

EUROPLANET – JRA1

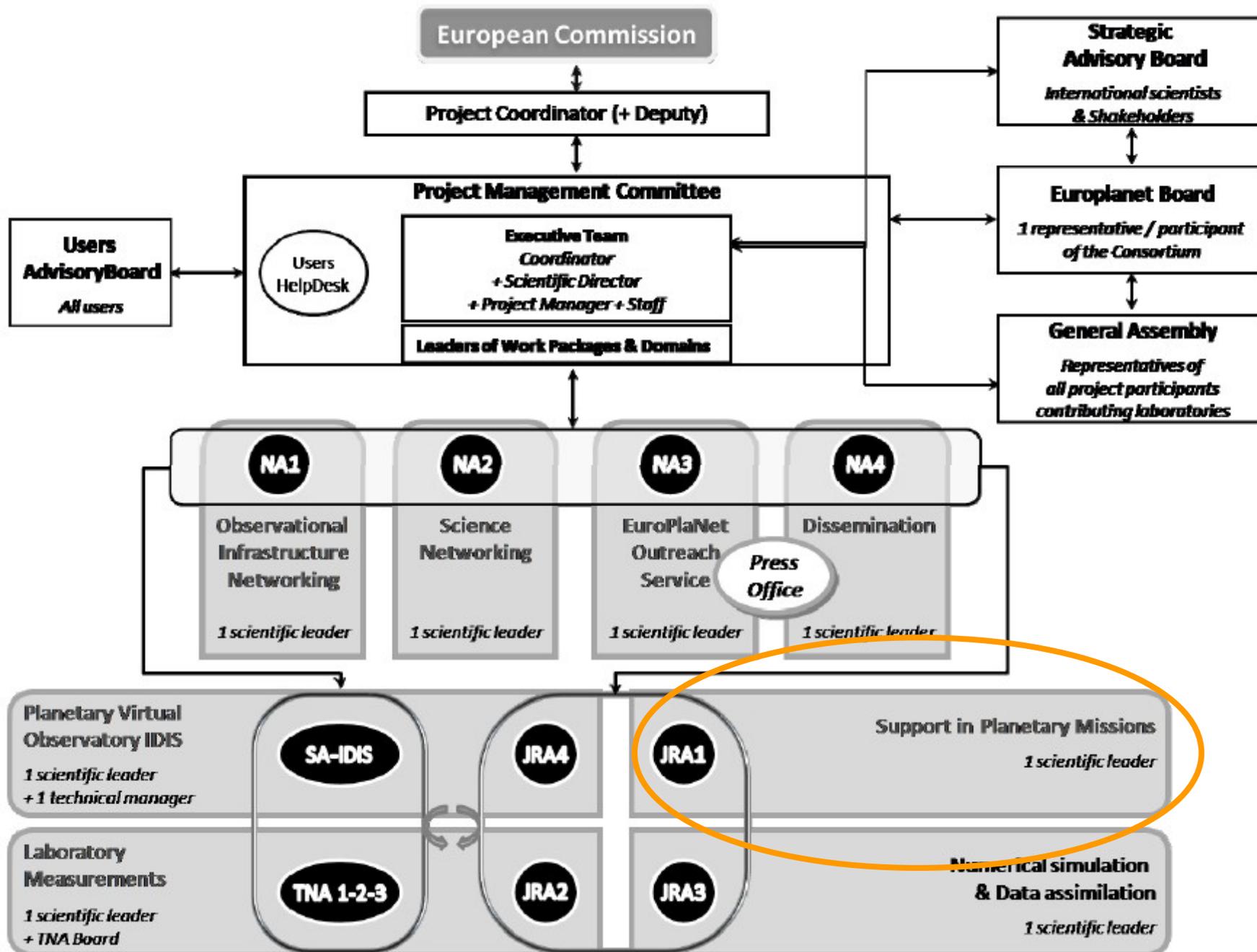
Infrastructure development for supporting planetary missions

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IMCCE – Paris Observatory

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Infrastructure development for supporting planetary missions

- Coordinator: J. Oberst (TUB/DLR)
Deputy: W. Thuillot (IMCCE)
- Organizations:
 - TUB Technical University of Berlin
 - IMCCE Paris Observatory
 - DLR Deutsches Zentrum für Luft und Raumfahrt
 - UW-MAPS University of Wales Aberystwyth
 - JIVE Joint Institute for VLBI Europe
 - UU University of Utrecht
 - AO Armagh Observatory



