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## Nonequilibrium Phenomena in Many-Body Quantum Systems

*Wednesday, September 25, 2024 2:10 PM (20 minutes)*

Understanding and modeling the nonequilibrium dynamics of many-body quantum systems is a crucial goal for many fields in physics and chemistry. Examples include scattering of molecules off metal surfaces, charge transport through molecular nanojunctions, spintronics, and molecular photophysics. This motivates the development of sophisticated theories capable of treating not only the large-dimensional nature of molecular systems but also inelastic interactions and nonequilibrium conditions. Even with sophisticated theory, nonequilibrium calculations of realistic systems require efficient numerical implementations and, even then, significant computational resources. In this contribution, we will introduce our work and how it is implemented on the bwHPC, as well as some particular examples highlighting the unique physics and challenges we face when modeling nonequilibrium dynamics of many-body quantum systems.

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**Session Classification:** Scientific Presentations

**Track Classification:** Contribution presents scientific results in a specific field acquired through bwHPC