Researcher in quantum electrical metrology

Full-time permanent position
Location: St Quentin-en-Yvelines (Trappes / France)
Reference: ML/MEQ/DMSI

Leader in the development of measurement technics and references, with a strong reputation in France and abroad as National Metrology Institute, the Laboratoire National de Metrologie et d'Essais (LNE) supports industrial innovation and is a key player in making the economy more competitive and society safer through reliable and harmonized measurements.
As the driving force behind French metrology, our research lies at the heart of our public service mission, and is a fundamental factor in supporting the academic world and the competitiveness of companies, through ever more reliable measurements on innovative subjects such as artificial intelligence, nanotechnologies and quantum technologies.

Context:

One of the main current challenges in quantum electrical metrology is to simplify the operating conditions of quantum electrical standards and the implementation of associated instrumentation, in order to make the electrical units of the International System of Units (SI) more accessible. As part of new developments in metrology, LNE and its partners are seeking to exploit the great potential of van der Waals heterostructures, particularly those based on graphene bilayers with control of the angle between the layers ("Twistronics"), to develop new quantum electrical standards and ultra-sensitive detectors (SQUID, electron and single photon). The ultimate aim is to combine them on a chip within a single "quantum multimeter".

Missions:

Working in LNE's fundamental electrical metrology department, you will contribute to research activities in the field of quantum electrical metrology. Your main missions will be to:

- Contribute to current work and projects in quantum metrology (quantum (anomalous) Hall and Josephson effects) in graphene and in innovative materials such as heterostructures based on graphene and hexagonal boron nitride (h-BN) at the so-called "magic angle" (MATBG, for "magic angle twisted bilayer graphene");
- Contribute to the engineering of the associated quantum standards and detectors (design, modeling, etc.) and their instrumentation (particularly cryogenic) for simplified operation;
- Analyze and interpret the data obtained, in conjunction with existing theoretical models;
- Ensure reporting and promoting results through scientific communications (publications, conferences, etc.), metrological good practice guides, and potentially through actions aimed at industrializing the technologies developed, e.g. by registering patents.
- Supervise a PhD student and/or a post-doctoral fellow, to work in close interaction with the current team, and possibly to welcome visiting scientists.
- Be able to fit your work into research and innovation programs (EURAMET EPM, Horizon Europe, ANR, etc.) and have the ability to develop collaborations with academic and industrial partners, using your own and/or the team's network.

Profile:

- PhD degree in condensed matter physics, mesoscopic physics/quantum transport and/or quantum physics;
- Strong experience in low-noise electronic transport measurements at (very) low temperatures. Interest in experimental science, measurement, instrumentation and technological and applied research;
- Knowledge of quantum effects: Josephson and quantum (anomalous) Hall effects. Specific knowledge of graphene physics would be highly appreciated;
- Ability to analyze results and synthesize information;
- Pragmatic by nature, rigorous, critical and self-reliant;
- Enjoy teamwork, and able to organize yourself to take part in several projects (at LNE and in European projects);
- Fluency in scientific English for the promotion of work (writing articles, conferences, meetings, etc.) and collaboration with the project's European partners.
- Occasional travel required for scientific exchanges (project meetings with European partners, international conferences, etc.) in Paris and Paris area, France, Europe and abroad.

Joining LNE means:

- ✓ Joining an international group with nearly 1,000 employees.
- ✓ Participating in the development of a Public Industrial and Commercial Institution (French acronym EPIC) that has been serving society and citizens since 1901.
- ✓ Joining a company that supports local authorities and industry in meeting tomorrow's social and environmental challenges.
- ✓ Join a research organization involved in European and international projects.
- ✓ Join a company that places respect and fairness at the heart of its HR policies.
- ✓ Join a company that is committed to a CSR policy and has set up a sustainable mobility package.
- ✓ Join a company that offers personalized introduction and regular training.
- ✓ A 12-month fixed salary plus an annual end-of-year bonus*.
- ✓ Executive status with a 205-day fixed salary and numerous benefits.
- ✓ A profit-sharing bonus and an employee savings plan (PEE/PERCO) with matching contributions*.
- ✓ Possibility of teleworking in accordance with the company agreement in force.
- ✓ Mutual insurance* and provident scheme*.
- ✓ Access to the company restaurant directly on our Trappes site.
- ✓ Access to a wide choice of offers through our social and economic committee (CSE).

* under the conditions set out in the agreements and their amendments.

To apply, send your CV and covering letter to: recrut@lne.fr, quoting job reference **ML/MEQ/DMSI** *in the subject line.*