



National Institute for Earth Sciences and Astronomy (INSU)

- February 2011 -

Institut National des Sciences de l'Univers

3, rue Michel Ange – 75794 Paris Cedex 16 (France)

+33 1 44 96 40 00

<http://www.insu.cnrs.fr/>

General presentation of INSU

INSU is one of the 10 institutes of CNRS (National Centre for Scientific Research)



Scientific objective

- Observe and describe the terrestrial and spatial environments at every scale...and predict their future evolution

Functions

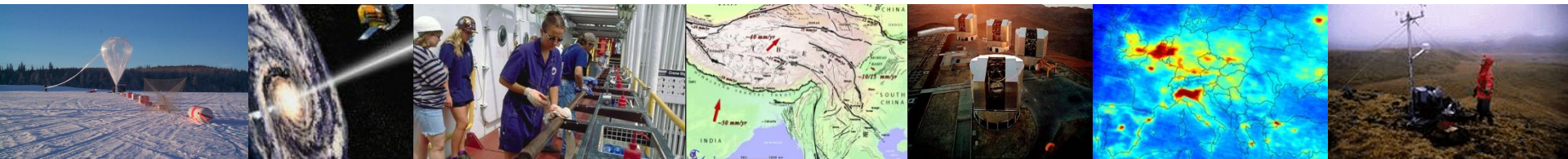
- Programming & prospective
- Management of the national means and observations facilities

General presentation of INSU

Means and Structure

- 112 joint laboratories; 8 900 employees
- **4 Scientific Divisions**
 - Astronomy & Astrophysics
 - Earth Sciences
 - Ocean & Atmosphere
 - Continental Surfaces and Interfaces
- **A Technical Division**
 - Observation stations, networks, instrumentation, telescopes, data centres
 - Vessels, aircrafts, balloons
- **2 major programs: the Mediterranean basin & the Arctic**

