

# Labex UnivEarthS

Laboratoire d'excellence Terre, Planètes, Univers

**Nam PHAN VAN SONG**

Project manager of the Labex UnivEarthS

International Workshop on Multi-messenger Tomography of the Earth – 4th of July, 2023

## What is the Labex UnivEarthS?

The “Laboratoire d’Excellence UnivEarthS” is a research programm, launched in 2011 by the French government as part as its “Programme d’investissement d’avenir”.

UnivEarthS is within Université Paris Cité

## Labex UnivEarthS mission

The development of interdisciplinary projects in the fields of **Earth Sciences and Astrophysics**.

*The primordial universe, stellar explosions and black holes, the development of planetary systems, the dynamics of proto-Earth, the origin of life on Earth, the study of geological and astronomical catastrophes, etc.*

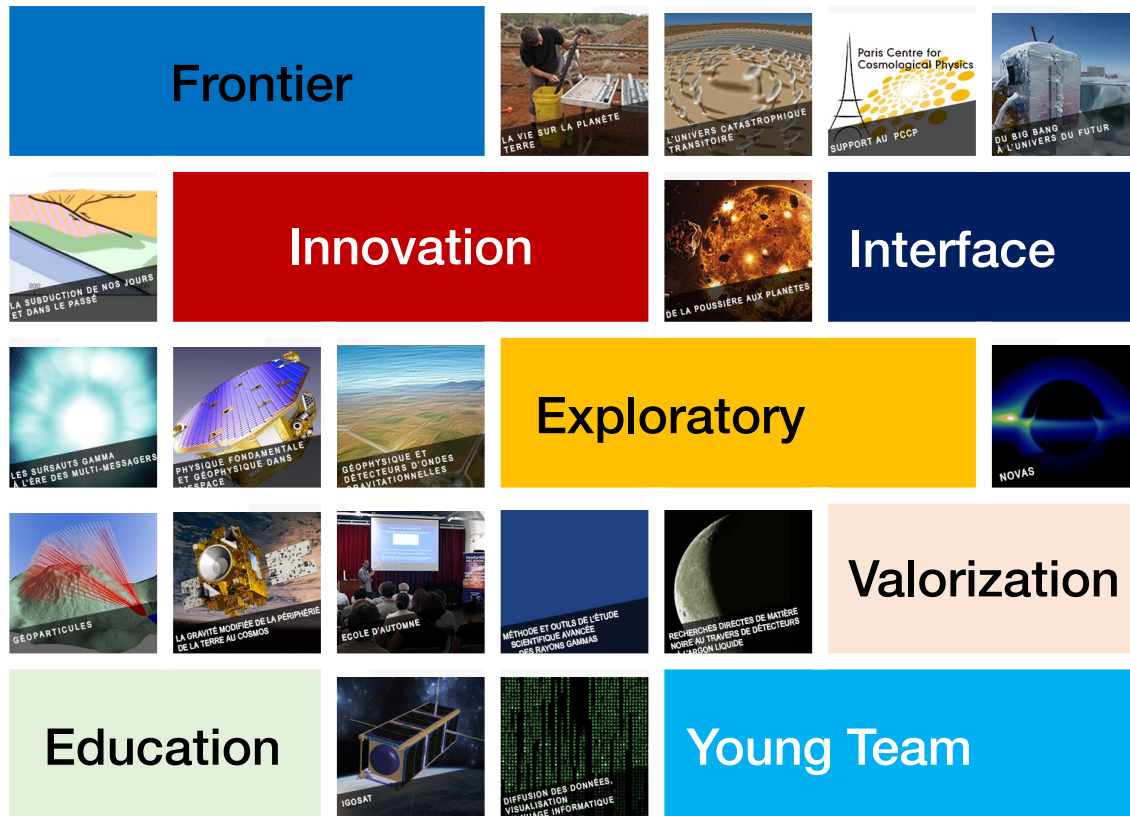
## Labex UnivEarthS partners



## Key Figures

- 4 laboratories
- 12 years of existence
- 13 millions euros budget between 2011 and 2024
- 50 projects funded in total, of which 21 are currently active
- 500 staff members involved, including 90 % of researchers
- 50 positions financed, of which 16 are ongoing
- 700 publications

