

ICMI Column

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Jean-Pierre Kahane (1926– 2017): His legacy to mathematics education



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On 21 June 2017, the mathematical community suffered a great loss with the death of Jean-Pierre Kahane at the age of 90. He was a student at the *Ecole Normale Supérieure* (ENS), defended his doctorate under the supervision of Mandelbrojt in 1954 and was appointed as *Maitre de Conférences* (1954–57) the same year and then professor (until 1961) at the University of Montpellier, before getting a position in Orsay (University Paris Sud), where he pursued his career until he retired in

1994, remaining as a professor emeritus until his death.

He was a world-renowned specialist in harmonic analysis, chaos theory and Brownian movement, and won several prizes: *Peccot* (1957), *Maurice Audin* (1960), *Carrière de mathématiques* (1964), *Servant* (1972), *Grand Prix d'Etat des Sciences Mathématiques et Physiques* (1980) and *Médaille Emile Picard* (1995). He was nominated at the French *Académie des Sciences* in 1988 and was made *Grand-officier de la Légion d'honneur*, *Chevalier de l'ordre national du mérite* and *Commandeur des palmes académiques*.

He was not only a brilliant mathematician but was also very active in many connected areas, in which his engagement was recognised for his cleverness and accuracy, as well as for his humanity, enthusiasm and eagerness. Among several responsibilities, he served as Secretary General of the French Union of Higher Education (1962–65), President of the French Mathematical Society (SMF) (1972–73), President du French National Committee of Mathematicians (CNFM) (1974–78), the second President of *Université Paris-Sud* (1975–78), President of the *Mission interministérielle de l'information scientifique et technique* (MIDIST) (1982–86), President of the International Commission on Mathematical Instruction (ICMI) (1983–90), President of the scientific committee of the *Instituts de recherche sur l'enseignement des mathématiques* (IREM) (1997–1999), President of the *Commission de réflexion sur l'enseignement des mathématiques* (CREM) (1999–2002) and President of the *Union Rationaliste* (2001–2004). Politically, he was engaged in 1946 with the French Communist Party (PCF), to which he remained faithful all his life. In particular, he was head of the scientific journal “Progressistes” since 2014.



“Coup d’œil sur l’analyse de Fourier”, conference at Ecole Polytechnique, May 2011.

A man of conviction, he has always been a source of inspiration for generations of young mathematicians to whom he stayed close until the very last days of his extraordinary life, a life of service to mathematics in all its forms, delivered with a fantastic openness of spirit.

Jean-Pierre Kahane and mathematics education

Jean-Pierre Kahane was not only an eminent researcher but also a mathematician who, throughout his career and up to the last days of his life, sought to pass on his passion for mathematics and to share his profound conviction that it is a powerful tool for understanding the world, both in its complexity and beauty and in the fight against all forms of obscurantism.

He was an outstanding teacher, perhaps because very early on, as a student at the ENS, he understood how much education is an opportunity to learn. He recounted this in an interview for the centenary of the International Commission on Mathematical Instruction (ICMI), which he chaired from 1983 to 1990 (<http://www.icmihistory.unito.it/clips.php>).

It was at the request of Lennart Carleson, who was then President of the International Mathematical Union (IMU) and whom he knew well, that he decided to engage with the ICMI, accepting the presidency and the challenge to revitalise the commission. As he explained in the interview mentioned above, the main lines of action were established during a meeting in December 1982 at Orsay University with Geoffrey Howson (who was going to accompany him as Secretary of the ICMI during his two terms of office), Bent Christiansen (a Danish educator and already Vice-President of the ICMI) and Ed Jacobsen (a mathematics specialist at UNESCO), where they decided to launch a series of studies (which would become an essential activity of the ICMI), as well as defining the objective and the

structure. It was also here that the first five themes were decided. Three of them, Studies 1, 3 and 5, were particularly relevant to Kahane: “The influence of computers and informatics on mathematics and its teaching”, “Mathematics as a service subject” and “The popularization of mathematics”. The model developed at the time generally remains the one followed today, 30 years and 25 studies later.

During the presidency of Jean-Pierre Kahane, with thanks also to Ed Jacobsen, relations with UNESCO were strengthened. UNESCO supported the development of the ICMI studies and, in 1992, republished an updated version of the first study, as well as the ICMI’s various activities regarding developing countries.

