
# Centre de Physique des Particules de Marseille

Aix*Marseille université
Socialement engagée

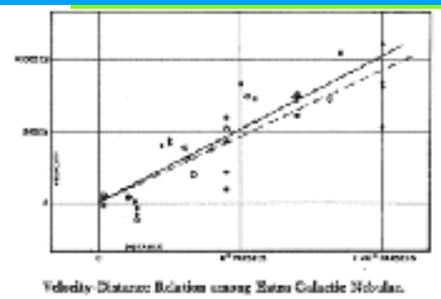
LABORATOIRE SOUS-MARIN PROVENCE MÉDITERRANNÉE
LSPM

cnrs
dépasser les frontières
IN2P3
Les deux infinis

# The physics of the 2 infinites

From the introductory talk of the conference on the Physics of the Two Infinities

**1927 Discovery of the expansion of the Universe**

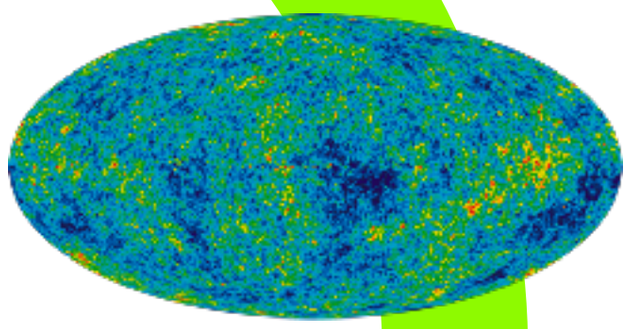


Velocity-Distance Relation among Extra-Galactic Nebulae.

**1930s Birth of the Big Bang theory**

**1950s The abundance of the elements in the Universe**

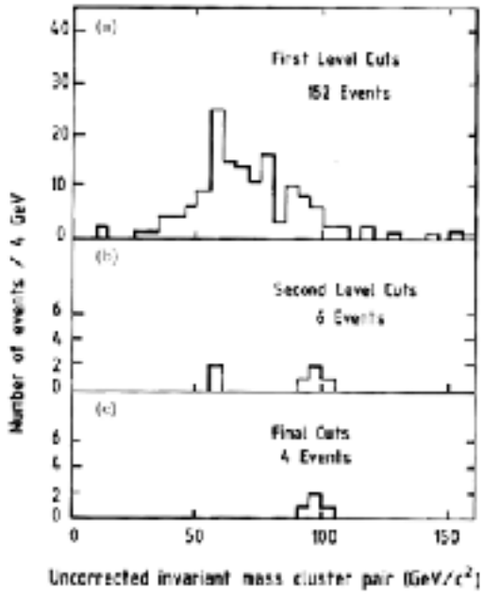
**1960s Discovery of cosmic microwave background CMB radiation**



**1970-1980s Huge progress in nuclear and particle physics. The Standard Model.**

- From the 1990s new ideas, new data and new research programs led to the idea of the existence of very strong and direct relations between the physics of elementary particles, low and high energy astrophysics, the primordial Universe and our dark Universe