Complementarity with national partners



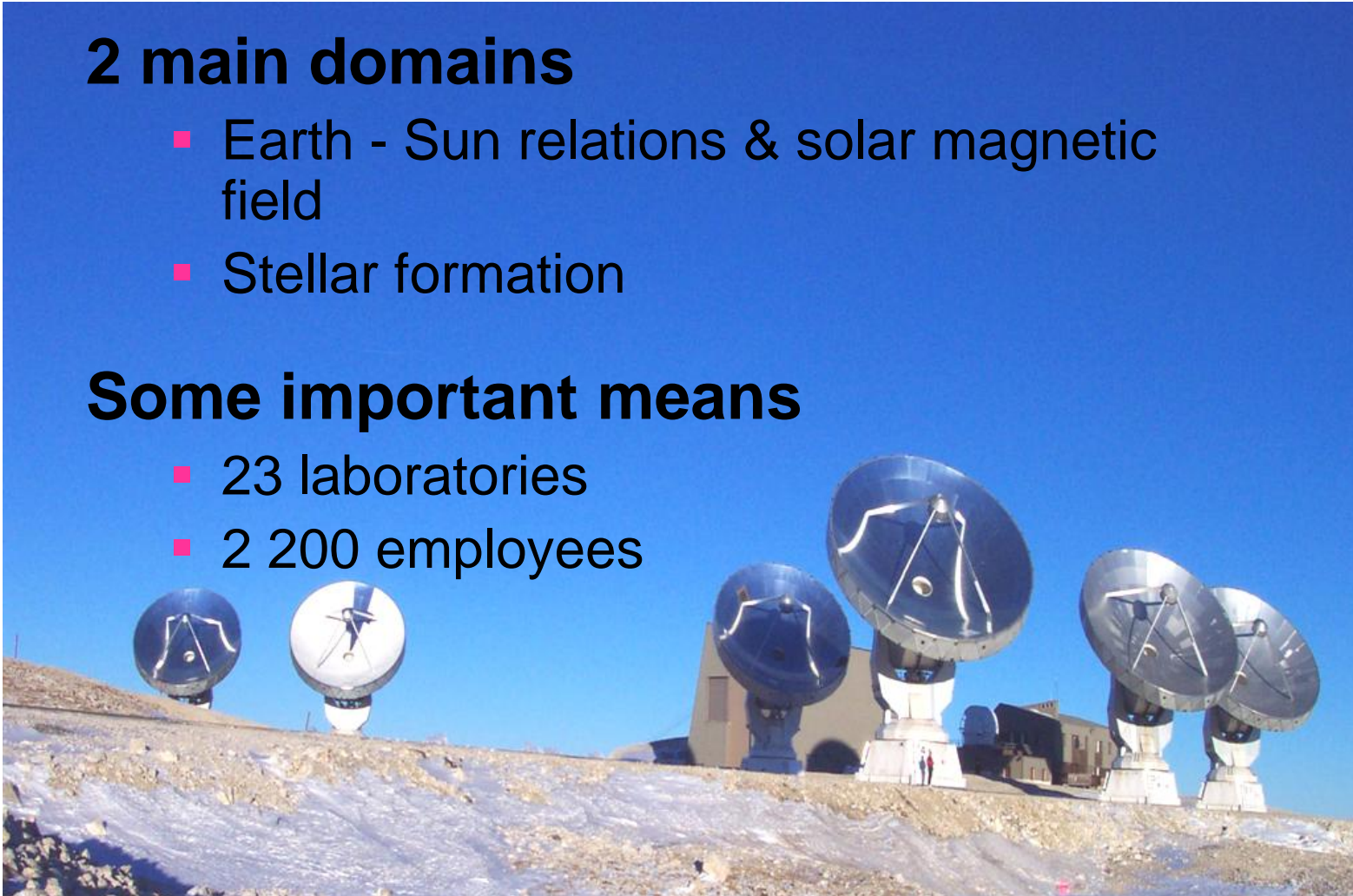
Astronomy and Astrophysics

2 main domains

- Earth - Sun relations & solar magnetic field
- Stellar formation

Some important means

- 23 laboratories
- 2 200 employees



Astronomy and Astrophysics

- A very competitive research area (USA)
- Importance of **international** (IRAM, CFH) and **European** (ESO, Astronet, GMES, GEO, GEOSS) cooperations
- **3 kinds of telescopes**
 - Optical: VLT-ELT, E-ELT, CFH
 - Radio: IRAM, SKA
 - Gamma Ray: CTA



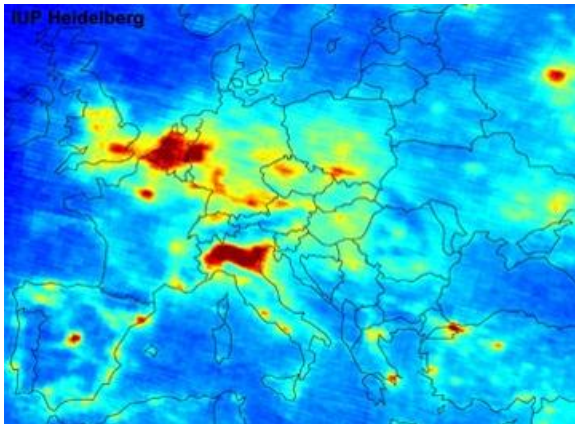
Earth Sciences

4 areas of research

- Planetology (The Earth within the solar system)
- Geodynamics (dynamics and evolution of internal Earth)
- Dynamics and Evolution of Terrestrial Surfaces
- Societal challenges (natural hazards, waste management...)

