

Commemoration of Professor Jean Jacques Moreau (1923–2014)
by Olivier Maisonneuve (Montpellier)

Jean Jacques Moreau passed away in Montpellier at the age of 90, in the night between the 7 and 8 January 2014. During the last three years, although he was needing important medical care and having many difficulties to move, he was always friendly for his visitors, with his well-known and attentive courtesy.

He was born on 31 July 1923 in Blaye (Gironde). “Agrégé in Mathematics and Doctor of Mathematics (University of Paris), he began his career as a researcher at Centre National de la Recherche Scientifique (CNRS) before being appointed as Professor of Mathematical Methods in Physics at Poitiers University, and then Professor of General Mechanics at Montpellier University II, where he spent most of his career. Here he created the renown Groupe d’Analyse Convexe. During the three years preceding his retirement, the Equipe d’Analyse Appliquée et Mécanique evolved, under his responsibility, to become the Laboratoire de Mécanique Générale et des Milieux Continus (LMGMC), joint research unit at Montpellier University II-CNRS, with effect from 1986. This one, after having absorbed the Laboratoire de Génie Civil, became in 1991 the Laboratoire de Mécanique et Génie Civil (LMGC), itself joint research unit at Montpellier University II-CNRS. Within LMGMC, Jean Jacques Moreau then continued his works very actively as Emeritus Professor till 2010.

Luminous and bright, his teaching has left an imperishable memory to his students.

The central theme of his researchs is nonsmooth mechanics, a field whose applications concern for example contacts between rigid or deformable bodies, friction, plastic deformation of materials, wakes in fluid flows and cavitation. The helicity invariant in the dynamics of ideal fluids, discovered by Jean Jacques Moreau in 1962, provided a starting point for the consideration of certain problems arising in fluid dynamics. His mathematical knowledge and creativity equipped him to develop theoretical tools adapted to these subjects, and these became standard practice in nonsmooth mechanics. This activity led him to important contributions in the construction of nonsmooth analysis, a mathematical field that is likewise of interest to specialists in optimisation, operational research and economics. He thus founded the Groupe d’Analyse Convexe in the 1970s, at the Institut de Mathématiques at Montpellier University II, which continued, under a succession of titles, to produce outstanding contributions.

Since the end of the 1980s, Jean Jacques Moreau focused more closely on the numerical aspects of the subjects he was studying. He notably devised novel calculation techniques for the statics or dynamics of collections of several bodies. Direct applications concerned, on one hand, the dynamics of masonry works subjected to seismic effects and, on the other, the largely interdisciplinary field of the mechanics of granular media. His innovating and outstanding computer simulations allowed him to make substantial personal contributions to this branch of mechanics, while his numerical techniques found applications in seismic engineering and rail engineering (LGV, lignes à grandes vitesses, ballast behaviour).

Jean Jacques Moreau was awarded a number of prizes by the Académie des Sciences of Paris, including the Grand Prix Joanidès. He spent a year as guest researcher at Mathematical Research Centre at Montreal University, and was invited abroad on numerous occasions by the top research teams in his field. He was author, co-author and editor of several advanced works on contact mechanics and more generally, on nonsmooth mechanics and analysis. All are pertinent, original and very elegant. His course in 1966-1967 at Collège de France on Convex Functionals is still a reference. He also published a two-volume course in mechanics that greatly influenced the teaching of this discipline.

For numerous academics Jean Jacques Moreau has been and truly will remain for a long time a “Master in Mathematics and Mechanics.