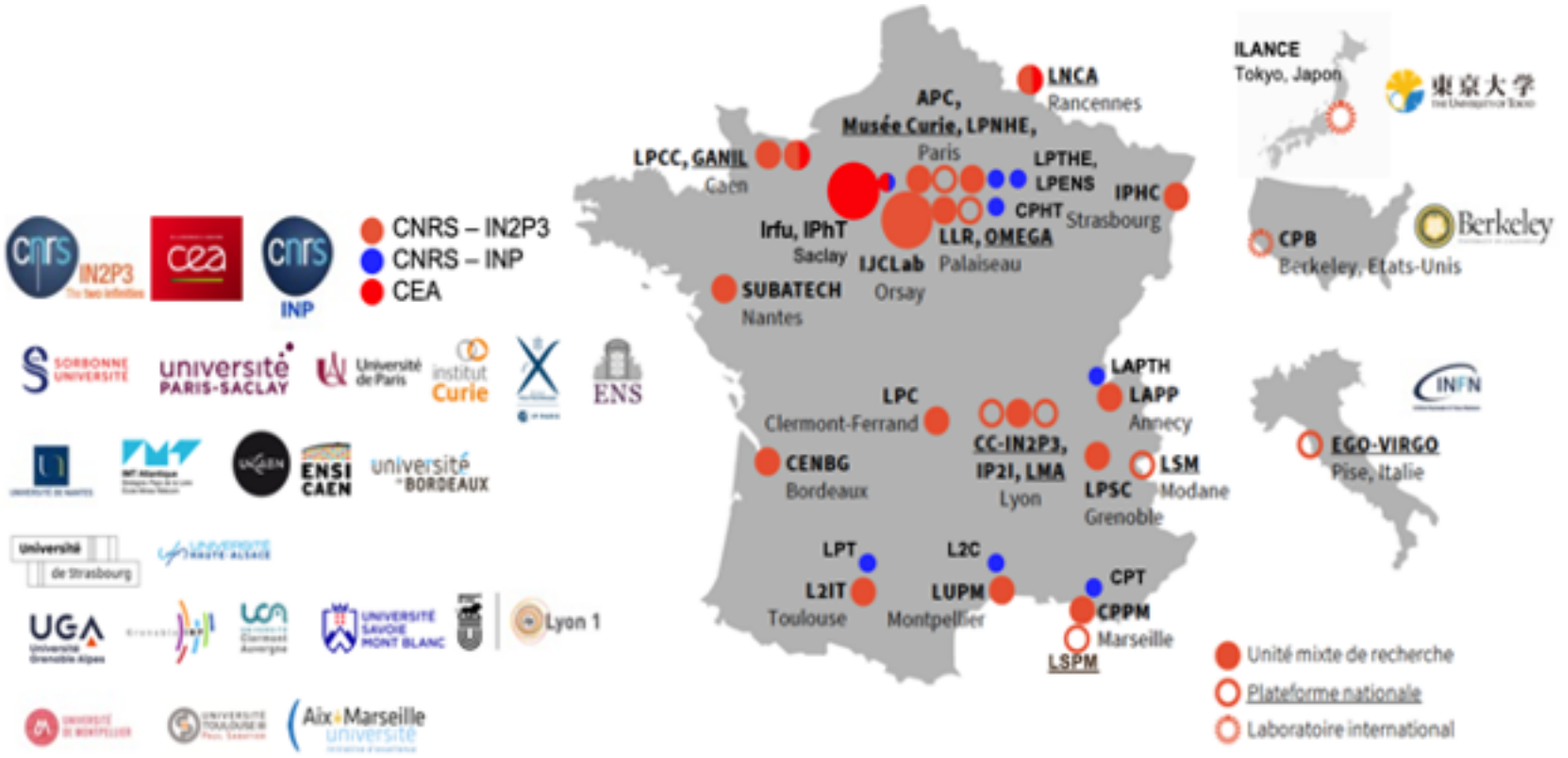
- **Dark Matter** (Wimps, Axions,..)
- **Higgs boson** and **Cosmology** (Inflation, dark matter,…)
- **Neutrinos** and **Cosmology** (Nucleosynthesis, Leptogenesis BAU,…
- **Antimatter** in our Universe (CP symmetry)
- **Supernova** explosions with 98% emission of neutrinos
- Very-high-energy **gamma ray** sources



# Centre de Physique des Particules de Marseille

- A joint venture between:
  - Aix-Marseille Université
  - CNRS/IN2P3
    - Centre National de la Recherche Scientifique
    - Institut National de Physique Nucléaire et Physique des Particules