Means

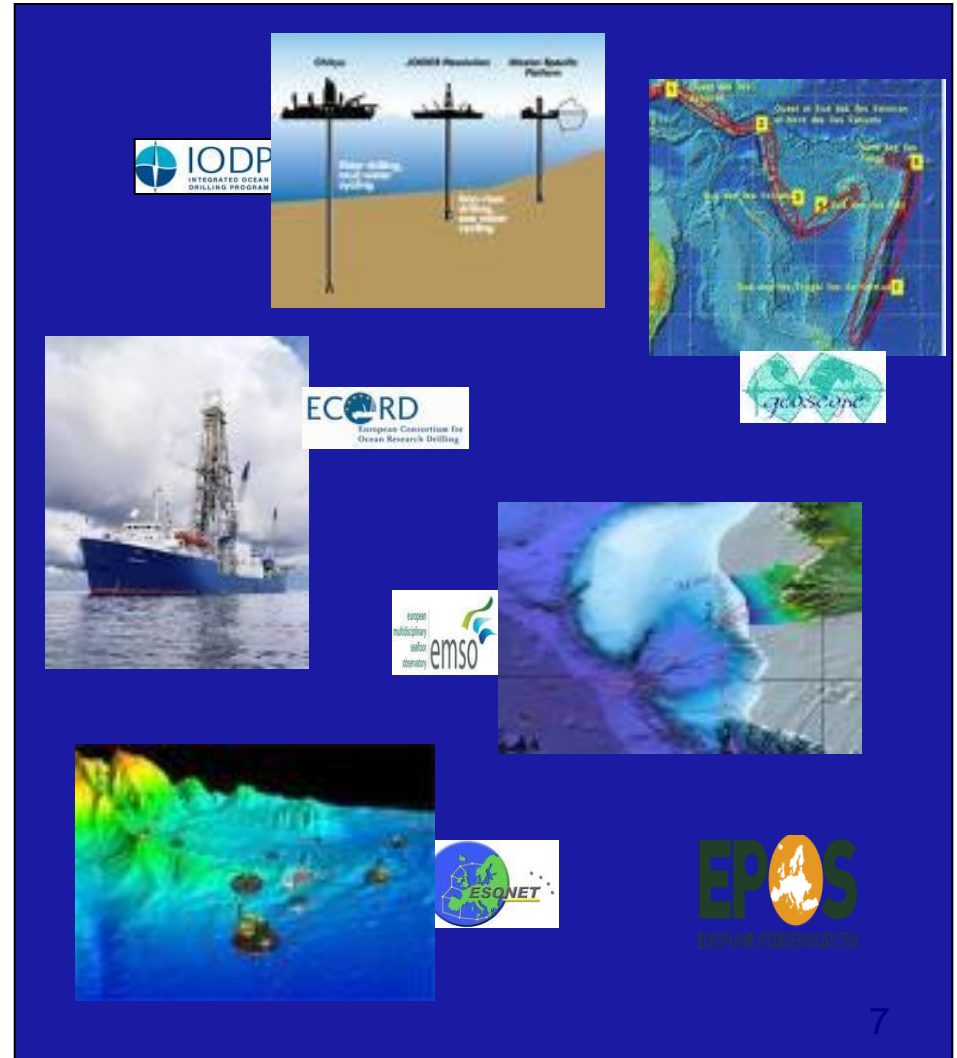
- 25 laboratories
- 2700 employees



Earth Sciences

Strongly structured around **international** and **European** programmes

- Ocean Drilling (IODP, ECORD)
- Sismology (EPOS, GEOSCOPE)
- Deep Ocean Structure (ESONET, EMSO)
- Mineral resources
- Specific actions in Chile, Himalaya, Medio Atlantic Rift, Anatolian Rift



Ocean & Atmosphere

Means

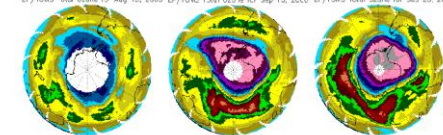
- 17 laboratories
- 1800 employees
- Vessels, aircrafts, balloons, observation systems
- Importance of computing and information systems and modeling

