The AFC crystal growth transverse axis is led by the French Committee for Crystal Growth (CFCC, *Comité Français de Croissance Cristalline*). It is composed of crystal growth related professional networks representatives and of two members of the AFC board of directors. The CFCC elects its chairman every two years (2018-2020: Matias Velazquez), and its current members are:

- Romain Grossier (CRISTAL) and François Puel (CRISTAL and IOCG),
- Philippe Guionneau and Pierre Bordet (AFC Board of Directors),
- Yann Le Godec and François Baudelet (High-pressures network),
- Monika Spano and Françoise Bonneté (IOBCr),
- Philippe Veber and Valérie Dupray (CRISTECH network),
- Matias Velazquez and Bertrand Ménaert (CMDO$^+$ network),
- Mathis Plapp and Silvère Akamatsu (GDR SAM),
- Jean-Noël Aqua (GDR PULSE),
- Wilfrid Prellier (GDR OXYFUN and RECITAL network).

- "CRISTAL" is the french community focused on the research in industrial crystallization and precipitation: http://www.colloque-cristal.fr/
- "High-pressures network" is the CNRS network (60 laboratories, 280 members) dedicated to high pressures: http://www.reseauhp.org/
- "IOBCr" is the International Organization for Biological Crystallization (20 laboratories): http://www.iobcr.org/
- "CRISTECH network" is the CNRS network (40 laboratories, 300 members) for crystal growth and crystallization: http://cristech.cnrs.fr/
- "CMDO$^+$ network" is the CNRS network (40 laboratories, 320 members) for Optical crystals, micro- and nanostructures, and devices: http://cmdo.cnrs.fr/
- The "GDR PULSE" (Ultimate processes of semiconductors' epitaxy) is a CNRS research consortium (30 laboratories, 250 members) gathering the experts of basic mechanisms driving epitaxial growth, its new topics and emerging technologies, as well as the properties and applications of epitaxial systems: http://www2.im2np.fr/GDR_CNRS_Pulse/index.html
- The "GDR SAM" (Solidification of metallic alloys) is the CNRS research consortium (22 laboratories, 87 members) dedicated to the science of solidification: http://solidification.cnrs.fr/
- The "GDR OXYFUN" (Functional oxides: from materials to devices) is the CNRS research consortium (54 laboratories, 460 members) that focuses on transition

metal oxides thin films and superlattices growth and characterizations and their implementation in devices: http://inl.cnrs.fr/gdr-oxyfun/index.php/fr/

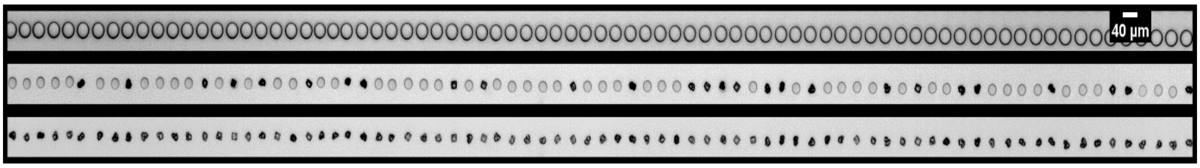
- The "RECITAL network" (Network for the growth and instrumentation in laser ablation) is a regional network (20 laboratories, 40 members) for users of the pulsed laser deposition technique and related instrumentation applied to thin films crystal growth: https://www.u-picardie.fr/recital/

Within the AFC crystal growth transverse axis, the goals of the CFCC are to:

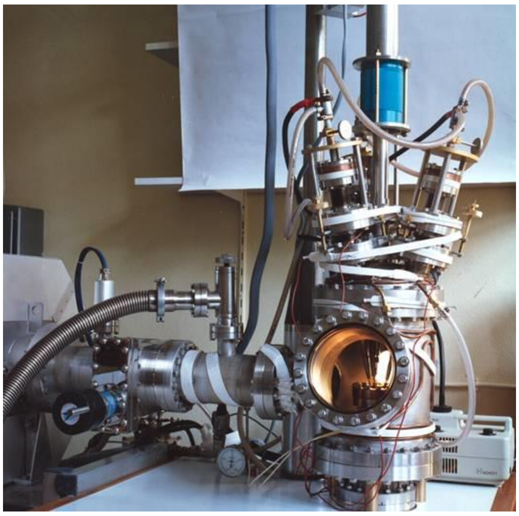
- ensure national and international visibilities of the French crystal growth communities and networks, both in national and international scientific institutions such as the International Organization for Crystal Growth (http://www.iocg.org/), the European Network of Crystal Growth (http://www.encg.info/), the International Union of Crystallography (https://www.iucr.org/iucr) and its commission on Crystal Growth and Characterization of Materials (https://www.iucr.org/iucr/commissions/crystal-growth);
- organize national or international scientific events, and coordinate many initiatives (workshops, schools, national training actions, topical days, etc.), in the realm of crystal growth and related characterizations.

