

**leti**  
cea tech

TECHNOLOGY  
RESEARCH  
INSTITUTE

**POST-DOC**

**& PhD**

**OFFERS**





## Committed to innovation, CEA-Leti creates differentiating solutions for its industrial partners

CEA-Leti is a recognized global leader in miniaturization technologies. CEA-Leti's teams are focused on developing solutions that will enable future information and communication technologies, health and wellness approaches, clean and safe energy production and recovery, sustainable transport, space exploration and cybersecurity.

For 50 years, the institute has built long-term relationships with its industrial partners, tailoring innovative and differentiating solutions to their needs. Its entrepreneurship programs have sparked the creation of 65 start-ups. CEA-Leti and its industrial partners work together through bilateral projects, joint laboratories and collaborative research programs. CEA-Leti maintains an excellent

scientific level by working with the best research teams worldwide, establishing partnerships with major research technology organizations and academic institutions. CEA-Leti is also a member of the Carnot Institutes network—a French network of 39 institutes serving innovation in industry.

### CEA-Leti at a glance

- Founded in 1967
- 800 publications per year
- 3,100 patents in portfolio
- 1,850 researchers
- Based in France (Grenoble) with offices in the US (San Francisco) and Japan (Tokyo)
- 300 industrial partners
- ISO 9001 certified since 2000
- 10,000 sq. meters cleanroom space, 100-200-300 mm wafers
- 65 start-ups created

Join CEA-Leti  
and benefit from:



RESOURCES TO ADDRESS  
MAJOR SOCIETAL CHALLENGES



MULTIDISCIPLINARY  
NETWORKS TO CONDUCT  
YOUR RESEARCH



WORLD-CLASS  
TECHNOLOGICAL PLATFORMS



AN INTERNATIONAL  
SCIENTIFIC, HIGH-SKILLS  
ENVIRONMENT



THE STRENGTH OF A MAJOR  
PUBLIC RESEARCH ORGANIZATION

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# A GREAT PLACE TO STUDY



The 2019 Shanghai Academic Ranking of World Universities named Grenoble-Alpes University **no. 1** in France for:

- Computer Science
- Electrical & Electronic Engineering
- Energy Science
- Water Resources Engineering
- Nanoscience & Nanotechnology
- Instruments Science & Technology

Grenoble's student population of 63,000 stands out for its diversity and excellence:

- 42% in science, technology, and engineering
- 3,700 PhD candidates
- 180 nationalities

Source: Invest in Grenoble Alpes

First place for R&D  
First in France  
for R&D jobs

Second in France  
for engineering  
jobs

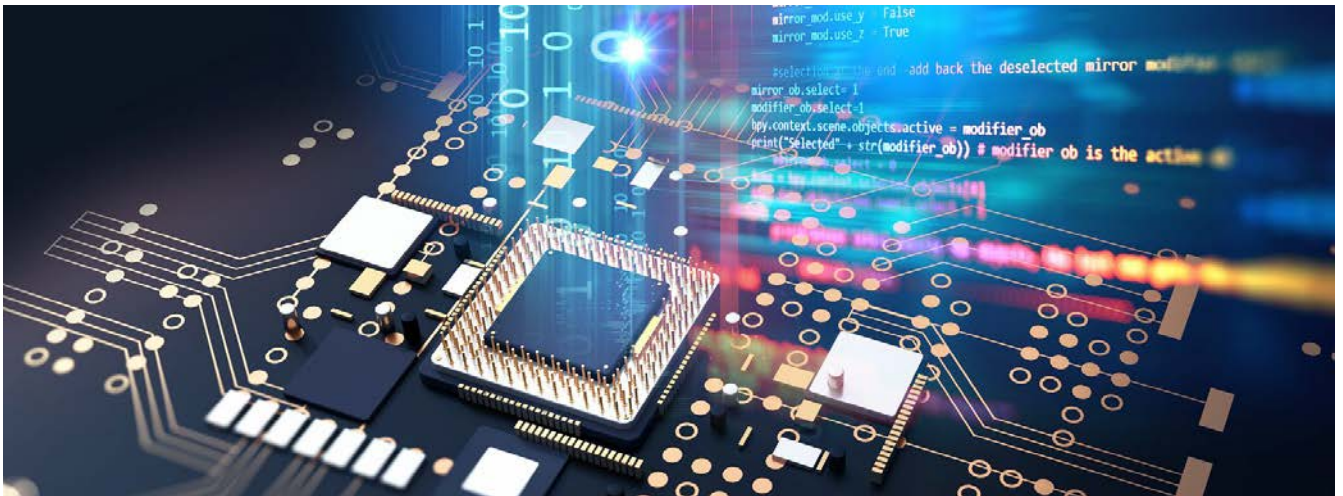




# PHD OFFER

## NUMERICAL SIMULATION

REF: SL-DRT-20-0679



### APPLICATIONS & SOCIETAL IMPACT

- › Advanced microelectronics
- › 3D nano-metrology
- › Products control, reliability and robustness

