

About Jean-François... (CORE Newsletter 7, September 2012)

Jean-François has made significant contributions to different fields, mainly but not exclusively to game theory. He has also contributed to probability theory, general equilibrium and social choice. His first publications date back to the late sixties and early seventies. They were concerned with stochastic processes and martingales, following his Master thesis (offering an original solution to an optimal stopping problem) and doctoral dissertation. Other contributions to mathematics came out regularly, mostly as by-products of his on-going research in game theory. His contributions are characterized by their depth, both mathematically and conceptually. Here are a few known and remarkable results:

- the conditions under which the core equivalence theorem remains valid in presence of atoms (with Jean Gabszewicz, *Econometrica*, 1971);
- the existence of a limiting value for infinitely repeated two-person zero-sum games with incomplete information on both sides, a result to which the "MZ" operator is associated (with Shmuel Zamir, *IJGT*, 1971);
- the existence of an undiscounted, uniform and limited average value for 2-person zero-sum stochastic games (with Abraham Neyman, *IJGT*, 1981);
- the extension of the Aumann-Shapley "*diagonal formula*" in non-atomic cooperative games to discontinuous games (*MOR*, 1980) and the existence of a value – and its diagonal formula – on a large space of games that include all non-differentiable market games (*IJGT*, 1988);
- the formalization of Harsanyi's infinite hierarchies of beliefs through the construction of a universal space of types where each subspace can be approximated by a finite subspace (with Shmuel Zamir, *IJGT*, 1985);
- the most general existence theorem for equilibria of discounted stochastic games, allowing for uncountable state spaces (with T. Parthasarathy, 1991);
- the most elaborate refinement of the Nash equilibrium, known as "*Mertens Stability*" (*MOR*, 1989 and 1990), based on an earlier joint paper with Elon Kohlberg (*Econometrica*, 1986);
- the introduction of "*Relative Utilitarianism*" through axioms defined on vNM preferences, thereby avoiding interpersonal utility comparison (with Amrita Dhillon, *Econometrica*, 1999), a criterion later used to define the discount rate for intergenerational cost-benefit analysis (with Anna Rubinchik, *Macroeconomic Dynamics*, 2012).

Worth mentioning, the "Mertens-Sorin-Zamir triptyque" on repeated games, that appeared as successive CORE Discussion Papers in 1994, will eventually be published by *Cambridge University Press*.

Pierre Dehez

A comprehensive bibliography (and more) is available on CORE's web page. There is also an excellent article devoted to Jean-François on Wikipedia.