

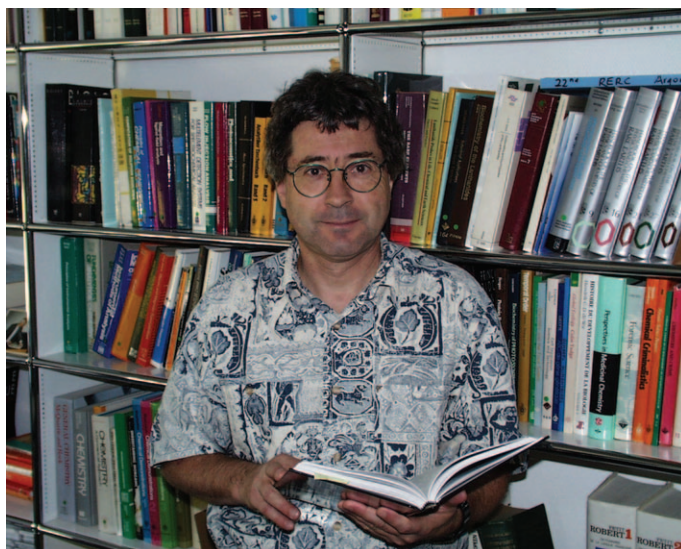
Editorial

Jean-Claude Bünzli was born on September 23, 1944, in Moutier (Switzerland), where he received his early schooling. After graduation at the Gymnasium of Bienne (high school) in the science section in 1963, he attended the Polytechnic School of the University of Lausanne (EPUL). As an undergraduate student, *Jean-Claude* became interested in reaction mechanisms and, over his summer holidays, opted to work with Prof. *Hans Dahn* with whom he studied isotope effects. For his diploma work thesis (equivalent to a Master Thesis today), *Jean-Claude* studied exchange reactions by Nuclear Magnetic Resonance in the group of Prof. *André Merbach* at the Institute of Inorganic and Analytical Chemistry. He received his EPUL diploma degree in chemical engineering in 1968 and decided to stay at the same location, at the Place du Château, a beautiful historical building at the heart of the City of Lausanne, working on inorganic reaction mechanisms. In 1971, *Jean-Claude* obtained his Ph.D. from the newly created Ecole Polytechnique Fédérale de Lausanne (EPFL). It should be noted that during his studies *Jean-Claude* was continuously honored with the highest distinctions and prizes.

Jean-Claude decided to broaden his research interests by going to the University of British Columbia (1971–1973) to work as a post-doctorial fellow with Profs. *C. A. McDowell* and *D. C. Frost*. He became interested in the application of photoelectron spectroscopy to study electronic structure and chemical bonding, and even build his own high-resolution spectrometer for the purpose. In 1973, *Jean-Claude* returned then to Switzerland with the position of scientific collaborator at the Laboratory of Organic Chemistry at the Eidgenössische Technische Hochschule in Zurich (ETH-Z). He continued his research on chemical bonding and extended it by using thermochemical methods to investigate the kinetics of important isomerization reactions.

In 1974, *Jean-Claude Bünzli* was appointed as an assistant professor at the Institute of Inorganic and Analytical Chemistry of the University of Lausanne and, in 1980, was promoted to full professor. On his return to Lausanne *Jean-Claude* decided to establish a research program on lanthanide chemistry, and over the years he has made many important and ground-breaking contributions to this field. The search for efficient luminescent compounds and their use as spectroscopic probes in biological systems led him to create one of the best spectroscopic laboratories for the study of these elements. In the years 1974–1995, *Jean-Claude* performed a thorough and systematic investigation of dilute lanthanide solutions in order to determine coordination numbers of Ln^{III} ions in nonaqueous solvents. He published the first systematic data on their coordination numbers and showed that inner-sphere interactions are substantial. Several experimental techniques were used ranging from conductimetry to FT-IR spectrometry, luminescence spectra and lifetimes, and even ¹³⁹La-NMR spectroscopy [1].

Over the years, the Lausanne group led by *Jean-Claude* has established itself as one of the leading laboratories in the design of bimetallic lanthanide luminescent bioprobes (LLBs). The group has formed numerous long-lasting collaborations with other groups around the world. He demonstrated that bimetallic lanthanide complexes ideally suited

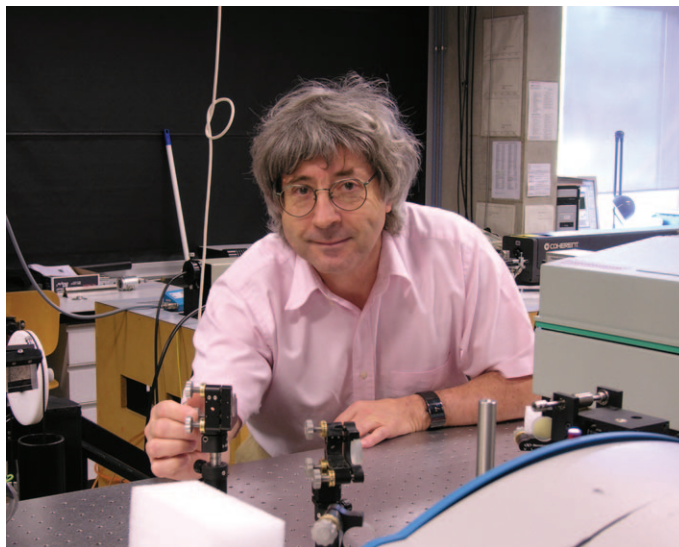


for time-resolved microscopy [2], for DNA analysis [3], and for lab-on-a-chip experiments. He edited *Lanthanide Probes in Life, Chemical and Earth Sciences*, published in 1989, with contributions from the leading coordination chemists and biochemists in the field. The chapter he wrote on *Luminescent Probes* has been cited over 700 times [4].

