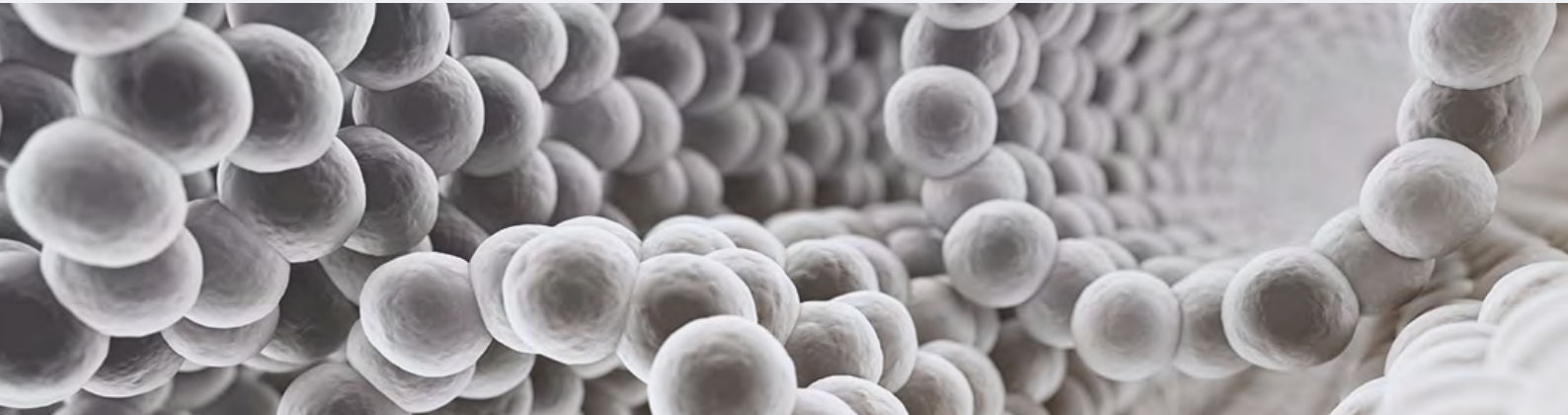


High Performance Materials



Developing innovative materials offering a better performance is a major issue for many industries. With their extensive experience in applied research and R&D partnerships, the Chimie Balard Cirimat Carnot Institute teams develop new processes for the synthesis and shaping of high value-added materials.



Research skills and areas:

- ▶ Metallurgical processes
- ▶ Alloys
- ▶ Oxides
- ▶ Thick and thin films
- ▶ Protective and functional coatings
- ▶ Nano-composites
- ▶ Carbon-based materials: graphene, nanotubes
- ▶ Nanostructured interfaces
- ▶ Polymers
- ▶ Bulk ceramics and powders
- ▶ Resistance to oxidation and corrosion, high temperatures, mechanical stress
- ▶ Magnetism and giant permittivity
- ▶ Studies of toxicity and environmental impact
- ▶ Physico-chemistry of interfaces and colloids
- ▶ Spark Plasma Sintering, additive manufacturing

Targeted industries

- Food industry
- Automotive industry
- Aeronautics
- Defence
- Energy
- Environment
- Railway
- Horology, jewellery
- Health - Pharmacy
- Fashion and luxury
- Biotechnology



Services we offer

- Patents/Licenses
- Studies and Engineering
- Technology Platforms
- Advising
- Technical Services



Industrial innovations and projects:

- ▶ Fabrication of hollow fibres
- ▶ Fabrication of reinforced conducting wires
- ▶ Fabrication of ceramic or metallic nanocomposites with nanocarbon reinforcement
- ▶ Shaping of high performance materials by SPS
- ▶ Synthesis and functionalisation of nanocarbon materials (nanotubes and graphene)
- ▶ Auto-repairing and stimuable membranes (pH, magnetic field)
- ▶ Development of porous thermal barriers with very high stability during thermal cycling
- ▶ Smart TBCs: doped with rare earths in the coatings, acting as thermal markers
- ▶ Coatings that limit the degradation of turbines by atmospheric pollutants
- ▶ Replacement of chromate-based processes for the corrosion protection of metal alloys
- ▶ Lubricating composite coatings based on nanoparticles of talc or carbon compounds

Our partners

Safran Ceramics • Safran Aircraft Engines • Arkema •
Véolia • Schneider Electric • Pall • Air Liquide • GE Power

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