Black Holes at Criticality

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The extended thermodynamics of Black Holes in AdS has a phase structure in the (T, p) plane that includes a line of first order phase transitions ending in a second order transition point. Scaling symmetries of black holes at that critical point show the appearance of fully decoupled Rindler space-time in a new double scaling limit (C. Johnson, 2017). Making use of the pdV terms in the first law of extended black hole mechanics, holographic heat engines are defined and their holographic meaning is explored (open question). It is argued that the efficiency of holographic heat engines approaches Carnot efficiency at finite power at the Critical point (Campisi/Fazio 2016, C. Johnson 2017, CB/P K Yerra 2017).

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