



The contribution of the Italian Space Agency (ASI) to GGOS

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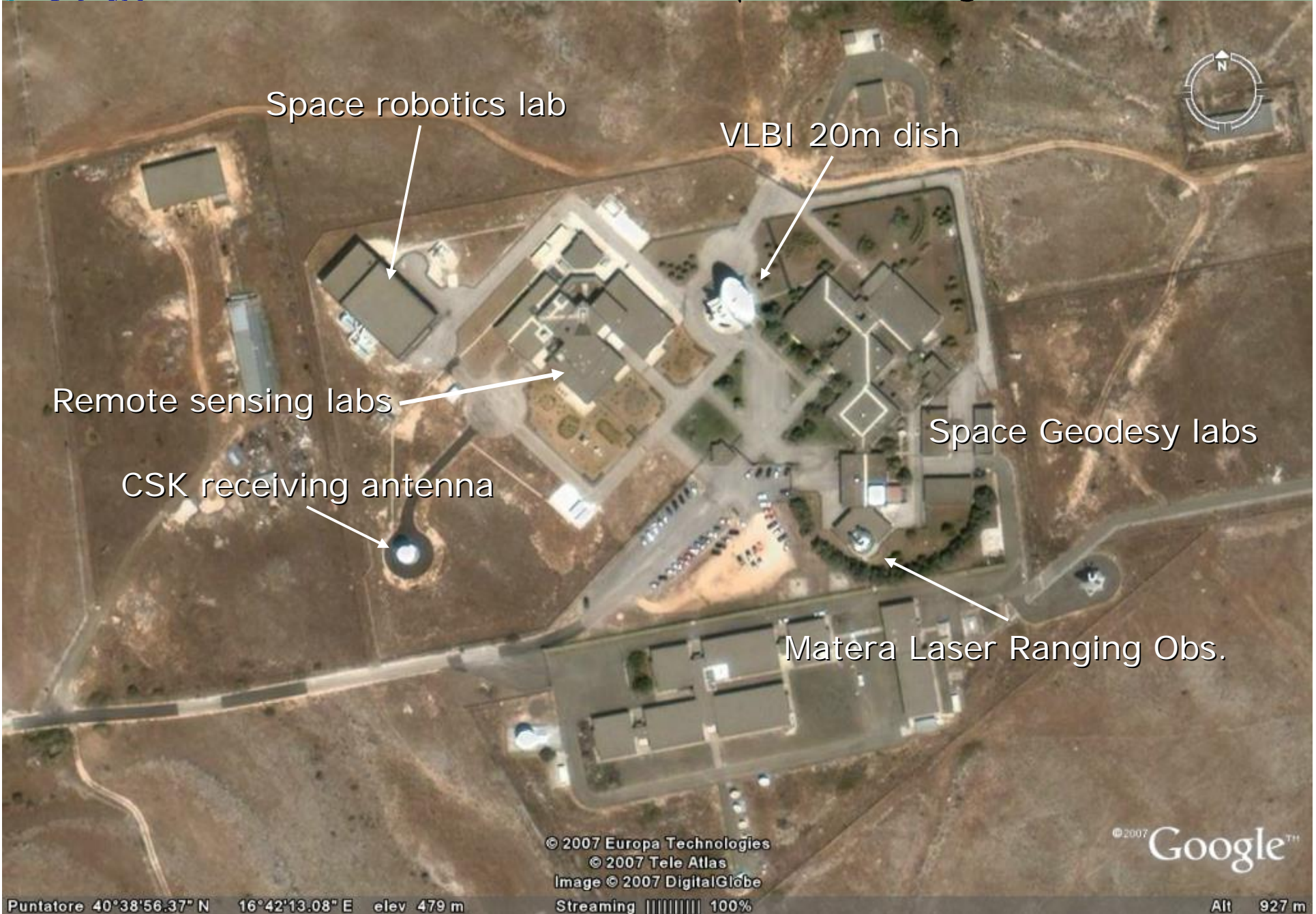
The LAGEOS-II satellite

- 60 cm diameter, 405 kg mass, 426 CCR's
- Launched in 1992 (STS52) and observed since then by the ILRS worldwide network
- Together with its twin, LAGEOS, it is the fundamental spacecraft for the establishment and monitoring of the Terrestrial Reference Frame

The Space Geodesy Center "Giuseppe Colombo"

- Located in Matera, Italy
- R&D facility mainly devoted to:
 - **Space Geodesy** (SLR/LLR, VLBI, GPS, absolute gravimetry)
 - observations
 - data analysis
 - **Remote Sensing** (SAR imaging)
 - Cosmo-SkyMed UGS
 - ESA missions (ERS-1/2 PAF's, ENVISAT PAC)