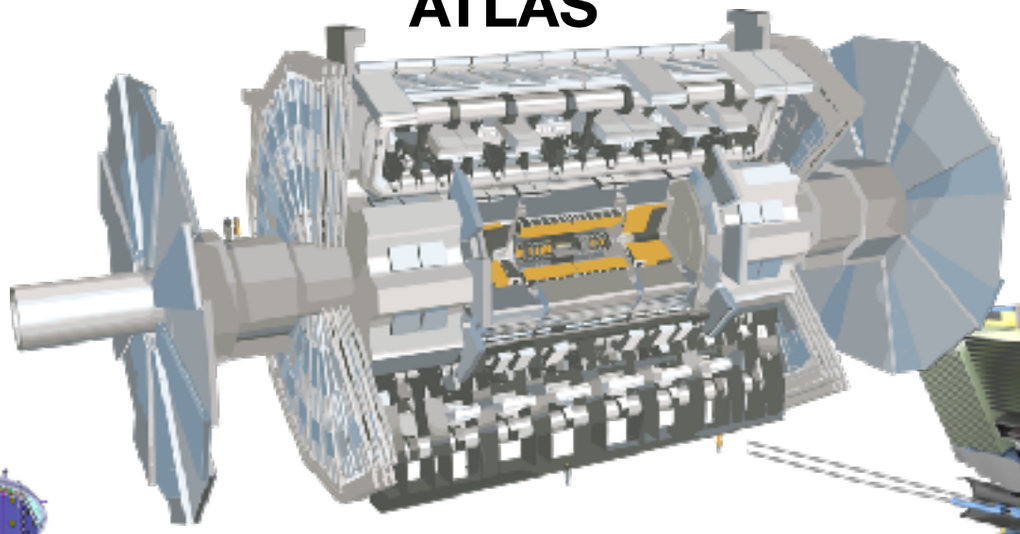
- 200 persons (120 permanent)
  - 45 Researchers
  - 75 engineers, technicians, admins
- 30 PhD students
- 20 temporary contracts
- 10-12 apprenticeships
- 20-30 internships



