



## Internship at ICJLAB (Paris-Saclay),

Niveau 4<sup>ème</sup> ou 5<sup>ème</sup> année école d'ingénieur, M1 ou M2 Physique ou maths appliquées, Compétences solides en python et éventuellement en HTML et MYSQL requises.

### **Infrastructure for catching Gravitational Wave events and listening to the Violent Universe in the framework of the international GRANDMA collaboration**

**3 months internship**

**[Développement de code Python (et HTML) pour l'Astrophysique]**

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In collaboration with Dr. Sarah Antier (APC)

**Key words: Data Analysis – and interest for Astrophysics – Joint coding**

In the context of the GRANDMA (<https://grandma.lal.in2p3.fr/>) project, we would like to propose an internship from February/March to August 2021 (or a subset of this period) to a student with strong skills on computing (Python, C++) and interesting in the astronomy and astroparticle fields.

Global Rapid Advanced Network Devoted to the Multi-messenger Addicts (GRANDMA) is a network of 25 telescopes spread all over the world, with both spectrometry and photometry facilities. Mostly robotics, they are able to rapid follow-up transient events from the sky, connected the Violent Universe as collapse of massive stars or neutrons star coalescence. Events can be observed via their short timescale multi-wavelength signature as well emission from gravitational waves.

In preparation of the gravitational astronomy for the next observing run in 2022, we propose in this internship to support the development of the e-infrastructure ICARE. It is in charge of ingesting alerts from the gravitational detectors, computing the observation plan and send it to the telescope of the GRANDMA consortium. ICARE also is connected to a web-interface allowing visualization of the current status of the observations.

The student will participate to the current development of the ICARE alert stream, coded in python, (see the documentation here <https://gitlab.in2p3.fr/icare/icare>). Competencies of HTML, database (with mysql) will be a plus to also support assistance for the web interface.

For the student, it will be the occasion to be involved in a fantastic project of astronomy and he/she will be integrated on an international team. It will be the occasion to improve his/her computing skills.