

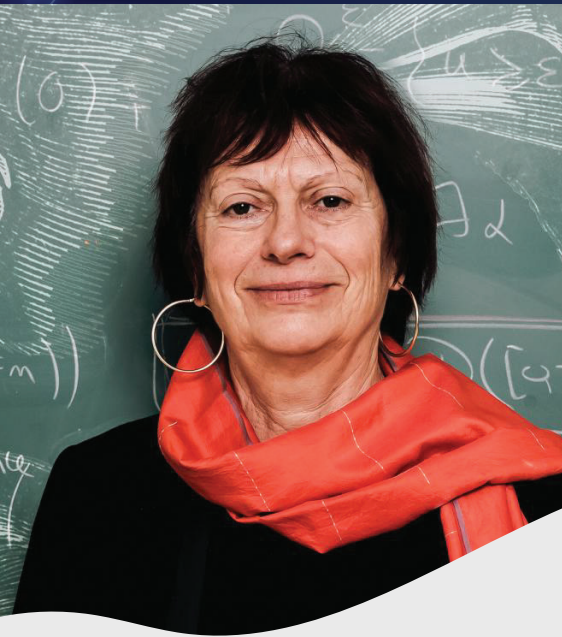
Colloquia Co-organized by HKIAS and MA

Long Time Behavior and Yaglom Limit for Real Trait-structured Birth and Death Processes

16 October 2025 (Thursday)

10:00am-11:00am

Interdisciplinary Multi-function Room (AE-040), LG/F, Academic Exchange Building, CityUHK



Speaker:

Professor Sylvie Méléard

HKIAS Senior Fellow

Professor of Applied Mathematics, Ecole Polytechnique

Member of the Academia Europaea

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Irène Joliot-Curie Award from the French Academy of Sciences (2024)

Abstract We study the long time behaviour of measure-valued birth and death processes in continuous time, where the dynamics between jumps are one-dimensional Markov processes including diffusion and jumps. Under suitable hypotheses on the Feynman-Kac semigroup, we prove a new recurrence for the moments and the extinction probability, their time asymptotics and the convergence in law for the measure-valued birth and death process conditioned to non extinction, leading to the existence of Q-process and Yaglom limit (in this infinite dimensional setting). We develop three classes of natural examples where our results apply. Joint work with Pierre Collet and Jaime San Martin.

Biography Professor Sylvie Méléard is a distinguished mathematician and Professor of Applied Mathematics at Ecole Polytechnique, France, where she also serves as a Senior Fellow of the Institut Universitaire de France. As Head of the Mathematical Modeling and Biodiversity Chair since 2009, she fosters interdisciplinary collaborations between mathematicians and biologists. Her expertise in probability theory, stochastic processes, and measure-valued processes drives her research on population dynamics, evolutionary ecology, bacterial biology, and hematology. Leading the PEIPS research group at the Centre de Mathématiques Appliquées (CMAP), she is the Principal Investigator of the ERC Advanced SINGER project, exploring stochastic dynamics of single cells, and the ITMO Cancer Aviesan-Inserm project on myeloproliferative neoplasms. Professor Méléard's academic journey began at the Ecole normale supérieure de Fontenay-aux-Roses (1977–1981), followed by her agregation in mathematics (1981) and a doctorate from Pierre and Marie Curie University (1984). She earned her habilitation in 1991 and held professorships at the Paris Nanterre University before joining Ecole Polytechnique in 2006. She has authored influential books, including *Stochastic Models for Structured Populations*, with Vincent Bansaye (2015) and *Modèles aléatoires en écologie et évolution* (2016). Her contributions have earned her prestigious accolades, including the Irène Joliot-Curie Prize for Woman Scientist of the Year (2024) and the Institute of Mathematical Statistics Medallion Lecture (2023).

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