Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

" Universality in non-equilibrium boundary-driven systems"

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Abstract: A central problem in condensed matter physics is the extension of the paradigm of universality to situations far from thermal equilibrium. By considering a quantum critical wire subjected to a boundary drive, we find two novel examples of such universal far-from-equilibrium scaling. For a time-periodic (Floquet) boundary drive[1], we find a driving regime displaying critical exponents unique to the Floquet setting, which can be understood exactly through boundary conformal field theory and Kibble-Zurek scaling arguments. Generalizing to the problem of Poisson noise at the boundary[2], we find that the dynamics are still analytically tractable, displaying universal scaling with the noise parameters and an intriguing separation between mean and typical values reminiscent of rare-region effects. Our results are generic to one-dimensional quantum critical systems described by a conformal field theory, and we confirm both pictures with exact numerics.

[1] WB, M. Kolodrubetz, R. Vasseur and J. E. Moore. Phys. Rev. Lett. **118**, 260602 (2017).
[2] WB, J. Marino and E. Altman. arXiv:1906.11253 (2019).

12:00pm noon
Thursday, September 12, 2019
Duboc Room (4-331)

Host: Xueda Wen