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Abstract for an Invited Paper
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Bold-line Monte Carlo and the nonequilibrium physics of strongly correlated many-body systems¹

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This talk summarizes real time bold-line diagrammatic Monte-Carlo approaches to quantum impurity models, which make significant headway against the sign problem by summing over corrections to self-consistent diagrammatic expansions rather than a bare diagrammatic series. When the bold-line method is combined with reduced dynamics techniques² both local single-time properties³ and two time correlators such as Green functions⁴ can be computed at very long timescales, enabling studies of nonequilibrium steady state behavior of quantum impurity models⁵ and creating new solvers for nonequilibrium dynamical mean field theory.

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²Guy Cohen, Eli Y. Wilner, and Eran Rabani. *New Journal of Physics* 15, 073018 (2013).

³Guy Cohen, Emanuel Gull, David R. Reichman, Andrew J. Millis, and Eran Rabani. *Physical Review B* 87, 195108 (2013).

⁴Guy Cohen, David R. Reichman, Andrew J. Millis, and Emanuel Gull. *Physical Review B* 89, 115139 (2014).

⁵Guy Cohen, Emanuel Gull, David R. Reichman, and Andrew J. Millis. *Physical Review Letters* 112, 146802 (2014).