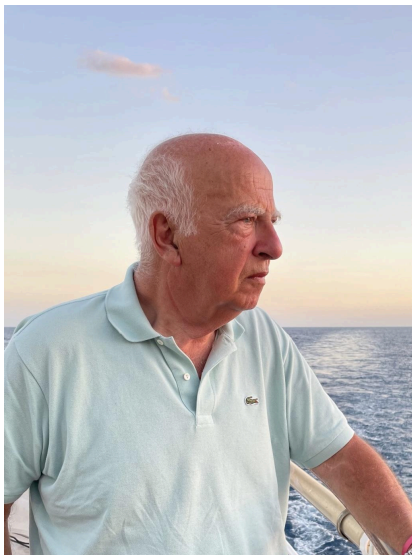
Paul Deheuvels

(March 11, 1948, Istanbul - January 30, 2026, Bourg-La-Reine)



Paul Deheuvels is a French mathematician[1]. He is recognized for a number of contributions in the fields of extreme value theory and empirical processes.[2].

He is a member of the French Academy of Sciences[3] since 2000 (corresponding member from 1994 to 2000), elected Fellow of the Institute of Mathematical Statistics[4] since 1985, elected member of the International Statistical Institute[5](ISI), and foreign corresponding member of the Royal Academy of Exact, Physical and Natural Sciences of Spain[6].

Distinctions

He received the Pierre-Simon de Laplace prize[7] from the French Statistical Society in 2007.

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[1] *Mathematical Statistics and Limit Theorems: Festschrift in Honour of Paul Deheuvels*. https://link.springer.com/book/10.1007/978-3-319-12442-1
[2] https://zbmath.org/authors/deheuvels.paul
[3] https://www.academie-sciences.fr/paul-deheuvels
[4] https://imstat.org/honored-ims-fellows/
[5] https://isi-web.org/our-members?page=3&alphabet=D&country=All&role=elected#scroll-to-form
[6] https://rac.es/sobre-nosotros/miembros/academicos/correspondiente-internacional/
[7] https://www.sfds.asso.fr/fr/group/prix_et_bourses/548-le_prix_pierre_simon_de_laplace.

Biography

Paul Deheuvels entered the École normale supérieure on rue d'Ulm in 1967 and became agrégé in mathematics in 1969. In 1974, he obtained his PhD (Doctorat d'État) in mathematical sciences under the direction of Daniel Dugué.

He first served as Director of Studies at the École pratique des hautes études (1977–1986), then founded the Laboratory of Theoretical and Applied Statistics (LSTA) at the Pierre et Marie Curie University (now Sorbonne University) in 1981, which he directed until 2013[8].

He was an Emeritus Professor of mathematics at Sorbonne University in Paris.

In 1971, he married Joële Deheuvels (Cormerais), with whom he had four daughters. His parents were France Deheuvels (née Lagarde) and the mathematician René Deheuvels.[9][10][11][12].

Mathematical work

Paul Deheuvels has made significant contributions to several areas of probability and statistics, notably extreme value theory and extreme copulas.[13], strong approximations, Erdős–Rényi-type laws[14][15][16], empirical and quantile processes[17], non-parametric function estimation, as well as Karhunen-Loève expansions[18].

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[8] https://www.lpsm.paris/informations/histoire/index
[9] https://cths.fr/an/savant.php?id=6260
[10] https://data.bnf.fr/fr/ark:/12148/cb118991271
[11]Review of alumni of the École Normale Supérieure on Rue d'Ulm https://www.archicubes.ens.fr/lassociation/m%C3%A9moire-normalienne/notices/deheuvels-ren%C3%A9-1942-s
[12]René Deheuvels Princetonhttps://www.ias.edu/scholars/ren%C3%A9-deheuvels
[13] Deheuvels, Paul (1994). "Probabilistic Aspects of Multivariate Extremes." In Galambos, J.; Lechner, J.; Simiu, E. (eds.).*Extreme Value Theory and Applications*. Springer. pp.185–201 https://link.springer.com/chapter/10.1007/978-94-017-3069-3_9
[14] Deheuvels, Paul (1987). "Many Heads in a Short Block". *Mathematical Statistics and Probability Theory*. Dordrecht: Springer. pp.53–67. https://link.springer.com/chapter/10.1007/978-94-009-3963-9_6
[15] Deheuvels, Paul; Devroye, Luc (1987). "Limit Laws of Erdős-Rényi-Shepp Type".*The Annals of Probability*. **15** (4): 1363–1386 https://www.jstor.org/stable/2244008
[16] Deheuvels, Paul; Devroye, Luc; Lynch, James (1986). "Exact convergence rate in the limit theorems of Erdős-Rényi and Shepp". *The Annals of Probability*. **14** **https://www.jstor.org/stable/2244089**
[17] Deheuvels, Paul (1998). "On the Local Oscillations of Empirical and Quantile Processes". In Szyszkowicz, Barbara (ed.). *Asymptotic Methods in Probability and Statistics*. North-Holland. pp. 127–134. https://www.sciencedirect.com/book/edited-volume/9780444500830/asymptotic-methods-in-probability-and-statistics?via=ihub%3D
[18]See note 1.