ASI/CGS aerial view (from GoogleEarth)



Space Geodesy: SLR/LLR



The MLRO (Matera Laser Ranging Observatory)
at ASI/CGS



The ILRS network

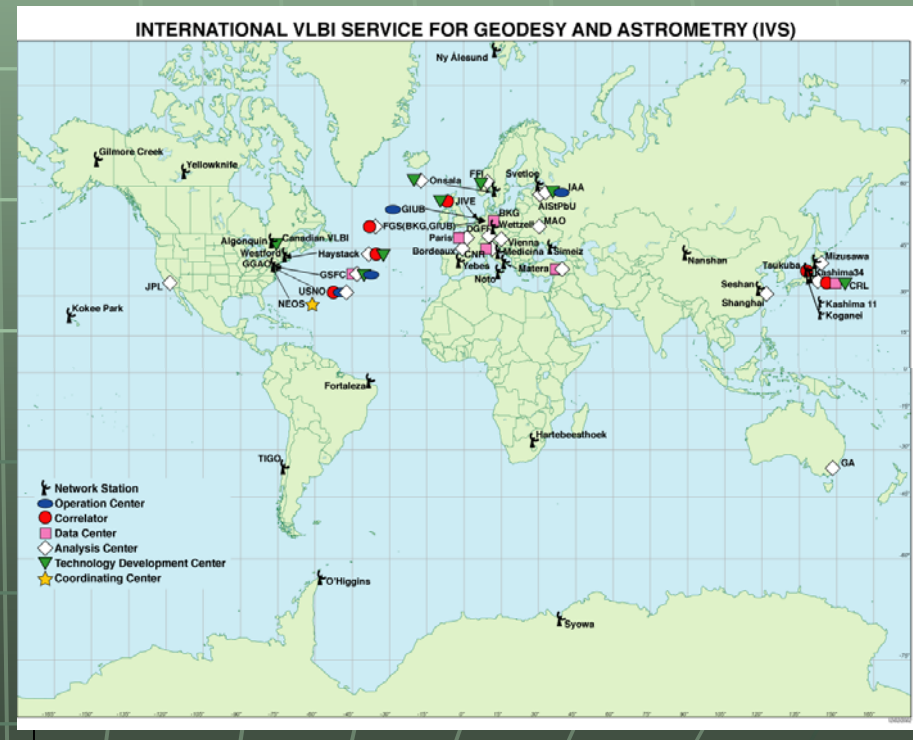
Space Geodesy: SLR/LLR

- Matera Laser Ranging Observatory (MLRO) operations in the framework of ILRS
- Members of EuroLAS (European Consortium of SLR stations)
- In 2004 the CGS/ASI has been selected as the Primary Official Combination Center of the ILRS