## 6 types of project supported

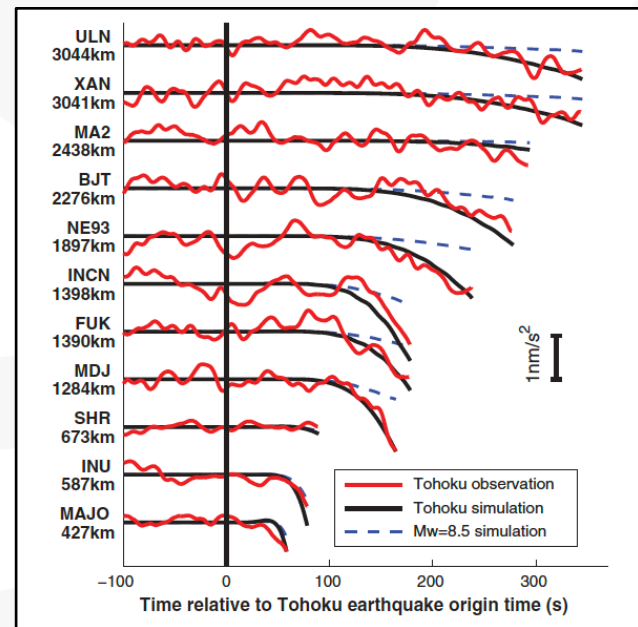
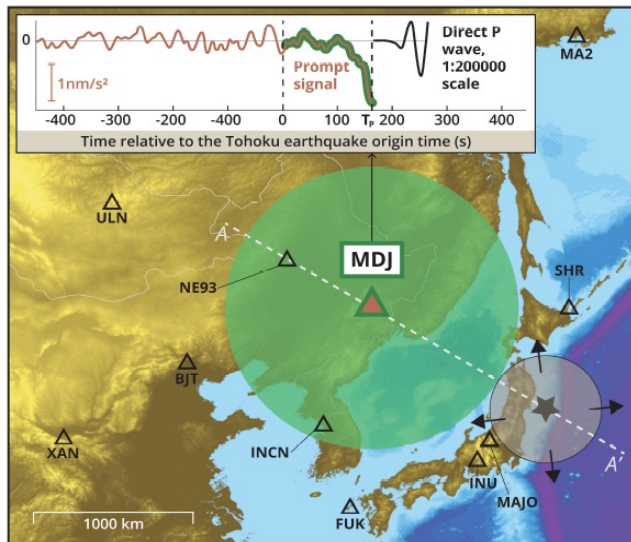


## Towards faster seismic early-warning alerts (IPGP / APC)

Measurement of the change in the gravity field (propagating at the speed of light) generated during an earthquake to improve early warning systems based on detection of P and S seismic waves (propagating at a few km/sec)

Ex: 2011 Tohoku-Oki earthquake (magnitude 9)

Montagner et al., Nature Com. 2016 ; Vallée et al., Science 2017 ; Vallée & Juhel 2019

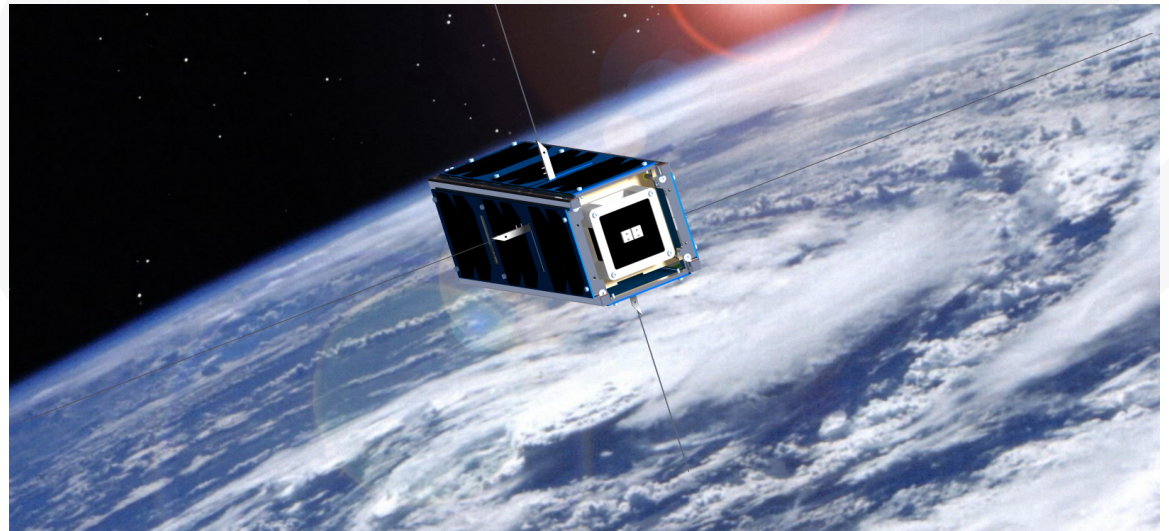


## IGOsat: nanosatellite student project (IPGP / APC)

The first Université Paris Cité Space Center's student made CubeSat, IGOsat will embark two payloads in a quasi-polar orbit at 650 km altitude:

- A dual-frequency GPS receiver to study the Total Electronic Content (TEC) of the ionosphere
- A scintillator and Silicon photomultiplier) for gamma rays and electrons detection.

