

POSTDOCTORAL POSITION IN ENVIRONMENTAL DATA ANALYSIS – APPLICATION TO AIR QUALITY SENSORS (M/F)



Unity: Center for Education, Research and Innovation in Energy Environment (CERI EE)

Managers: Anna Font, Sabine Crunaire & Nathalie Redon

Nature of employment: Fixed term during full time (100%), 24 months

Location of work: IMT Nord Europe (Douai, France)

Presentation:

Public establishment belonging to IMT (Institut Mines-Télécom), placed under the supervision of the Ministry of Economy, Finance and Industrial and Digital Sovereignty, IMT Nord Europe has three main objectives: providing our students with ethically responsible engineering practice enabling them to solve 21st century issues, carrying out our R&D activities leading to outstanding innovations and supporting territorial development through innovation and entrepreneurship. Ideally positioned at the heart of Europe, 1 hour away from Paris, 30 min from Brussels and 1h30 from London, IMT Nord Europe has strong ambitions to become a main actor of the current industrial transitions, digital and environmental, by combining education and research on engineering and digital technologies.

Located on two main campuses dedicated to research and education in Douai and Lille, IMT Nord Europe offers research facilities of almost 20,000m² in the following areas:

- Digital science,
- Energy and Environment,
- Materials and Processes.

For more details, visit the School's website : www.imt-nord-europe.fr

The candidate will join the CERI EE (<https://research.imt-nord-europe.fr/energy-and-environment/>), and more specifically, the thematic axis « Observations, Sources et Atmospheric Processes » (OSPA). Its area of research focuses on the physico-chemistry characteristics of trace air species in outdoor ambient air (troposphere), to better understand the processes of generation and transformation to eventually propose solutions adapted to the needs of society and economic stakeholders.

Scientific context of the study:

The activities associated with this position will be partly linked to those of the CERI EE for the French National Reference Laboratory (LCSQA; <https://www.lcsqa.org/fr>). LCSQA is the designated institute for the technical coordination of French air quality networks. Its primary missions include: (i) ensuring the quality of the data, devices, and methodologies, as well as their compliance with European requirements and the needs of the national network, (ii) managing the distribution and the exploitation of the data produced by the national network, (iii) advancing scientific and technical knowledge to support the implementation of action plans and anticipate future monitoring strategies and, (iv) coordinating the national network. In this context, the candidate will contribute to metrological activities related to ambient air pollutants and the development of new measurement methodologies, in particular through contribution in the working group on air quality

sensors. The main task will be to develop and validate a protocol for qualifying of air quality sensors in mobile applications, leveraging data from a mobile platform currently under development.

The other part of the job will involve contributing to various ongoing and upcoming research projects at CERI EE. These tasks will specifically include:

- Processing data from the EXAMEN project: This project aims to estimate personal exposure of cleaning products in indoor air using personal sensor systems. The goal will be to correlate sensor data with other metadata (location, products used, practices, ...) for measurements collected during field campaigns carried out in March - May 2025.
- Contributing to the deployment and data validation of a multi-sensor network as part of the PHO-THO project. This project aims to equip the city of Hanoi (Vietnam) with a network of air quality sensors (i) to provide daily air quality forecasts and (ii) develop scenarios tools to assess the efficacy of mitigation policies to reduce ambient air pollution, such as the implementation of Low Emission Zones (LEZ).
- Contributing to the PROMETH'AIR project, which aims to identify and discriminate anaerobic digestion activities from conventional farming practices. The methodology relies on data from a multi-sensor system combined with objective sensory measurements of atmospheric pollutants and odorous compounds.
- Contributing to the submission and execution of a project aiming to evaluate the personal exposure of the population in Martinique to air pollutants resulting from the decomposition of Sargassum algae, using sensors adapted to the target pollutants and the environmental conditions.

Main activities:

The successful candidate will provide scientific and technical support to the CERI EE research studies and projects related to sensor qualification (in the laboratory), data acquisition (in the field), and data analysis from campaigns using a set of different air quality sensors.

Metrological characterization will be carried out, as well as the deployment of sensor on the field as part of the national and international projects described above.

Finally, the candidate will be responsible for the quality assurance and quality control (QA/QC) of the laboratory instruments (used in calibration exercises, preventive maintenance, life-cycle documentation, etc.) (5% of the time), writing technical reports, experimental protocols, and user manuals (both in English and French), and participating in the dissemination of results within the LSCQA, other project partners and in international and national conferences. Additionally, the candidate will contribute to the literature review on analysis techniques used or of interest (20 to 25% of the time).

The candidate will also have opportunity to teach and/or supervise activities in to the training courses offered to undergraduate students at IMT Nord Europe or other programs in which CERI EE is involved (10% of the time).

Candidate profile: (Prerequisites/Degree)

- PhD with strong expertise in data processing and advanced analysis, preferably in the field of air quality, as well as experience in database management and utilization.
- Demonstrated experience in deploying instrumentation both in the laboratory and in the field.
- Strong ability to plan and prioritize tasks to meet deadlines.
- Excellent proficiency in English level is required for international collaborations.
- Proficient in scientific communication (written/oral).

- A valid driving licence is highly recommended.

Activities:

The person will be responsible for the following tasks:

- Advanced processing of geolocated data applied to sensors and sensor networks to improve selectivity, detection limit, influence parameters (e.g. aging, relative humidity, temperature, etc.), calibration, etc.
- Participating to dissemination of results through *(i)* the writing of scientific publications, contractual reports, technical guidance, etc. and *(ii)* the active participation in working groups related to the above-mentioned projects.
- Supporting the technical teams, trainees, and students working on topics related to the tasks of this position.

Abilities:

- Scientific rigor and writing quality
- Communication and teamwork skills
- Organized, rigorous, autonomous, and responsive
- A good level of English is necessary for international collaboration

Conditions:

The position is available as soon as possible for 24 months (Fixed-term contract (CDD)).

Travel in France (including overseas territories), Asia and Europe to be planned

Possibility of partially teleworking (maximum 2 days/week)

Many holidays

Wide range of social benefits

Information and application submission procedures:

For any information regarding the position, please contact:

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For any administrative information, please contact the Human Resources Department: jobs@imt-nord-europe.fr

In addition, the position can be adapted for a disabled person.

To apply, please connect to our recruitment platform via the following link:

<https://institutminestelecom.recruitee.com/o/post-doctorantepost-doctorant-en-analyse-de-donnees-environnementales-application-aux-capteurs-de-qualite-de-lair-hf-en-cdd-24-mois-a-imt-nord-europe>

Application deadline: 31/03/25