Space Geodesy: VLBI



The 20m VLBI dish at
ASI/CGS

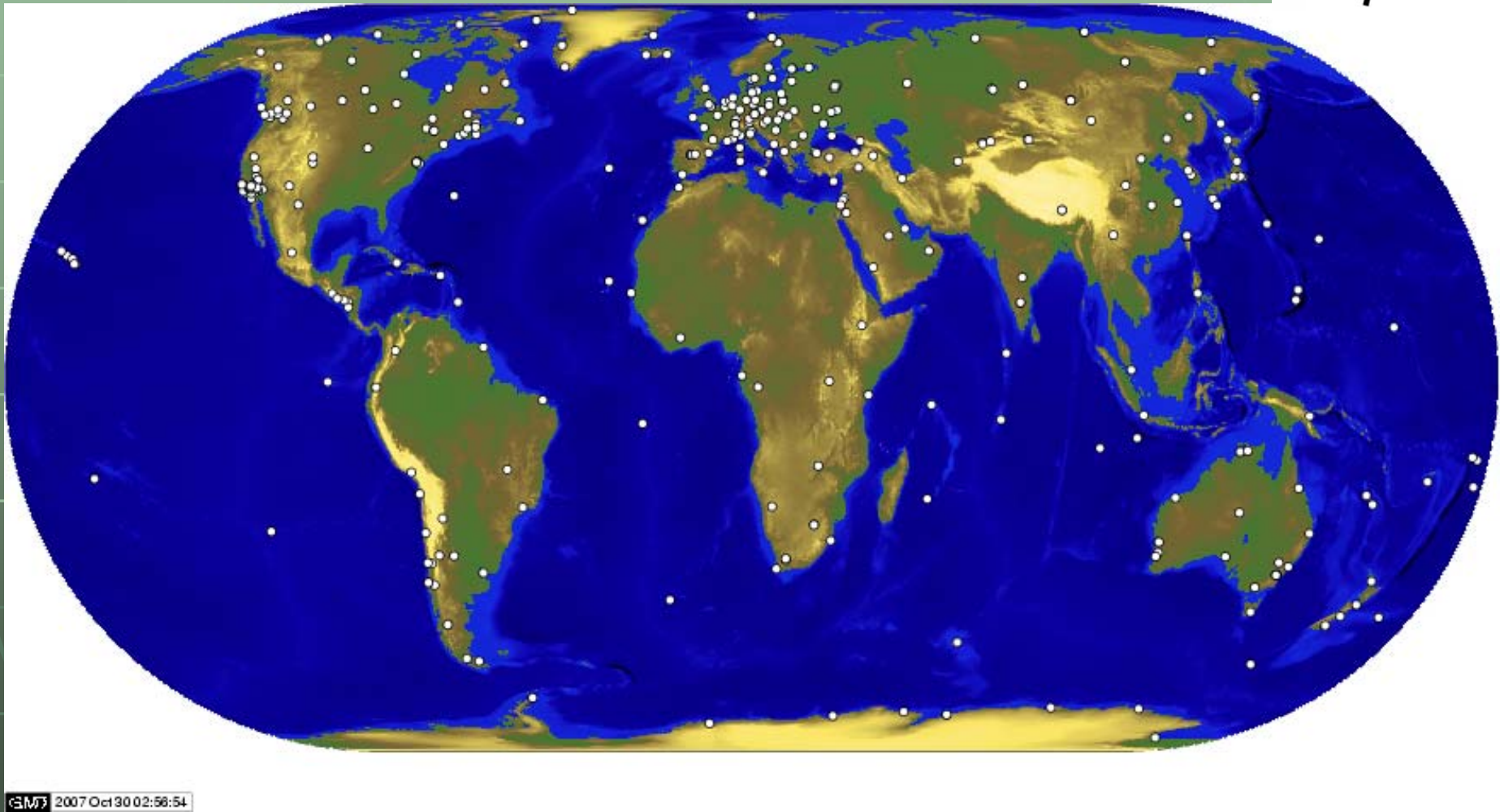
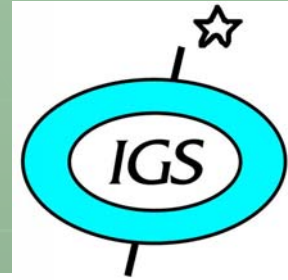


The IVS network

Space Geodesy: VLBI

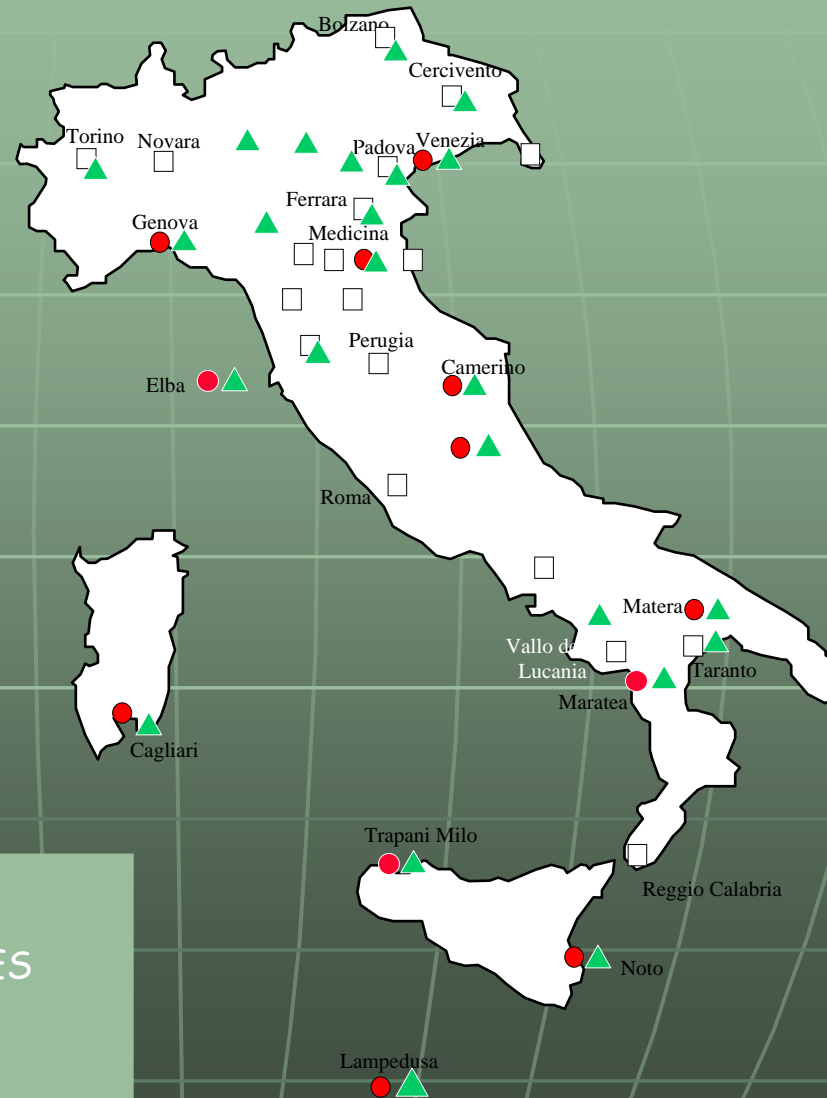
- ASI VLBI station in operation since 1990 in the IVS network
- 20-m wheel and track Cassegrain radiotelescope, S/X bands, standard MARK V - VLBA terminal
- High precision time and frequency system (Cesium, H-Maser)

