



Sommerfeld Theory Colloquium

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ASC-PhD-prize colloquium:
Predicting survival: From bacteria to bosons

Whether a species is able to survive may depend on the interplay of many factors: its interactions with other species, environmental conditions, demographic noise, and so forth. I present how a coarse grained stochastic model of bacterial dynamics can be used to unravel this interplay for a model system of three *Escherichia coli* strains (colicin producing, sensitive, and resistant strains). We used the stochastic model to predict which strains survive a competition for new territory, finding close agreement with experiments.

The question of which species survive a competition is also posed on a more abstract level in theoretical ecology. I present results on the survival of species for a general class of models of theoretical ecology, namely for conservative Lotka-Volterra systems. Surprisingly, we found that these systems do not only model the dynamics of predator-prey interactions, but also the dynamics of bosons in driven-dissipative quantum systems. In the latter context, survival can be interpreted as condensation.

Wednesday, 24 January 2018, 16:15h, Room A348/349, Theresienstr. 37/III