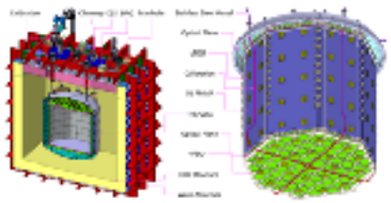
# The physics of the 2 infinites

MadMax

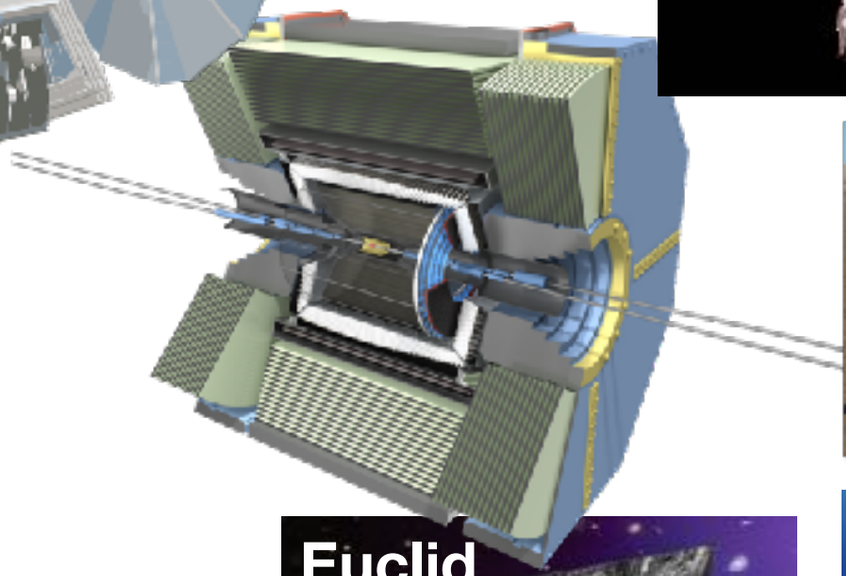
ATLAS



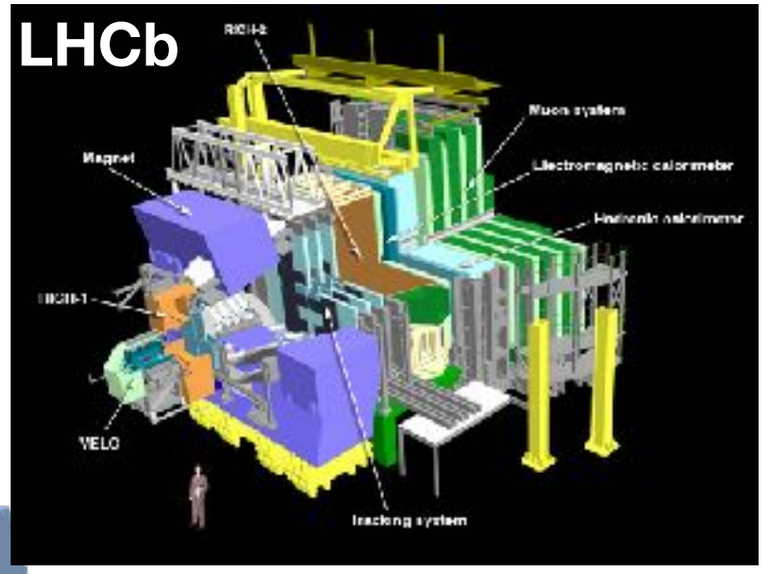
Darkside



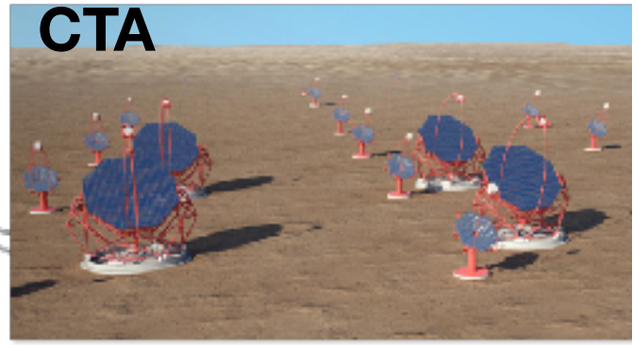
Belle II



LHCb




CTA



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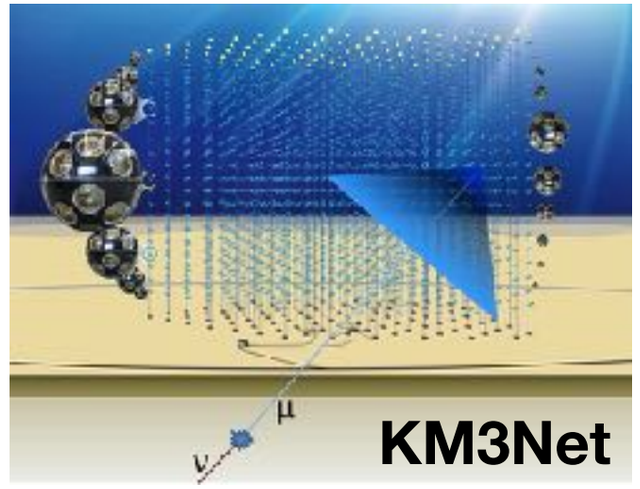
Euclid