Space Geodesy: GPS



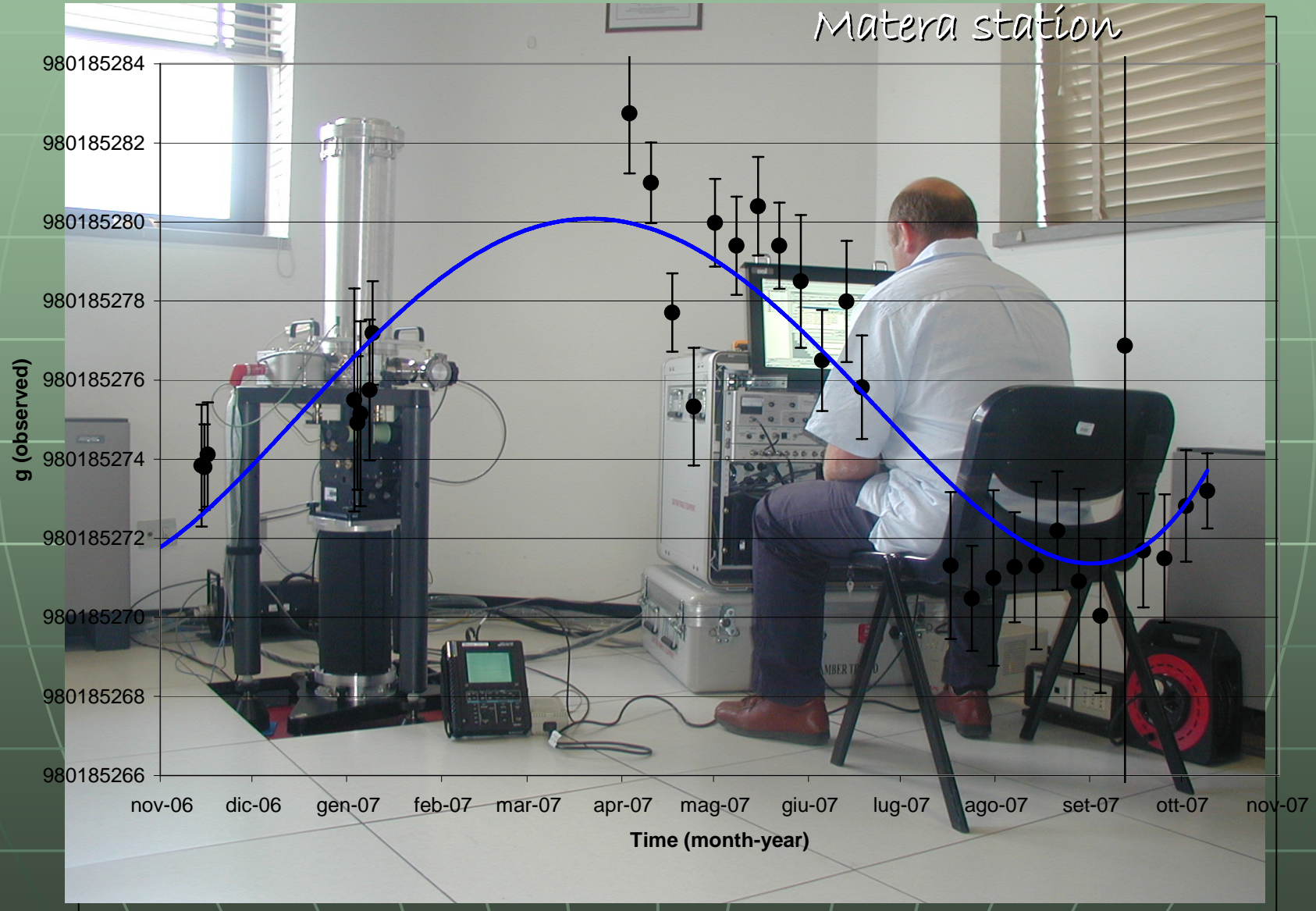
The International GNSS Service (IGS) Network

