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May 18, 2015 Editor No Comments

Obituary: Evarist Giné-Masdeu, 1944–2015

Evarist Giné-Masdeu, known as Evarist Giné, last June at the conference in his honor in Cambridge, UK

Evarist Giné-Masdeu—or just Evarist Giné—passed away on March 13 in Hartford, CT. He was a significant contributor and co-creator of several branches of modern probability theory that have been profoundly influential, in particular in statistics and learning theory. This includes the areas of probability in Banach spaces; empirical process theory; asymptotic theory of the bootstrap and of U-statistics and processes; as well as nonparametric statistics. He wrote over 100 articles in leading scientific journals: 22 papers in the *Annals of Probability* alone, 10 in *Probability Theory and Related Fields*, and 8 in the *Annals of Statistics*. Moreover, he wrote two influential books, one on the central limit theorem in Banach spaces with Aloisio Araujo, and the other with Victor de la Peña on decoupling. With Richard Nickl he completed his third book *Mathematical Foundations of Infinite-Dimensional Statistical Models* just a few weeks before he tragically passed away—it will appear with Cambridge University Press.

Evarist was made a fellow of the IMS in 1984, an elected member of the ISI in 1991, became a corresponding member of the Institut d'Estudis Catalans in 1996, and gave a Medallion lecture at the 2004 Bernoulli–IMS World Congress in Barcelona. Over the years he was on the editorial board of many journals including the *Annals of Probability*, the *Journal of Theoretical Probability, Electronic Journal of Probability,* and *Bernoulli*; he was Senior Advisory Editor of *JSPI*. A conference was held on the occasion of Evarist's 70th birthday in June 2014 in Cambridge, UK, to honor his mathematical achievements. The photograph above was taken by Lucien Birgé at this conference: Evarist in full health and in his usual great spirits. Evarist was always extremely modest; with his usual sense of humor he wrote in an email in July 2014 that this conference was "totally undeserved, but enjoyed nonetheless". In reality this conference was a special event that highlighted the many areas within mathematics and statistics in which Evarist and his work have had the most substantial impact. The great respect and admiration for his mathematics and his great personality were shared by the many friends and colleagues present in Cambridge.

Evarist was born on 31 July 1944 in Falset, a small town in Catalonia, into a family that was mostly engaged in agriculture and wine-making. His prodigious mathematical talent showed early and his family were convinced by a local teacher that Evarist should attend a secondary school that led to entrance to university. Evarist succeeded with distinction and studied mathematics at the Universitat de Barcelona, obtaining the degree of Llicenciat (comparable to BSc) in 1967. Evarist met and married his wife Rosalind Eastaway during that time.

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Partly because of the Franco regime and partly because of their adventurous characters, they left Catalonia, and after some time teaching mathematics in Venezuela, Evarist was accepted by the PhD program in mathematics at the Massachusetts Institute of Technology (MIT). Evarist completed his PhD in 1973, under the supervision of Richard M. Dudley, his main work being on statistical tests for uniformity on Riemannian manifolds, published in the *Annals of Statistics*. This early work, highly cited in statistical literature in the following years, already showed one of the main features of Evarist's research: his deep interest in the problems motivated by mathematical statistics, where there was a need to develop both subtle and powerful mathematical tools. His prolific mathematical abilities produced two further papers during his PhD years, both published in *AOP*, that also started one of the main lines of his research, the study of limit theorems in infinite-dimensional Banach spaces.

Evarist then spent 1974–75 in Berkeley as a lecturer, where he met Lucien Le Cam and the other greats of that Berkeley Golden Age in statistics. After some 'wandering years' that included a return to Venezuela and extended visiting positions at the Universitat Autonoma de Barcelona, Evarist finally settled at Texas A&M University, becoming a professor there in 1983.

Some of Evarist's most influential and original work was done in that time with Joel Zinn, a colleague and friend at Texas A&M. Their joint work resulted in the development of the most important tools of empirical processes theory, such as symmetrization inequalities, entropy bounds and random multiplier inequalities, that later penetrated many areas of mathematics, statistics and computer science (in particular, machine learning). The classical paper "Some limit theorems for empirical processes" (1984, with J. Zinn) contained some necessary and sufficient conditions for a class of sets to be a Donsker class—conditions which easily implied many of the existing results. Many more of Evarist's papers had a major impact. "Bootstrapping general empirical measures" (1990, with J. Zinn) contained necessary and sufficient conditions for the central limit theorem for the bootstrap in the empirical setting. His paper "Limit theorems for U-processes" (1993, with M. Arcones) combined methods from the theory of empirical processes with the method of decoupling to obtain limit theorems for U-processes. This led to his book (with V. de la Peña) on decoupling, which gave a thoughtful and systematic treatment of decoupling and its applications to randomly stopped processes, U-statistics and U-processes. "When is the Student *t*-statistic asymptotically normal?" (1997, with F. Götze, and D. M. Mason) solved the problem mentioned in the title, and thus the long-standing conjecture of Logan, Mallows, Rice and Shepp (1973).

After two years as a professor in New York at CUNY Evarist took up a professorship at the University of Connecticut in 1990, where he stayed until his death, ultimately as the head of the department of mathematics there. Evarist had eight PhD students, most notably Miguel Arcones, and had a substantial impact on a whole generation of probabilists and theoretical statisticians whose formative academic years were 1990–2010.

That Evarist is gone leaves a great emptiness in the mathematical community. For those who knew him personally and worked with him, he will always remain a great friend with whom they spent endless hours talking mathematics at the board or in his warm and hospitable house. The loss is even greater for his family: he is survived by his wife Rosalind, his two daughters Nuria and Roser, and his two grand-children Liam and Mireia. But his great enthusiasm, intellectual brilliance and profound original ideas will live on for many generations to come, through his mathematical writings, in our memories, and in his family.

Written by Vladimir Koltchinskii, Richard Nickl, Sara van de Geer, Jon Wellner and Joel Zinn

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