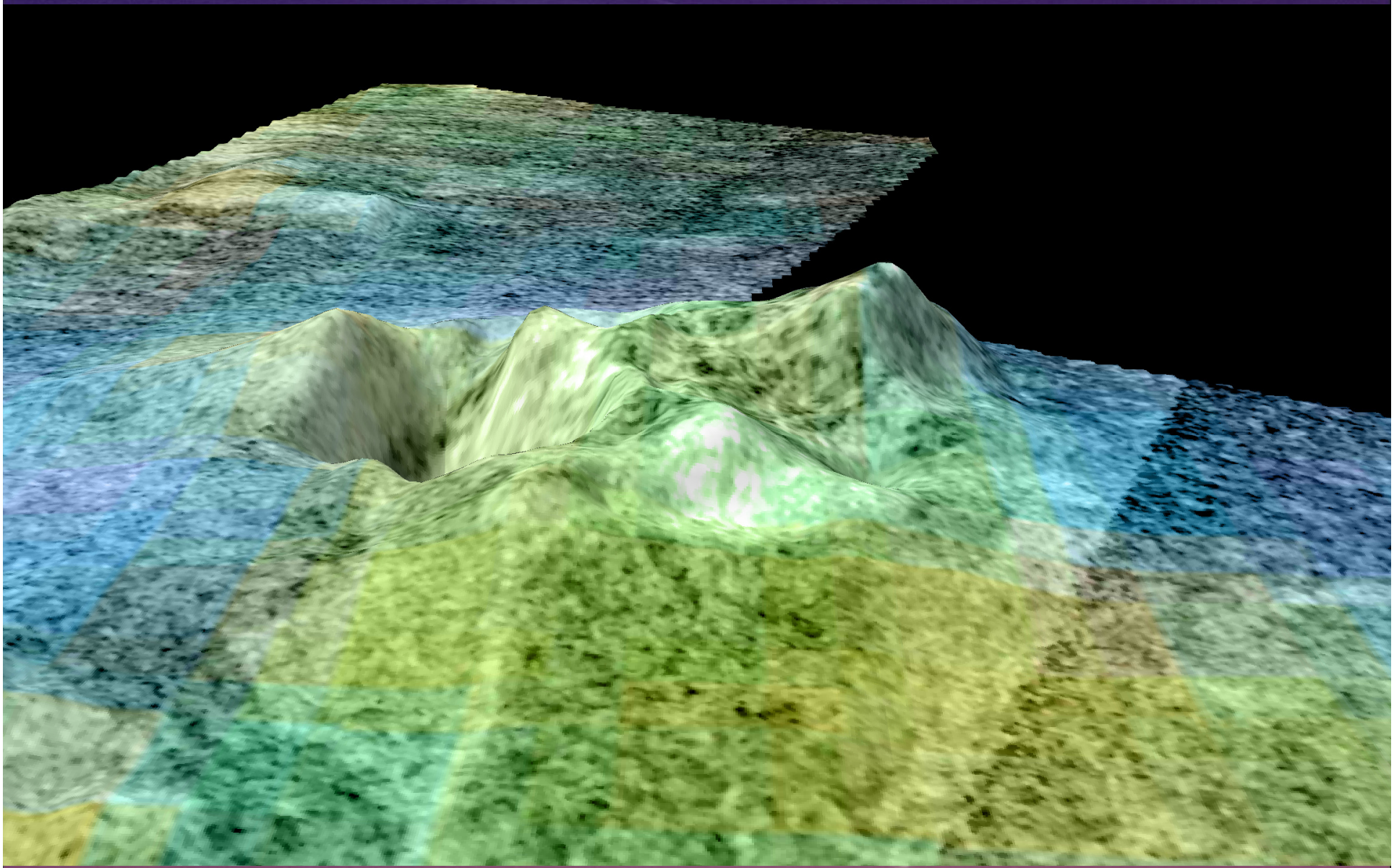


Seas and Islands

