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CENTER FOR THEORETICAL PHYSICS



# Arnold Sommerfeld Lecture Series

Professor Mehran Kardar

MIT, USA

Research Seminar:

## Life on a Noisy Seascape: Extinction, Growth, and Diversity

Populations and communities rarely evolve in static environments; their fitness landscapes fluctuate across space and time, forming what may be called a *noisy seascape*. This talk examines how such variability modifies classical models of population dynamics and community stability. Beginning from the logistic equation, I will show how spatiotemporal fluctuations in fitness lead naturally to power-law population statistics and, under certain conditions, to the empirical (fractional) Richards growth law. Extending these ideas to interacting species reveals that the combined effects of dispersal and environmental noise can stabilize large, diverse communities despite strong competitive interactions. The resulting framework connects extinction, growth, and coexistence within a unified view of life on a noisy seascape.

Thursday, January 15, 2026, 16:15 h, N020, Geschwister-Scholl-Pl. 1, LMU