



Pacific Institute *for the*
Mathematical Sciences

PIMS - UVic Distinguished Lecture

Thursday, January 23, 2020
Meet & Greet at 3:00, talk at 3:30

CLE – A207
University of Victoria



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Mathematics of Evolution: mutations, selection, and random environments

Understanding how environmental randomness affects evolution is of fundamental importance for biology. The presence of temporal or spatial randomness significantly affects the competition dynamics in populations and gives rise to some counterintuitive observations. In this talk, I will present some recent results on the evolutionary dynamics in systems where spatial and temporal randomness affects division and/or death parameters of cells. Of particular interest are the dynamics of non-selected mutants, whose rates come from the same distribution as those of wild type cells. Temporal and spatial types of randomness possess fundamentally different properties. Under temporal randomness, depending on the exact formulation of the update rules, minority mutants can be advantageous, disadvantageous, or neutral. In contrast to this, under spatial randomness, minority mutants are always advantageous. Applications to biomedical problems, including biofilms and cancer, are discussed.