The AFC crystal growth transverse axis not only encompasses bulk crystal growth activities but also includes many more scientific and technological branches such as:

- Fundamentals of nucleation and crystal growth: theory, modeling and experiments designed to learn the fundamental aspects of nucleation and crystal growth; Thermodynamics of interfaces; Growth simulation and practice, current status and future prospects of potential and limitation on simulation for prediction of crystal growth ; Physicochemical properties measurements of liquids involved in crystal growth.



- Bulk crystal growth: crystallization mechanisms, morphological instabilities, growth instabilities; Growth technologies and process control; Development of new methods and approaches for bulk growth.



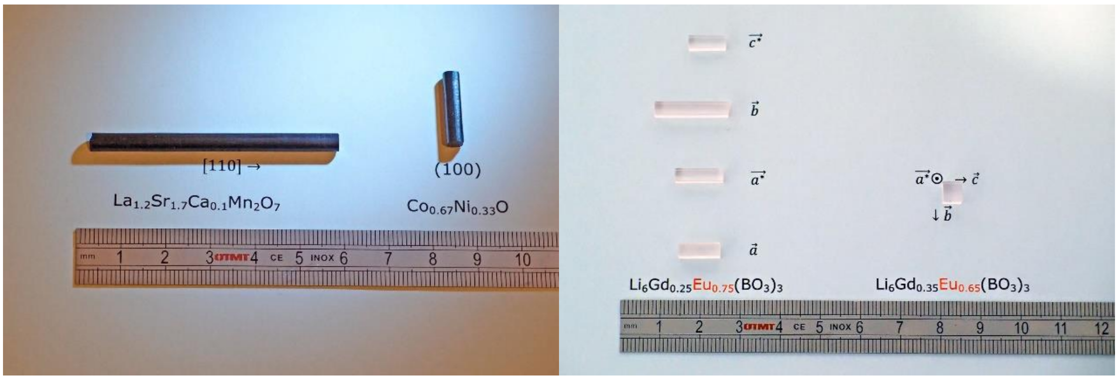
Tri arc pulling furnace for Czochralski growth experiments.

- Surfaces, Interfaces, Epitaxial Growth, Thin Films: structure and properties of solid-vapor, solid-liquid and solid-solid interfaces and surface morphology; Physical, chemical, and technological aspects of thin film formation and epitaxial growth; Interface science of surface defects, and surfactants; Stress evolution during growth; Morphological stability.

- Structural defects and impurities in crystalline materials: mechanisms of defects formation in crystals; Investigations of crystal chemistry, crystalline structure, structural defects-based physical properties; Surface and bulk defects.

- Crystal growth and characterization of nanostructures, low-dimensional and confined systems: synthesis of nanoparticles, quantum dots, nanowires, nanotubes, and other low dimensional structures; Materials for additive manufacturing; Precise fabrication of nanometer-scale structures by lithography, self-assembly, chemical synthesis; Applications in areas of energy conversion, storage, magnetics, optoelectronics, quantum computation, nanoelectromechanical systems and semiconductor electronics.

- Crystallization of inorganic materials: growth of advanced inorganic materials; Crystallization in solid-vapor, solid-liquid and solid-solid systems; Crystalline structure and physical properties; Mesocrystals and colloidal systems.



Varied transition metal oxide single crystals grown by vertical zone melting in an optical furnace (left), by the Czochralski method (right), oriented by the Laue method and cut oriented (M. Velazquez – LPCES ; R. Belhoucif/P. Veber/M. Velazquez – ICMCB).

