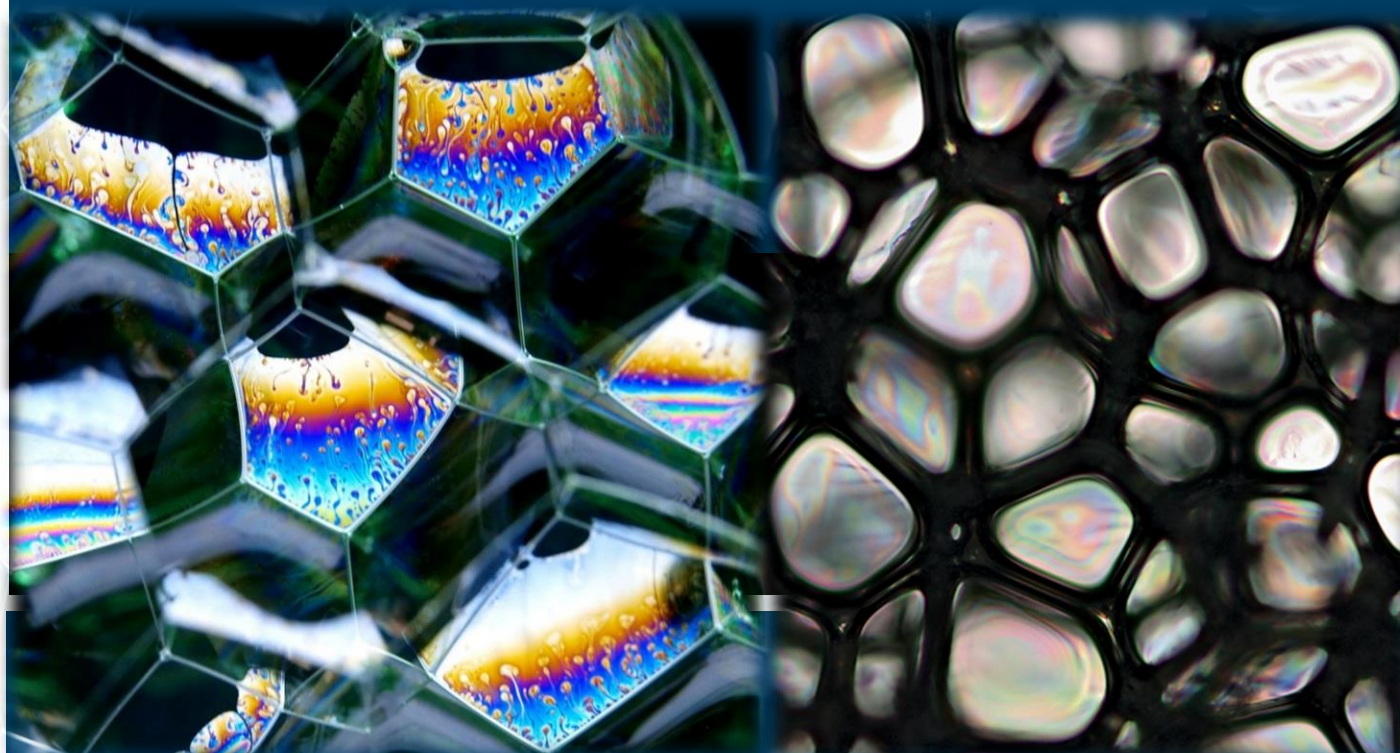
De la surface liquide aux surfaces solides : stratégie de recherche sur la structure et les propriétés des matériaux polymères alvéolaires



CONTROLLING SOLID FOAM PROPERTIES

MATERIAL OF WHICH THE FOAM IS MADE

FOAM DENSITY & MATERIAL DISTRIBUTION

PROPERTIES OF SOLID FOAM

CELL TOPOLOGY & GEOMETRY

CELL CONNECTIVITY (OPEN- OR CLOSED-CELL FOAM)

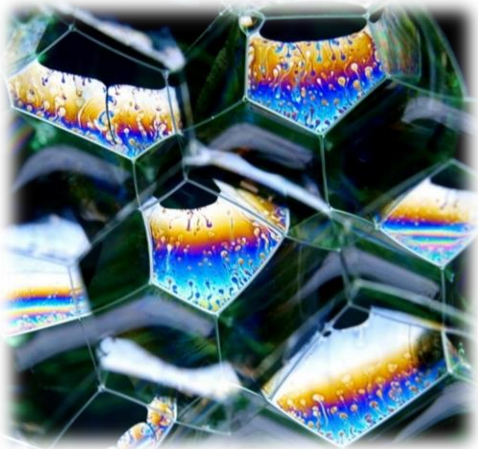
CONTROLLED IN THE LIQUID STATE (and during solidification)

