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## Team : Solid State Chemistry of F-based compounds

### 3 research topics :

- Synthesis, crystal structure and chemical-physical properties
- Reactivity and electronic properties
- UV-Visible-NIR absorption properties

**Keywords :** inorganic synthesis, direct F<sub>2</sub> fluorination, thermal analysis under F<sub>2</sub>, hydrothermal, solvothermal, microwave, nanostructured F-based materials, crystal structure,

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## Title : Fluoride materials, reactivity and optical properties

*Method: Microwave-assisted solvothermal synthesis, F<sub>2</sub>, HF fluorination (up to 10 bars and T=600° C), Radio-frequency Plasma fluorination (CF<sub>4</sub>, C<sub>4</sub>F<sub>8</sub>, ...), TGA coupled MS and FTIR under elemental fluorine F<sub>2</sub>, Autoclave for 500g synthesis (scale-up) and furnace under vacuum or Ar (T<500° C)*

*Collaborations : IMMM, Le Mans, PHENIX, Paris, Kageyama Lab, Kyoto University, JP, SOLVAY Gmbh FLUOR, Hannover, DE*

- TOPICS** :
- Synthesis and structural features of mixed anions compounds (F, O, H, S, ...)
  - Synthesis and characterization of nanostructured fluorides
  - Surface treatment of materials using fluorinated plasma and gas phase
  - Reactivity of fluorides under elemental fluorine (generation of F<sub>2</sub> and chemical storage)
    - Thermal stability of inorganic fluorides
    - Following the thermal events during the synthesis of inorganic fluorides
    - Fluoride materials for nuclear industry
    - Fluoride materials for batteries
    - Fluoride materials as UV-Visible-NIR pigments, luminescence and photovoltaics
    - Fluoride materials for heterogeneous catalysis