

INSIS

Institute for **Engineering**
and **Systems Sciences** (INSIS)



Responding to society's needs

CNRS's Institute for Engineering and Systems Sciences (INSIS) brings together fundamental research, engineering and technology, emphasizing a naturally integrative systems approach stemming from the scientific disciplines encompassed by the Institute. From understanding phenomena to thinking up systems of major technological and societal importance, and from designing such systems to developing basic concepts and technologies, engineering and systems sciences lie at the heart of tomorrow's technologies.

cnrs

www.cnrs.fr

MISSION

INSIS's mission is to promote and coordinate research carried out in engineering and systems sciences, while reinforcing and creating synergies between the various disciplines represented in the Institute:

- Materials and structural mechanics and engineering. Solids mechanics. Acoustics
- Fluid and reactive media: transport, transfer, transform processes
- Micro- and nanoelectronics, Micro- and nanotechnologies, Micro- and nanosystems, Electromagnetism, Electrical engineering, Photonics

Interdisciplinarity lies at the heart of INSIS, both in-house regarding its own disciplines, and with other institutions. In addition, INSIS conducts strategic actions in partnership with industry, other research institutions, and local and regional authorities, and is closely involved in structures such as competitiveness clusters and the Carnot Institutes.



Micro- and nanotechnologies platform: automated oven for the growth and deposition of silicon-based materials.

STRATEGIC PRIORITIES

INSIS focuses on four sectors:

- **the environment**, through the development of clean processes and sustainable materials and structures, the reduction of noise pollution, pollutant emissions and the environmental impact of products, as well as the design of new sensors for environmental monitoring;
- **health engineering and bioengineering**, through research into imaging, micro- and nanosystems applied to the life sciences, tissue engineering, biomechanics and process engineering;
- **communication nanotechnologies and technologies**, with the aim of designing and producing ever smaller and more efficient devices and systems, taking advantage of the properties inherent to their reduced size;
- **energy**, which represents a major challenge for our society. This is an extensive area of research at CNRS. INSIS, CNRS's representative institute within the French National Alliance for the Coordination of Energy Research (ANCRE), concentrates on this field, which involves a large number of its laboratories and Research Federations, such as the Institut Photovoltaïque d'Île-de-France (IPVF), the International Thermonuclear Experimental Reactor (ITER), the Fédération de Recherche sur l'Énergie Solaire (FEDESOL), etc.

EXTENSIVE TEST FACILITIES

To carry out its research, INSIS relies on a number of research and test facilities:

- Supersonic and hypersonic wind tunnels
- Anechoic chambers for acoustics and electromagnetic compatibility (EMC)
- Imaging platforms
- Fire tunnels
- Laser platforms
- Test beds: mechanical test beds, rotating machines, tribology
- Wave basins and towing tanks
- Solar furnaces
- the French National Network of Large Technological Facilities for Basic Technological Research (RENATECH and its 7,000 m² of clean rooms for research into micro- and nanotechnologies)

INTERNATIONAL PRESENCE

Research at INSIS has strong international repercussions, and the Institute is involved in collaborations with more than twenty countries from every continent. These partnerships range from the straightforward exchange of researchers to the setting up and support of international joint units in France and abroad.

Key figures

6 317 researchers and academics (including **1 196** from CNRS), **2 573** engineers and technicians (including **1 107** from CNRS), and **5 933** PhD students and postdoctoral fellows*

125 research and service units and **22** federative research structures*

33 research networks*

5 international joint units, **13** international associated laboratories and **6** international research networks

210 patents filed for the period 2010-2011, **61** ongoing industrial contracts in 2011

*Source: Labintel, 31/12/2011 – processed by CNRS / SAP2S

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