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Universal features of Thermopower in High T_c systems and Quantum Criticality

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I will discuss the qualitative insights in the computation intensive field of thermoelectric constants, especially in correlated electronic systems. My efforts in the last few years have yielded two new simple and yet powerful formulas for the thermopower, the high frequency formula S^* and the Kelvin formula. These are not exact in general, but capture the essential physics in different regimes. Using these powerful formulas, the role of features in the DOS, and of electronic frustration in triangular lattices becomes transparent, as compared to the "the computer (and perhaps God) understand the details" view point of the computational efforts using the indisputably exact but opaque Kubo formula. I will summarize these formulas, some new applications, and prospects for the future.