Boss/eBoss/DESI

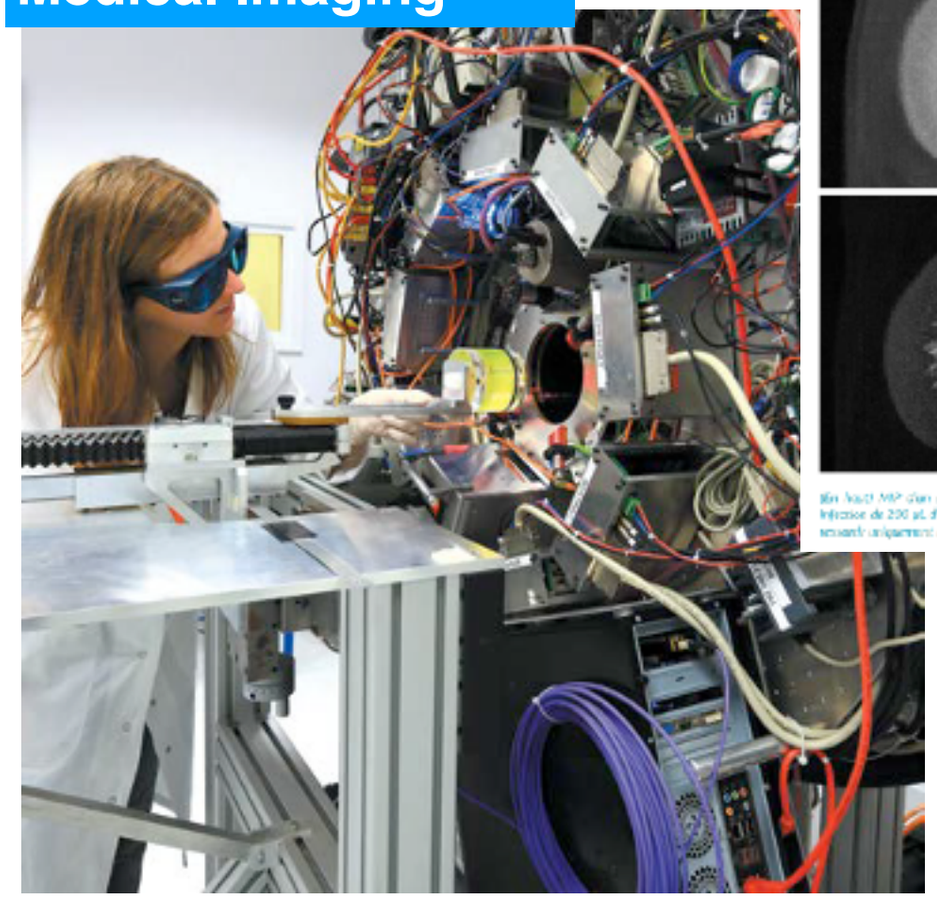
KM3Net

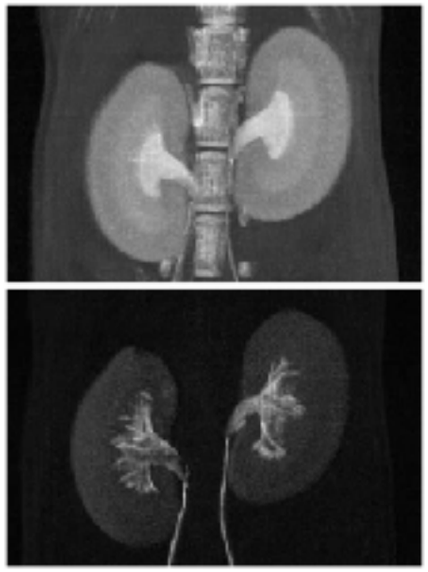



LSST

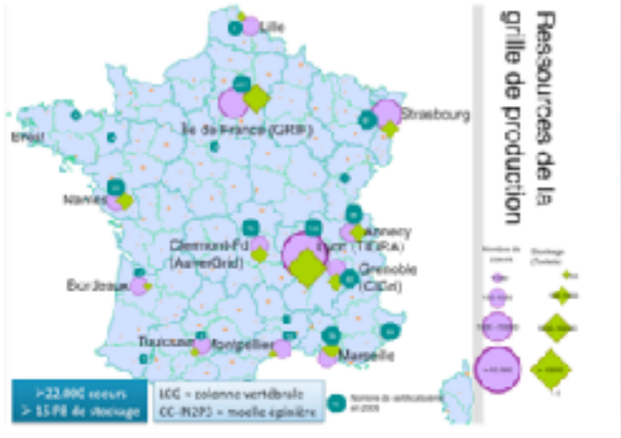
# Other things comes along

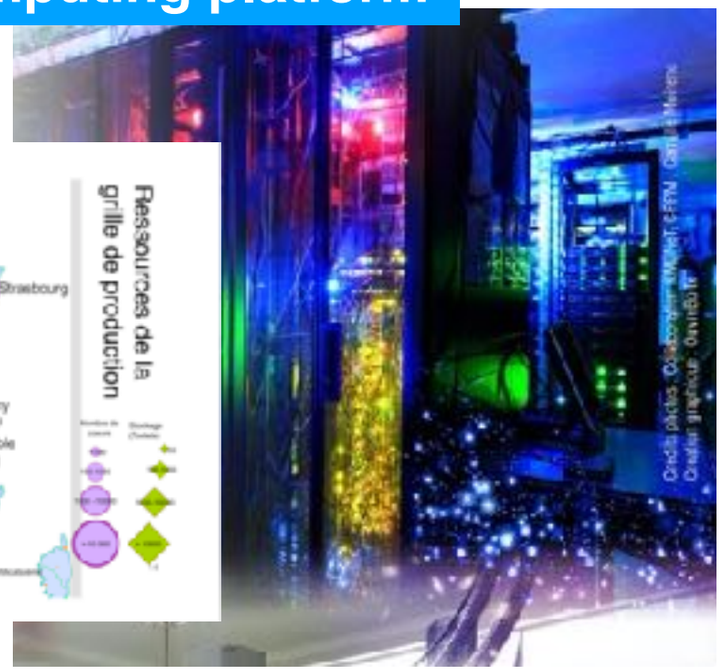