Jean-Pierre Kahane’s presidency was noteworthy, as Geoffrey Howson testified in the text sent for the colloquium held at Orsay University in honour of his 90th birthday:¹

“Then and throughout the eight years in which he and I co-operated his knowledge, his leadership, his network of friends, his status within the mathematics community, his ability to raise funds, and his personal charm and efficiency never failed to impress me and others. Personally, it was not only a pleasure to work with and, indeed, just to be with, Jean-Pierre, but also to learn so much from him – his great erudition, his ability to supply simple explanations and guidance, and his wide interests. When he stepped down as President, ICMI was in a much stronger position than when he had taken over.”

Jean-Pierre Kahane’s commitment to teaching and disseminating mathematics was, of course, not limited to his work at the ICMI. It has been a constant of his professional life, as evidenced by the various responsibilities he has exercised (as recalled at the beginning of this notice). We would like to mention here more particularly his role as President of the CREM (the commission on reflection on the teaching of mathematics) from 1999 to 2002. This commission was created at the request of associations of teachers and learned societies alarmed by the statements of the French Minister of Education of the time, Claude Allègre, on mathematics and its teaching. The commission was given charge of an in-depth reflection on the teaching of mathematics and, in particular, on the relations between mathematics and computer science. To lead this commission, which was composed of strong personalities, in a climate of tension generated by curricular reforms in progress, was not an easy task. Jean-Pierre Kahane, through his intelligence, his listening and his sense of dialogue and synthesis, combined with a determination without flaw, managed this leadership perfectly. Daniel Perrin expresses this well in the text he sent for the Orsay colloquium:

¹ The various testimonies quoted here are all accessible online on the website of the *Commission Française pour l’Enseignement des Mathématiques* (CFEM): <http://www.cfem.asso.fr/actualites/deces-de-jean-pierre-kahane>.



During the prizes ceremony for the junior contest organised by the French mathematical society SMF, 10 June 2017 (11 days before he died).

“In retrospect, I think he carried out this difficult task, where we had to manage the strong and diverse personalities, with both subtlety and firmness. Subtlety, because he quickly sensed people in their complexity, which enabled him to anticipate conflicts and solve some of them before they even broke out. Firmness, because he knew how to put a stop when the slips began.

In any case, and I have precisely this memory about the elaboration of the report on geometry, he knew both how to trust people by giving them a real job, to help them from his great culture by being at their side and to realize and sustain them morally by constantly encouraging them. It was a great experience for me.”

From the different works he supervised as the President of the CREM, the reports on the teaching of geometry, computation, statistics and probabilities and computer science (Kahane, 2001)² are still considered as texts of reference and are regularly cited.

Jean-Pierre Kahane was also a loyal supporter of the network of research institutes on the teaching of mathematics (IREM), created at the turn of the 1970s and a unique institution, where university mathematicians, researchers in mathematics education, teachers and teacher educators can collaborate together (<http://www.univ-irem.fr>). He became the president of the scientific committee of the IREM network in 1997, at a critical moment for this institution, and managed to mobilise the national and international mathematical community for their defence and to plead the cause with government delegates. He also encouraged the scientific committee to carry out a thorough reflection on the missions of the IREMs and how to effectively fulfil them in a context of deeply renewed teacher training. He succeeded in making the scientific committee a place of debate and reflection open on the “outside”. The structure that he then imparted to the functioning of the scientific committee continues to this day.

² The reports are accessible on the website of the Paris IREM: http://www.irem.univ-paris-diderot.fr/articles/document_rapport_et_annexes_de_la_commission_kahane.

Jean-Pierre Kahane's activities in the service of mathematics education also included innumerable lectures for all kinds of public groups, up until just days before his death, at the presentation of prizes for the junior competition organised by the French Mathematical Society (SMF) on 10 June 2017, support for the activities of associations such as MATH.en.JEANS (<https://www.mathenjeans.fr>), of which he was a member of the scientific committee, his participation on the French commission for the teaching of mathematics (<http://www.cfem.asso.fr>), the French sub-commission of the ICMI, of which he was honorary president, and his interventions with the Academy of Sciences.

He always surprised us with his unwavering combativeness, the strength and clarity of his ideas and his insatiable intellectual curiosity, without forgetting, as Cath-

erine Combelle wrote in a message sent for the Orsay colloquium, the "amused and always benevolent malice of his eyes". He was a great man!



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