



Press release  
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## **Orange and the CEA launch a world-class joint research laboratory on semantic communications, a major technological breakthrough for networks in the AI era**

- **Named AI-Native Communications**, this joint laboratory will enable the development of semantic communications, a promising technology for the development of future networks that are more efficient and sustainable.
- **By combining their expertise and research efforts**, Orange and CEA, already pioneers in this field, confirm their shared ambition to position France as a leader in future network technologies.

Major players in technological research, Orange and CEA are joining their expertise to lead an ambitious, globally-reaching research program aimed at significantly improving the performance, efficiency, and sustainability of tomorrow's communication networks. The announcement was made at the Orange stand at VivaTech by Christel Heydemann, CEO of Orange, and Anne-Isabelle Etienvre, General Administrator of CEA, in the presence of Anne Le Hénanff, the French Minister Delegate in charge of Artificial Intelligence and Digital.

### **A paradigm shift towards smarter networks**

Current networks transmit data (the "bits") by reproducing them exactly. Any alteration of a bit or a small part of the message is interpreted as an error that degrades communication. The semantic communication envisioned by Orange and CEA introduces a new paradigm that will allow a transmission to be considered correct as soon as the meaning or content of the message is understood by the receiver. And this is the case even if the data received is not perfectly identical to the sent data.

This approach could significantly reduce the volume of exchanged data, leading to more efficient, less energy-consuming networks that require less infrastructure investment. The initiative also opens new perspectives for exchanges between artificial intelligence agents, which are expected to play a central role in future networks.

Through the AI-Native Communications joint laboratory, the partners will pool their expertise to:

- Anticipate network evolutions,
- Develop semantic communication technologies and their most promising applications,
- Design shared semantic representations between AI models,
- Contribute to the emergence of future standards in the field.

These research efforts aim to lay the foundations for networks capable of natively integrating artificial intelligence, while still meeting the needs of use cases that will continue to require accurate and comprehensive data transmission.



### **A joint research laboratory of excellence dedicated to developing future networks**

This five-year partnership is part of a shared ambition for technological sovereignty. By developing inventions intended to become integrated into future standards, Orange and CEA are helping to establish long term mastery of the intelligent communication networks in France and Europe.

CEA teams in Grenoble have been developing internationally recognized expertise in semantic communications for several years, at the interface of artificial intelligence, signal processing, and intelligent networks. Their work is foundational in many projects across France and Europe, notably within the "Future Networks" and "France 6G" programs, as well as through coordination of major projects in Europe and Asia, such as 6G-GOALS, 6G-DISAC, and 6GARROW, and participation with Orange in flagship projects funded by the European Commission, Hexa-X and SUSTAIN-6G on the sustainability of 6G communications.

Orange plays a leading role in the research and standardization of future networks which aims to become more resilient, sustainable, and automated. With nearly 700 researchers and a portfolio of 11,000 active patents, the Group contributes directly to the development of the technological standards that are shaping future networks through several collaborative research projects, notably the European flagship project SUSTAIN-6G, the Hexa-X and Hexa-X-II flagship projects, the NGMN Alliance, and the Global IOWN Forum.

This collaboration strengthens Orange's pioneering position in shaping the standards of tomorrow and aims to produce innovations that could become global references.

*"Through this joint laboratory with CEA, Orange reaffirms its commitment to building the networks of the future: smarter, more sustainable, and natively designed for artificial intelligence. By combining our research capabilities, we are choosing technological sovereignty in order to position France and Europe at the forefront of future global standards. This is a key step in reconciling the performance of our infrastructure with the need to reduce our future carbon footprint," Lyse Brillouet, Executive Vice President of Research at Orange.*

*"Semantic communications represent a major breakthrough in how future networks will process information. By uniting our expertise, we affirm a clear ambition: to enable Europe to design and influence technological standards, thereby strengthening its sustainable capacity to shape intelligent networks in favor of its sovereignty. With our experience, it is with pride and commitment that we put our know-how at the service of one of the sector's leaders in France and Europe," Anne-Isabelle Etienvre, General Administrator of CEA.*

### About Orange

Orange is one of the world's leading telecommunications operators. The Group aims to be the trusted partner for everyday digital life by providing individuals, businesses and communities with reliable connectivity and innovative services. As of the end of 2025, Orange connects 340 million customers (including MasOrange) across 26 countries and generated 40.4 billion euros in revenues. As a trusted player, Orange leverages the excellence of its very high-speed broadband networks to deploy digital infrastructure in Europe, Africa and the Middle East. The Group is a European leader in fiber, with 100 million connectable households, and convergent offers. In France, Orange connects 34 million customers and was ranked No. 1 by the regulator Arcep for the quality of its mobile network for the 15th consecutive year. In Africa and the Middle East, the Group's growth engine, Orange serves nearly 180 million customers and promotes digital and financial inclusion through its connected solutions. Under the Orange Business brand, the Group supports companies in transforming their networks as well as in AI, trusted cloud and cybersecurity. Orange is also a major player in the wholesale market, where it has a leading global telecom infrastructure and significant capabilities for deploying and operating submarine cables. A committed innovator, Orange relies on 700 researchers and holds a portfolio of 11,000 patents.

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### About CEA

The CEA works to ensure the scientific, technological, and industrial sovereignty of France and Europe in four key areas: low-carbon energy, digital technologies, the medicine of the future, and defense and security, based on cutting-edge fundamental research. Learn more at: [www.cea.fr](http://www.cea.fr)

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