Jean-Cyrille HIERSO
Distinguished Full Professor (PR-Ex2) – born 1971
Director, Institute of Molecular Chemistry of the University of Burgundy
Université Bourgogne Europe - CNRS UMR 6302 – Dijon, France

Scientific Fields
Ligand chemistry; organometallics; homogeneous and heterogeneous catalysis; nanomaterials; chemical sensors; hydrogen technologies; advanced NMR spectroscopy.

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1. Research Project
Ligands Chemistry for Advanced Nanoscale Catalysts and Sensors Technology
Ligand chemistry has been a cornerstone of major advances in modern chemical sciences, spanning catalysis, molecular materials, nanosciences and sustainable technologies. My research focuses on the **rational design of polytopic ligands** and their structuring role in **transition-metal reactivity**, from homogeneous catalysis to heterogeneous systems and functional nanocomposites.
My projects address:

- **ligand–metal cooperativity** in selective catalysis,
- **sustainable processes** (selectivity, recycling),
- **decarbonated energy-related chemistry**, with a strong focus on **hydrogen (H_2)**,
- the development of **hybrid nanocatalysts and nanosensors** for catalysis, sensing and energy applications.

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2. Current Scientific Activity
Since 2009, I have been leading a research group at the Institute of Molecular Chemistry of the University of Burgundy (CNRS). I served as **Deputy Director** of the institute from 2017 to 2023 and have been its **Director** since 2024.
My research activities encompass:

- organometallic chemistry and ligand design,
- palladium-, gold- and copper-based catalysis (C–C, C–X couplings, C–H activation),
- recyclable heterogeneous catalysis,
- hybrid nanomaterials (nanodiamonds, functionalized diamondoid),
- fundamental high-resolution NMR spectroscopy,
- materials and catalytic systems for **secure hydrogen storage and delivery**.

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3. Scientific Mobility: my scientific trajectory evolved from homogeneous catalysis to heterogeneous catalysis and nanoscience. I developed innovative ligands enabling:

- C–C and C–X bond formation,
- activation of challenging aromatic C–H and C–Cl bonds,
- the design of catalytic nanocomposites and chemical sensors,
- current applications in **catalytic hydrogen delivery systems**.

Geographical Mobility: Postdoctoral appointments and visiting professorships in France, the Netherlands, the United Kingdom, Germany, Ukraine, China, Japan, Singapore, Canada and the Czech Republic. Invited professor at more than **15 international universities** worldwide.

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4. Education and Academic Career

Education

- PhD in Chemistry (1997), Université de Toulouse / ENSCT – Highest Honors
- MSc (1994) and BSc (1993) in Physical Chemistry – First-Class Honors

Academic Positions

- Assistant Professor (Maître de Conférences): 2001–2006
- Full Professor since 2009: PR2 (2009), PR1 (2014), PR-Ex1 (2018), **PR-Ex2 (2023)**
- **Elected Member of the Institut Universitaire de France (IUF)** since 2012

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5. Leadership, Distinctions and Funding

- Director, Institute of Molecular Chemistry (CNRS UMR 6302) since 2024
- Member of the National Committee of the CNRS (Section 14: Coordination Chemistry, Catalysis, Interfaces and Processes), 2017–2021
- PI and coordinator of national and international research programs (ANR, ANR–DFG)
- Coordination of large-scale projects (**> €3M total funding**)
- **European patent (2023)** and SATT maturation program (2023–2025) on secure hydrogen delivery from solid sources
- Ranked among the **Top 2% most-cited scientists worldwide** (Stanford/Elsevier rankings, 2021–2024)

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6. Scientific Output and Impact

- **155 international publications and patents**
- **5,500 citations**; h-index: 38
- Supervision of **20 PhD students** and **14 postdoctoral fellows**
- **92 invited lectures**, including 16 invited international conferences
- Publications in leading journals (*JACS, Angewandte Chemie, Chemical Reviews, ACS Catalysis, Advanced Functional Materials*)
- Extensive peer-review activity for major publishers (ACS, RSC, Wiley, Elsevier)

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7. Major Scientific Contributions

- Ligand design for highly efficient and low-loading catalytic systems
- Sustainable palladium-based catalysis and recyclable heterogeneous catalysts
- Fundamental NMR spectroscopy: “through-space” spin–spin coupling
- Nanodiamond- and diamondoid-based hybrid materials for sensing
- Nanocatalysts and materials for **hydrogen energy technologies**
