

Massachusetts Institute of Technology  
Department of Physics

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Condensed Matter Theory Seminar

"Duality, effective theory, and multicritical points around the deconfined quantum critical point"

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**Abstract:** I will review the recent progresses towards understanding 2+1d quantum critical points. First of all, the easy-plane version of the deconfined quantum critical point is proposed to be dual to the  $N=2$  noncompact QED with Dirac fermion matter fields, and these two theories each has its own self-duality. These dualities make strong predictions on the infrared emergent symmetries and critical exponents of these theories, and we will discuss numerical simulations that strongly support these proposed dualities. We will also discuss multi-critical points around the easy-plane deconfined quantum critical point, including a multi-critical point that drives the deconfine QCP into a self-dual  $Z_2$  topological order. Generalization of these results to other lattice systems will also be discussed.

12:00PM  
Tuesday, September 26, 2017  
Duboc (4-331)