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Head of the « Atom Interferometry and Inertial Sensors » team
SYRTE Laboratory

Around 20 members
6 experiments (gravity and rotation sensing)

Active in the field of atom Interferometry for about 20 years

Some activities of relevance

❑ Development of a state of the art cold atom gravimeter

❑ World record stability for the large area atomic gyrometer

Long term stability at the level of 0.2 nrad/s

Continuous rotation measurements

❑ Hybridization of sensors

First demonstration of hybridization of classical and quantum accelerometers

Continuous, wideband, accurate and long term stable acceleration measurement

❑ Demonstration of an optimized architecture for compact sensor

Patented & transferred to the industry (creation of the Muquans company)

Cold atom gravimeter

Best sensitivity : $5.7 \cdot 10^{-9} \text{g}$ at 1s

Best stability : $< 10^{-10} \text{g}$

Accuracy : $2 \cdot 10^{-9} \text{g}$

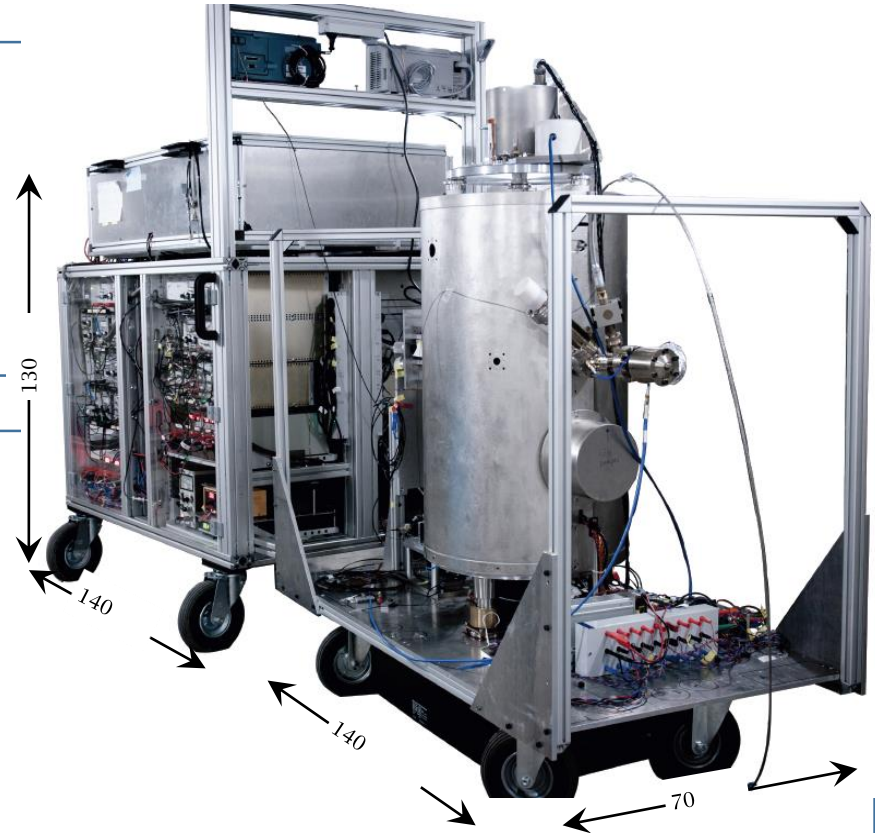
Robust and transportable

Several measurement campaigns
outside the laboratory
(LSBB, BIPM, Walferdange)