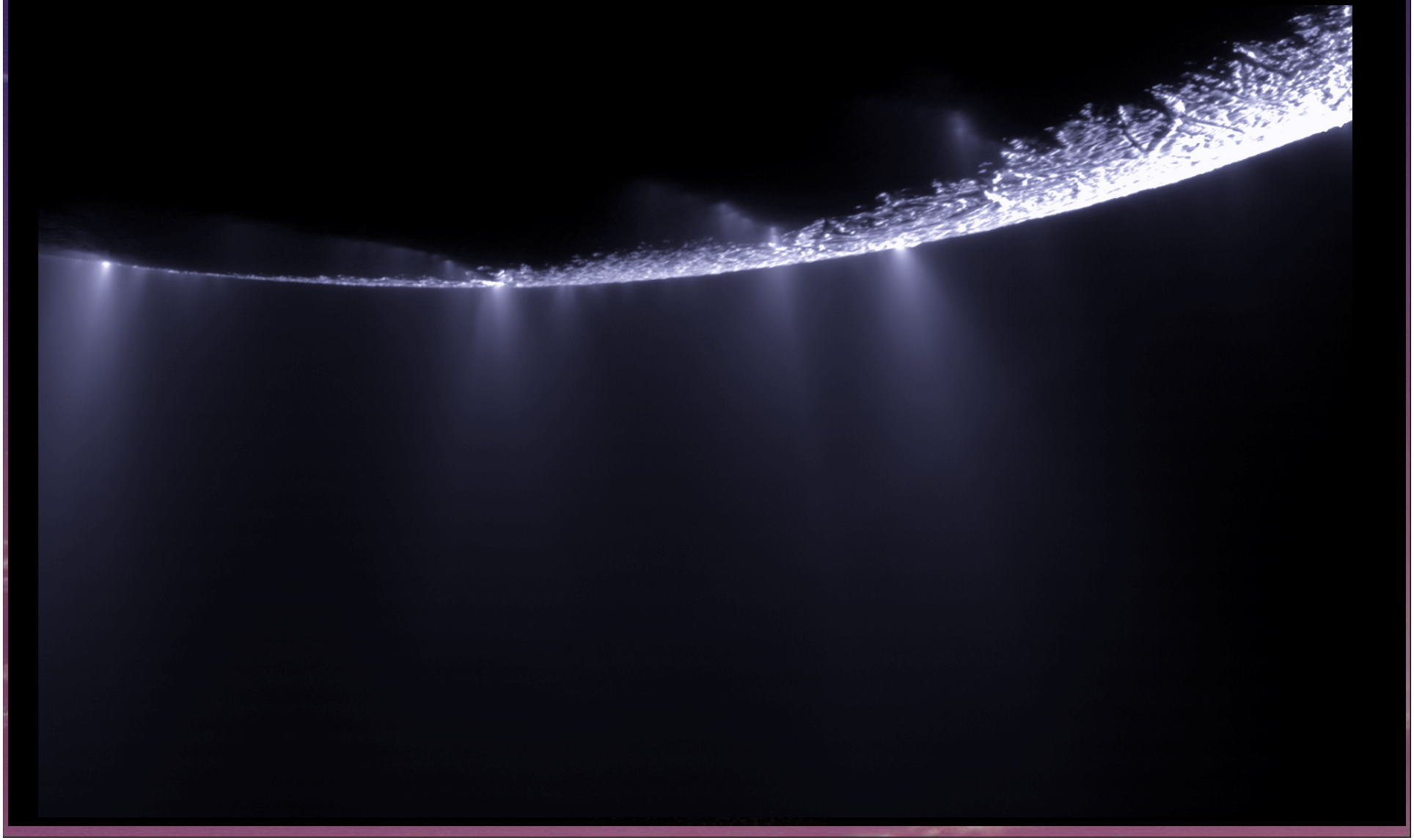
North Polar Region Mosaic



A Crio-Volcano on Titan

