

### Answer on Question #55029, Physics / Astronomy | Astrophysics

The Milky Way is moving toward the larger galaxy M31 at about 100 kilometers per second. M31 is about 2 million light years away. How long will it take before the Milky Way collides with M31 if it continues at this speed?

#### Answer

$$v = 100 \frac{km}{s} = 10^5 \frac{m}{s}; S = 2 * 10^6 ly = 2 * 10^6 * 9.5 * 10^{15} m \approx 2 * 10^{22} m.$$

$$t = \frac{S}{v} = \frac{2 * 10^{22}}{10^5} = 2 * 10^{17} s \approx 5.5 * 10^{13} hr \approx 2.3 * 10^{12} days = \mathbf{6.3 * 10^9 years}.$$