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Abstract for an Invited Paper
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Describing nonequilibrium behavior in strongly correlated materials via dynamical mean-field theory[1]

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Dynamical mean-field theory was introduced in 1989 and has become one of the most successful methods for solving models of strongly correlated electrons in equilibrium (it becomes exact in the infinite-dimensional limit). In this talk, I show how to generalize dynamical mean-field theory to nonequilibrium situations. For transient response, one discretizes the Kadanoff-Baym-Keldysh contour then solves the discrete problem directly. For steady-state response, one can formulate a theory directly in the long-time limit for the retarded Green's functions. These techniques are applied to the problem of the quenching of Bloch oscillations due to electron-electron interactions and to the problem of time-resolved pump/probe photoemission spectroscopy of strongly correlated electrons when a system is driven to a nonequilibrium steady state and cannot be described by the quasiequilibrium approximation with an effective temperature. This work was completed in collaboration with Tom Devereaux, Sasha Joura, Hulikal Krishnamurthy, Brian Moritz, Thomas Pruschke, Volodomyr Turkowski, and Velko Zlatić. Recent references include: J. K. Freericks, V. M. Turkowski, and V. Zlatić, Phys. Rev. Lett. **97**, 266408 (2006); J. K. Freericks, Phys. Rev. B **77**, 075109 (2008); A. V.Joura, J. K. Freericks, and Th. Pruschke, Phys. Rev. Lett. **101**, 196401 (2008); J. K. Freericks, H. R. Krishnamurthy and Th. Pruschke, Phys. Rev. Lett. **102**, 136401 (2009); and B. Moritz, T. P. Devereaux, and J. K. Freericks, arXiv:0908.1807.

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