It is not possible to describe here all the interest of *Jean-Claude Bünzli* in lanthanide chemistry; his research spanning classical coordination chemistry to macrocyclic chemistry, *Schiff* bases, calixarene and cyclen derivatives, and extending to supramolecular chemistry. This last topic started after *Claude Piguet* (now full professor of chemistry at Geneva University) spent six months in his laboratory. *Jean-Claude Bünzli* became interested in self-assembly processes and formed a strong collaboration with *Claude Piguet*, in the early 1990s, which is still active today. Initially, their research centered on the design of symmetric ditopic hexadentate ligands for the formation of triple-stranded bimetallic 4f-4f helicates [5], then evolving towards the control of the properties of one metal ion by another one through intermetallic communication in nd-4f edifices. Modifying the initial ligands to render them asymmetric allowed the recognition of a hetero-pair of 4f,4f' ions, and the thermodynamics behind the self-assembly process was subsequently unraveled [6].

Presently, time-resolved imaging of cancerous cells and targeting specific proteins are the main goals of *Jean-Claude*'s research, as well as the development of inexpensive, fast, and robust methods to analyze cancerous tissues. A second focus of his current research is the sensitization of NIR luminescence in novel doped glasses and nanoparticles, with medical imaging as a target application. And finally, he remains strongly interested in the basic luminescent properties of lanthanides, along with the development of hands-on instrumentation.

Jean-Claude Bünzli is presently chairing the working group 'Imaging' of the European COST Action 'Metal-based systems for molecular imaging applications'.



Spreading his enthusiasm for lanthanide chemistry, and eager to keep the international f-element community together and in communication, he has been involved in the organization of international conferences in the field since 1985. In 1989, he founded the *European Rare Earths and Actinide Society*, which sponsors a Europe-based broad-scope conference on f-element science every three years. *Jean-Claude* has maintained close links with similar organizations worldwide, in particular in USA, China, and Japan, so that a worldwide scheme for international conferences on f-elements was made possible. In recognition of *Jean-Claude's* international activities, he was awarded a Doctorate Honoris Causa by the Northwest Teachers University, Lanzhou, Gansu, People's Republic of China in 1989. He became Foreign Member of the Finnish Academy of Arts and Sciences in 1998 and was honored with the Lecoq de Boisbaudran Award for '30 + years of outstanding contributions to lanthanide science' in 2006.

The passion of *Jean-Claude-Bünzli* is not limited to research; he has been strongly involved in teaching, in university management, and in the dissemination of science to the general public. Over the years, he has taught courses on instrumental analysis, coordination chemistry, f-elements, and thousands of students in medicine and biology will remember his dynamic teaching of general chemistry. He acted in the frame of the Swiss virtual campus (2000–2003) as Leader for a project '*General chemistry for students enrolled in a life sciences curriculum*'. The web site is visited daily by more than 2700 students, among them 800 or so from Europe and the remaining mostly in the USA. His enthusiastic teaching led to prestigious invitations such as Invited Professor at the Université Louis Pasteur, Strasbourg, France (1996), Science University, Tokyo, Japan (1998), Université de Louvain, Belgium (2008), and Adjunct Professor at the Korea University, Daejeon, South Korea (2009).

His dedication to management led him to accept a mandate of Dean of the Faculty of Science, immediately followed by that of Vice Rector of the University of Lausanne

(1990–1995), in charge of student's affairs, student mobility, social and cultural affairs, as well as the relationship between the Swiss Federal Institute of Technology (EPFL) and the University of Lausanne (UNIL). It is worth noting that the chemistry department of these two institutions merged a few years later (2001). In 2001, at the occasion of the merger *Jean-Claude* created 'The Laboratory of Lanthanide Supramolecular Chemistry and Spectroscopy' and at the same time received the title of Honorary Professor of the University of Lausanne. He chaired the Research Commission of EPFL (2004–2008) and acted as member of the search committee for chemistry. *Jean-Claude* was also invited by the *World Bank* as an expert for a development program of provincial Chinese Universities (1989) and by the Norway Research Council to review chemistry in this country.

In the last couple of years, *Jean-Claude* initiated and organized the first seminar series for the Institute of Chemical Sciences and Engineering at the EPFL. His choice of speakers and organizational skills were truly inspirational, setting high standards for future organizers. Indeed, it is impossible to measure his contribution to the wellbeing of the Institute over the years, but it has been considerable.

Over the years, *Jean-Claude Bünzli* has made a major impact through the mentoring of graduate students and postdoctoral fellows, who had the privilege of working in his laboratory. Many of them are now occupying leading positions in academic and industry.

This special issue of *Helvetica Chimica Acta* is dedicated to *Jean-Claude* at the occasion of his 65th birthday and to celebrate his continuous outstanding contributions to chemistry. It comprises a compilation of articles from *Bünzli's* former students and friends from all over the world who sincerely appreciate *Jean-Claude* for his scientific accomplishments and for his warm, open personality. Browsing through this issue it is clear that *Jean-Claude* has had an enormous influence in the field of lanthanide chemistry, and we believe that this issue is a magnificent tribute to a pioneer, creative researcher, outstanding teacher, colleague, and friend.

Paul Dyson and André Merbach

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