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Forum de Physique Statistique @ ENS

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LPENS, College de France, 3 rue d Ulm
Domaines : cond-mat.stat-mech

Titre : *Competition at the front of expanding populations*

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Résumé : *When competing species grow into new territory, the population is dominated by descendants of successful ancestors at the expansion front. Successful ancestry depends of the reproductive advantage (fitness), as well as ability and opportunity to colonize new domains. (1) Based on symmetry considerations, we present a model that integrates both elements by coupling the classic description of one-dimensional competition (Fisher equation) to the minimal model of front shape (KPZ equation). Macroscopic manifestations of these equations on growth morphology are explored, providing a framework to study spatial competition, fixation, and differentiation, In particular, we find that ability to expand in space may overcome reproductive advantage in colonizing new territory. (2) Variations of fitness, as well as fixation time upon differentiation, are shown to belong to distinct universality classes depending on limits to gain of fitness.*