JRA1 - Goals

Development of an European infrastructure of planetary scientists for mission planning products

Task 1. Coordination

Task 2. Planetary dynamics + geodesy + cartography
→ Project of an European centre

Task 3. Spacecraft tracking
→ Demonstrator

Task 4. Empowering of Europe's amateur astronomy infrastructure
→ Meteors science case

JRA1 - Activities and deliverables

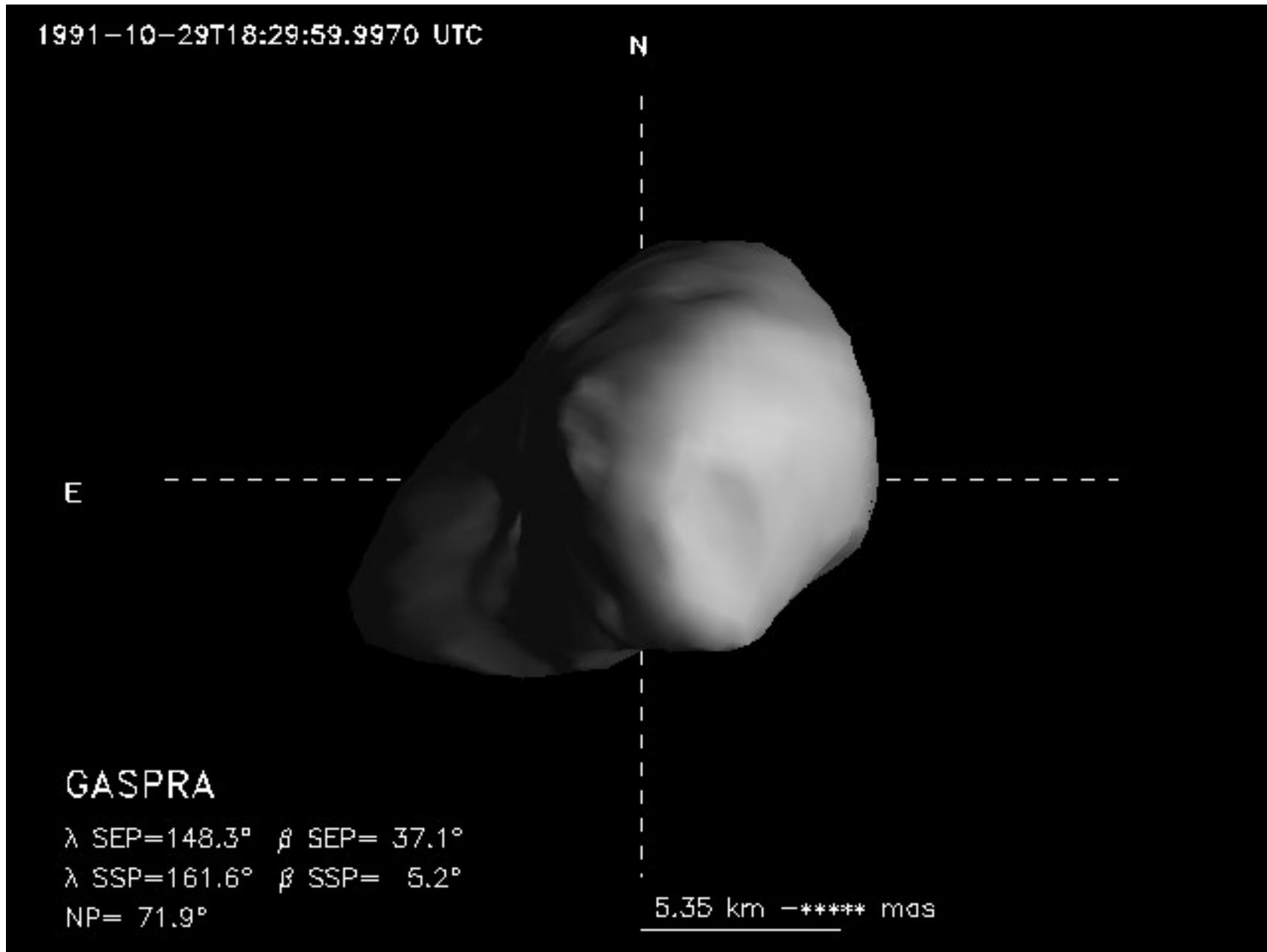
T2. Planetary dynamics + geodesy + cartography Basis for an European centre linked to SA-IDIS

