**Context**

This offer is within the framework of a partnership, funded by a DigiCosme grant, supporting jointly the LR1 Laboratory of the University of Paris Saclay and INRIA Saclay.

The teams INFINE-POST (Saclay) and ROC5 (LRI, UPS) have research activities in Internet of Things (IoT). In this area, recently, Low-Power Wide Area Networks (LPWAN) have recently gained considerable attention. The key objective of these wireless technologies is to connect low-power devices over very large areas, with low data rates. LPWANs are promising for various emerging IoT applications, complementing the traditional cellular and short-range technologies.

**Assignment**

Assignments:

- With the help of Cedric Adjih (Inria) and Steven Martin (ROCS), the recruited person will be taken to develop a simulator for LPWAN that will be the basis on research in that area. The simulator will be implemented in MATLAB, and will include some of the most relevant parts of the LoRAWAN specifications and 3GPP NB-IoT standard. It will include the following software modules: radio propagation model, interference model, channel access method, and scheduling. Using object oriented programming in MATLAB, the simulator will enable to simulate a network deployment with multiple antennas or cells and multiple IoT devices. The objective is to study the performance of LPWAN networks (including different scheduling strategies, improvements and variations at the MAC level...) and to release a final version of the simulator in open source.

For a better knowledge of the proposed research subject:

Main activities
The main activities are as follow:

- Develop the simulator in MATLAB, also integrating various pre-existing modules
- Write documentation
- Manage the simulator as an open-source project

Skills
Technical skills and level required: Good proficiency in programming
Languages: French, English

Benefits package
- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours
- Sports facilities

Remuneration
In regards to diplomas and experiences.