

# *Institut Carnot*

## *Centre Interuniversitaire de Recherche et d'Ingénierie des Matériaux*



The CIRIMAT was created in 1999 by the merging of three laboratories. This multidisciplinary unit gathers chemists, physicists, crystallographers, metallurgists and polymerists, therefore leading research projects expanding from the conception of materials to the study of their behavior in use.

Several steps are investigated: elaboration, characterization, modeling, as well as optimization of the properties and durability of the materials, and multi-scale approaches in view of industrial development. With the support of the University of Toulouse (by way of the UPS and INPT) and that of CNRS, the CIRIMAT deals with a variety of research themes (both fundamental and applied), and is strongly oriented towards industrial needs, especially via regional, national and European research programs.

The CIRIMAT was labeled "**Carnot Institute**" in 2006 as a national acknowledgement of the quality of its partenarial research

### *Research themes*

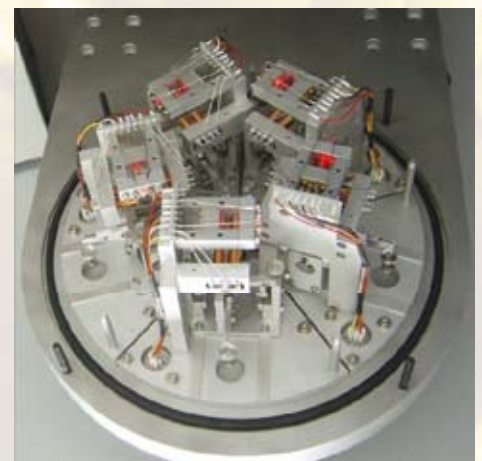
Design, modelling, elaboration, shaping, physical properties in use, durability of materials  
Powders, nanomaterials, nanocomposites,  
Multifunctional layers, protective coatings, surface treatment,  
Microstructure-mechanics coupling under rigorous environment,  
Physics of polymers and organic composites materials,  
Biomaterials, nanoparticles for biomedical applications, galenic formulations

## *Key points of the CIRIMAT Carnot Institute*

A range of skills in Science and Engineering of materials, more specifically in chemistry of materials (elaboration, reactivity), a multidisciplinary culture, a potential of training through research, an opening towards various socio-economical sectors, in interaction with the other Carnot institutes (micro- and nano-electronics, mechanics, materials for energy and environment and health nanobiotechnologies...).

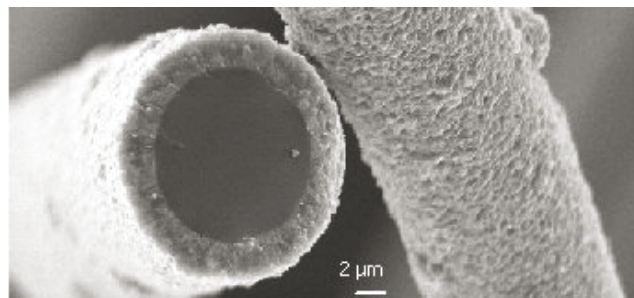
### *Trajectory and perspectives :*

Gathering of "materials engineering" facilities and personal.  
Creation of the CIRIMAT in 1999 to develop new materials and processes to answer the needs of varying targeted markets.  
Development of research activities, in particular in adequacy with the French competitiveness clusters "Aeronautics, Space and Embarked Systems" and "Cancer-Bio-Health".  
Development of advanced research networks such as « Sciences and technologies for aeronautics and space » and « biomaterials, bone and teeth ».



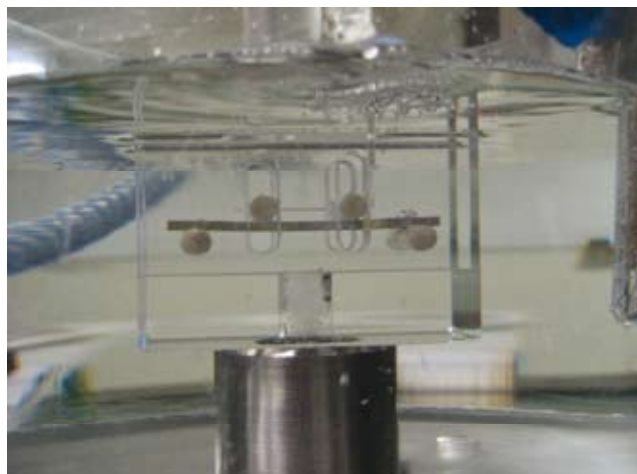
## 8 Research groups

- \* **SURF** Surfaces, reactivity, protection
- \* **MEMO** Mechanics, microstructure, oxidation, corrosion
- \* **PPB** Phosphates, pharmacotechnics, biomaterials
- \* **NNC** Nanocomposites and carbon nanotubes
- \* **OVM** Mixed valence oxides
- \* **RTS** Coatings and surface treatments
- \* **LCSC** Behavior of complex systems
- \* **PSP** Properties and structure in polymers



## Repartition of the applied research activity in 2005 :

- \* **Transport** (aeronautics, spatial, terrestrial): 24%
- \* **Chemistry/Metallurgy** (new materials): 23%
- \* **Health (nano)technologies**: 22%
- \* **Energy** (storage and conversion, nuclear): 11%
- \* **Electronics** : 5%
- \* **Environment** (corrosion, supported catalysts): 5%
- \* **Others** (buildings, optics...): 10%



## Key figures :

**Permanent Staff** : 80 (full-time equivalent)  
**PhD students, postdocs** : 65  
**Budget** : ~5.650 K Euros  
**Contractual incomes** : 2.450 K Euros  
**Industrial partners** : 17% SME  
83 % large groups

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