Areas of Research

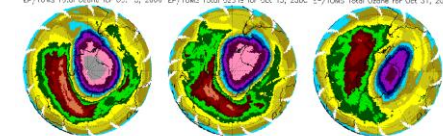
- Dynamics of the Ocean and the Atmosphere and their Interaction
- Atmospheric Chemistry
- Marine Biogeochemical Cycles
- Climate Evolution and Variability



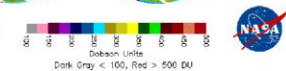
EP/TOMS Total Ozone for Aug 15, 2000 EP/TOMS Total Ozone for Sep 15, 2000 EP/TOMS Total Ozone for Sep 25, 2000



EP/TOMS Total Ozone for Oct 5, 2000 EP/TOMS Total Ozone for Oct 15, 2000 EP/TOMS Total Ozone for Oct 31, 2000



Le "trou d'ozone" Antarctique 2000
vu par EP/TOMS



Ocean & Atmosphere

Integrated approach towards planetary environmental changes at regional levels

- Ocean:
 - EUR-OCEANS Consortium
 - IMBER
 - MOOSE (Mediterranean basin)

- Atmosphere:
 - International program: AMMA – African monsoon
 - European infrastructure project: ICOS – CO₂ measure in Europe



This complex block contains several visual elements:

- Top Left:** A photograph of a large iceberg floating in the ocean under a cloudy sky.
- Top Right:** A photograph of a massive dust storm or sandstorm over a flat landscape.
- Bottom Left:** A satellite image of Earth showing the curvature of the planet and the blue of the oceans.
- Center:** The "eurOcean" logo, featuring the word "eur" in orange and "Ocean" in white on a dark blue background.
- Right Side:** A map of Europe and its surrounding regions, color-coded to show different categories: EEA E1 (orange), EEA no E1 (light blue), E1 members (green), E1 candidates (yellow), E1 potentially candidates (red), Other european countries (light orange), and Overseas territories (light blue). A legend for "French Departments of Overseas" is also present, listing Guadeloupe, Martinique, French Guiana, and Réunion.
- Bottom Right:** The "ICOS" logo, which includes three red spheres and the text "integrated carbon observation system".
- Top Right (Small):** The "AMMA" logo, featuring the acronym in blue and a globe icon.

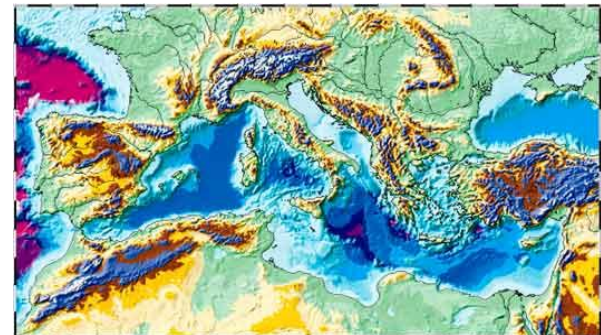
Continental Surfaces and Interfaces

Challenges

- Integrated Coastal Zone Management
- Ecotoxicity
- Management of Natural Resources