These areas are highlighted in a Festschrift, a collective work published in his honor on his 65th birthday, as well as in his official biography at the Academy of Sciences (see note 3).

Extreme Value Theory

Paul Deheuvels was a pioneer in the study of multivariate extreme-value distributions[19]. His work in the 1970s and 1980s provided complete characterizations of multidimensional extreme laws and the conditions for convergence to these laws[2021].

His results on the probabilistic aspects of multivariate extremes, including decompositions of infinitely divisible extreme distributions, remain highly influential.[222324].

Empirical processes and limit theorems

Deheuvels has made fundamental contributions to the theory of empirical processes, including strong approximations, functional laws of the iterated logarithm, and limit theorems for tail quantile processes and order statistics[25].

Notable results include strong approximations of quantile processes by iterated Kiefer processes[26], and nonstandard functional laws of the iterated logarithm for tail empirical and quantile processes[27].

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[19] Deheuvels, Paul (1983). "Point Processes and Multivariate Extreme Values". *Journal of Multivariate Analysis*. **13** (2): 286–304. https://www.sciencedirect.com/science/article/pii/0047259X83900258?via%3Dihub

[20] Deheuvels, Paul (1994). "Probabilistic Aspects of Multivariate Extremes". *Extreme Value Theory and Applications*. Springer. pp.185–201 https://link.springer.com/chapter/10.1007/978-94-017-3069-3_9

[21] Deheuvels, Paul (1987). "CaracterisationComplete Characterization of Multivariate Extreme-Value Distributions".*Extreme Value Theory*. Springer. https://link.springer.com/chapter/10.1007/978-1-4612-3634-4_3

[22] Deheuvels, Paul (2010). "Extreme Value Theory". *Encyclopedia of Quantitative Finance*. Wiley.https://onlinelibrary.wiley.com/doi/10.1002/9780470061602.eqf19017

[23] Deheuvels, Paul (1989). "On the non-parametric estimation of the bivariate extreme-value distributions". *Statistics & Probability Letters*. **8** (5): 429–435 https://www.sciencedirect.com/science/article/abs/pii/0167715289900382?via%3Dihub

[24] https://link.springer.com/chapter/10.1007/978-3-030-04161-8_51

[25] del Barrio, Eustasio; Deheuvels, Paul; van de Geer, Sara (2007). *Lectures on Empirical Processes: Theory and Statistical Applications*. EMS Series of Lectures in Mathematics. European Mathematical Society. doi:10.4171/027. ISBN 978-3-03719-027-2. https://ems.press/books/elm/223

[26] Deheuvels, Paul; Mason, David M. (2000). "Strong approximation of quantile processes by iterated Kiefer processes". *The Annals of Probability*. **28** (2): 678–715. https://projecteuclid.org/journals/annals-of-probability/volume-28/issue-2/Strong-approximation-of-quantile-processes-by-iterated-Kiefer-processes/10.1214/aop/1019160265.full

[27] Deheuvels, Paul; Mason, David M. (1990). "Nonstandard functional laws of the iterated logarithm for tail empirical and quantile processes". *The Annals of Probability*. **18** (4): 1693–1722. https://www.jstor.org/stable/2244344

An entire Festschrift was dedicated to him in 2015 (*Mathematical Statistics and Limit Theorems*), underscoring his central role in these areas[28].

Nonparametric statistics and functional estimation

Deheuvels developed fundamental results in nonparametric estimation, including kernel density and regression estimators, hazard function estimation under censoring, and kernel-based estimators for tail indices in heavy-tailed distributions[29].