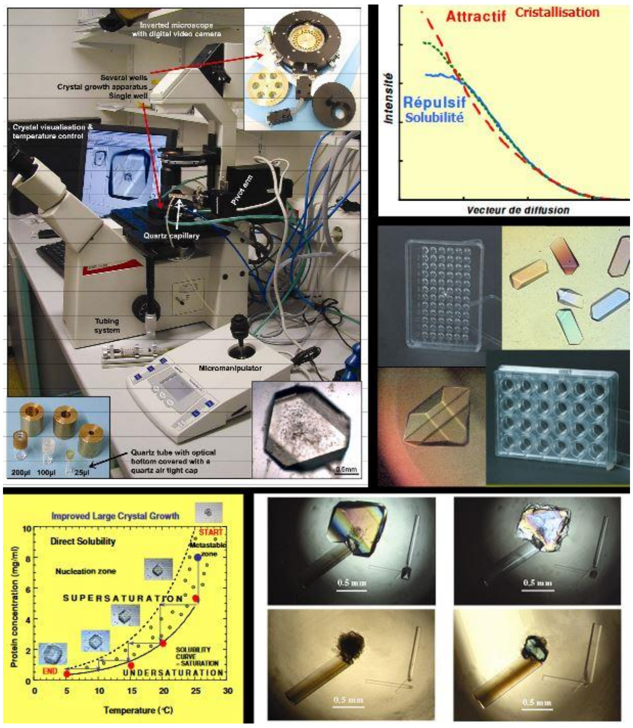
- Crystallization in organic and biological systems: advances in growth of organic, macromolecular and biomolecular crystals; Protein and polymer crystalline materials; Current advancements in biomineralization, macromolecular crystallization, protein crystal growth and bio-inspired materials synthesis; Biomimetics, learning from nature to grow organic and biomacromolecular crystals.

- Industrial crystallization, technologies and process control: crystallization for industrial applications; New equipments and technologies, innovations made over the last decade in the area of industrial crystallization; Food, cosmetic and pharmaceutical crystallization; Crystal preparation such as cutting, polishing, structuring and shaping.

- Novel materials and structures: new materials and structures with specific or improved properties and/or newly-designed applications; Inorganic and organic hybrid structures; Applications in areas of energy conversion, storage, magnetics, optoelectronics, quantum computation, nanoelectromechanical systems and semiconductor electronics.

- New methods and techniques for crystal growth: crystal growth under variety of external fields and extreme conditions – electric fields, magnetic fields, hyper and micro gravity, radiation, vibration, ultrasonic, high pressure, thermal and mechanical stress, etc.; Advanced Growth Technologies.

- Advances in observation and characterization methods: *In situ* monitoring methods and analysis of physical, structural and chemical properties of crystals; Microscopy, spectroscopy, topography, scattering and other characterization techniques; Recent advancements in in-situ monitoring methods.



Investigations by optical microscopy of crystals in solution.

Virtually all the types of materials are addressed in the investigations covered by the AFC crystal growth transverse axis:

- III-V Semiconductors (Bulk and epitaxial growth);
- Group IV Semiconductors (the latest progress in growth of group IV semiconductors such as Si, Ge, and SiGe);
- 2D Materials (Growth and application of graphene and other two dimensional materials);

- II-VI and oxide materials (Growth of HgCdTe, ZnSe, ZnO and CdTe, as well as other II-VI and oxide materials);
- Materials for Spintronics (Growth of spintronic materials including diluted magnetic semiconductors, oxides and metals);
- Materials for optical devices (Crystal growth and characterization of materials for optical devices such as lasers, nonlinear optics, solar cells, magnetooptic materials, and so on);
- Materials for electronic devices (Preparation and characterization of advanced materials);
- Materials for organic devices and bio-applications (Functional materials and devices for organic electronics and bio applications. Thin film growth, self-assembly, and self-organization);
- Nitride Semiconductors (Recent progress and outlining future directions in the field of bulk substrates and thin film growth of III-Nitrides);
- Silicon Carbide (Scientific and technological advances in the field of SiC and related materials such as diamond);
- Ferroelectric, Piezoelectric, Dielectric materials, including lead-free ones;
- Chiral materials, especially multiferroic materials;
- Crystals for heat-scintillation cryogenic bolometers;
- …

Growth of a $Li_6Eu(BO_3)_3$ single crystal by the optical floating zone method (R. Belhoucif/M. Velazquez – ICMCB).