#ELECTRON MICROSCOPY

#APPLIED MATHEMATICS

#IMAGES TREATMENT

#INVERSE PROBLEM

Requirements: Engineer/M2

Contract Period: 3 years

Start date: 09/2020

Workplace: Grenoble

### 3D reconstruction of nanoscale objects from stereoscopic electron microscope images

#### CONTEXT

Robust, non-destructive and fast 3D metrology is a world-wide major challenge of microelectronics industry to better improve and control the nanotechnology processes. CEA-Leti has state-of-the-art electron microscopes (SEM) for imaging objects from different points of view. These equipments could be used in production to reconstruct the 3D topography of objects from SEM imaging models and innovative algorithms. CEA-Leti already has strong expertise in this field, and several industrial partners show a strong interest in the development of this technology.

#### ABSTRACT

The objective of this thesis is to develop a 3D metrology from SEM images the most precise and robust as possible. For this, the PhD student will use the Computational Lithography group's theoretical and simulation resources to improve and develop new SEM imaging models. The scope of these models is broad, from the simulation of micrometric objects to nanoscale structures. The PhD student will train the SEM models on a collection of multi-stereo SEM images of patterns, whose 3D topographies will be measured via 3D reference metrology. He will then investigate different mathematical strategies of 3D reconstruction, allowing rapid convergence and quality.

To apply, please contact: [aurelien.fay@cea.fr](mailto:aurelien.fay@cea.fr)

# PHD OFFER

## T E L E C O M M U N I C A T I O N S

REF: SL-DRT-20-0689



### APPLICATIONS & SOCIETAL IMPACT

- › Anywhere/Anytime broadband Wireless Access
- › Haptic environnements
- › Teleoperation, telepresence
- › Medicine 2.0

# 5G/6G MMW

# SUB-THZ

Requirements: Telecom and IC design experience

Contract Period: 3 years

Start date: Oct. 2020

Workplace: Grenoble

### Disruptive receiver architectures for wideband mmW modulations

#### CONTEXT

Existing telecommunication and data communication networks are evolving towards extremely high capacity and data-rate connections that will require innovative transceiver architectures. For wireless data links, beyond 5G and 6G and systems will be required in the next 5 to 10 years able to provide 100Gb/s or higher data rates by efficiently using the wide spectrum available at millimeter-wave (mmW) or sub-THz frequencies. Traditional transceiver architecture that have been used in the past may result too power consuming or simply not performant enough to respond to this challenge.

#### ABSTRACT

The CEA-Leti research institute has been conducting research during the lasts year in the field of innovative modulations schemes and transceiver architectures trying to respond to the above-mentioned high data-rate in wireless environments considering the limitation imposed by existing electronic devices required to build the transceivers. This thesis subject will explore the practical implementation of circuits based on innovative modulation schemes and architectures for high-speed, large-bandwidth, imperfection resilient mmW receivers for beyond 5G and 6G telecommunication applications and other high data-rate wireless communications applications.

To apply, please contact: [joseluis.gonzalezjimenez@cea.fr](mailto:joseluis.gonzalezjimenez@cea.fr)

# POST-DOC OFFER

N A N O C H A R A C T E R I S A T I O N

REF: PsD-DRT-19-0115



## APPLICATIONS & SOCIETAL IMPACT

- › Nanocharacterisation
- › Advanced microelectronics

#TOF-SIMS

#CHARACTERISATION

#TANDEM MS

#MICROELECTRONICS

Requirements: PhD

Contract Period: 2 years

Start date: Oct 2020

Workplace: Grenoble

## Advanced tandem time-of-flight mass spectrometry for microelectronic applications

### CONTEXT

CEA-Leti seeks to recruit a post-doctoral researcher to work on the development of advanced time of flight secondary ion mass spectrometry applications (TOF-SIMS). The candidate will work on a new TOF-SIMS instrument equipped with tandem MS spectrometry, in-situ FIB and Argon cluster sputtering. The candidate will also have access to the wide range of state of the art instruments present on the nanocharacterization platform as well as bespoke samples coming from the advanced technology branches developed at the CEA-Leti. The candidate will also benefit from a collaboration with the instrument supplier.