Italian GPS Network



- ASI SITES
- OTHER INSTITUTION SITES
- ▲ HOURLY SITES

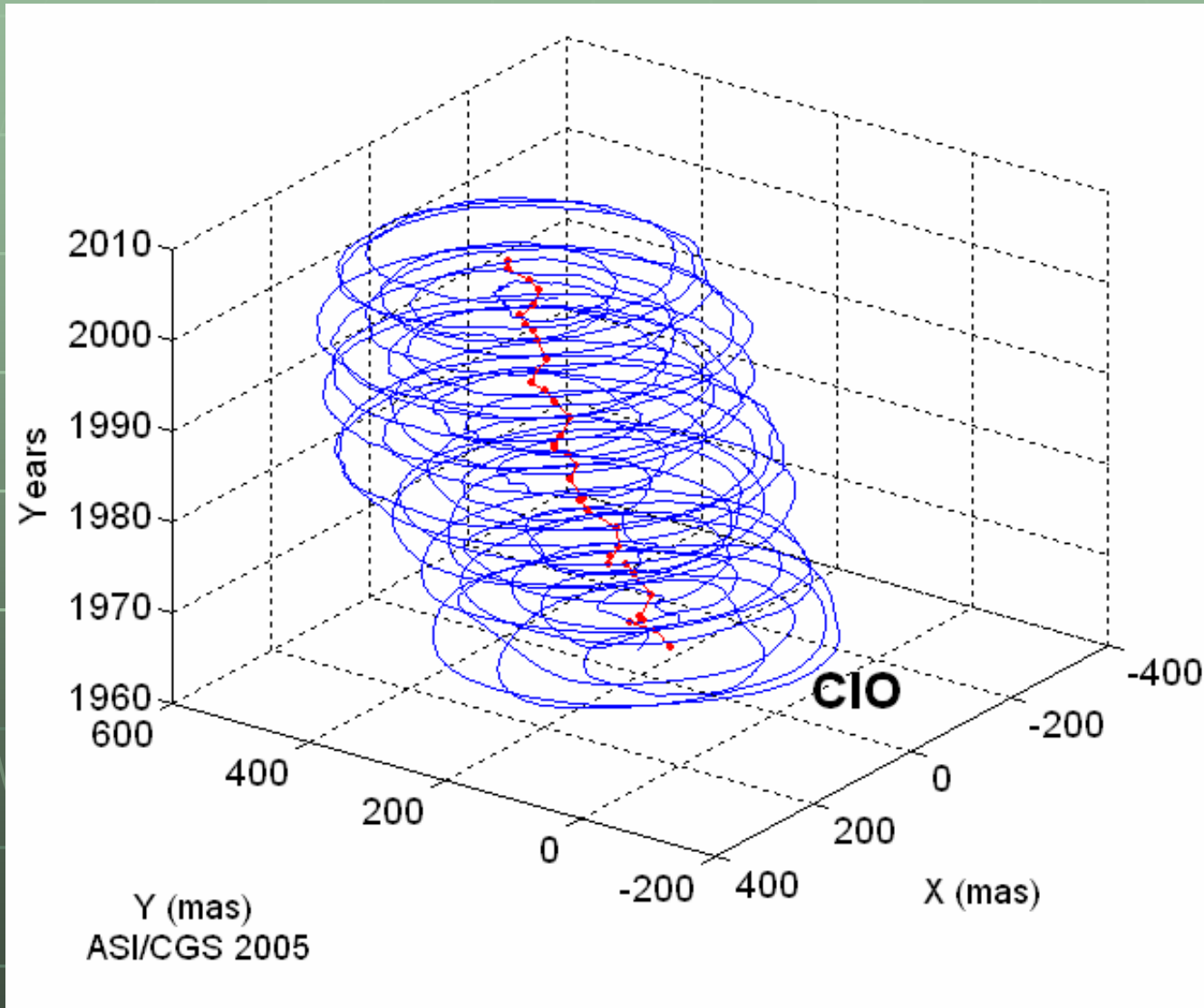
Absolute Gravimetry



Space Geodesy Research

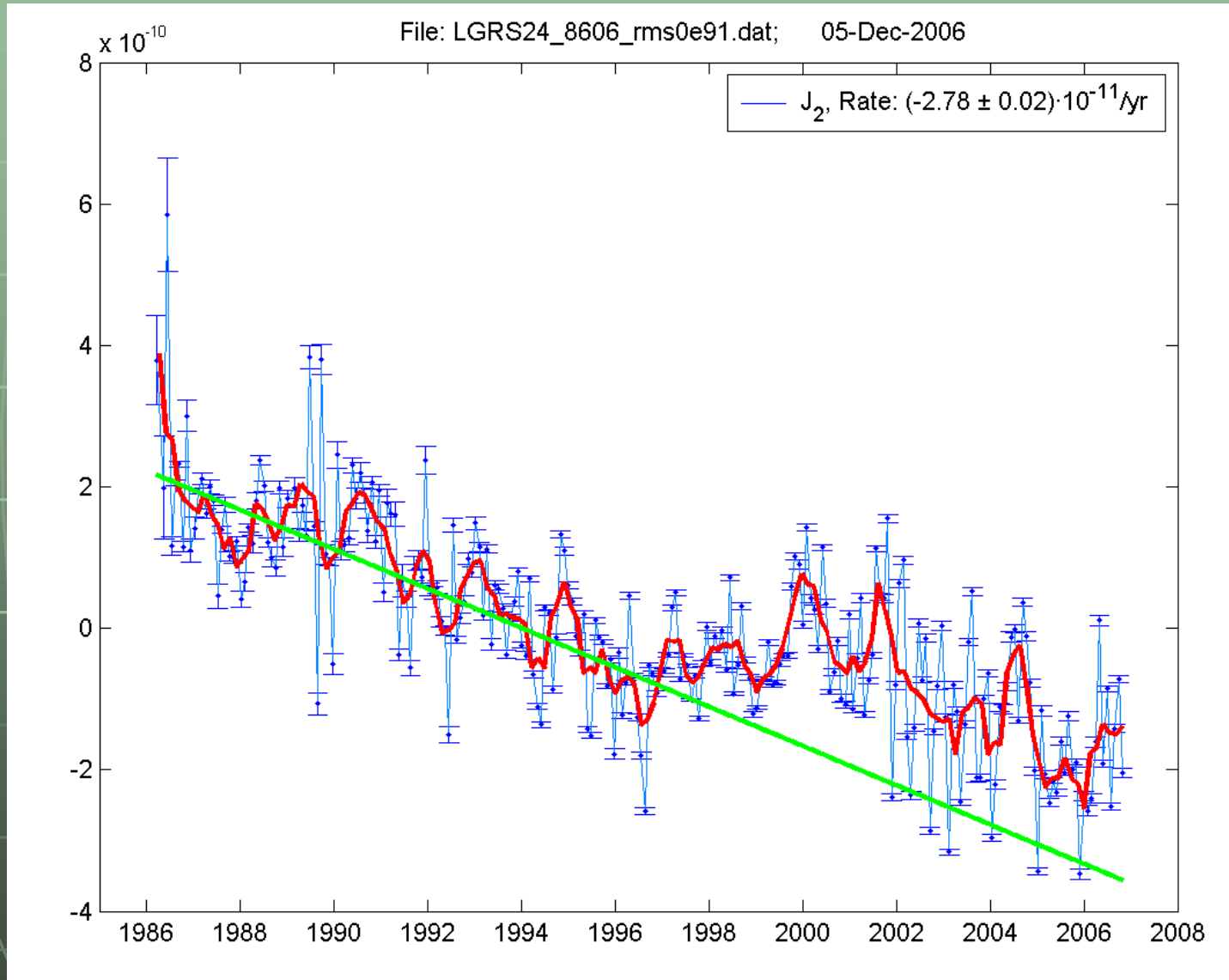
- Periodic SLR, VLBI e GPS solutions to study:
 - Crustal deformations
 - Celestial Reference System
 - Terrestrial Reference System
 - Earth rotation
 - Geopotential
 - Precision Orbitography
 - Atmospheric sounding
 - Fundamental Physics