→ Ephemerides

- Specific for space projects
- Planets, natural satellites, small bodies
- Spacecraft and probe orbits
- Astrometric data: GB + SPC (tracking data)
- VO and “Spice” compliant
- Standalone tools + web services

To be delivered to SA-IDIS

Gaspra as seen by Galileo spacecraft during the fly-by

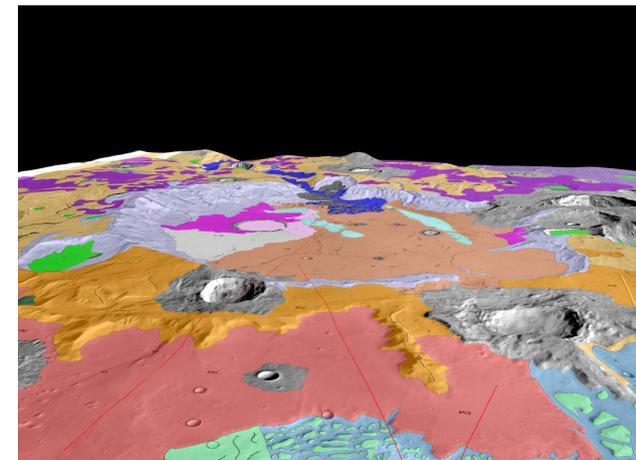


JRA1 - Activities and deliverables

T2. Planetary dynamics + geodesy + cartography Basis for an European centre linked to SA-IDIS

→ Geodesy + cartography

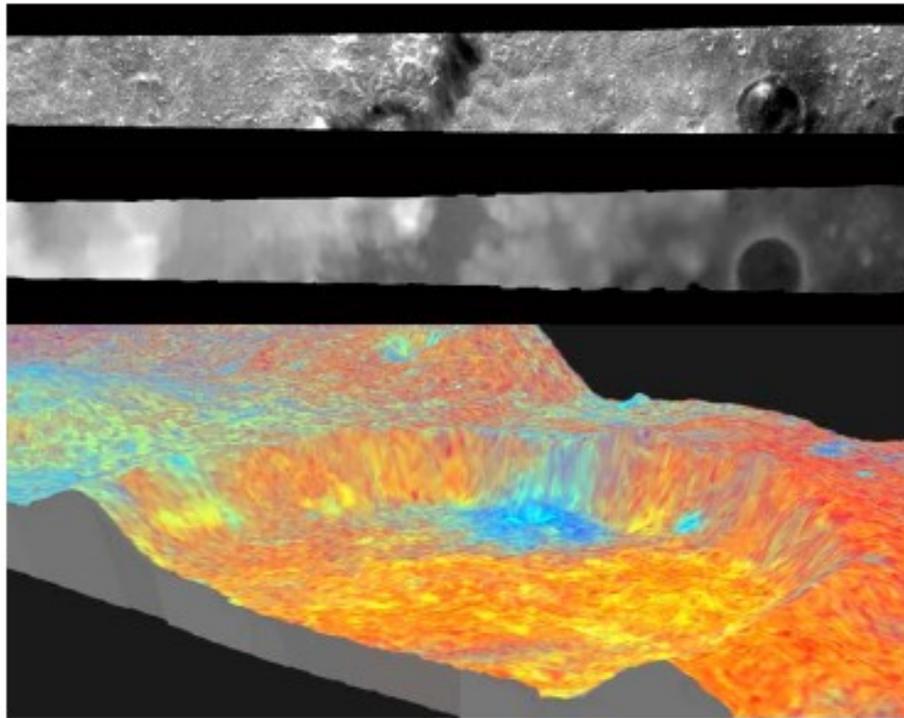
- Accurate planetary maps and landing sites for future missions (simulation, data)
- Standard maps or special ones on request
- Thematic maps: topography, slope, geological, multispectral
- Combination of expertise: obs., navig., in situ measurements
- Involvement in Mars-Express, Selene, Messenger, Dawn, Rosetta



