



PRESS RELEASE – JUNE 23, 2023

Institut Polytechnique de Paris, the Defence Innovation Agency (AID), Dassault Aviation, Dassault Systèmes, Naval Group and Nexter, a KNDS' company, have announced the creation of an academic and research chair dedicated to the complex systems' architecture.

FRANCE - On June 22, 2023, an Institut Polytechnique de Paris' academic and research chair in complex systems' architecture was created in the presence of Sébastien Lecornu, Minister of Armed Forces, and Emmanuel Chiva, General Delegate of Armaments. Dassault Aviation, Dassault Systèmes, Naval Group, Nexter (KNDS' company), and the Defence Innovation Agency (AID) are the sponsors and partners of this chair, which aims to develop academic and research through a systemic and multidisciplinary approach.

The growing complexity of industrial and operational systems (interconnection between hardware and software, organisations' networks) calls for a global approach, which requires mastering the concepts and principles of system architecture and considering numerous scientific disciplines. In the defence sector in particular, these systems need to be robust, secure and designed to be able to evolve with new technologies over long periods of time.

With regard to issues related to national sovereignty in the field of defence, the Chair of complex systems' architecture aims to follow an approach based on two main axes: education and research. It will be supported by 4 permanent lecturers recruited by the Chair, with the support of engineers and post-docs, who will define, using a comprehensive and complementary approach, the academic and research priorities for tackling the complexity of the subject.

Training tomorrow's engineers

The Chair will provide resources to increase the offer of academic courses in this systemic approach within four of Institut Polytechnique de Paris's institutions (École Polytechnique, ENSTA Paris, Télécom Paris and Télécom SudParis). It will give students a better understanding of the defence's challenges by providing them with

knowledge in the field of complex systems, and by making them aware of national sovereignty's challenges in relation to the expectations of the Ministry of Defence.

Research to stay one step ahead

Complex systems' architecture, essential to the design of collaborative weapons systems that respond to changing threats and anticipate major technological breakthroughs, will be addressed in all its dimensions (concepts, methods, projects, etc.), in a wide variety of environments (air-land, maritime, civil-military, etc.) and across many disciplines. In particular, researchers aim to tackle the complexity of the subject through three approaches that will be detailed during the first year:

- **Systems engineering:** how to design, understand and define a system architecture that allows integration of new technologies while maintaining robustness and safety? This approach includes the use of mathematical and numerical models of complex systems. Dassault Systèmes' 3DEXPERIENCE platform will drive the transformation of systems engineering.
- **Artificial Intelligence's integration:** what are the levels of autonomy for any functions, how to manage interactions between systems and operators while ensuring the overall security?
- **Information and communication systems:** how is data exchanged securely, efficiently, and robustly between operating or autonomous weapon systems in multimedia and disadvantaged environments?

Created at IP Paris with the support of the General Directorate of Armament (DGA) and the Defence Innovation Agency (AID), this chair strengthens the CIEDS and is part of the ambition of the Center for large-scale collaborations with major defence manufacturers.

The partners' initial commitment runs through the end of 2028.

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ABOUT INSTITUT POLYTECHNIQUE DE PARIS:

Institut Polytechnique de Paris (IP Paris) is a public higher education and research institution that brings together five prestigious French engineering Schools: École Polytechnique, ENSTA Paris, ENSAE Paris, Télécom Paris and Télécom SudParis. Under the auspices of the Institute, they share their combined expertise to fulfil two major ambitions: to develop educational programs of excellence and cutting-edge research in science and technology. Thanks to the academic anchorage of its five founding Schools and its alliance with HEC Paris, IP Paris positions itself as a leading teaching and research institution in France and internationally. www.ip-paris.fr

ABOUT DASSAULT AVIATION:

With over 10,000 military and civil aircraft (including 2,700 Falcons) delivered in more than 90 countries over the last century, Dassault Aviation has built up expertise recognized worldwide in the design, development, sale and support of all types of aircraft, ranging from the Rafale fighter, to the high-end Falcon family of business jets, military drones and space systems. In 2022, Dassault Aviation reported revenues of €6.9 billion. The company has 12,700 employees. www.dassault-aviation.com

ABOUT DASSAULT SYSTEMES:

Dassault Systèmes, the 3DEXPERIENCE® Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating virtual twin experiences of the real world with our 3DEXPERIENCE platform and applications, our customers can redefine the creation, production and life-cycle-management processes of their offer and thus have a meaningful impact to make the world more sustainable. The beauty of the Experience Economy is that it is a human-centered economy for the benefit of all – consumers, patients and citizens. Dassault Systèmes brings value to more than 300,000 customers of all sizes, in all industries, in more than 150 countries. For more information: <https://www.3ds.com>

ABOUT NAVAL GROUP:

Naval Group is a partner to its customers' maritime sovereignty. An international player in naval defence and heir to French naval know-how, Naval Group develops innovative solutions to meet the needs of navies. Present throughout the entire life cycle of the ships, the group designs, builds, integrates and maintains submarines and surface ships, as well as their systems and equipment, through to dismantling. It also provides services for shipyards and naval bases. A high-tech company, it builds on its exceptional expertise, its unique design and production resources and its ability to set up strategic partnerships and successful transfers of technology. Attentive to the challenges of corporate social responsibility, Naval Group is a member of the United Nations Global Compact. With operations on five continents, the group has a turnover of 4.3 billion euros and employs 16029 people (full-time equivalents / 2022 data).

ABOUT KNDS:

KNDS (KMW+NEXTER Defense Systems) is the result of the association of Krauss-Maffei Wegmann and Nexter, two of the leading European manufacturers of military land systems based in Germany and France. KNDS forms a Group of around 9,000 employees, with a 2022 turnover of 3.2 billion euro, an order backlog of around 11 billion euro and incoming orders of 3.4 billion euro. The range of its products includes main battle tanks, armored vehicles, artillery systems, weapons systems, ammunition, military bridges, customer services, battle management systems, training solutions, protection solutions and a wide range of equipment. The formation of KNDS represents the beginning of consolidation in land defense systems industry in Europe. The strategic alliance between KMW and Nexter enhances both groups' competitiveness and international positions, as well as their ability to meet the needs of their respective national army. In addition, it offers to its European and NATO customers the opportunity of increased standardization and interoperability for their defense equipment, with a dependable industrial base. KNDS headquarters are based in Amsterdam.

ABOUT GENERAL DIRECTORATE OF ARMAMENTS (DGA):

The General Directorate of Armaments (DGA) is an expert testing and engineering arm of the French Ministry of Defense. The DGA's mission is to equip armies in a sovereign manner, prepare the future of defense systems, promote European cooperation, and support exports. As the State's largest buyer, in 2022, the DGA placed €16 billion of orders with industry and invested €1.1 billion in innovation and defense technology projects. With 18 sites

in France, its 10,200 civilian and military men and women (nearly 62% of whom are managers, engineers or experts) and its network of international collaborators, the DGA is involved in all areas of defense (land, naval and air combat, electronic communication and information systems, deterrence, space, cyber security, robotics, etc.).

ABOUT THE DEFENCE INNOVATION AGENCY (AID):

Placed under the responsibility of the General Directorate of Armaments (DGA), the Defence Innovation Agency (AID) federates the Ministry's innovation initiatives by ensuring the coordination and coherence of all innovation initiatives. While pursuing work on technological innovation over the long term, the Agency is the sensor of opportunity innovations for the benefit of all end users, whatever their field: operations management, equipment, support, operation, administration.