Polar motion



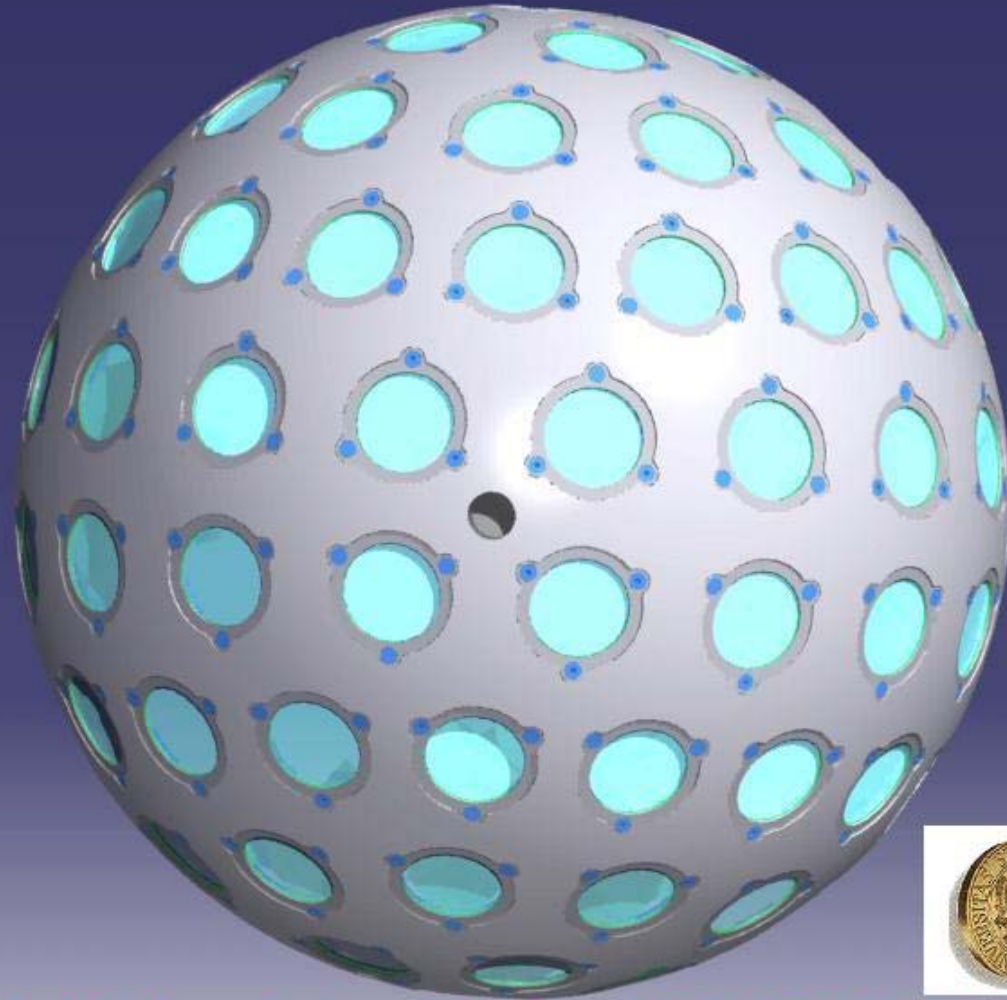
Crustal deformation

Geopotential



LARES

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ASI-Università del Salento-Sapienza Univ. Roma-LNF INFN-CGS ASI

GOCE

Gravity and Ocean Circulation Experiment



ACES

Atomic Clock Ensemble in Space

- Applications:
 - Geodesy
 - Gravimetry
 - Precise orbit determination
 - Earth monitoring
 - VLBI
 - Global positioning
 - Navigation



ACES payload mock-up

SRT

Sardinia Radio Telescope

- 64 m dish radiotelescope
- Mainly devoted to astronomy, it will be compatible with astrogeodynamic applications (VLBI)

