Figure 1: A section of a metal wire.

When applying a *voltage* across a metal wire, a *current* (designated as I) will flow. A voltage can be seen as electric pressure between two points. A current can be seen as movement of electric particles in the wire, in this case electrons. Note that the electrons, having a negative charge, move in the opposite direction of the measured current (as shown by I_e).

The resistance of a metal wire with length L and diameter d is:

$$R = \frac{\rho L}{A} \tag{1}$$

where A is the area of the cross section with

$$A = \frac{1}{4}\pi d^2 \tag{2}$$

and ρ is the specific specific resistance of the metal in Ω m (ohm meter).