



## KEY TECHNOLOGIES

### New metallic, Ceramic, Polymer and Composite Materials: Characterisation, Behaviour and Processing

Controlling materials has become a major challenge for the manufacture and processing of products. The Basse Normandie Scientific Teams have special skills and expertise in the following fields:

- ▶ Polymers and composites
- ▶ Metallic and ceramic materials
- ▶ Processing plastics
- ▶ Materials for electronic components
- ▶ Catalysis

#### THE TEAMS

They are broken down into

▶ One, a scientific team, headed by Professor Raveau, based mainly Caen and working at 5 laboratories with 200 people. All the scientists are organised within a 'Materials' *Centre National de Recherche Technologique* (CNRT *Matériaux*, national centre for technological research) boasting four areas of skills and expertise:

- . Materials for electronics
- . Catalytic materials
- . Polymer materials

▶ A technology centre at Alençon organised around the Institut Supérieur de Plasturgie d'Alençon (ISPA, the Alençon higher institute of plastic processing) with 12 people



#### SPECIAL EQUIPMENT

A complementary range of equipment for image acquisition in a small space enables a comprehensive approach to materials:

- . TEM, transmission electron microscopy (5 apparatuses)
  - . X-rays
  - . MRI
  - . rays Gamma camera
  - . Positron emission tomographer
  - . Scanning electron microscope (3 apparatuses)
  - . Atomic Force Microscope (AFM)
  - . Confocal microscope
  - . Dilatometer (ADAMEL)
  - . Porosity tester (MICROMETRIX)
  - . Granulometer (MALVERN)
  - . Measuring chain of electric properties in an air-conditioned chamber
- And processing equipment
- . Substrates for wafer deposit using cathode sputtering (3 machines)
  - . Sintering furnaces (7 including 4 CA sintering furnaces)
  - . Uniaxial pressurised sintering furnace
  - . Mixing and grinding equipment (4 machines)

## METHODS, SKILLS AND EXPERTISE

Activities focus on three fields:

▶ Research and development of new materials with special magnetic and electric properties, and their processing. This research relies on three technologies:

- . High temperature synthesis
- . Ceramic sintering (standard sintering and microwave technology)
- . Development of wafers (cathode sputtering, laser ablation, molecular beam epitaxy)

▶ Study of nanostructures for nanotechnologies (with a focus on electronic nanotechnologies) using high-resolution electronic microscopy

▶ Catalysis technologies

▶ Study of polymers and applying the research to polymer processing

## CONTACTS

*For general technological or scientific information*

■ **M. Bernard RAVEAU (Director)**  
**ISMRA - CRISMAT**  
email : [bernard.raveau@ismra.fr](mailto:bernard.raveau@ismra.fr)

Phone: **33 (0)2 31 45 26 16**  
Fax: 33 (0)2 31 95 16 00

*For economic or industrial information*

■ **Normandie Développement**  
57 Avenue de Bretagne - BP 1083  
76173 ROUEN CEDEX 1 FRANCE

Phone: **33 (0)2 35 03 06 04**  
Fax: 33 (0)2 35 03 07 86  
email: [ndrouen@normandydev.com](mailto:ndrouen@normandydev.com)

■ *For international contact*

**AFII (Agence Française pour les Investissements Internationaux) - [www.afii.fr](http://www.afii.fr)**

### For further information:

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## SPECIAL FUNDING

The activities pertaining to the different topics are eligible for Appels à Projet de Recherche Appliquée (requests for proposals in applied research) for projects partnering companies and public research laboratories.

## SUPPORT TO BUSINESS SET-UP PROJECTS IN BASSE-NORMANDIE

The Basse Normandie Region has rolled out all its resources to support business projects in the following areas:

- ▶ General funding
- ▶ Business project support
- ▶ Training programs
- ▶ Corporate user services at operations site
- ▶ Technology transfer to companies: [www.gravir.org](http://www.gravir.org) and [www.ismra.fr](http://www.ismra.fr) and [www.ispa.fr](http://www.ispa.fr)