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Abstract: We consider two classes of objects: resistor networks and stochastic particle systems with hard-core interaction and symmetric jump rates. The geometrical setting is random: nodes and possible particle locations, respectively, form a simple point process in R^d. Further randomness is allowed in the environment. Our target has been to derive the scaling limit of the directional conductivity and the hydrodynamic limit of the particle density, respectively, for universal classes, under stationarity and ergodicity. The characters of this story are a probability space, the actions of the abelian group R^d (or Z^d), a simple point process and a conductance field. In the scaling limit they will merge indissolubly to produce the effective homogenized matrix, which will dictate the limiting behavior. We will also briefly discuss some applications to computational geometry and to electron transport in doped semiconductors. **(09:00 - 10:00)**