

63. Let the power of the laser beam be  $P$  and the energy of each photon emitted be  $E$ . Then, the rate of photon emission is

$$\begin{aligned} R &= \frac{P}{E} = \frac{P}{hc/\lambda} = \frac{P\lambda}{hc} \\ &= \frac{(5.0 \times 10^{-3} \text{ W})(0.80 \times 10^{-6} \text{ m})}{(6.63 \times 10^{-34} \text{ J}\cdot\text{s})(2.998 \times 10^8 \text{ m/s})} \\ &= 2.0 \times 10^{16} \text{ s}^{-1} . \end{aligned}$$