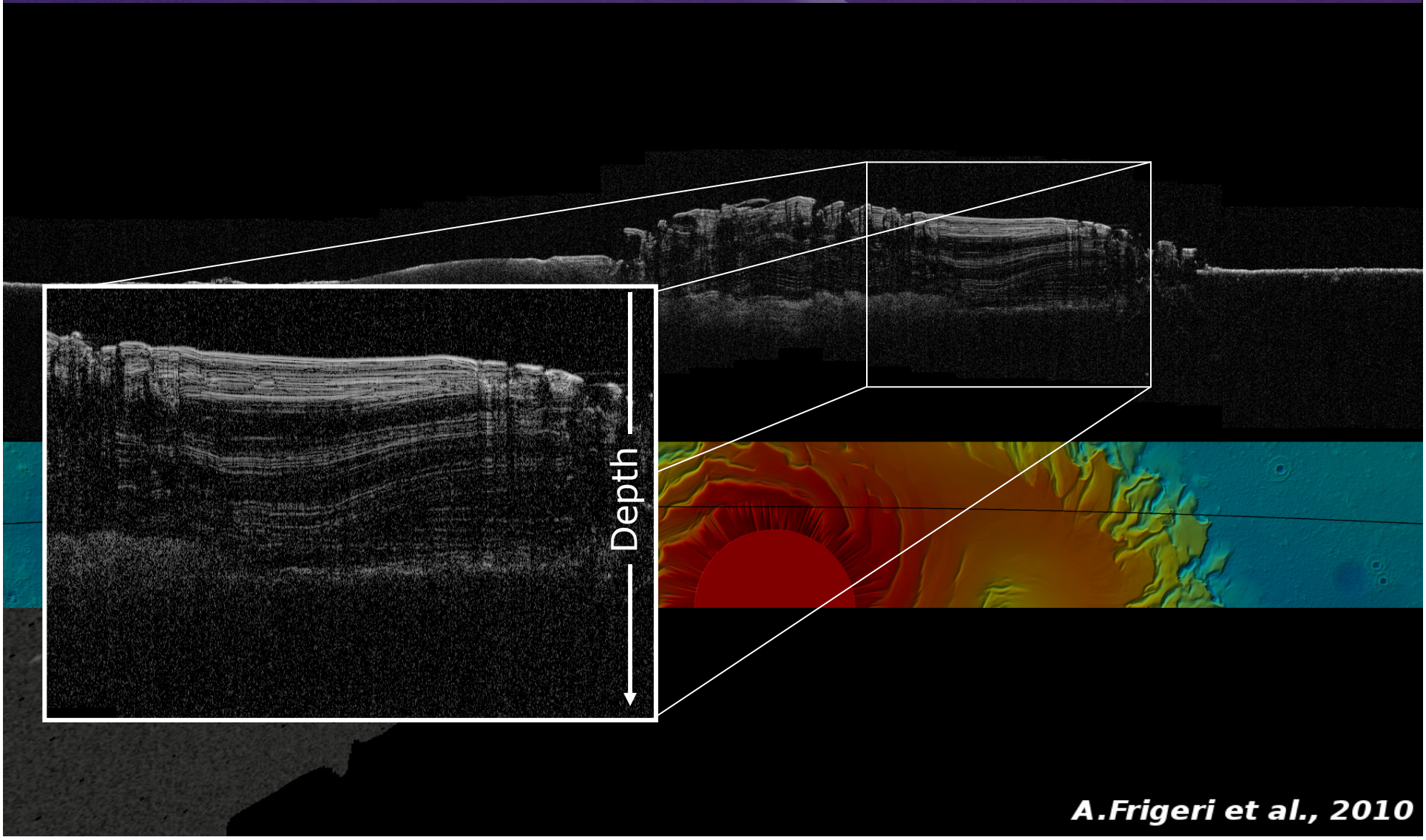


Geisers on Enceladus



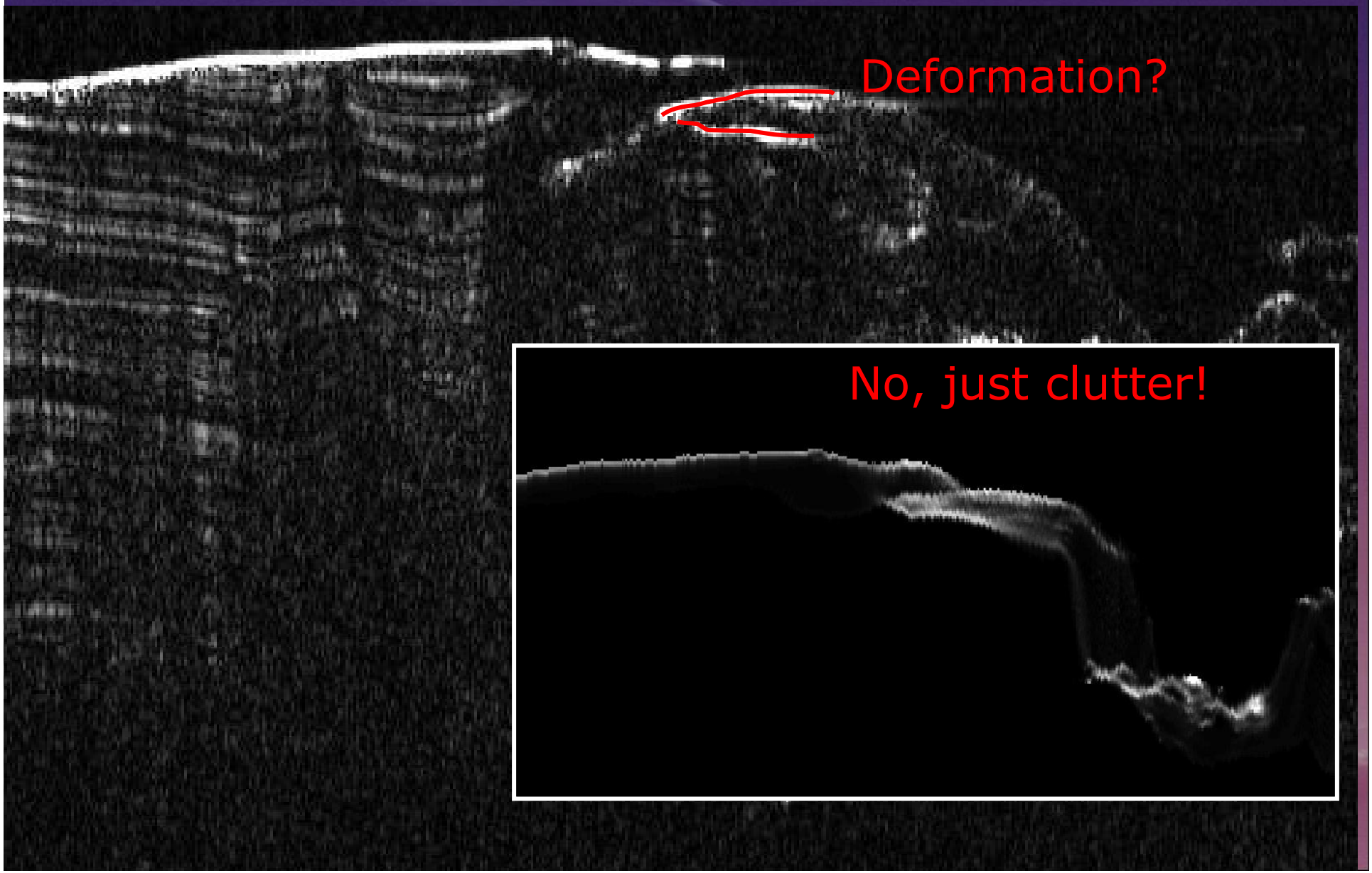