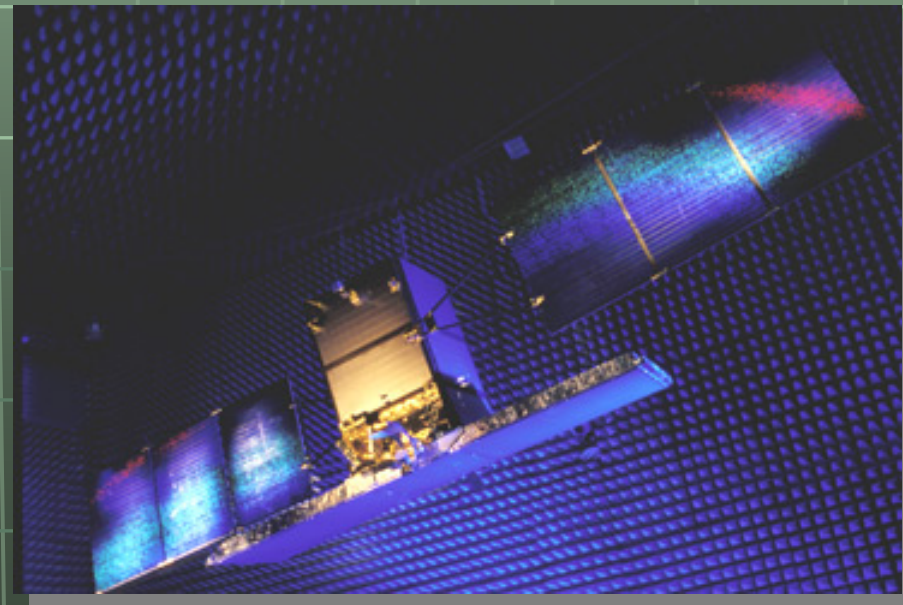


SRT

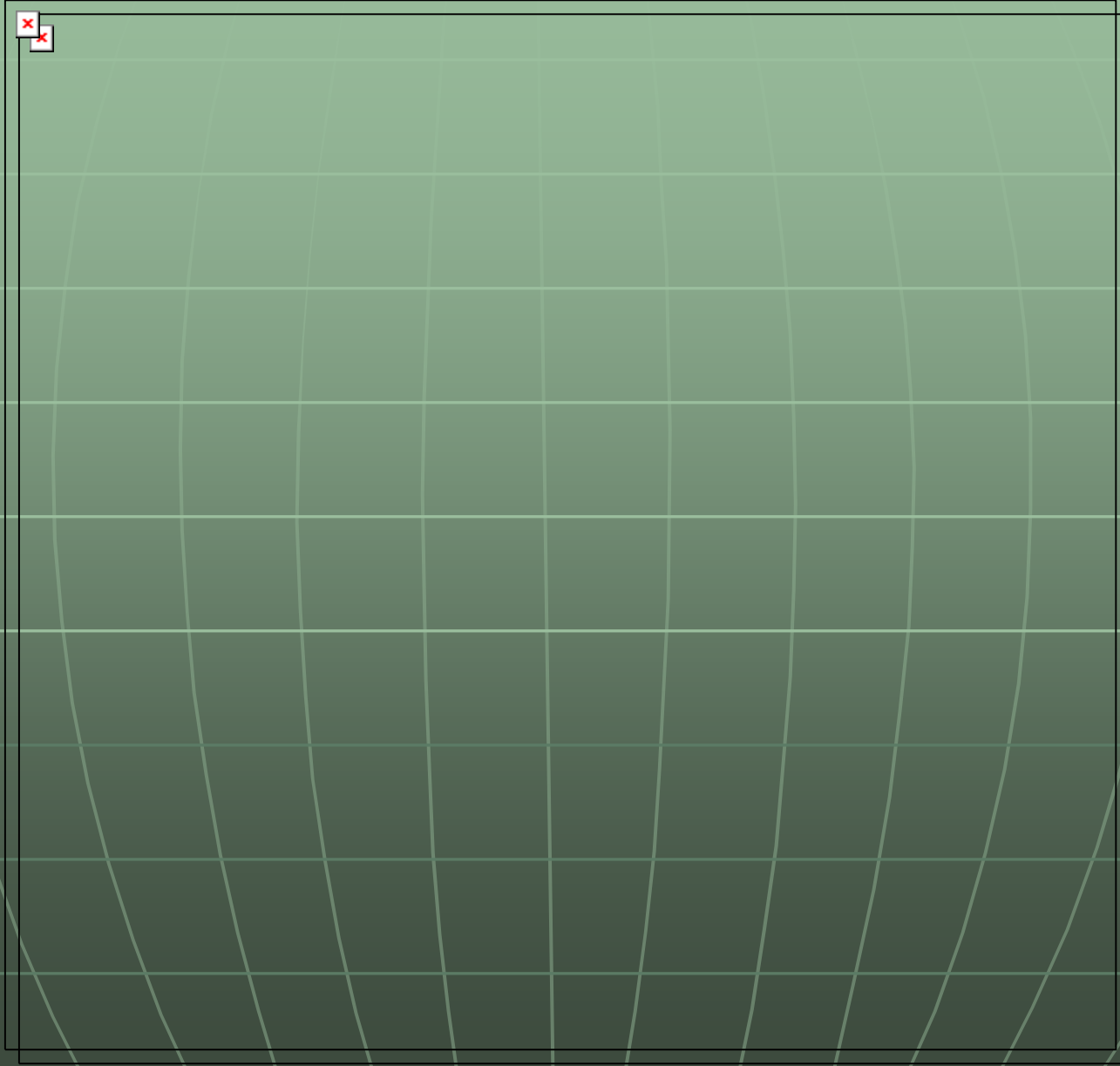
SARDINIA
RADIO
TELESCOPE

COSMO-SkyMed

- 4-satellite dual-use constellation for high resolution SAR imaging and interferometry
- First satellite launched in June 2007
- Second satellite to be launched within 2007
- Whole constellation to be deployed by 2009
- UGS located at ASI/CGS, Matera



Tidal creek in Africa seen by CSK



Mt. Etna seen by CSK



ASI Station at Malindi, Kenya

- Remote sensing activities under way
- Regional Center for Earth Observations (feasibility study)
- AFREF reference station



CONCLUSIONS

- ASI is ready to play a fundamental role in GGOS:
 - by means of dedicated space missions (e.g. LAGEOS-II)
 - by means of dedicated facilities (like the fundamental station CGS in Matera)
 - Thanks to a two-decade experience in Space Geodesy and Remote Sensing data analysis