



## Press Release

### NAAREA, the CNRS and Université Paris-Saclay launch a joint laboratory dedicated to molten salt chemistry research

**26/06/2024 – Nanterre – One year after receiving the France 2030 label, NAAREA, a French company developing a fourth-generation molten salt fast nuclear microreactor, is partnering with the CNRS and Université Paris-Saclay to create a joint laboratory dedicated to molten salt chemistry. Known as Innovation Molten Salt Lab (IMS Lab), this laboratory will draw on the expertise of NAAREA and ICJLab<sup>1</sup> (*Laboratoire de Physique des 2 Infinis Irène Joliot-Curie*). Its aim is to become the European leader in the field of molten salts R&D for both nuclear (molten salt reactors) and non-nuclear applications.**

For nearly 20 years, molten salt chemistry has been one of the focuses of research at IJCLab, which analyses the molten salt fast-spectrum reactor concept and conducts experimental studies on the chemistry and treatment of liquid salt fuel. Benefiting from their complementary strengths, NAAREA, which is developing a fourth-generation molten salt fast-spectrum nuclear microreactor, and the molten salts team at IJCLAB are joining forces to create a joint research laboratory known as Innovation Molten Salt Lab (IMS Lab).

The laboratory will bring together ICJLab's historical expertise in molten salts chemistry and NAAREA's technological knowledge in the fields of materials, neutronics, safety analysis and materials and fuel data. Innovation Molten Salt Lab (IMS Lab) will accelerate research on the synthesis of chemical compounds in molten salts and expand the experimental scientific knowledge base in this area, with the potential to benefit industrial sectors beyond the nuclear field.

Under joint governance, Innovation Molten Salt Lab (IMS Lab) will follow a roadmap for research and innovation. This roadmap will aim to foster collaborative work and capitalize on the concepts and innovations developed at NAAREA to the benefit of the European molten salt reactor sector, in particular in the context of the strategic partnerships it recently formed. This collaboration also aims to create synergies with other public and private entities with an interest in research on the properties of molten salts. The goal of Innovation Molten Salt Lab (IMS Lab) is to become the European leader in the field of molten salts research and development, for both molten salt nuclear reactors and other non-nuclear applications such as metallurgy and concentrated solar power.

Jean-Luc Alexandre, Founder and CEO of NAAREA: *"Innovation Molten Salt Lab (IMS Lab) allows us to pool our skills and demonstrates our ability to step up our efforts to develop our XAMR® project. The creation of this joint laboratory also marks a significant milestone for NAAREA, which is positioned to make a vital contribution to establishing and achieving recognition for true French leadership and expertise in the field of molten salt research at European level. This valuable expertise will not only have a positive impact on NAAREA, but also on a variety of industrial sectors, whether related to nuclear energy or not."*

Jean-Luc Moullet, Deputy CEO for Innovation at the CNRS: *"The CNRS welcomes the creation of the IMS Lab with NAAREA, an ambitious joint laboratory that symbolizes the contribution of French research to the revival of the nuclear sector. The CNRS encourages the development of joint laboratories, which offer a flexible and long-term framework conducive to the development of fruitful public-private partnerships."*

Camille Galap, President of Université Paris-Saclay: *"Université Paris-Saclay is a research-intensive university committed to contributing to finding solutions to scientific and technological challenges. We are therefore delighted to join this partnership with NAAREA and the CNRS to create the joint laboratory IMS Lab, whose research work will help respond to the critical challenges of decarbonizing energy, in particular for industry."*



<sup>1</sup> IJCLab (CNRS/Université Paris-Saclay)

### **IJCLab's expertise:**

IJCLab (*Laboratoire de Physique des 2 Infinis Irène Joliot-Curie*) is a joint research unit of the CNRS (French National Centre for Scientific Research) and Université Paris-Saclay, with a team of nearly 730 people. IJCLab is one of the top research laboratories in Europe, in particular in the field of high-energy physics and accelerator physics. The research it conducts has contributed to major international discoveries in the physics of the infinitely large and infinitely small. IJCLab's scientific activities are organized around seven scientific areas: Astroparticles, Astrophysics and Cosmology; Accelerator Physics; High-Energy Physics; Nuclear Physics; Theoretical Physics; Energy and Environment; and Health Physics. The laboratory also has a large Engineering centre as well as four research and technology platforms that support high-level research, from the conceptual phase to experiments and even the production of large-scale research instruments.

