

3.7 Why Are There No Green Stars?

PRE-LECTURE READING 3.7

- None

VIDEO LECTURE

- Why Are There No Green Stars?¹ (5:11)

SUPPLEMENTARY NOTES

Cones

- See Cones².
- If a source of light is sufficiently bright, the human eye detects it with “cones.”
- Cones measure the brightness of an object in three visible bands, roughly corresponding to red, green, and blue.
- The human brain then combines these measurements into a single color.
- Thermal spectra of increasing temperature result in the following combined colors: red, orange, yellow, yellow-white, white, blue-white, blue.
- Why not green?

Rods

- See Rods³.
- If a source of light is too faint to detect with cones, the human eye tries to detect it with “rods.”
- Rods measure the brightness of an object in a single visible band, not splitting the light three ways like cones do.
- The human brain interprets this measurement as a shade of gray, with white corresponding to bright and black corresponding to too faint to detect.
- The stars at night are incredibly colorful, but too faint to detect with your cones (with a few exceptions). Consequently, the night sky looks black and white to us. Too bad!

¹<http://youtu.be/KTZE9N82o9k>

²http://en.wikipedia.org/wiki/Cone_cell

³http://en.wikipedia.org/wiki/Rod_cell

EXERCISE

If aided by a telescope, the human eye can see red, orange, yellow, yellow-white, white, blue-white, and blue stars. Why are there no green stars?