TEP Seminar

UCLA

Tuesday, April 21st @ 2pm
Schwinger Lounge
Hosted by Prof. Thomas Dumitrescu

"Thermal phase transition in massless QCD and the possibility of a conformal manifold"

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Abstract: Massless QCD at finite temperatures undergoes a phase transition that restores the spontaneously broken chiral symmetry. Growing lattice evidence suggests that this phase transition is continuous (or at most very weakly first-order). In contrast, the Landau-Ginzburg analysis is known to predict a robust first-order transition. Here we study general constraints on a CFT description of the chiral phase transition arising from symmetries and 't Hooft anomalies. These constraints allow, in addition to Landau-Ginzburg scenarios, a beyond-Landau scenario in which a conformal manifold extends along the imaginary baryon chemical potential. We find preliminary evidence for the existence of such a conformal manifold from the 2+ε expansion of a nonlinear sigma model, and hope to gather further evidence for this conjecture in the future.