Recent progress in solving the nonequilibrium many-body problem

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Recently, there has been significant progress in applying dynamical mean-field theory to solve the nonequilibrium many-body problem. I will describe some of these recent advances with an application to pump/probe spectroscopies including time-resolved photoemission spectroscopy and high harmonic generation. In particular, I will discuss scenarios for nonequilibrium melting of a charge density wave insulator, and how a pump pulse excites electrons from a lower to an upper band when generating high harmonics. This work has shown some interesting results seen in recent experiments, like the transient collapse of the gap in the charge density wave insulator with an intact order parameter and the production of odd harmonics of a fundamental pulse in high harmonic generation. I will end with a discussion of where the field is likely to go in the near future, and open questions that are not likely to be solved soon.