

Main Research topics

- Ceramic processes
- Surface treatment processes
- Multi-scale structural organisation of materials

Equipment/ Technical resources

- CVD and microwave PECVD reactors
- Pulsed laser deposition (PLD) equipment
- thermal plasma spraying set up in air and under controlled atmosphere and pressure
- Hot pressing (1800°C), and hot isostatic pressing
- Synthesis of powders by spray pyrolysis
- Equipments for shaping
- Plasma diagnostics by mass
- Particles diagnostic set up in flight in a plasma jet or during their impact and flattening on substrate
- Liquid diagnostic set up in a plasma jet or in a flame (shadowgraphy)
- Capillary and rotating rheometry
- XPS
- Scanning electron microscopy and chemical analysis (EDX) + FESEM equipped with a cryogenic cell
- High resolution transmission microscopy (200 kV) and chemical analysis (EDX)

Industrial applications

Field of energy (Common laboratory, CEA), Syngas production (Common laboratory Air Liquide), Space propulsion, Biomaterials (implant, prothesis), Metallurgy (specific refractory materials), Optic, Glaze layers manufactured by a thermal spray route for environmental barriers, DLC layers manufactured by a vapor deposition route for tribological layers, Thermal barrier coatings manufactured by a thermal spray route.

Benefits : cadvice / training

Sectors of application: Materials, chemistry, electronics, telecommunications, energy, environment, TIC, mechanics, health, transportation, optics

Key words :

Ceramics, Materials, Solid chemistry, Cristalochimie, Ceramic processes, Surface treatments (plasma, flame, CVD, laser ablation ...), Nanostructured materials and coatings, Material with controlled microstructure and architecture, Materials with controlled porosity, High temperature materials Biomaterials, Materials for energy and environment, Materials for technologies of information and communication (TIC), Modelling

Head:

Thierry Chartier thierry.chartier@unilim.fr

Main collaborations with universities

Current national university collaboration:

| UPR 2949, Néel Institute, Grenoble | UPR 3079, CEMHTI, Orleans | UPR 9048, ICMCB, Bordeaux | UMR 5085, CIRIMAT, Toulouse | UMR 5615, LMI, Villeurbanne | UMR 6172, XLIM | UMR 6595, IUSTI, Marseille | UMR 6630, PHYMAT, Poitiers | UMR 7647, LPICM, Palaiseau | UMR 8578, LPGP, Orsay |

Current international university collaboration:

| University of Sherbrooke (Canada) | University of Genoa (Italy) | Nagoya Institute of Technology, Nagoya (Japan) | Jozef Stefan Institute (Slovenia) | Laurence Berkeley National Laboratory (USA) | Academy of Sciences, Institute of Plasma Physics, Prague (Czech Republic) |

Partnerships with companies

National:

| _ALCAN LRF + CRV | L'AIR LIQUIDE | BERNARDAUD | BODYCOTE | CERADROP | CILAS | EADS/ASTRIUM | IMERYS | LEGRAND | PECHINEY | PHOTONIS | SOREVI | THALES/DGA | HEF | CNES |

Shared research laboratory with a private enterprise

| LRC CEA | LC Air Liquide |

Key figures

FP6 NMP - NoE - FAME " Functionalised advanced materials engineering of hybrids and ceramics"