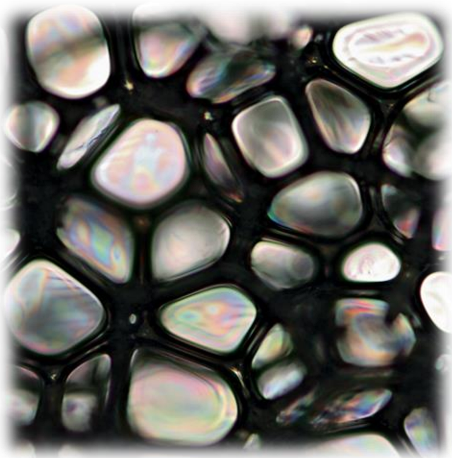
BRIDGING LIQUID AND SOLID TWO-PHASE MATERIALS

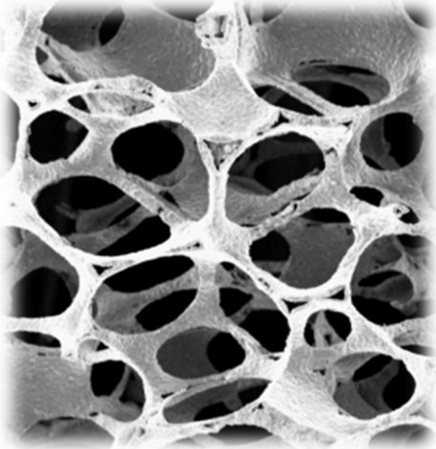
SOLIDIFICATION

LIQUID
TWO-PHASE TEMPLATE
gas/liquid; liquid/liquid

SOLID
TWO-PHASE MATERIAL
gas/solid; liquid/solid; solid/solid







SCALE: 0.1 – 1 mm

TEMPLATE CONTROL

STRUCTURE/PROPERTY RELATIONS

