Lecture 2: Light: What it is

Slide 2: "What does an astronomer do?"
What is the fundamental difference between how an astronomer and a physicist performs experiments?
Why is understanding light so critical for an astronomer?

Slide 3: (nasty equations explained)
What two physical types of energy (fields) is light made of?
How do changes in these two energies effect one another?

Slide 4: "Light is a…"
What is light?
What is a photon?
What property of light does "wavelength" describe?

Slide 5: "A light beam is a composite…."
How do we know that a light beam is comprised of many photons of different wavelengths?

Slide 6: "Photons – wave packets of energy"
For visible light, which colors have the longest wavelengths? Shortest wavelengths?
What is the typical wavelength of visible light (not exact, but roughly)?

Slides 7 & 8: The Electromagnetic Spectrum
What are the seven fundamental regions of the electromagnetic spectrum?
How are energy and wavelength related?
Which types of photons have the shortest wavelengths and highest energies?
Which types of photons have the longest wavelengths and lowest energies?
What is the wavelength range of visible light?
What are the typical objects that have similar sizes of the wavelengths of each region of the spectrum?

Slides 9, 10, &11: Crab Nebula, Pillars of Creation, Strip of Sky
What are these slides illustrating about why it is useful and important to study objects in all regions of the electromagnetic spectrum?

Slide 12: Spectra
What is a blackbody?
What is a continuous spectrum?
What is a blackbody spectrum?
On what quantity does the shape and intensity of a blackbody spectrum depend?
How does the spectrum of a blackbody change as its temperature is increased?
How does the spectrum of a blackbody change as its temperature is decreased?

Slide 13: “Though Stars are hot and dense…”
Are stars blackbodies?
Do the spectra (of some stars) look pretty close to a blackbody spectrum?
How do they differ from a blackbody spectrum?
What can we learn about stars due to these differences?

Slide 14: “The apparent color...”
What observed apparent color do cooler stars have?
What observed apparent color do moderate temperature stars have?
What observed apparent color do hotter stars have?
Explain why this is so.

Slide 15: What real stellar spectra…”
Do hot or cool stars have spectra most closely resembling a blackbody spectrum?
Why are the many features in stellar spectra useful to astronomers?

Slide 16: What real galaxy spectra…”
In the visible, why does the continuum shape of galaxy spectrum kind of look like a stellar spectrum?
What other objects in galaxies create strong features in galaxy spectra?
In the infrared, what causes most of the continuum emission of light?