### ABSTRACT

The research project will be focused around the following topics•  
1)Developing methods to correlate TOF-SIMS with AFM, XPS and Auger. This will include localisation of the same area, use of a transfer capsule and data treatment aspects. 2) Improving the sensitivity and fragmentation efficiency of the tandem MS spectrometer, this aspect will involve increasing the efficiency of producing fragment ions using different collision gases 3) Developing 3D FIB-TOF-SIMS applications and improving the spatial resolution for TOF-SIMS imaging.

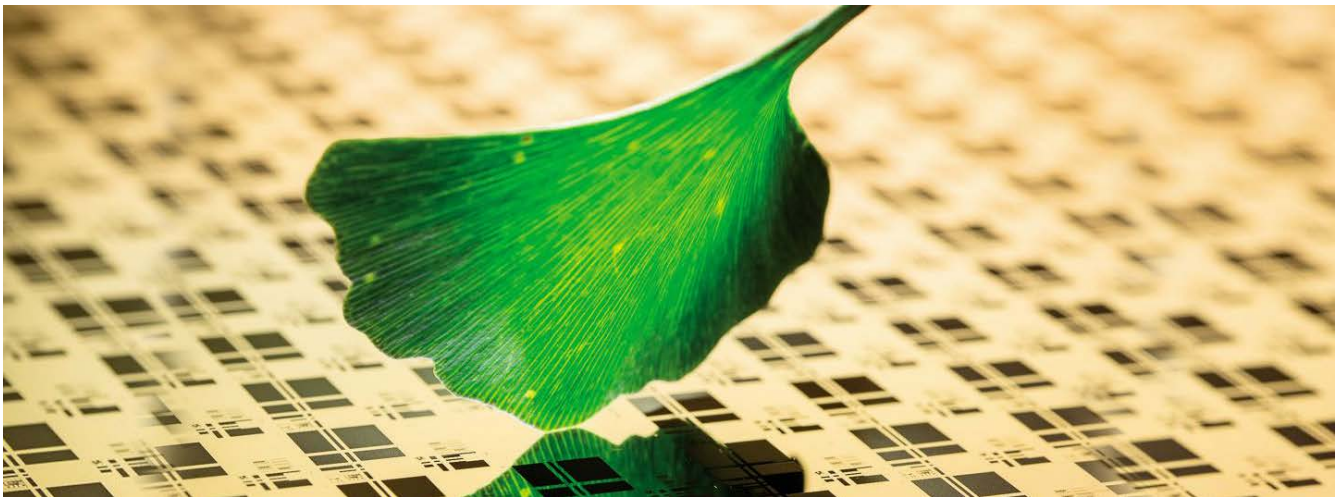
To apply, please contact: [jean-paul.barnes@cea.fr](mailto:jean-paul.barnes@cea.fr)



# POST-DOC OFFER

S U S T A I N A B L E E L E C T R O N I C S

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## APPLICATIONS & SOCIETAL IMPACT

- › Electronics for sustainability
  - › Functional electronics
  - › Reduce. Reuse. Recycle.
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# SUSTAINABILITY

# GREEN ELECTRONICS

# ECODESIGN

# LIFE CYCLE

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MSCA Requirements: PhD  
outside of France

Contract Period: 2 years

Start date: Jan. 2021

Workplace: Grenoble

## Marie Skłodowska-Curie Individual Fellowship Proposal : Sustainable Electronics & Life Cycle Assessments

### CONTEXT

CEA-Leti seeks to recruit a post-doctoral researcher to work on Sustainable Electronics & Life Cycle Assessment in the frame of a Marie Skłodowska-Curie Action project. The candidate will work on the development of methodologies and new concepts (resilience, modularity, dismantling) to reduce the ecological footprint of electronics. The candidate will have access to Life Cycle Assessment tools and mechanical and electronics conception platforms to develop sober systems in particular for consumer IoT, industrial IoT, e-health, environment and telecommunication systems.

### ABSTRACT

The research project will focus on the following topics: 1) Developing new electronics concepts facilitating the reuse of components (modular systems and easy-to-dismantle designs), 2) Developing methodologies and tools to design frugal electronics systems, in particular in terms of data or energy, and 3) Developing resilient electronic devices able to repair or reconfigure themselves in-situ without the need for human decision or intervention and involving built-in fault detection, fault masking or mitigation abilities, towards the development of zero-maintenance electronics.

To apply, please contact: [sebastien.boisseau@cea.fr](mailto:sebastien.boisseau@cea.fr)

## *Interested in other areas of research?*

Find a complete list of current  
thesis and PhD opportunities

[www.emploi.cea.fr](http://www.emploi.cea.fr)

Or feel free to send  
your spontaneous application

[lea.dicioccio@cea.fr](mailto:lea.dicioccio@cea.fr)



CEA-Leti, technology research institute

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