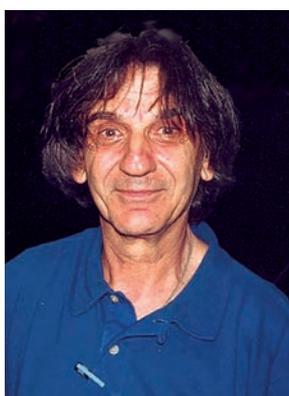


Michel Mendès France, 1936–2018¹

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Michel Mendès France.

Our dear friend and colleague, Michel Mendès France, passed away on January 30, 2018. He was 82. He was the author of over 130 research papers in the mathematical and physics literature, and several books and book chapters, including *Les nombres premiers* (with W. J. Ellison) and *Les nombres premiers, entre l'ordre et le chaos* (with Gérald Tenenbaum).

Michel was a mathematician (even if he liked to say he

was more of a physicist than a mathematician) of unusual creativity and breadth. His published work dealt with number theory (normal and transcendental numbers, continued fractions, Diophantine approximation), automata theory, theoretical physics (entropy, thermodynamics, the Ising model), the history of mathematics, and art, among other topics, and appeared over the period 1962 to 2018.

His most-cited paper, entitled “Suites algébriques, automates et substitutions”, appeared in the *Bulletin de la Société Mathématique de France* in 1980. In this paper, Michel and his co-authors Christol, Kamae, and Rauzy, expanding on a result of Christol from 1979, established an unexpected connection between finite automata, formal power series over a finite field, and iterated morphisms over a finite alphabet, and illustrated this connection with several examples. It has been cited over 300 times in the scientific literature. His three-part paper “Folds!” (co-written with Dekking and van der Poorten) in the *Mathematical Intelligencer* was also highly cited and influential.

More recently, Michel worked on questions at the boundary between geometry and physics, developing a notion of entropy and temperature for planar curves. The definitions that he proposed, including pressure and volume, imply that at an infinite temperature, planar curves behave like a perfect gas!

Michel had the daily habit of checking the abstracts, and sometimes the full papers, of journals that had just arrived at the department (this was, of course, in the days when journals were still on paper) and – perhaps partly due to this – he was able to supply, at a moment’s notice, the crucial reference needed on a wide variety of mathematical subjects. Beyond the classical dichotomy of those

who pose interesting new problems and those who solve them (Michel being more a part of the former), there is another one: the dichotomy between those researchers who dig deeply into a subject (or add bricks to existing constructions), and those who prefer to find unexpected connections and build bridges between areas that, at first glance, appear entirely unrelated. Michel was part of this second group, and therefore had a strong influence on mathematicians who were pleased to join him in this quest.

Michel supervised several doctoral students. We found, in alphabetical order, these: Anne Bertrand, Emmanuel Cateland (co-directed with J.-P. Allouche), Michel Olivier, and Jia-yan Yao.

Michel was born on January 1, 1936, the son of (future Président du Conseil) Pierre Mendès France and Lily Cicurel. As a child, he was forced to leave France during World War II and spent part of his formative years in New York City, where he learned to speak English fluently.

Michel matriculated at the École Polytechnique in 1957 and graduated in the *Corps de l’armement*. His 1966 “Thèse d’état” (which corresponds to what is now called “Habilitation”, i.e., a degree after the doctoral thesis which would itself correspond to a PhD) at the Faculté des sciences de Paris was entitled “Nombres normaux, fonctions pseudo-aléatoires” and his advisors were Charles Pisot and Jean Bass. The results of his thesis appeared in Volume 20 (1967) of the *Journal d’analyse mathématique*. He did a postdoctoral visit at the University of California, Berkeley. After a post at the Université de Paris, he became professor (and later, emeritus professor) at the Université de Bordeaux. He received the Prix Paul Doistau-Émile Bluet de l’information scientifique de l’Académie des sciences, shared in 1999 with Gérald Tenenbaum for their book *Les nombres premiers*.

In 2000 the Université de Bordeaux hosted a conference in honour of Michel’s retirement. Among the attendees were the authors, Didier Nordon, Jacques Peyrière, Andrzej Schinzel, Hédi Daboussi, Gérald Tenenbaum, Martine Queffélec, Alan Baker, Vitaly Bergelson, Michel Dekking, Anne Bertrand-Mathis, Michael Keane, Zhi-Ying Wen, Bernard Derrida, Imre Ruzsa, Georges Rhin, Vera Sós, Alf van der Poorten, Wladyslaw Narkiewicz, Andrew Pollington, Étienne Fouvry, and Bahman Saffari. The list gives some idea of his wide collaborations and interests.