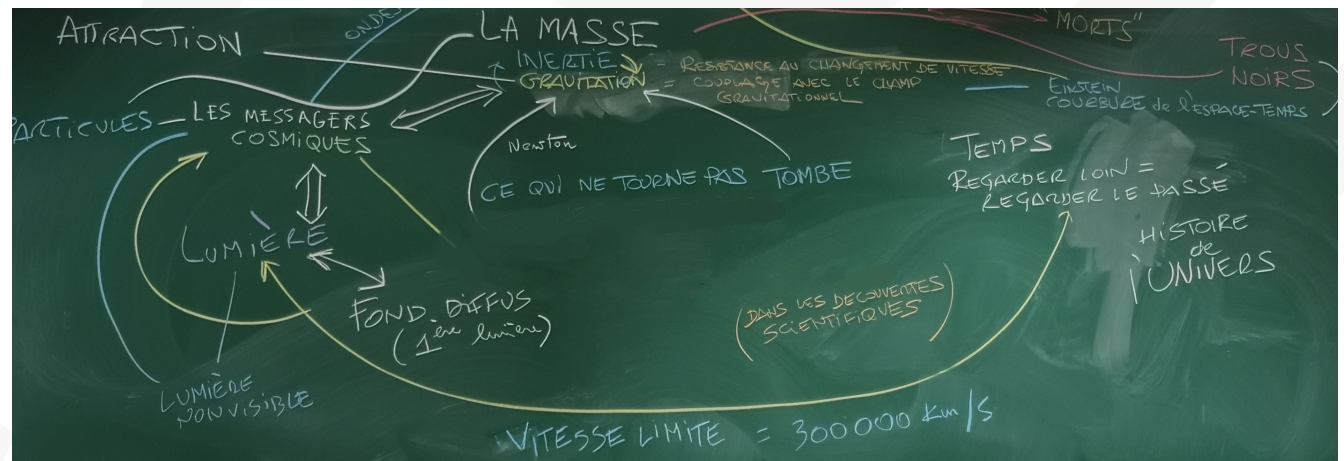
*More than 300 students involved*



## PCCP: Paris Centre for Cosmological Physics (APC)

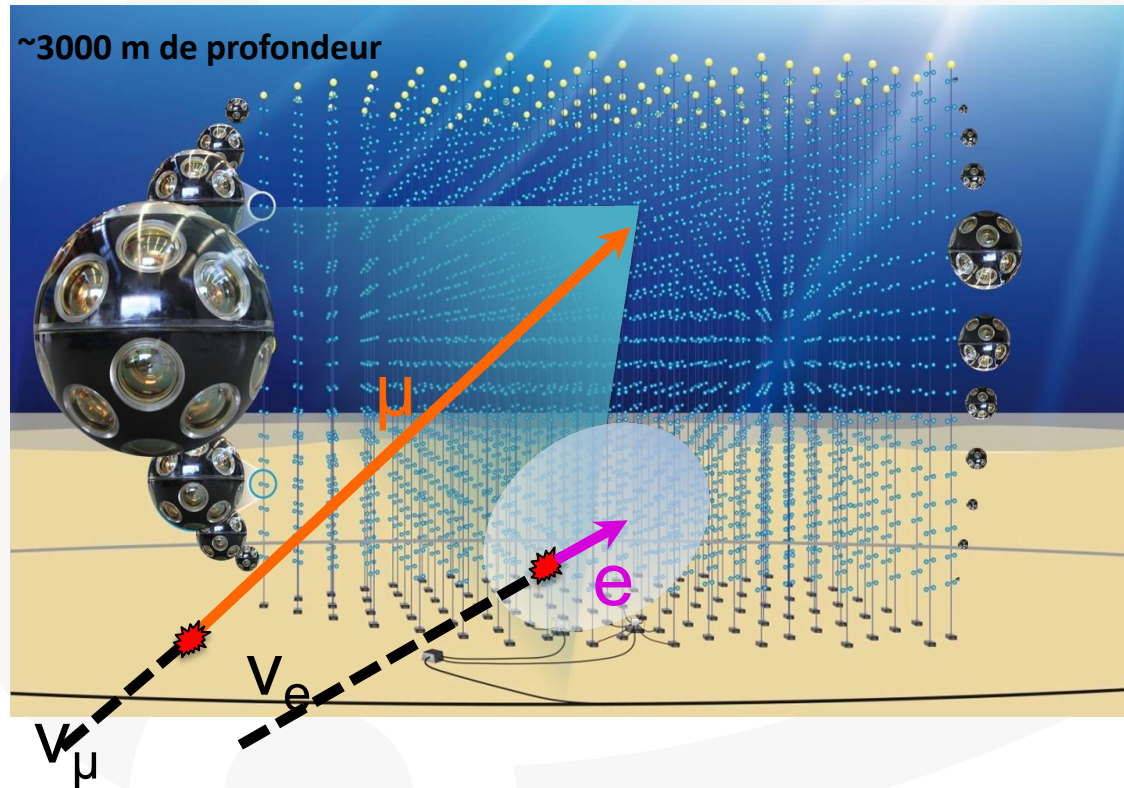
A place dedicated for research, education and exchange on the physics of the Universe. Notable actions includes :

- Creation of the MOOC "Gravity !"
- Interventions to high-school students on science and society
- Art and science installation following residence for young artists



## ARGOS: Astroparticle Research, Geology and Oceanography Studies (IPGP / APC)

Investigating the potential of atmospheric neutrino tomography for studying the Earth's internal structure





**We wish you a nice and fruitful workshop!**