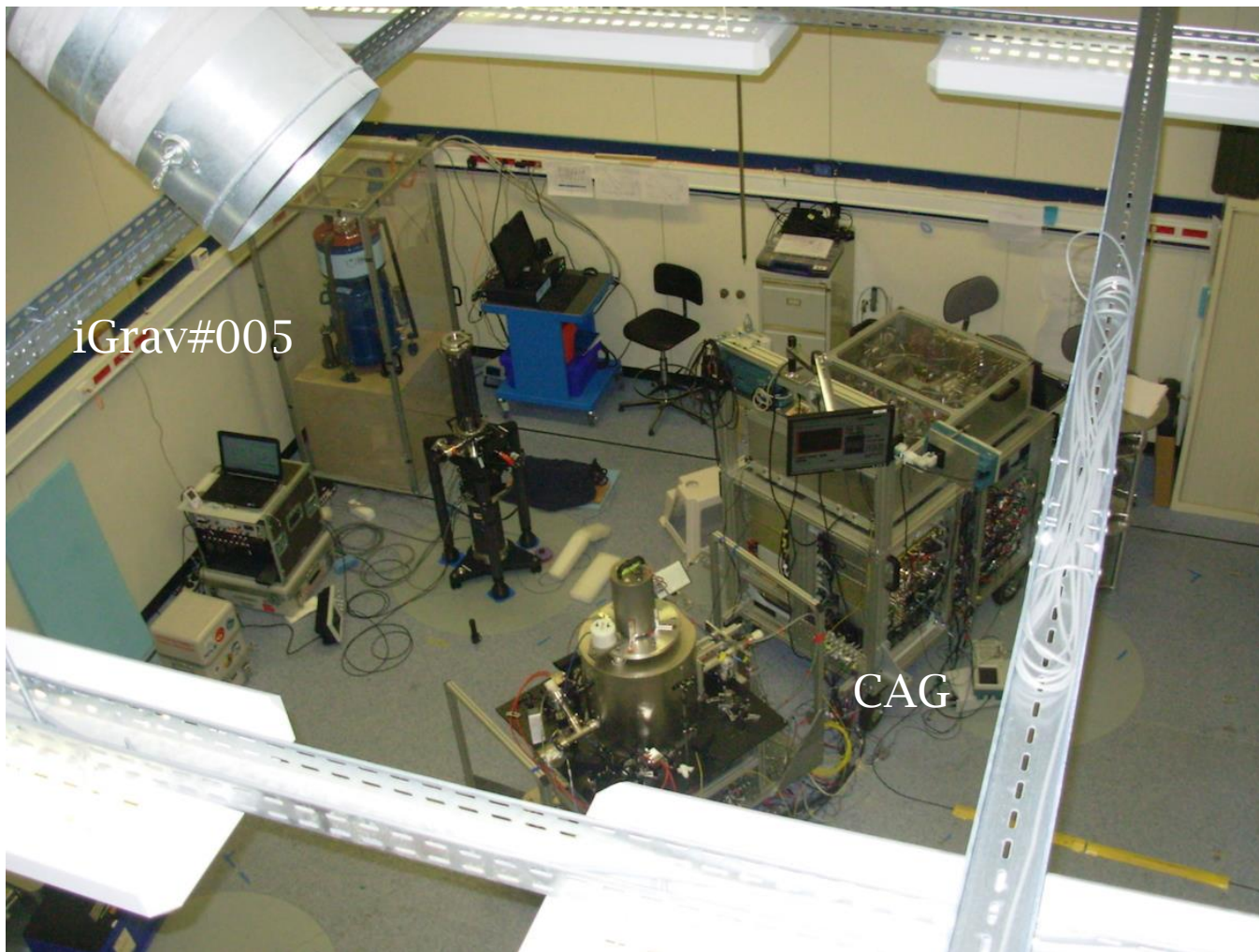
First cold atom sensor to participate to international comparisons of absolute gravimeters

Contribution to the LNE Kibble balance, realization of the kilogram

Under upgrade for improved stability and accuracy



Gravimetry lab at LNE



Regular comparison campaigns with AGs (FG5, Muquans AQG)
Contribution to the gravity database IGETS (Station TR, GNSS link to RENAG & EPOS)
Part of the French National Observation Service on Gravimetry

Gradiometry

Activities

1) Development of a quantum gradiometer

Target sensitivity: $< 1 \text{ E at } 1\text{s}$

2) Collaboration with MUQUANS

Development of a prototype industrial quantum gradiometer

3) Paper studies & R&D activities for space agencies (ESA, CNES)

4) Partner of the MIGA project of long baseline gradiometry at LSBB for gravitational wave detection

