



Coloquio Queretano de Matemáticas

Viernes 17 de Mayo @ 1pm

Rigorous (in)validation of ecological models

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Ecological dynamics are entangled with complex biotic and abiotic factors. In practice, we often only have very limited characterization of the ecological systems, because many species and environmental factors are unmonitored. This incomplete knowledge poses a fundamental challenge in deriving any robust conclusion of ecological dynamics. Here, bringing tools from statistical physics, we develop fundamental constraints on ecological fluctuations based on our partial characterization. These constraints are fundamental because they must be satisfied regardless of unobserved biotic and abiotic factors. We apply these fundamental constraints to address some long-standing questions in ecology and evolution. Focusing on identifying functional forms of predation dynamics, we found strong empirical evidence that the nature of predation is prey-dependent instead of ratio-dependent. Focusing on dissecting ecological and evolutionary processes, we found strong empirical evidence that predation ability of the predator is evolving while prey is static. Focusing on detecting high-order interactions, we found weak empirical evidence that barnacles and algae have higher-order interactions on mussels. In sum, our methods provide a non-parametric computation tool to identify forms of ecological and evolutionary dynamics in complex ecological systems.

investigación

biomatemática

estadística

Evento híbrido, con transmisión en vivo

presencial: Aula Teórica, IM-UNAM Juriquilla

virtual: Zoom ID: 979 443 2722 pass: DRvwX2

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