

Answer on Question #73096-Physics-Mechanics-Relativity

A spaceship is receding from the earth at a speed of $0.3c$. A light on the spaceship emits light of wavelength $\lambda = 4500\text{\AA}$ which appears blue to a passenger on the spaceship. What color would the light appear to a person on earth?

Solution

$$\lambda = 4500 \text{\AA}$$

$$v = 0.3c$$

$$\lambda' = \lambda \frac{1 + \frac{v}{c}}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\lambda' = 4500 \frac{1 + 0.3}{\sqrt{1 - 0.3^2}} = 6132.5 \text{\AA}.$$

Thus, the new color of light is **orange**.

Answer provided by <https://www.AssignmentExpert.com>