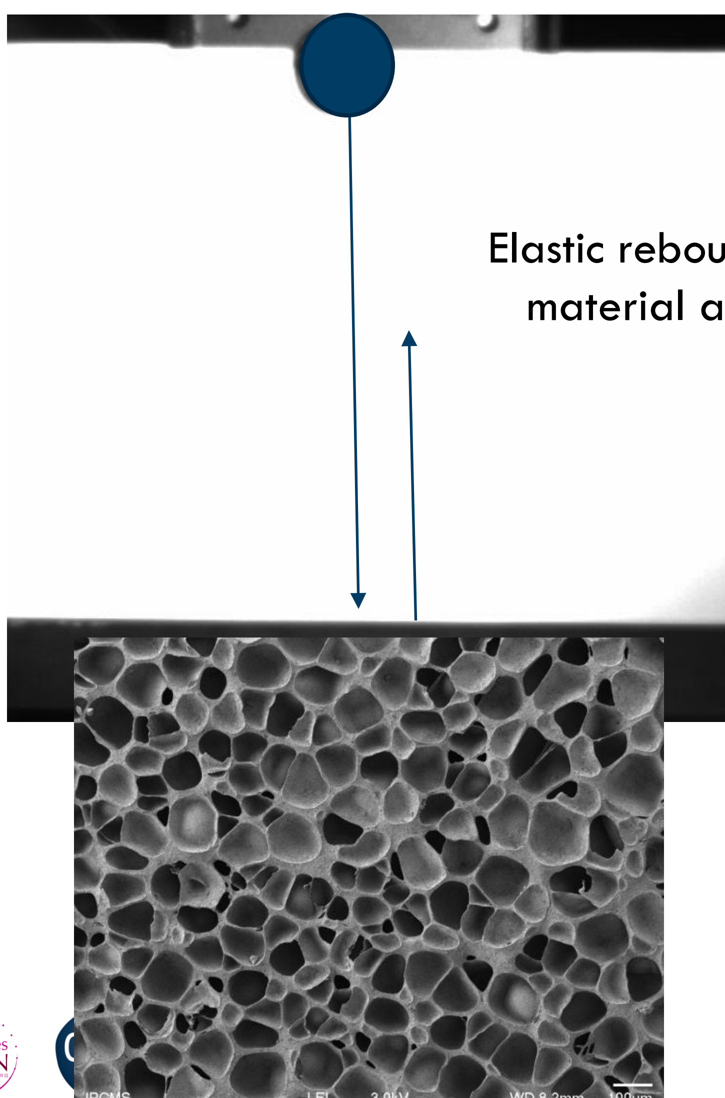
FEEDBACK

FOCUS: POLYMER-BASED MATERIALS

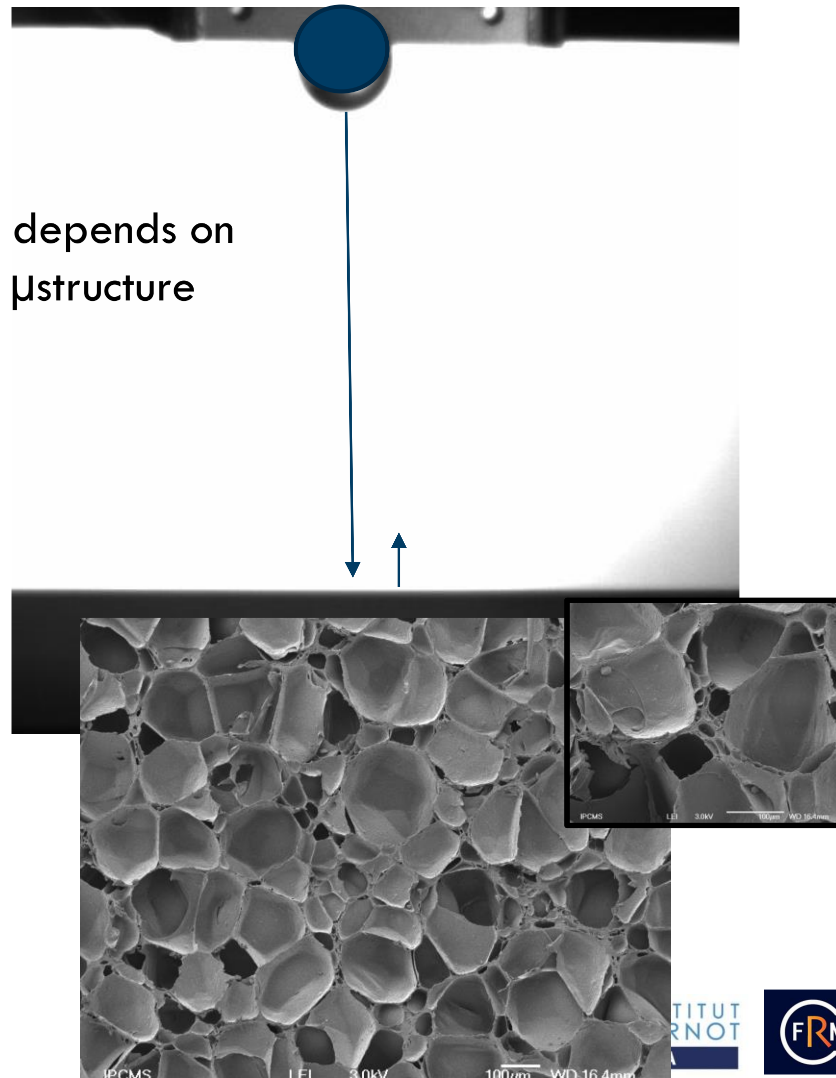
EXAMPLES OF FOAM-RELATED ACTIVITIES

LINKS BETWEEN STRUCTURE, MATTER AND PROPERTIES

≈ 15 cm



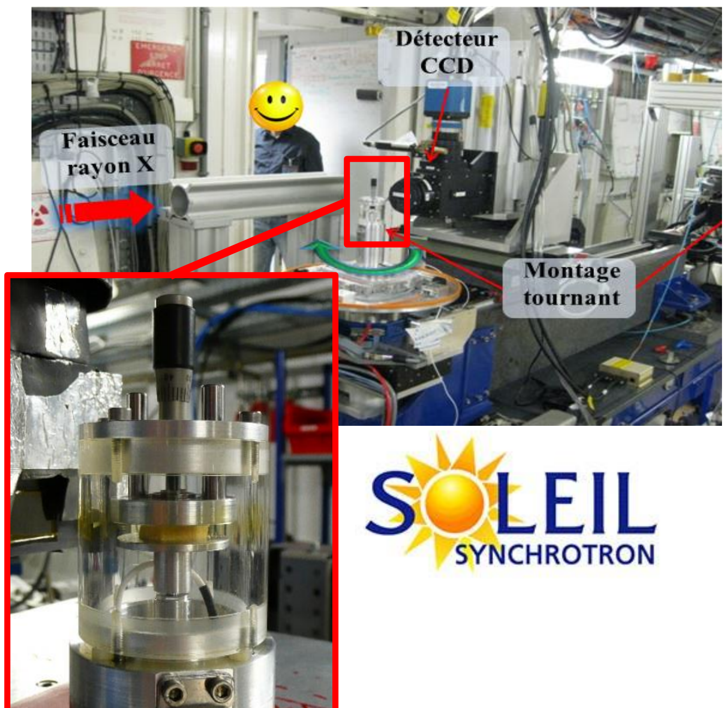
Elastic rebound depends on material and µstructure



