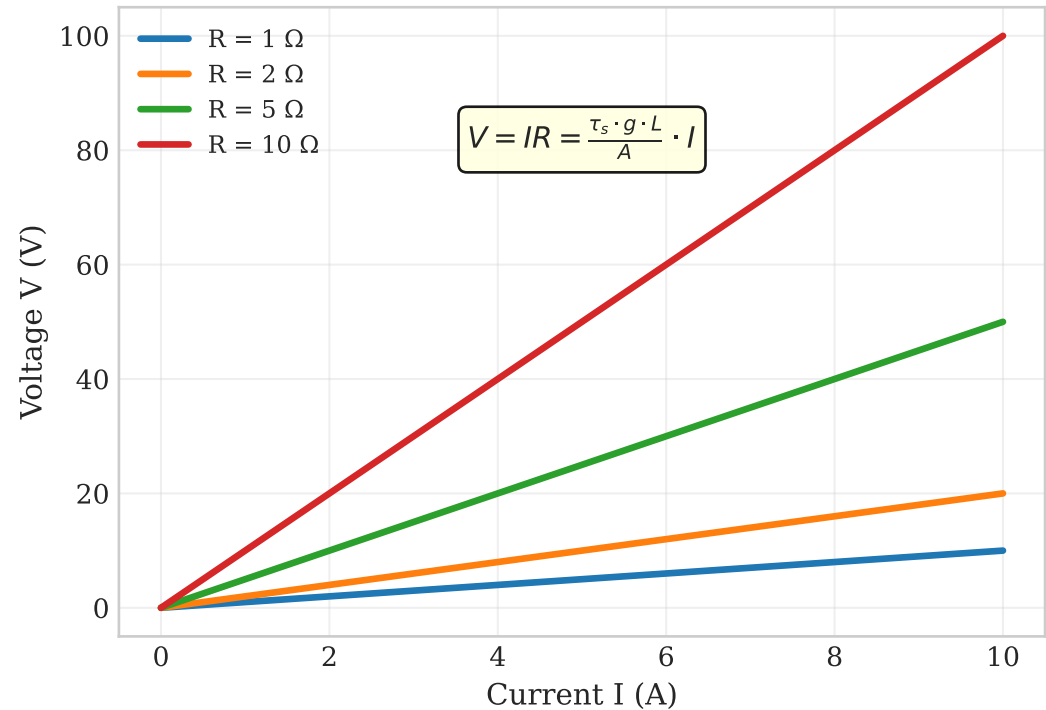
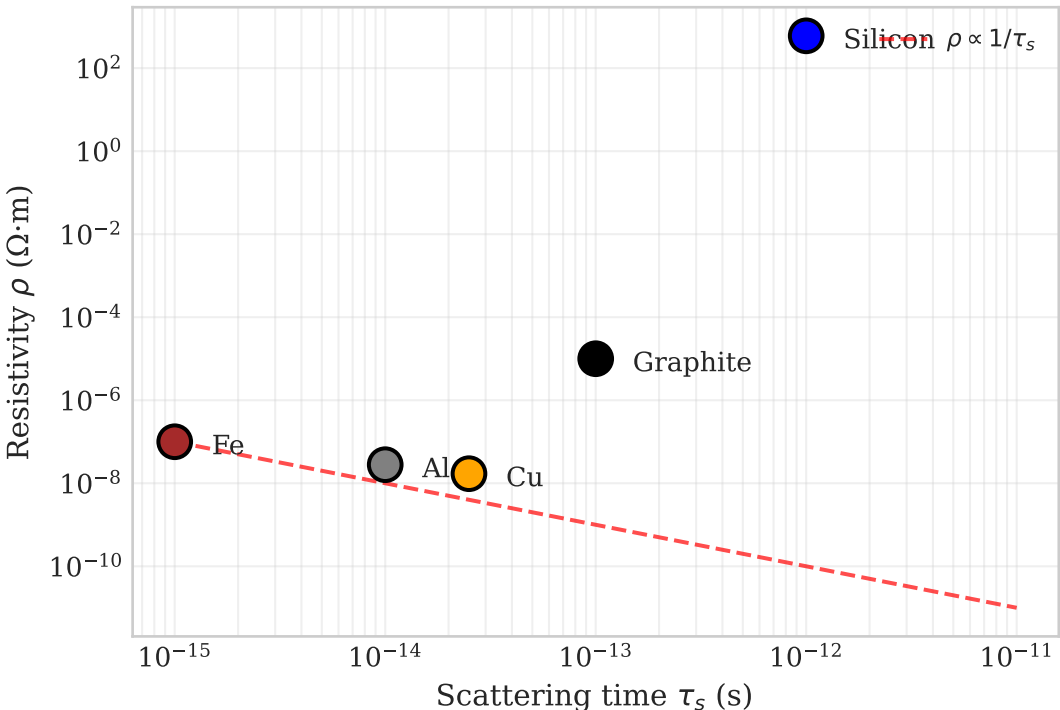


Panel C-3/C-4: Ohm's Law and Kirchhoff's Laws from Categorical Dynamics

(A) Ohm's Law:  $V = IR$



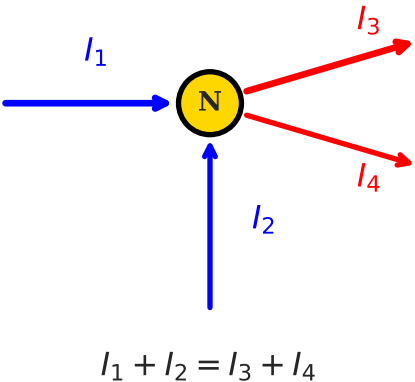
(B) Resistivity from Scattering Partition Lag



(C) Kirchhoff's Current Law: Conservation at Nodes

$$\sum I_{in} = \sum I_{out}$$

(Categorical state conservation)



(D) Kirchhoff's Voltage Law: Loop Closure

$$V_s - V_1 - V_2 - V_3 = 0$$

