

Institutions and organizations: who does what?

The roles played by various actors quoted in articles in this issue are summarized below.

Bell Laboratories: research unit of the American group **Lucent Technologies**, where the transistor was invented.

Caltech: the California Institute of Technology (Pasadena) is active in nanosciences, and in 2004 created the Kavli Nanoscience Institute.

CNRS (Centre national de la recherche scientifique): nanosciences, nanotechnologies and nanomaterials are one of the priority interdisciplinary research directions of the French National Scientific Research Centre (CNRS), which brings together 4,500 researchers, research-tutors and technical and administration staff, including almost 1,500 doctorate and post-doctorate students working in the field.

European Commission: executive body of the **European Union**. Legislature comes under the joint decision-making power of the **Council of the European Union** and the **European Parliament**, following propositions put forward by the European Commission. The EU's main instrument of R&D is the Framework Programme for Research and Technology Development (**FPRTD**). Nanotechnologies form a priority research area of the 6th FPRTD, which covers several issues ranging from intelligent materials and new production processes to nanoelectronics.

Crolles2 Alliance: a microelectronics research centre shared by the alliance between the Europeans **STMicroelectronics** and Philips Semiconductor and the American Freescale Semiconductor. The state-of-the-art 300 mm silicon wafer pilot line has been designed to integrate future CMOS technologies at 90 nm feature-size or smaller. The CEA-Leti, already involved in Crolles1 along with STMicroelectronics, has provided support by expanding its research capacity at the Grenoble CEA centre to create **Nanotec 300**.

DOE (Department of Energy): US Ministry of Energy, running national laboratories such as the **Sandia National Laboratory**.

Inserm (Institut national de la santé et de la recherche médicale): the French National Institute of Health and Medical Research, a public research organization with a 5,000-strong staff, including 2,200 researchers and engineers, counts therapeutic research, particularly biomedical engineering, as one of its three priority targets.

Intel: world leader in semiconductors, reaching a turnover of \$34.2B in 2004.

MEDEA+: pan-European programme for R&D in microelectronics (system innovation on silicon) led as part of the Eurêka project.

Minatec: Europe's first innovation and expertise cluster in micro- and nanotechnology was created in 2002, based on a joint CEA-INPG (Institut national polytechnique de Grenoble) venture, in partnership with French government, the Rhône-Alpes regional council⁽¹⁾, the Isère Department Council, the Grenoble-Alpes-Métropole and Grenoble Urban Area Council, and the French Consignments and Loans fund. Based around the CEA-Leti, Minatec is to draw in research, education and industry to form a 45,000 m² centre of excellence set to support 4,000 research staff and host new start-ups, as well as industry-sponsored pilot-lines. It has attracted €170M in funding, including €32M from the CEA itself. In 2003, the CEA, **STMicroelectronics** and France Télécom also launched the Minatec Idea's Lab, a joint multidisciplinary platform conducting research into new physical devices that intercommunicate, and new micro- and nanotechnology applications.

MIT: around a dozen departments of the Massachusetts Institute of Technology (Cambridge, MA) are working with nanotechnologies.

Nanobio: multidisciplinary and multi-site nanobiotechnology innovation centre. Instigated by a joint CEA Grenoble-Joseph Fourier university initiative and funded by the Grenoble-Alpes-Métropole and Grenoble Urban Area Council, and Isère General Council and the Rhône-Alpes Regional Council, the Nanobio project works in synergy with **Minatec**, and represents €46.4M in investment.

Nano2Life: first **EC**-recognized excellence cluster in nanobiotechnologies supported as part of FPRTD6. Launched in 2004 and run by CEA Grenoble, Nano2Life draws on a skills base of 200 researchers and engineers and 23 institutions, including the CEA, **CNRS**, the **Inserm**, the Fraunhofer Institute, the Lausanne Federal Institute of Technology (École polytechnique fédérale de Lausanne), Lund, Munster and Newcastle universities, among others, plus twenty-odd industry leaders and start-ups (including IBM, BASF, Apibio – a biochips specialist created by bioMérieux and CEA Valorisation -, Protein Expert, and others).

OMNT: the Observatory for Micro- and Nanotechnologies created by a joint CEA-**CNRS** initiative coordinates a network 180 experts operating a strategic watch.

R3N: The French Research Network in Nanosciences and Nanotechnologies set up by the French Ministry of Research as a core element of the French National Research Agency (ANR)⁽²⁾ programme offering €70M in incentives for innovation funding in 2005. Its main missions are to fund scientific and technological platforms and top-class projects both upstream and downstream, and to network public research laboratories with the major private research centres and pioneering SMEs. It has issued calls for project proposals in nanobiosciences, nanomaterials and nanoelectronic components. It will also supervise discussions on ethical and health-related issues and link up with European initiatives by contributing to the Eranet NanoSciERA and Eranet MNT project network funded by the **European Commission**. Oseo-Anvar (support to innovative SMEs and business start-up support in growth sectors) is already a stakeholder. Launched in 1999, the French Research Network in Micro- and Nanotechnologies (**RMNT**) - "precursor" of the R3N - has labeled 59 projects mobilizing over 1,000 engineers per year and €200M in investment, of which 25% comes from state funding.

Rosendorf: the German Forschungszentrum Rosendorf (FZR) research centre is engaged in application-oriented basic research in structure of matter, life sciences and the environment.

Silicon BioSystems: a start-up founded by the department of Microelectronics at Bologna University, Italy.

SME: SNPE Energetic materials (a subsidiary of the SNPE Group) manufactures propellants and pyromechanical devices as well as powders and explosives for military applications.

Soitec: spin-off company created in 1992 by two researchers, André-Jacques Auberton-Hervé and Jean-Michel Lamure from the CEA-Leti, to exploit and develop the *SmartCut*TM molecular bonding process invented at the Leti by Michel Bruel for producing silicon-on-insulator (SOI) wafers designed for the semiconductor industry.

STMicroelectronics: a global leader in semiconductor solutions with a turnover of \$8.76B, of which 17% is ploughed back into R&D, and strongly supported by the CEA-Leti, particularly through the implementation of bilateral agreements (concluded in 2004) with the three stakeholders of the **Crolles2 Alliance**. The Group holds 65% of its stock, the remainder being held by the Italian Finmeccanica and a French consortium including Areva and France Télécom.

Tracit Technologies: a spin-off from CEA-Leti created in 2003 and specializing in thin layer transfer by molecular bonding and mechanical and/or chemical thinning down.

(1) On 12 July 2005, the French Government selected the **Minalogic** project (micro- and nanotechnologies; integration of hardware/software) for the Rhône-Alpes Region, in which the CEA is heavily involved, as a "competitive cluster" given "world strategic project" status.

(2) The National Research Agency (ANR), through the ANR economic interest group set up in February 2005, selected the CEA as a "support" organization for deploying the "Nanoscience and Nanotechnology" programme.