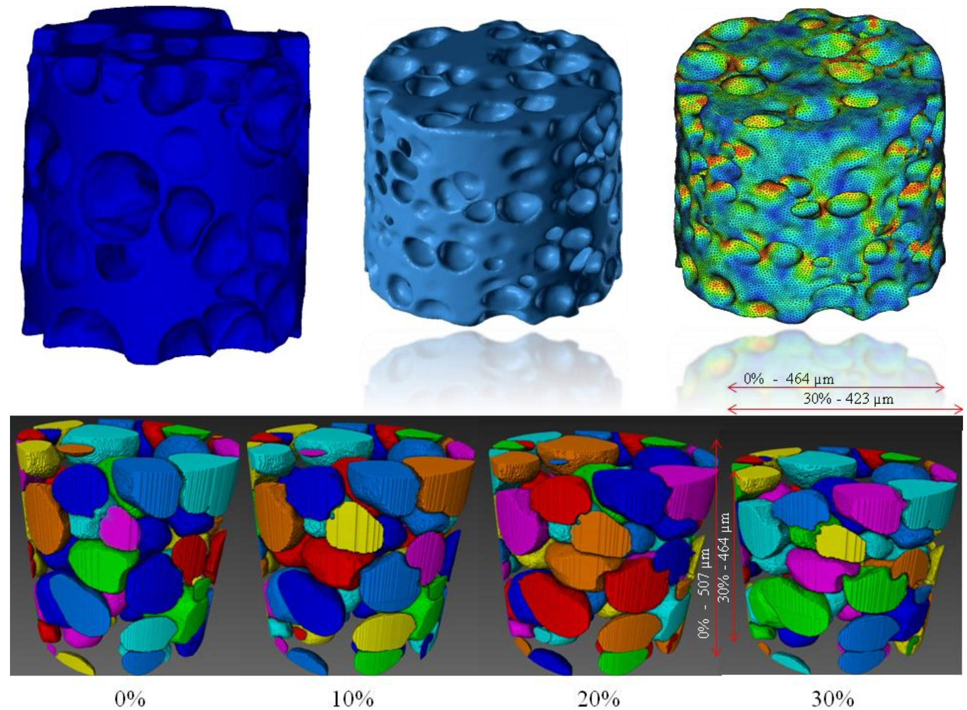
EXAMPLES OF FOAM-RELATED ACTIVITIES

IN-SITU TOMOGRAPHY

PLATFORM MICASOL + FUTURE TOMOGRAPH AT ICS



SOLEIL SYNCHROTRON

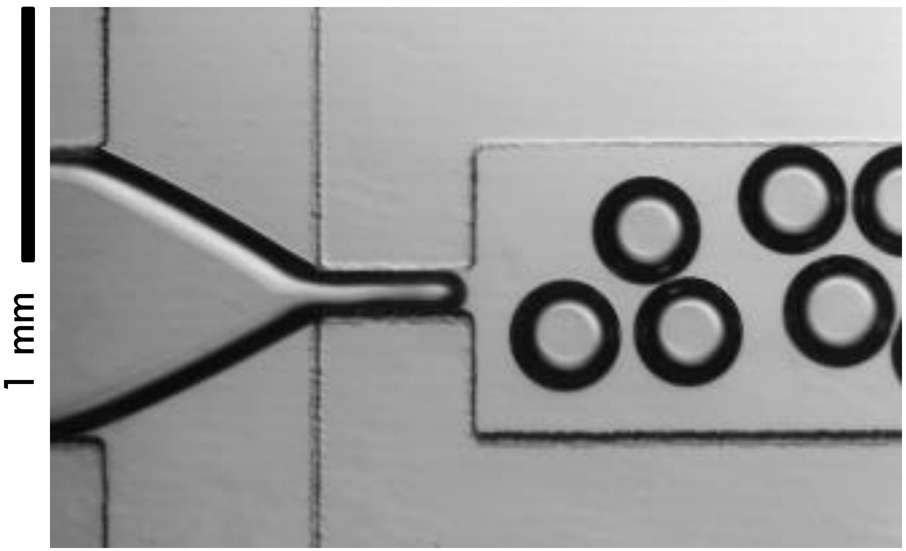


