Ruth Williams

Professor & Charles Lee Powell Endowed Chair in Mathematics at UC San Diego

La Jolla, CA, US

Ruth Williams is a mathematician working with stochastic processes as models for complex systems and networks.

Biography

Williams holds the Charles Lee Powell Chair in Mathematics at the UC San Diego. She is a mathematician who works in probability theory, especially on stochastic processes and their applications. She is particularly known for her foundational work on reflecting diffusion processes in domains with corners, for co-development with Maury Bramson of a systematic approach to proving heavy traffic limit theorems for multiclass queueing networks, and for the development of fluid and diffusion approximations for the analysis and control of more general stochastic networks, including those described by measure-valued processes. Her current research includes the study of stochastic models of complex networks, for example, those arising in Internet congestion control and systems biology. Williams studied mathematics at the University of Melbourne where she earned her Bachelor of Science (Honours) and Master of Science degrees. She then studied at Stanford University where she earned her Ph.D. degree in Mathematics. She had a postdoc at the Courant Institute of Mathematical Sciences in New York before taking up a position as an assistant professor at UC San Diego. She has remained at UC San Diego during her career, where she is now a Distinguished Professor of Mathematics. Williams is an elected member of the US National Academy of Sciences, an elected fellow of the American Academy of Arts and Sciences, an elected corresponding member of the Australian Academy of Science, an inaugural fellow of the American Mathematical Society, a fellow of the Institute for Operations Research and the Management Sciences, a fellow of the American Association for the Advancement of Sciences, and a fellow of the Institute of Mathematical Statistics. She is also a fellow of St. Hilda's College at the University of Melbourne, and received an honorary Doctor of Science degree from La Trobe University in Australia. Williams has been a Guggenheim Fellow, an Alfred P. Sloan Fellow and a National Science Foundation Presidential Young Investigator. She delivered a 45-minute invited address at the International Congress of Mathematicians in 1998.

Areas of Expertise

Mathematics, Probability Theory, Stochastic Processes and Applications, Complex networks (e.g., optimization and control, resource sharing, dimension reduction), Systems Biology

Education

Stanford University
Ph.D. Mathematics

University of Melbourne
M.S. Mathematics

University of Melbourne
B.Sc. (Hons) Mathematics

Accomplishments

Award for the Advancement of Women in Operations Research and the Management Sciences, INFORMS
2017

John von Neumann Theory Prize, Institute for Operations Research and the Management Sciences
2016

President of the Institute of Mathematical Statistics
2012

Best Publication Award of the INFORMS Applied Probability Society
2007