SHARAD on MRO

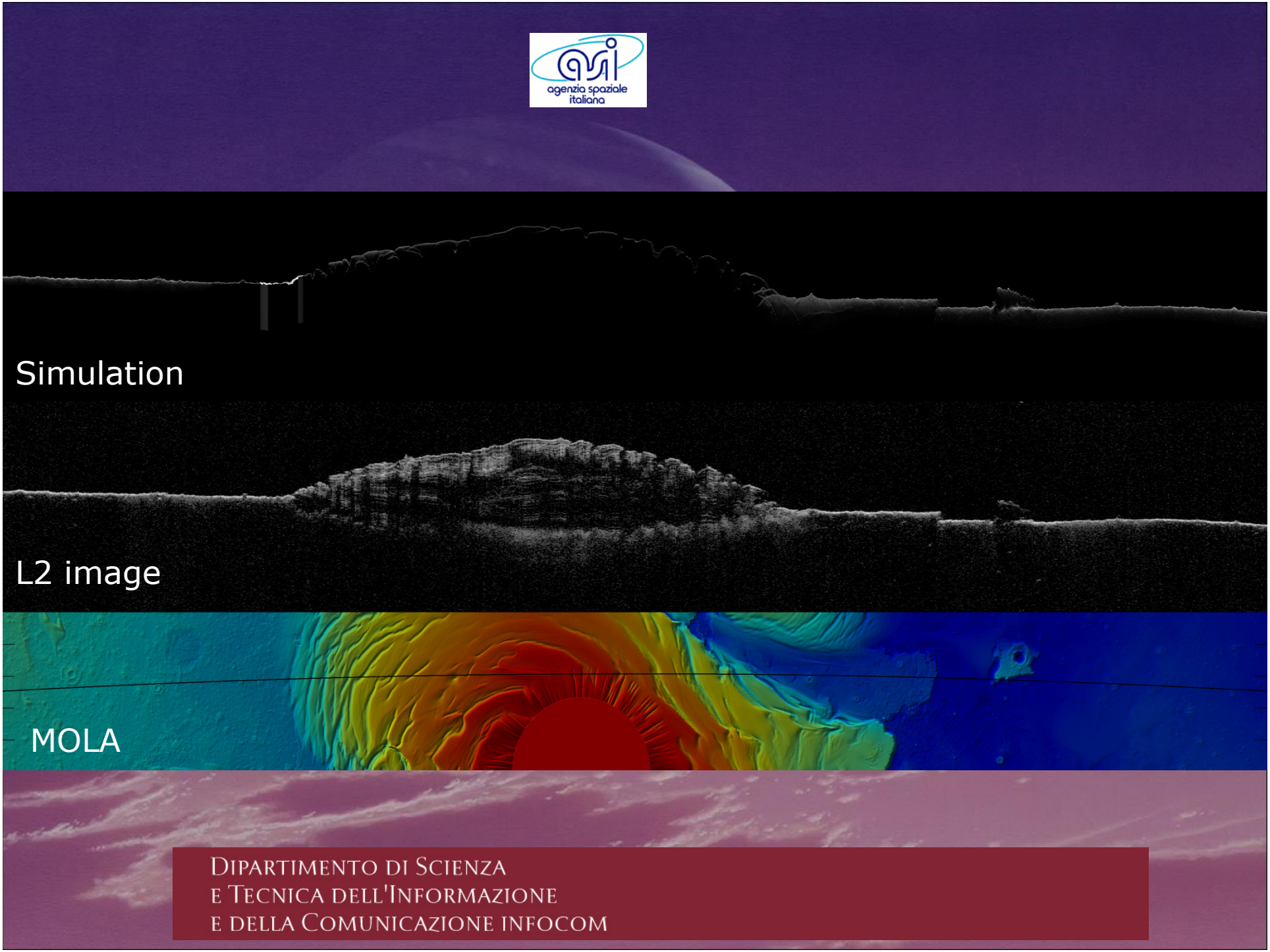
SHARAD extends the knowledge of planetary surfaces to a third dimension: the depth!