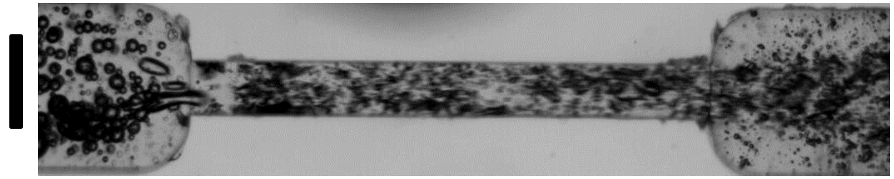
EXAMPLES OF FOAM-RELATED ACTIVITIES

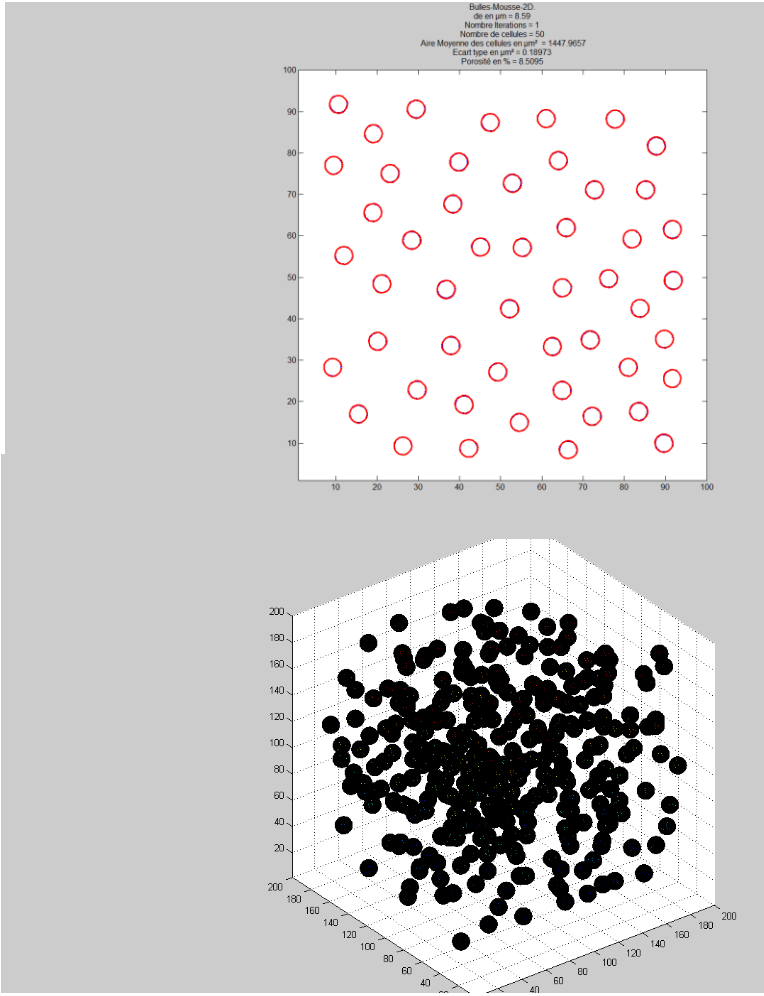
FOAM FORMATION

- Physical AND chemical foaming
  (techniques and mechanisms)
- Experiments AND simulation

