CIFRE PhD Thesis | Application Form

- **Name of the company *:** ..... **ST Microelectronics** and **CNRS-ESYCOM** Université Gustave Eiffel
- **City and zip code *:** 93162
- **Name of the partner academic laboratory (so already known):** . CNRS-ESYCOM Uni Gustave Eiffel, ESIEE Paris
- **Code of the laboratory:** .....UMR 9007
- **Title of research theme (without any confidential character) *:** .....

"Development of a SiGe/Si BiCMOS co-integrated ultrafast interface for LiFi, Optical Free Space; LIDAR and Radio-over-Fiber applications"

- **Description of the theme of research (without any confidential character) *:** .....

This PhD position is intended to contribute to the development of SiGe/Si ultrafast microwave phototransistor (HPT) and their exploitation into fundamental circuits for the new application of LiFi, LiDAR and Radio-over-Fiber for the 5G and 6G.

- **Description of job *:**

SiGe microwave phototransistors are a recent technology that operate in the visible and near visible wavelength range that have the promises to provide an intrinsic integration of photonics and electronics on the chip. Their development and the construction of new circuits and functions have the potential to overperform in the field of ultra-high speed and highly compact optical communications such as LiFi and RoF for the 5G and 6G, but also LiDAR sensing systems for the automotive or industrial applications.

The PhD has the ambition to integrate this device within current B55 and B55X advanced SiGe BiCMOS technology from ST-Microelectronics with >300GHz fT / fmax, through the smart arrangements of existing semiconductor and interconnect layers. This is supported by the experience of French laboratory ESYCOM from CNRS and University Gustave Eiffel.

The PhD candidate will then develop fundamentals circuit bricks exploiting the HPT for linear functions (TIA) and non-linear function (clock recovery, frequency synchronization, mixing) to fit the market needs. Novel circuits are expected with a clear impact on low-energy consumption per bits, low-noise and high gain for the receiver modes.

- **Main Research Field *:**

- ☐ Agricultural sciences
- ☐ Anthropology
- ☐ Architecture
- ☐ Arts
- ☐ Astronomy
- ☐ Biological sciences
- ☐ Chemistry
- ☑ Communication sciences
- ☐ Computer science
- ☐ Criminology
- ☐ Cultural studies
- ☐ Demography
- ☐ Economics
- ☐ Educational sciences
- ☑ Engineering
- ☐ Environmental science
- ☐ Ethics in health sciences
- ☐ Ethics in natural sciences
- ☐ Ethics in physical sciences
- ☐ Ethics in social sciences
- ☐ Geography
- ☐ History
- ☐ Information science
- ☐ Juridical sciences
- ☐ Language sciences
- ☐ Literature
- ☐ Mathematics
- ☐ Medical Sciences
- ☐ Neurosciences
- ☐ Pharmacological sciences
- ☐ Philosophy
- ☐ Physics
- ☐ Political sciences
- ☐ Psychological sciences
- ☐ Religious sciences
- ☐ Sociology
- ☑ Technology
- ☐ Other

- **Function *:** .....PhD thesis.....
- **Research Profile*:** .....

Main skills from the PhD candidate will be the understanding of Electron Devices, Semiconductor physics and technology. She/he will also be keen to operate in the experimental field with an ideal preliminary experience in microwave devices characteristion on probes (probe station, VNA).

- **Date of recruitment *:** ……September 2021…….
- **E-mail address to which the candidate has to send his candidacy**

  Mail to : jean-luc.polleux@esiee.fr and pascal.chevalier@st.com

  CV, Motivation letter and University transcripts are required.

- **Website :**

  Research Laboratory: https://esycom.cnrs.fr/

  Company: https://www.st.com/content/st_com/en.html