

Tenure Track Faculty, Assistant Professor
Hydrogen and Energy Decarbonization Chair

INSA Rouen Normandie
Department of Energy
CORIA Laboratory, UMR6614

Keywords: Energy decarbonization, sustainable fuels, pollutants emissions, propulsion, energy efficiency and transition, environmental impact, safety.

Anticipated contract duration: 5 years. After evaluation of the scientific achievements and professional capabilities of the chairholder by a tenure commission, he/she will be eligible for a full-tenure position of Professor.

Research activity description

CORIA, "Complexe de Recherche Interprofessionnel en Aérothermochimie", is a Joint Research Unit (UMR) attached to the Institute of Engineering and Systems (INSIS) of the CNRS, the University of Rouen Normandy and the Institute of Applied Sciences (INSA) of Rouen Normandy.

Member of LabEx EMC3, its research focuses on reactive and non-reactive flows: two-phase flow, turbulent mixing, combustion, plasmas, supersonic flows ..., and optics and lasers. It combines theoretical studies, modelling, numerical simulations and experiments on different scales, with a very strong specificity in the development of optical and laser diagnostics and the development of high-performance computations. This diversity and thematic complementarity (laser metrology and high-performance computing) is part of a research and innovation strategy related to the ecological transition, for the decarbonation of energy and aeronautical, land and aerospace propulsion. Its work contributes to the strategic axis optimization of the energy and propulsion systems of the CARNOT ESP «Energy and Propulsion Systems».

Around the societal issues associated with energy (decarbonization, efficiency, environmental impact...), the project of this Chair aims to provide a better understanding of reactive and complex flows through experimental (advanced laser diagnostics), numerical (high performance calculation) or theoretical approaches.

The scientific project of the Chair will respond to the challenges of a faithful description of the multi-scale character of these flows, by favoring local and in-situ approaches, in order to

remove the barriers associated to the multi-physical phenomena in the fields of energy decarbonization, propulsion (aeronautics, aerospace, land and river transport) and industry: energy efficiency, control and safety, impact and polluting emissions.

It will reinforce or complement CORIA's strategic guidelines to address the challenges of the use of sustainable alternative fuels, including the storage and combustion of new energy carriers (green hydrogen and its derivatives), and security (materials handling), by taking advantage of the CORIA environment through cross-cutting actions between the three Research Departments: "Reactive Flows", "Turbulence, Atomization, Sprays, Chaos", "Optics and Laser".

During this tenure-track position, the candidate will carry out ambitious projects by applying to national and international calls for proposals and by producing scientific papers in the best journals in his/her field. His/her expertise will reinforce the orientations initiated at CORIA by an original proposal.

Teaching description

The chairholder will have a teaching duty of 64 hours per year during the tenure-track period. She/He will teach in the Energy Department at INSA Rouen Normandie and will be involved in the department teaching classes such as heat and mass transfers, experimental or numerical activities, thermodynamics, etc.

Candidate's profile

The candidate must hold a Ph.D. thesis in Mechanical Engineering, in Energy or any closely related field with the research profile of the employment, with a solid experience on the multi-physics analysis of reactive flows through experimental, numerical or theoretical skills. This must be reflected in a significant scientific output (publications in peer-reviewed journals, communication in international conferences). The candidate must be able to manage research activities, to lead national and international research projects and to supervise young researchers. The candidate must demonstrate teamwork skills.

Salary and human and financial resources:

In order to carry out the research and teaching projects, the Chair will be co-funded by the National Agency of Research (ANR) with an amount of 200 k€ (of which at least 120 k€ of payroll, thesis or postdoc).

The gross monthly salary is 3443.5 €/month

Application and contacts

- First, interested candidates should send a Curriculum Vitae and a list of publications accompanied by a short cover letter to both:
 - Bruno Renou (bruno.renou@insa-rouen.fr), Teaching contact
 - Armelle Cessou (armelle.cessou@coria.fr), Research contact

This preliminary step is essential to discuss the research and teaching projects and the integration in the laboratory.

- Second, they should apply officially via the *Galaxie* website where the position offer will be published. The application deadline is the 31th of August. The selected candidates for the audition will present their project to the selection committee with the conditions specified in the invitation letter.

Evaluation Criteria

- Excellence of the candidate, motivation, supervisory skills
- Quality and originality of the research and teaching projects
- Integration of the project within the laboratory
- Ability to establish collaborative networks
- Adequacy of the means to the proposed project and ability to mobilize complementary means