



**IMT Atlantique**  
Bretagne-Pays de la Loire  
École Mines-Télécom

**Nantes Campus**

**Fixed term contract  
(12 to 24 month)**

**Post-Doctoral position in Marine Spectroscopy –  
Electromagnetic Characterization  
DAP Department**

**Research Field:** Modelling tools, Geological engineering, Simulation engineering, Electromagnetism

### 1. Context

#### **IMT Atlantique institute**

**IMT Atlantique**, internationally recognized for the quality of its research, is a leading general engineering school under the aegis of the Ministry of Industry and Digital Technology, ranked in the three main international rankings (THE, SHANGHAI, QS).

Located on three campuses, Brest, Nantes and Rennes, IMT Atlantique aims to combine digital technology and energy to transform society and industry through training, research and innovation. It aims to be the leading French higher education and research institution in this field on an international scale. With 290 researchers and permanent lecturers, 1000 publications and 18 M€ of contracts, it supervises 2300 students each year and its training courses are based on cutting-edge research carried out within 6 joint research units: GEPEA, IRISA, LATIM, LABSTICC, LS2N and SUBATECH.

#### **Job environment**

The position is a part of the collaboration between BRGM, IMT Atlantique and Elwave.

At ITM Atlantique, you will be primarily in contact with ReV (Robotics And Living) team researchers. The research themes of the team are:

- Bio-inspired action
- Perception of bio-inspired environment
- Assistance and support to the human
- Bio-inspired design

BRGM, the French geological survey, is France's leading public institution for Earth Science applications for the management of surface and sub-surface resources with a view to sustainable development ([www.brgm.fr](http://www.brgm.fr)). Its action is oriented towards scientific research, support for public policies and international cooperation.

At BRGM, you will be primarily in contact with DRP/IGT team (Geophysical imaging and remote sensing). The main research themes for this subject are:

- Signal processing
- Petrophysical characterization through physical laboratory and numerical modelling
- Quantitative imagery/inversion: link measured signals to geological/anthropic information for quantitative interpretation

ELWAVE develops a new generation of detection systems using the electromagnetic technology known as "electric sense." This innovation stems from a decade of research conducted at the biorobotics laboratory of the Institut Mines-Télécom Atlantique (IMT Atlantique).

Since 2018, ELWAVE has been developing and marketing real-time, 360° detection and characterization systems for the offshore industry. ELWAVE, in collaboration with IMT Atlantique, developed the patented technology known as CEDAR (Controlled Electric Detection And Ranging), which is implemented in its first product, "Octopulse".

## **2. Job description**

It offers 1 to 2-years postdoctoral position whose purpose is participating to design of a new sensor technology based on "electric sense" able to characterize objects materials in marine environment.

Integrated to the R&D team, and leverage your expertise in electromagnetic characterization methods, you work on the following thematic:

- Define and conduct experimental scenarios (multi-frequency excitation, power, signal shape, distance to the sample) on different materials
- Analyse experimental data
- Participate in specifying new sensor features to characterize various materials in a marine environment by defining the frequency range, power, waveform ...
- Collaborate in an interdisciplinary team

## **3. Training and skills**

Doctoral degree in Modelling, electromagnetism, geophysics or a related technical field, you have strong knowledge on electromagnetic methods for material characterisation (impedance analyser, spectroscopy, tomography), an interest on innovative technologies. You have the following technical skills:

- Proficiency with measurement devices (impedancemeter, function generator, oscilloscope)
- High background on theoretical aspects of impedance spectroscopy
- inversion of electrical/electromagnetic data to spatialize anomalies
- Octave / Matlab, Python programming
- Writing technical documents

You are autonomous and pragmatic, with an intrinsic motivation and good team spirit.

### **Additional information**

- Start date: ASAP
- Contract: Fixed-term contract
- Contract duration: from 12 to 24 months
- Location: Nantes
- The positions offered for recruitment are open to all with, upon request, accommodations for candidates with disabilities
- Hierarchical category: Category II trade P of IMT Atlantique management cadre
- Contact: [vincent.lebastard@imt-atlantique.fr](mailto:vincent.lebastard@imt-atlantique.fr) / [lyes.ifrek@elwave.fr](mailto:lyes.ifrek@elwave.fr) / [j.deparis@brgm.fr](mailto:j.deparis@brgm.fr)
- Please send your application to [Marion.tondut@imt-atlantique.fr](mailto:Marion.tondut@imt-atlantique.fr) - Director of Human Resources

**Application documents**

- Resume with list of publications
- Cover letter
- Names and emails of referees that may be contacted