



Mathematics and CS Seminar

Macroscopic regularity from microscopic complexity

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Understanding the macroscopically observable behavior of large complex systems based on the laws governing their microscopic constituents is an intriguing fundamental problem. Traditional statistical mechanics introduces "ensembles" (e.g., microcanonical, canonical, ...) to describe many-body systems at equilibrium. The success of this method relies on the empirical fact that many microscopically distinct systems or states exhibit the same macroscopic properties. We first review how this cornerstone of equilibrium thermodynamics can be understood within a quantum mechanical framework. Thereafter, we sketch recent ideas to develop a similar ensemble approach for systems and processes away from equilibrium. Adopting this approach, we present specific examples of analytical predictions for the observable dynamics of many-body quantum systems and verify them by comparison with experiments and numerical simulations.

Tuesday, March 5, 2024 04:15pm - 05:15pm

Office Bldg West / Ground floor / Heinzl Seminar Room (I21.EG.101)



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

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