

Memorial of Hubert Curien, 1924–2005

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“In the order or disorder, condensed matter does lack neither exemplarity nor trick”

--Hubert Curien

Hubert Curien, a Senior Fellow of MSA, died suddenly at his country house at Loury, France, on February 6, 2005. An Emeritus Professor at the University Pierre et Marie Curie/Paris-VI, a former Minister of Research in several French Governments, and a scientist having had the highest charges in numerous scientific organisms in France and in Europe, Hubert Curien had an undisputed flair for politics and diplomacy at the highest level. He was honored by having the mineral curiënite named for him (Cesbron and Morin 1968). He is survived by his wife, Perrine, and their three sons, Nicolas, Christophe, and Pierre-Louis.

Hubert Curien was born on October 30, 1924, in Cornimont, in the Vosges region of eastern France in 1924. His mother was a headmistress and his father a tax collector. In 1944, at the time of the liberation of France, he was studying in the preparatory classes for entrance to Grandes Écoles at Lycée Saint Louis in the Quartier Latin in Paris. He left his studies to enlist in the French resistance. Engaged in serious fighting close to his native village, he was awarded for his bravery in action. Just afterwards, he entered the Ecole Normale Supérieure in Paris, and went on to pursue a research career in crystallography. In 1948, encouraged by the physicist and geophysicist Yves Rocard, he joined the Laboratoire de Minéralogie of the Sorbonne, where Jean Wyart had just succeeded to Charles Mauguin as Director.

Hubert Curien's interests ranged widely from solid-state physics to mineralogy, and he always encouraged active collaborations between mineralogists and physicists. In 1951, he passed his PhD, prepared under the supervision of Jean Laval, on the thermal diffuse scattering of X-rays by c.c. α -iron. From the careful measurements performed using an ionization chamber and a quadrant electrometer, he deduced the phonon spectrum, which required quite difficult calculations. His research interests also included Compton scattering and the influence of point defects on physical properties of lithium fluoride, such as ionic conductivity and electronic and thermodynamic properties. With Alexandre Rimski and Louis Bosio, he worked on the phase diagram of gallium and determined the structure of three metastable phases of gallium despite the experimental difficulties in these early years to produce diffraction patterns under non-ambient conditions. He made important contributions to the application of group theory in crystallography by investigating the theoretical representation of twins and twinning in synthetic



crystals and minerals. With Yves LeCorre and José Donnay, he introduced the description of twinning using the formalism of color groups. With Raymond Kern he revisited the notions of contact and penetration twins and of composition plane.

In this period of active development of X-ray diffraction methods, he strongly supported the determination of mineral structures. He participated to the determination of the structure of hibonite and erionite, two minerals now considered to be of great interest in planetary and environmental sciences, respectively. He developed the use of electron microprobe, performing an element mapping of meteorites as early as 1965, and participated to the use of nuclear reaction analysis for the determination of oxygen self-diffusion in quartz. In 1968, Cesbron and Morin gave the name curiënite to a uranyl and lead vanadate discovered in the supergene alteration zone of the uranium deposit of Mounana, Gabon.

Appointed assistant professor in 1949, associate professor in 1953, and full professor in 1956, his entire career teaching crystallography and mineralogy was spent at the University of Paris. At the start of his career, he was located in the Faculty

of Sciences at the Sorbonne. Later, he moved to the University “Pierre et Marie Curie/Paris-VI,” when the University of Paris split after the events of spring 1968. Throughout his subsequent long political career, he continued to teach in his laboratory and participated to the progressive move of graduate studies from crystallography to materials science. Attached to teaching, he developed an original contribution to the application of group theory for describing crystal structure and properties. Hubert Curien maintained his courses at the university until 1994 without discontinuity, despite all his political duties.

Outside of crystallography and mineralogy, Hubert Curien is mostly known for his many management responsibilities that he took with elegance and efficiency, not only in France but also in Europe. A great administrator of research, he left his mark on an impressive number of scientific institutions. Scientific Director for Physics of the CNRS, the French National Center for Scientific Research (1966–1969), he was appointed in 1969 General Director of this research institution. In 1973, he became General Delegate for Scientific and Technical Research, responsible for the organization of research in France in which capacity he initiated reorganization of the French research institutions. Having a strong interest for space research, he was then appointed Chairman of CNES, the French Space Agency from 1976 to 1984. The French scientific community still remembers the exceptional time, during which President François Mitterand nominated him as a minister of Research within four different cabinets, in 1984–1986 and 1988–1993. Hubert Curien was appreciated across the political spectrum, and knew how to overcome differences of opinion. No other scientist was so successful in the political and decisional sphere. In this key position, he advanced the development of scientific research in France.

Outside of France, Hubert Curien had also major positions. He was the first President of the European Space Agency (1981–1984); he is remembered as one of the “fathers” of the Ariane series of space rockets. From 1994 to 1996, he presided over the European Organization for Nuclear Research, CERN. He played a major role in the definition of a common policy for the development of science in Europe, as one of the promoters of the EUREKA European program for technological research and development. He participated to the creation of the European Science Foundation that he presided from 1979 to 1984. He was also Chairman of Academia Europaea (1994–1997).

Strongly involved in scientific organizations, Hubert Curien was president of both the Société française de Minéralogie et Cristallographie (1967) and the Association française de Cristallographie (1968). In 1954, he played an active role in the organization of the 3rd International Congress of the International Union of Crystallography in Paris. In 1993, he was elected to the French Academy of Sciences, of which he was president from 2001 to 2003.

Recognized by the highest French and foreign distinctions and decorations, Hubert Curien was well known for his courteous character and subtle humor. He was highly intelligent, but always simple and modest. He knew how to listen and diffuse conflict, replacing a “No” by a disarming “Do you believe?” Despite his highest functions, he always seemed to have time to discuss and to listen, with a smiling complicity. It is amazing how he was always available to discuss a troublesome problem or to give his opinion on personal problems or strategic planning, during early morning meetings in his office at the University. Two days before his death, on a cold and sunny morning of February, he was still visiting us on our provisional campus, now far from his home, inquiring as always about the potential problems faced by the laboratory. He was universally appreciated and liked, with a mix of respect, admiration, affection, and gratitude. A man of conviction, a great scientist, a great manager, he will be missed by all.

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