He obtained functional laws of the iterated logarithm for the increments of empirical and quantile processes, with applications to the uniform consistency of kernel estimators and to local oscillations of the functionals of empirical processes, often in collaboration with David M. Mason.

These contributions, including strong limit results for nonparametric estimators under incomplete data, remain influential in asymptotic nonparametric statistics[30].

Extreme dependence and extreme copulas

Deheuvels made pioneering contributions to the modeling of Extreme dependence through his work on multivariate extreme-value distributions and their nonparametric estimation. He established consistency results for estimators of bivariate extreme-value distributions[31] and characterized the limiting behavior of the Pickands estimator for the dependence function in bivariate extremes, including functional central limit theorems and laws of the iterated logarithm[32]. These results laid foundational groundwork for extreme-value copulas and extreme dependence modeling, as highlighted in surveys on copula developments and the Festschrift in his honor[33].

These diverse contributions across extreme value theory, empirical processes, nonparametric estimation, and extreme dependence have established Deheuvels as a leading figure in asymptotic statistics and probability, as recognized by the Festschrift dedicated to him and his election to major academies (see notes 1, 3).

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[28] See note 1

[29] Csörgő, Sándor; Deheuvels, Paul; Mason, David M. (1985). "Kernel estimates of the tail index of a distribution". *The Annals of Statistics*. **13** (3): 1050–1077. https://www.jstor.org/stable/2241125

[30] See note 1 and:Deheuvels, Paul; Mason, David M. (1992). "Functional laws of the iterated logarithm for the increments of empirical and quantile processes". *The Annals of Probability*. **20** (3): 1248–1281. https://www.jstor.org/stable/2241125

[31] Deheuvels, Paul; de Oliveira, José Tiago (1989). "On the non-parametric estimation of the bivariate extreme-value distributions". *Statistics & Probability Letters*. **8** (5): 429–435. https://www.sciencedirect.com/science/article/abs/pii/0167715289900382?via%3Dihub

[32] Deheuvels, Paul (1991). "On the limiting behavior of the Pickands estimator for bivariate extreme-value distributions". *Statistics & Probability Letters*. **12** (5): 429–439. https://www.sciencedirect.com/science/article/abs/pii/016771529190032M

[33] See note 3

Institutional role

Beyond his scientific contributions, Paul Deheuvels played a major role in structuring statistics in France, notably by founding and directing the Laboratoire de Statistique Théorique et Appliquée (LSTA) at Université Pierre et Marie Curie from 1980 to 2013.

He supervised numerous PhD students, many of whom have become prominent in academia and industry. He held visiting professorships at institutions including KU Leuven(Belgium), Università degli Studi di Torino (Italy), Columbia University (1989, 1999), and Erasmus University Rotterdam (Netherlands).

Publications and influence

Paul Deheuvels authored over 160 scientific articles in leading international journals, frequently cited in probability and statistics (see notes 1, 2, 3).

Works

Deheuvels has authored several books on mathematics, probability, and the philosophy of science:

These works include technical monographs and popular science explanations of probability concepts:

- *L'Intégrale*, Presses Universitaires de France, 1980 (ISBN 2130366481).
- *La recherche scientifique*, Que sais-je?, 1990 (ISBN 9782130432418).
- *Lectures on Empirical Processes: Theory and Statistical Applications*, EMS Series of Lectures in Mathematics, 2007 (co-authored with E. del Barrio and S. van de Geer).
- *Probabilité, Hasard et Incertitude*, Que sais-je?, PUF, 2008 (ISBN 9782130571254).

Scientific activities

Deheuvels served on numerous editorial boards, including *Mathematical Methods in Statistics*, *Statistics and Probability Letters*, *Statistical Inference for Stochastic Processes*, and *Extremes*. He was a member of the CNRS National Committee for Scientific Research, the National Council of Universities (CNU), and the agrégation jury in mathematics. He also edited the mathematics series for Presses Universitaires de France.

Other activities

He has been a scientific advisor for Total and Sanofi, particularly on issues related to rare or extreme phenomena.

An experienced mountaineer, Paul Deheuvels climbed numerous peaks in the Hautes-Pyrénées, the United States, and Ecuador. He regularly practiced climbing in Fontainebleau.