

**Answer on question #58675, Physics / Other — Relativity**

**Question** find the velocity acquired by an electron in falling through a potential difference of 5000 volts

**Solution** We can find from energy conservation.

$$\frac{mv^2}{2} = eV$$

where  $V = 5000$  volts,  $m = 9.1 \cdot 10^{-31}$  kg is mass of electron,  $e = 1.6 \cdot 10^{-19}$  C is its charge. Hence

$$v = \sqrt{\frac{2eV}{m}} = \sqrt{\frac{2 \cdot 1.6 \cdot 10^{-19} \cdot 5000}{9.1 \cdot 10^{-31}}} \approx 132.6 \cdot 10^5 \text{ m/s}$$