## Medical Imaging



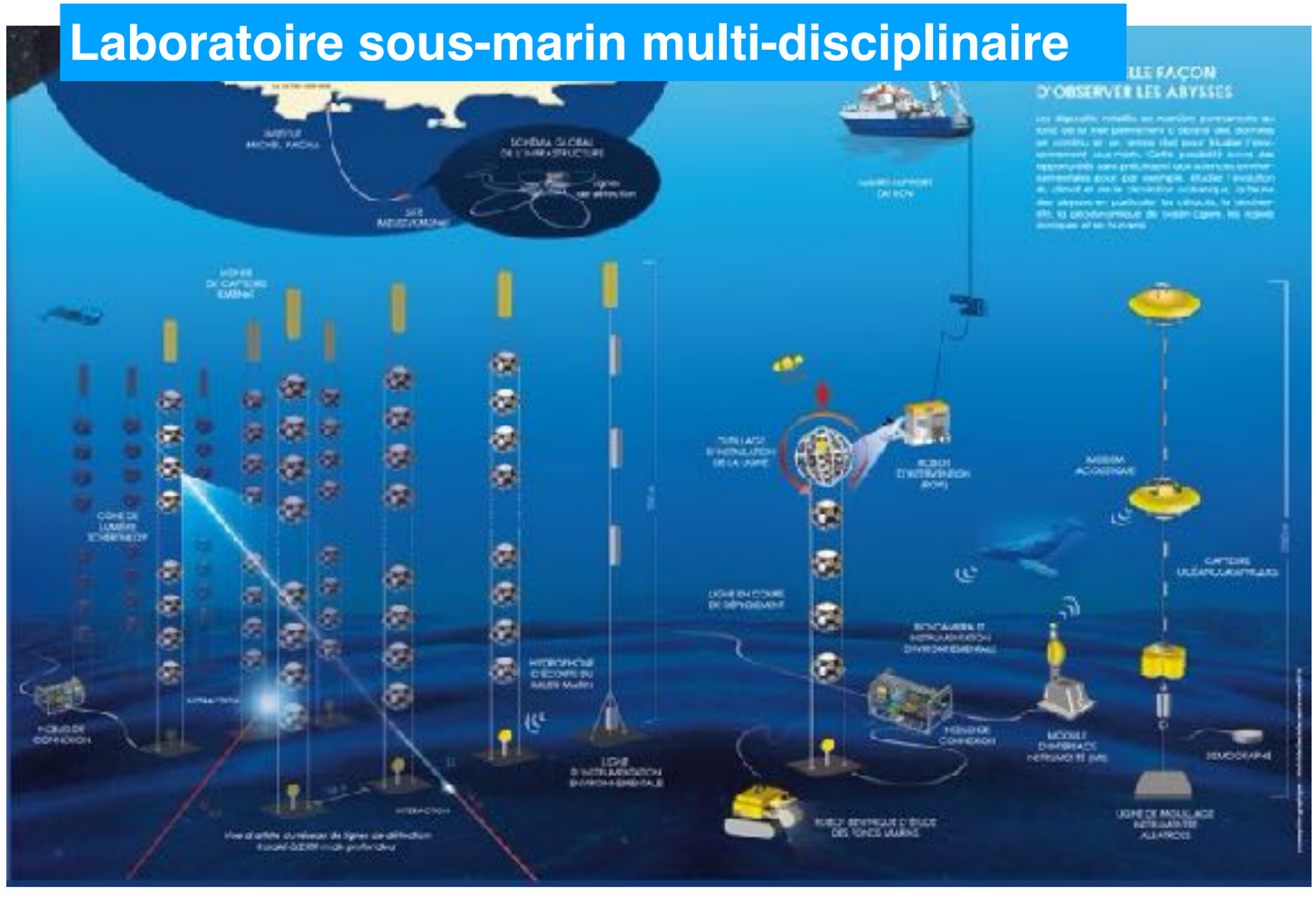


## High-Performance Computing platform



## Laboratoire sous-marin multi-disciplinaire



## Research and Development axis
## ➡ visit to the CPPM labs…