1 mm

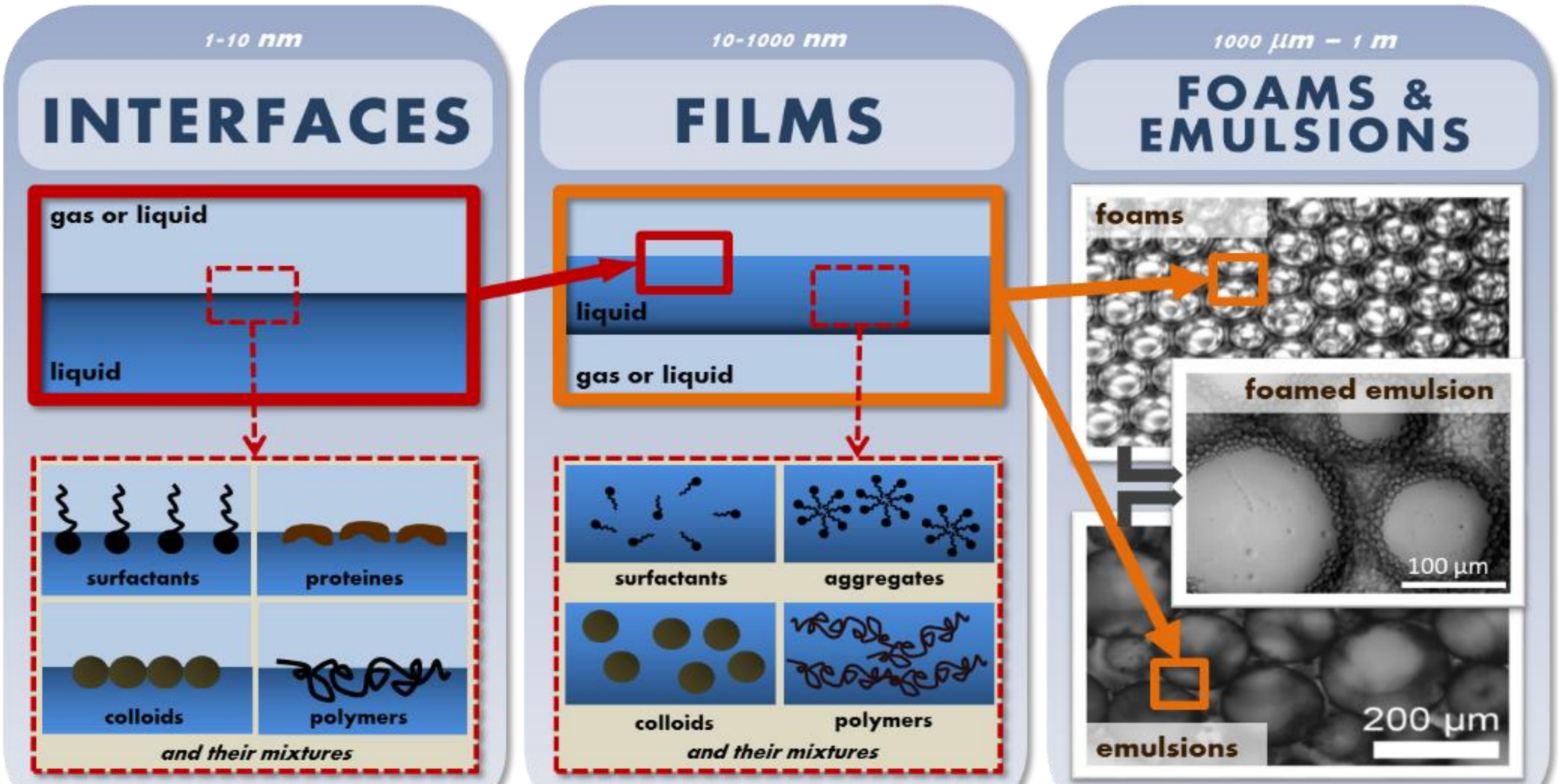






EXAMPLES OF FOAM-RELATED ACTIVITIES

- FOAM STABILITY – LINKING THREE LENGTH SCALES

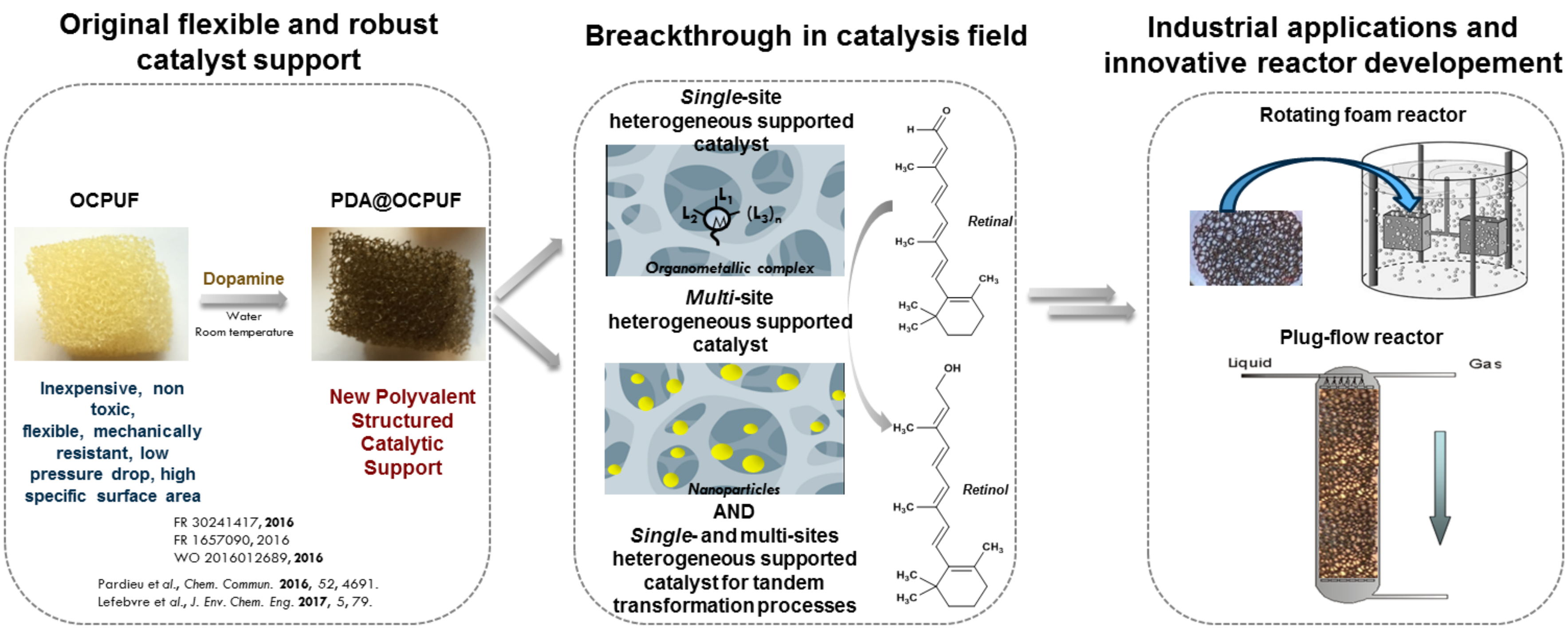


+ *phospholipids*

EXAMPLES OF FOAM-RELATED ACTIVITIES

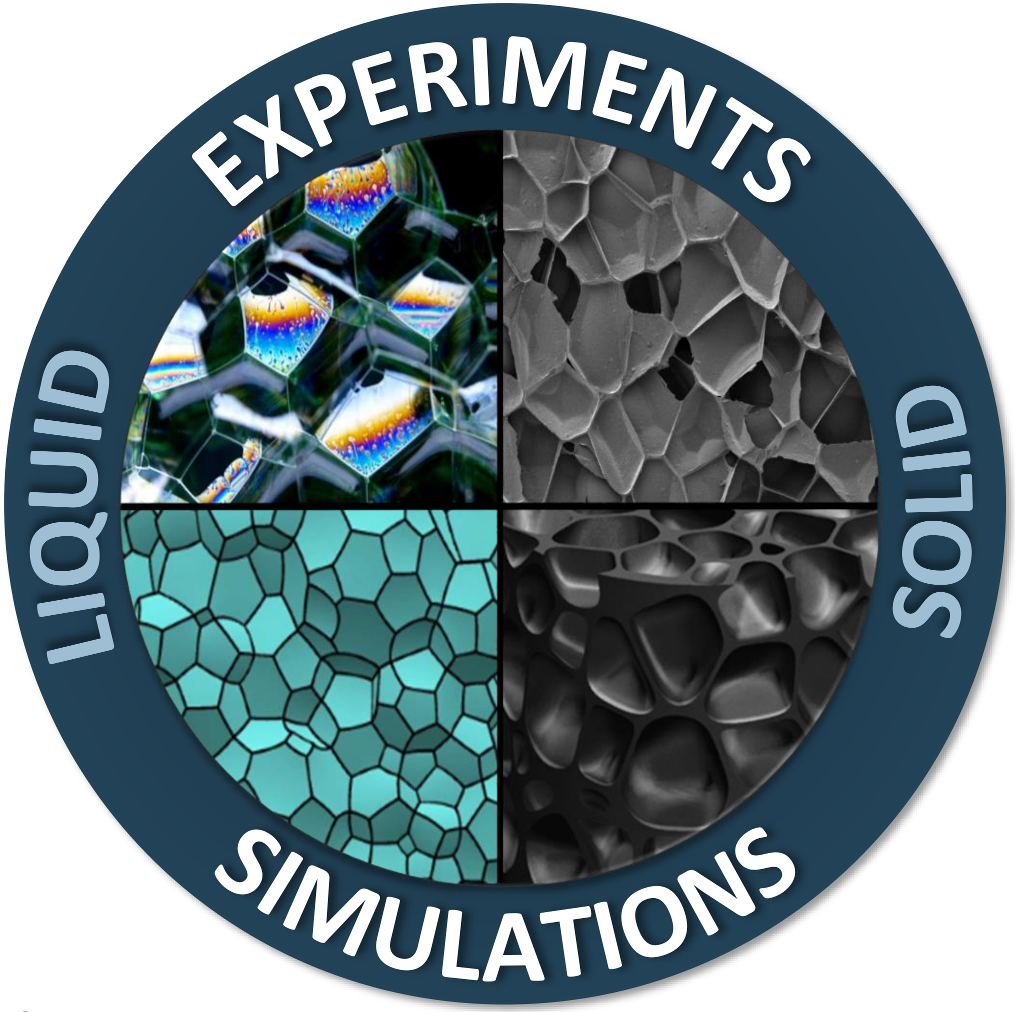
CONTROLLED SURFACE MODIFICATION

Example: (photo)catalysis



Current collaboration with three industrial partners through pre-maturation project from SATT-Alsace

OUR PHILOSPHY



INVOLVED PERMANENT RESEARCHERS & ENG.


C. Gauthier
Foam mechanics, contact creep


T. Roland