To be delivered to SA-IDIS

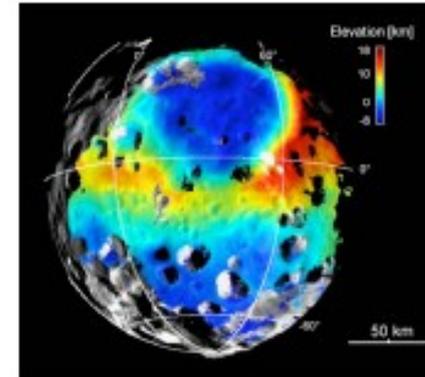
Réunion OV-Planeto, Paris, 14 nov. 2008

The Universe of Planetary Geodesy and Cartography

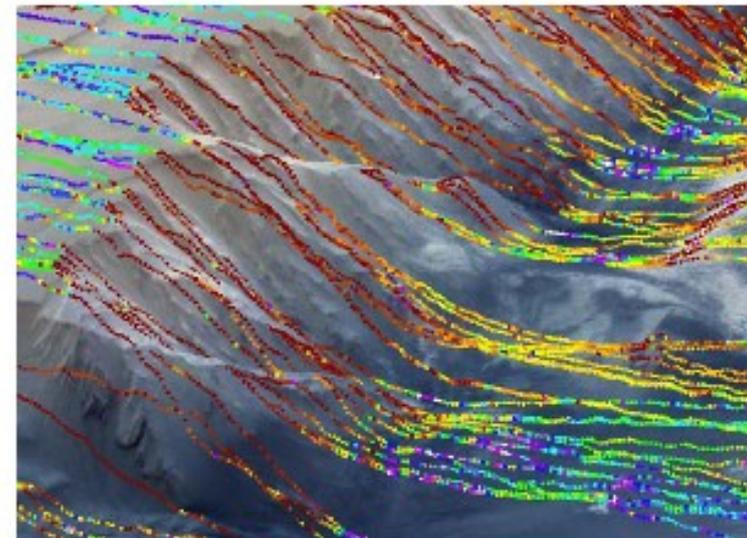


Clementine / Lunar Mare Orientale

HRSC oblique view and MOLA pulse spread data
/ Mars Valles Marineris



Cassini ISS / Global Terrain Model of Phoebe



JRA1 - Activities and deliverables

T3. Spacecraft tracking Demonstrator

→ VLBI tracking

- GB radio-telescope techniques for spacecraft tracking
- Accurate measurements: position & velocity
- Coordination with RadioNet
- Set of demonstration experiments for simulation

To be delivered to SA-IDIS

JRA1 - Activities and deliverables

2. Spacecraft tracking

Demonstrator

→ Laser ranging

- Advanced Lunar Laser ranging experiment
- Study for active or passive transponders
- Tests and demonstrations: NASA Lunar Reconnaissance Orbiter (laser receiver)

To be delivered to SA-IDIS



JRA1 - Activities and deliverables

T4. Empowering of Europe's amateur astronomy infrastructure for meteoroid science

→ The Amateur Community : major contributor to forefront planetary science (exoplanet transits, meteor activity and lunar impact monitoring) and planetary missions (SMART-1 impact campaign, Venus Amateur Observing Project)

However, the usefulness of the work is hampered by the issue of equipment calibration and standardization

Aim of this task: Develop European infrastructure to carry out proof-of-concept tests on equipment and techniques that will standardise and empower the amateur community to the benefit of European Planetary space missions.

JRA1 - Activities and deliverables

T4. Empowering of Europe's amateur astronomy infrastructure for meteoroid science

→ Meteors: Our test case

- Meteoroids impacts on the Moon : software & techniques
- Digital Meteor Station: camera + software + network (DLR)

Major Deliverables:

- Lunar Impact Observatory, VHF demo, Meteor Network: system description, manual and test reports, **to SA IDIS**
- Reflexive report on empowering amateurs, **to SA IDIS**

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TUB (Technical University of Berlin)	Planetary maps	26 pm
IMCCE (Paris Observatory)	Ephemeris	14 pm
DLR (Deutsches Zentrum für Luft und Raumfahrt)	Planetary maps	14 pm
UW-MAPS (University of Wales Aberystwyth)	Cartography	4 pm
JIVE (Joint Institute for VLBI Europe)	VLBI	4 pm
UU (University of Utrecht)	Landing sites	4 pm
AO (Armagh Observatory)	Meteors	6 pm
		72 pm