

## Critical behavior of transport near percolation threshold

conductivity

$$\sigma(p) \sim \sigma_0 (p - p_c)^t, \quad p \rightarrow p_c^+$$

permeability

$$\kappa(p) \sim \kappa_0 (p - p_c)^e, \quad p \rightarrow p_c^+$$

conductivity exponent  $t$

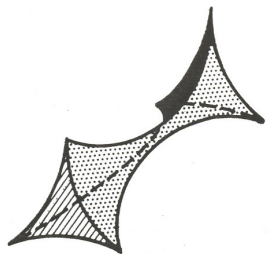
UNIVERSAL for lattices

depends only on dimension,  $e = t$

$d = 3$  numerical  $t \approx 2$

rigorous bound  $1 \leq t \leq 2$

*Golden PRL 1990, CMP 1992*



continuum exponents can be *non-universal*

**SWISS CHEESE**

*Halperin, Feng, Sen PRL 1985*