

Episode 700: Preparation for astronomy topic

This topic may be either in the first or second year of Advanced Physics. In some specifications, it appears as an optional topic.

There is some algebra, so you may decide to quote some results, rather than giving full derivations.



Episode 701: Observing stars

Episode 702: Red shift

Advance warning

There is little scope for practical work in this topic, so you should look out for paper-based activities, multimedia software etc.

Spectrometers are useful, since spectroscopy plays a central role in astronomy. Hand-held **spectroscopes** are useful, although you can get away with just looking through diffraction gratings. Check with colleagues from the chemistry department to see what they can make available to you. (Also, ask them what your students may have learned about atomic spectra in their chemistry studies.)

As this is a rapidly-changing area, it is worth making an effort to keep up-to-date by reading magazines such as *New Scientist*, *Scientific American* etc. Encourage your students to do the same.

The Particle Physics and Astronomy Research Council is a good source of booklets and posters: <http://www.pparc.ac.uk/Ed/pubs.asp>

A visit to an observatory can greatly enhance this topic.

Main aims

Students will:

1. Name different types of spectra.
2. Describe the information which can be deduced from spectra.
3. Understand how the Doppler effect can give rise to red and blue spectral shifts.

Prior knowledge

Most students should have heard of the Big Bang and expanding Universe, whose present age ~ 14 billion years. This topic makes it all plausible. Some points which you will need to draw on:

- the wave speed formula $v = f\lambda$
- diffraction by a grating (qualitative)
- the electromagnetic spectrum

Where this leads

This topic acts as an introduction to cosmology and ideas about the history of the Universe.