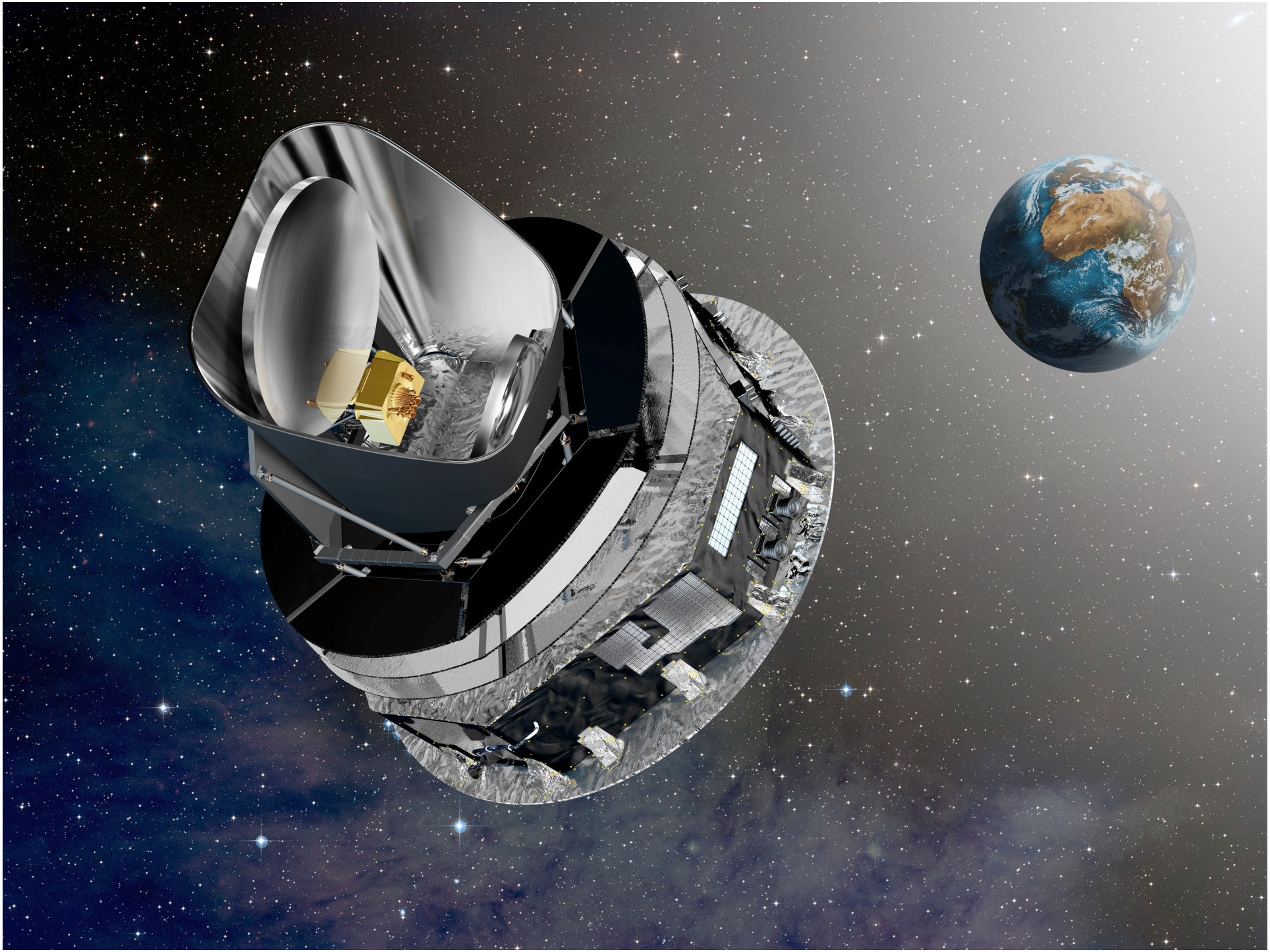
A.Frigeri et al., 2010

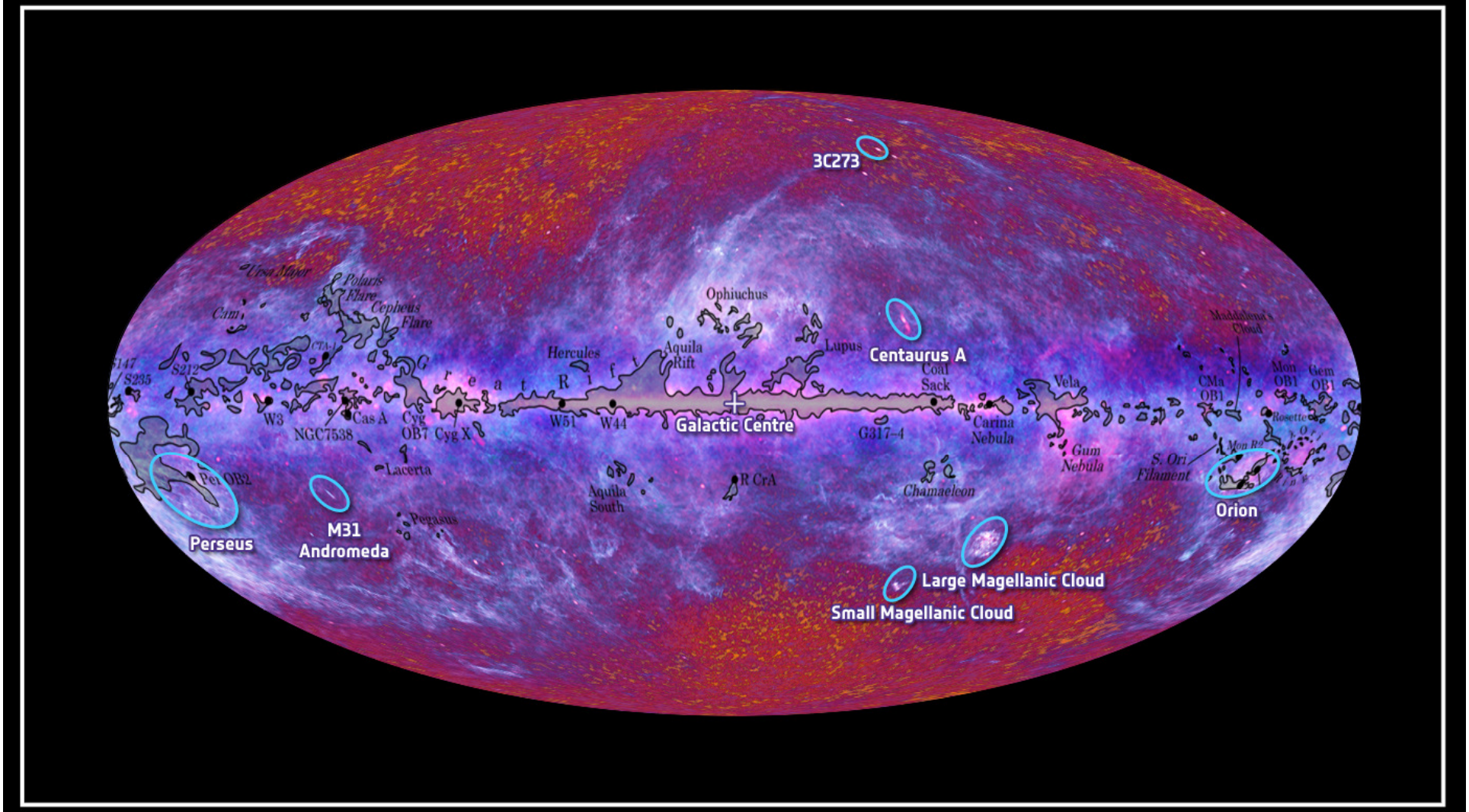
Sub-surface structure investigation





DIPARTIMENTO DI SCIENZA
E TECNICA DELL'INFORMAZIONE
E DELLA COMUNICAZIONE INFOCOM





The Planck one-year all-sky survey

esa

Leonardo Da Vinci 1452-1519

"The Sun does not move...the Earth is not in the center of its motion and it is not the center of the Universe"

agenzia spaziale italiana


Thanks