

# XVth Quark Confinement and the Hadron Spectrum



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## Universal features of non-Fermi liquids and application to black holes

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Most of the condensed matter is dominated with models with quasiparticles in the form of Fermi liquid theory. However, physics becomes quite interesting where there is a lack of quasiparticles in the so-called strange metals. We will introduce the physics of non-Fermi liquids in the form of a model without quasiparticles, namely the Sachdev-Ye-Kitaev (SYK) model. We will discuss its various dynamic and thermodynamic properties including charge transport in SYK chains as well as critical exponents for the associated phase transition. Apart from the observed universalities, there might lurk *a universality of universalities* in the properties of such non-Fermi liquids that we will discuss in the form of critical exponents and quantum chaos characterized using Lyapunov exponents. SYK model has been proposed as a dual to some gravity models and we will discuss the implications of the results for the black holes.

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