

Messages of Light—First Thoughts

E2:A0

“Unbroken starlight allows us to admire a star’s external characteristics; its spectrum allows us to look into its very soul.” – James Kaler

Electromagnetic radiation received from space carries encoded messages about physical properties of distant objects that are not discernible through imaging alone. Analysis of the wavelengths of light present (or absent) in an object’s spectrum can reveal recognizable patterns that provide astronomers with information about the object’s color, temperature, and chemical composition.

In this Exploration, you will investigate how astronomers decode the messages of light. As you proceed, keep in mind the following Essential Question:

What can be learned from analyzing the light from astronomical objects?

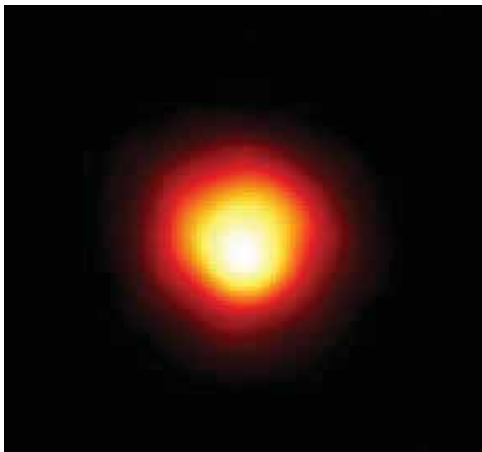


Figure 4-1: Image of the star Betelgeuse

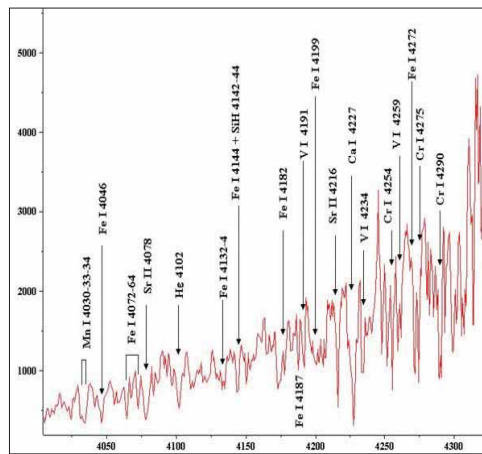


Figure 4-2: Spectrum of Betelgeuse

First Thoughts—Making Claims

To begin this Exploration, you will make claims about the kinds of information provided by the electromagnetic radiation coming from the planetary nebula in Figure 4-3.

1. What types of information might the electromagnetic radiation coming from this planetary nebula provide?
2. What might be the differences between the green gas and the red gas?



Figure 4-3: Image of the Cat's Eye nebula taken by the Hubble Space Telescope

3. What other information could we learn from analyzing the electromagnetic radiation from this object?