Both of us were privileged to be frequent collaborators with Michel. Working with him was always entertaining, consisting of mathematics, philosophy, a story from Michel’s past (frequently hilarious and punctuated by the idiosyncratic interjection “Schlak!”), puns in two or more languages, and commentary on the issues of the day, often accompanied by espresso or red wine on

¹ This paper is a slightly modified translation of a paper published in French in *La Gazette des Mathématiciens* 158 (2018), 81–82. The EMS Newsletter thanks the Société Mathématique de France and *La Gazette des Mathématiciens* for authorising the publication of this translation.



Michel Mendès France with the authors, Jeffrey Shallit...

the patio of the “Fac” at Bordeaux. To give some small taste of his wit, we repeat one of his most-quoted aphorisms: “A good research lecture in mathematics should be either beautiful, deep, surprising, ... or short!”

His talks were often gently provocative, as (for example) when he claimed to prove a theorem by *descending* induction: first one proves that if the result is true for $n+1$, it must be true for n ; it then only remains to prove it for n infinite. Since there are no infinite integers, the result follows! There always seemed to be a Bourbakian representative of right-thinking present who agitated on his chair, and finished by objecting that this did not seem to be a rigorous proof. This amused Michel, who knew well (as did the objector) that one could rearrange the argument to satisfy the guardians of the mathematical temple.

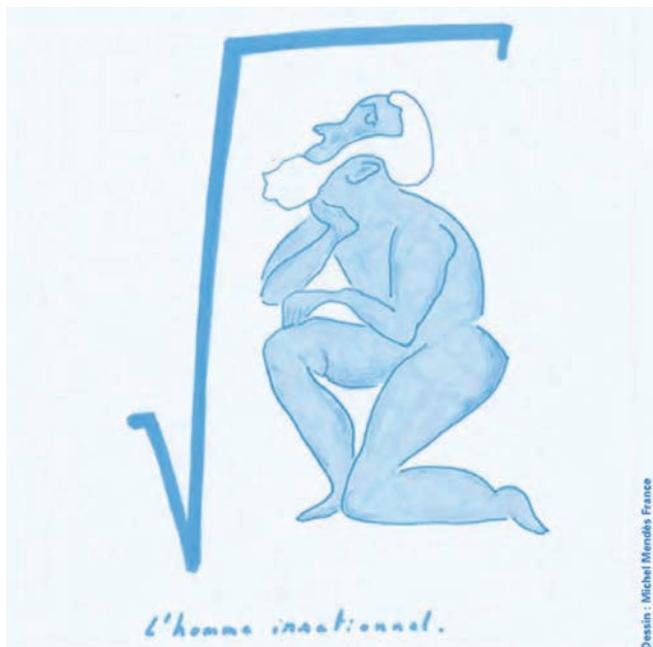
At night we often had dinner at Michel’s and Joan’s house in Gradignan – a suburb of Bordeaux – where Michel delighted in playing host, showing us his superb collection of vintage posters from his time in Berkeley in the 1960s and finding eggs recently laid by the chickens pecking in the spacious grounds. His bookcases were crammed with books on all subjects and stretched to the top of the high ceilings. There were also sheep, and from time to time a sheep would escape and be returned by a local farmer who drove up with the sheep in the back seat. One day, one of us accidentally let a sheep into the kitchen and Michel had to be called to wrestle it out again. Michel sometimes cooked – the *poulet gros sel* being a particular favorite – and the conversation often continued late into the night. (One of us recalls inviting Michel and two friends to a restaurant on the rue Saint-Jacques in Paris. That day, the *poulet gros sel* suggested by the proprietor had been transformed into what we laughingly called an OESNI – objet extrêmement salé non identifié – but Michel only remarked diplomatically that there had been just a bit too much salt.)

Michel was also a talented artist. His drawings and collages, frequently with humorous or mathematical



... and Jean-Paul Allouche.

themes, came each year in the mail, and appeared, for example, in Didier Nordon’s book *Les mathématiques pures n’existent pas!* (1981). An exhibition of his work entitled *Petits croquis en prose* took place at the Musée des Beaux-Arts d’Angoulême in 1992.



L’homme irrationnel. Drawing by Michel Mendès France for the poster of the “Journée Annuelle 2012 de la SMF”, first published for the cover of the book *Les mathématiques pures n’existent pas!* (D. Nordon 1981)

We were greatly privileged to be friends and collaborators with Michel for more than 35 years – and thanks to him, we first met when Michel invited one of us to Bordeaux in 1985.

An older brother, Bernard Mendès France, died in 1991. Michel is survived by his wife, Joan (née Horsley) and his children Tristan and Margot. We send them our deepest condolences.