Means

- 15 laboratories
- 1200 employees



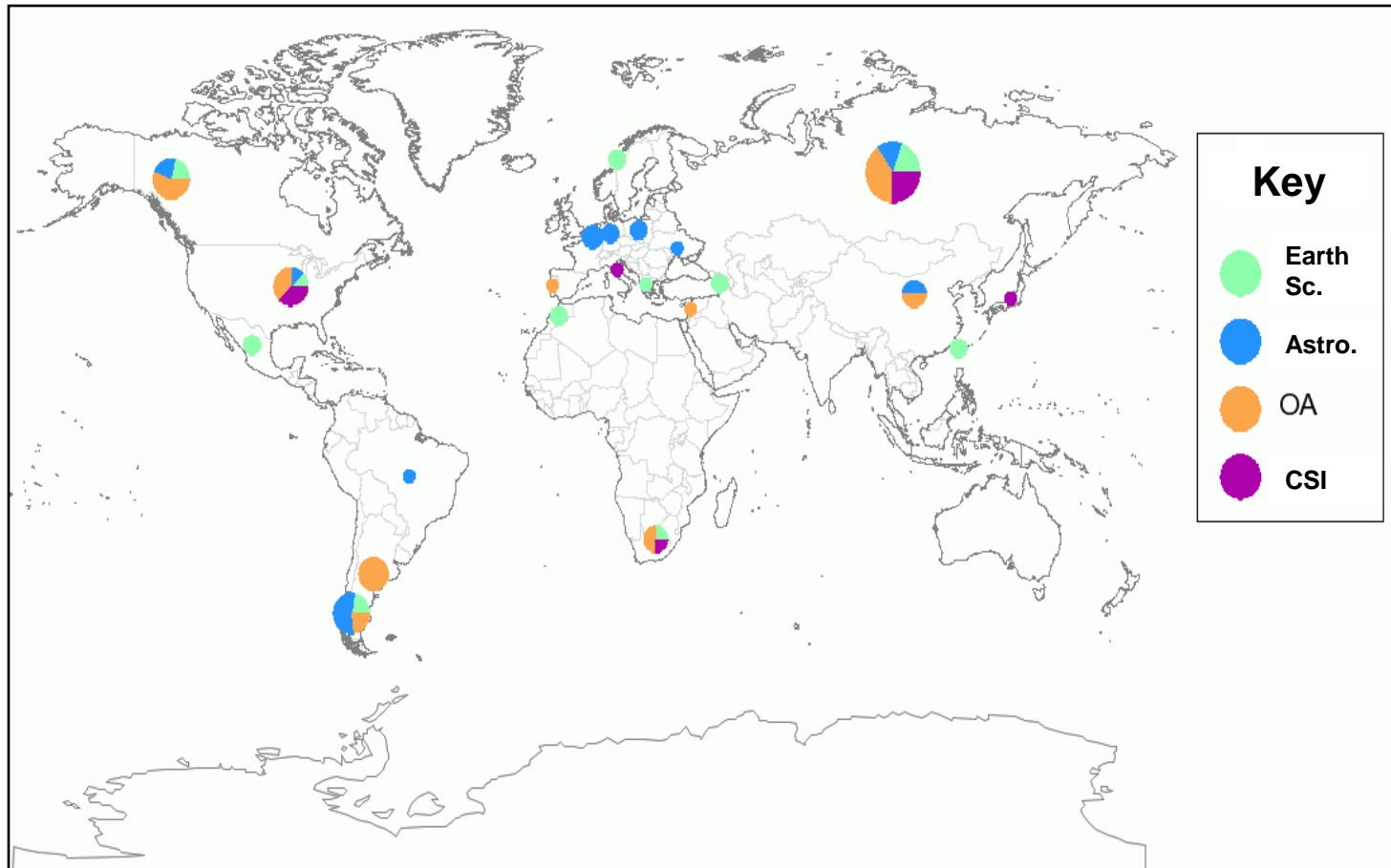
Continental Surfaces and Interfaces

Specificities of that research domain

- High heterogeneity and diversity of scales
- Strong capacity to intervene on the environment
- Pregnancy of societal challenges and environmental risks



International actions of INSU according to the 4 scientific divisions



Conclusion



Multi-scales

- Universe
- Planet
- Continent
- Local
- Micro...

Multidisciplinary

- Physics
- Biology
- Geology
- Astronomy
- Chemistry...

OBSERVE

DESCRIBE

UNDERSTAND

MODELISE

Multi-environments

- Cosmos
- Internal Earth
- Terrestrial surface
- Ocean
- Atmosphere...

Collaborative

- National partnerships
- European & International collaborations...