Foam mechanics, tomography


P. Kekicheff
Tomography, thin films


W. Drenckhan
Interfaces, thin films, foams & emulsions


H. Pelletier
Hybrid foams


M. Bouquey
Formulation, dispersions & hybrid foams


F. Schosseler
Interfaces, Nanoemulsions


C. Serra
Microfluidics, Drop & Emulsion processing


F. Boulmedais
Interfaces


L. Jerry
Foams for catalysis


M.-P. Krafft
Microbubbles, Lipids at Interfaces


D. Favier


R. Bollache

INSTRUMENTATION


L. Jacomine


M. Brender

CHARACTERISATION

+ about 15 non-permanent staff

Institut Charles Sadron CNRS · UdS · Strasbourg
CNRS
Université de Strasbourg
Institut Carnot MICA
FRMNA

INDUSTRIAL and ACADEMICS PROJECTS

SAINT-GOBAIN

Teclis Scientific

KNAUF

PROTiP MEDICAL

FOAMPARTNER

INTEREP CLOSED CELL RUBBER SOLUTIONS

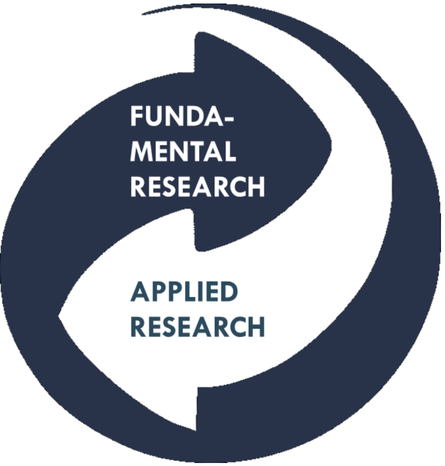
L&L Products

EVONIK INDUSTRIES

Gerflor theflooringroup

En discussion:

LABORATOIRES URGO



USIAS University of Strasbourg Institute for Advanced Study

ANR PROJET FINANCÉ PAR L'ANR - PROJECT FUNDED BY THE ANR

INVESTISSEMENTS D'AVENIR

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