

28. (a) Eq. 38-33 leads to

$$v = \frac{\Delta\lambda}{\lambda} c = \frac{12 \text{ nm}}{513 \text{ nm}} (2.998 \times 10^8 \text{ m/s}) = 7.0 \times 10^6 \text{ m/s} .$$

(b) The line is shifted to a larger wavelength, which means shorter frequency. Recalling Eq. 38-30 and the discussion that follows it, this means galaxy NGC is moving away from Earth.