Through its Energy and Environment unit, IJCLab has skills in the field of the chemistry of molten salt reactors, combined with its experimental facilities enabling the development of numerous projects in the fields of chemistry, the reprocessing of molten salts and nuclear waste management. The laboratory's expertise also includes the development of electrochemical and analytical methods to monitor corrosion in extreme environments and determine characterization data for solutes in molten salts and potentiometric methods for monitoring the oxide content in these salts. It also specializes in the calculation of thermodynamic potential-acidity diagrams, similar to Pourbaix diagrams for molten salt media. The laboratory's expertise also encompasses the field of experimental simulation of the effects of irradiation in solids, via the use of accelerated ion beams and related characterization techniques.

This range of expertise has led IJCLab to collaborate with major research organizations and industrial actors in the field of nuclear energy.

### **About NAAREA:**

NAAREA (Nuclear Abundant Affordable Resourceful Energy for All) was founded in 2020 by Jean-Luc Alexandre and Ivan Gavriloff to help meet the objectives of energy sovereignty, decarbonization and improving the energy mix. With this aim, NAAREA is developing a groundbreaking energy solution that will completely close the fuel cycle: the XAMR® (eXtrasmall Advanced Modular Reactor), a molten salt fast neutron microreactor capable of producing electricity (40 megawatts electric) and heat (80 megawatts thermal) that will burn plutonium and the most highly radiotoxic waste (with a lifetime of over 100,000 years) produced by nuclear power plants. The XAMR® is designed to be industrially mass-produced and installed in close proximity to consumers, namely in the mobility sector, electro-intensive industries and remote areas. NAAREA benefits from the support of the French Alternative Energies and Atomic Energy Commission (CEA) and French National Centre for Scientific Research (CNRS), as well as industry players such as Assystem, Dassault Systèmes and Orano. A carbon-free and non-intermittent energy source planned to be on the market by 2030, the NAAREA XAMR® is opening the way for sustainable and innovative nuclear energy that supports energy independence, increased resilience and the circular economy. NAAREA is a winner of the "Innovative Nuclear Reactors" call for proposals under the France 2030 investment plan and a beneficiary of the French Tech 2030 support programme.

Learn more at: [www.naarea.fr](http://www.naarea.fr)



### **About the CNRS:**

The French National Centre for Scientific Research (CNRS) is an internationally recognized public research institution, among the top in the world. For over 80 years, it has pursued a standard of excellence in terms of recruitment and developed multi- and interdisciplinary research throughout France, the rest of Europe and around the world. Focused on the common good, it contributes to scientific, economic, social and cultural progress in France. The CNRS is made up of 33,000 men and women and 200 professions. Its 1,000 laboratories, most of which are joint units with universities, schools and other research organizations, represent more than 120,000 people; they contribute to advancing knowledge by exploring the living world, matter, the universe and the functioning of human societies. The close link that it builds between its research activities and their transfer to society have made it a key contributor to innovation today. Partnerships with companies are the foundation of its policy to maximize the impact of its research. These partnerships notably take the form of more than 200 joint structures with companies in industry and the creation of around a hundred startups each year, a testament to the economic potential of its research work. The CNRS makes its research work and data accessible, sharing knowledge with various groups including scientific communities, the media, decision-makers, economic actors and the general public. [www.cnrs.fr](http://www.cnrs.fr)

### **About Université Paris-Saclay:**

Born of the combined ambition of a number of French universities, *grandes écoles* and research organizations, Université Paris-Saclay is a leading university in Europe and the world, covering the fields of science and engineering, life sciences and health, and humanities and the social sciences. Its scientific policy closely intertwines research and innovation, incorporating both basic and applied sciences to respond to major societal challenges. From undergraduate to doctoral studies, including the programmes of its specialized *grandes écoles*, Paris-Saclay offers degrees across a wide range of disciplines, all with a focus on student success and employability. It prepares its students for a fast-changing society, in which critical thinking skills, agility and continual skill development are key. Université Paris-Saclay also offers a rich range of lifelong learning programmes. Located to the south of Paris, with its campuses extending over a large area, Université Paris-Saclay enjoys an ideal geographic position that favours both its international visibility and forming close ties with its socio-economic partners, such as major industrial groups, SMEs, startups, local governments and non-profit organizations. [www.universite-paris-saclay.fr](http://www.universite-paris-saclay.fr)

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