UNIVERSITY OF CANTERBURY PHYSICS AND ASTRONOMY

NAME:

ASTR109/PHYS109: 2008

HOMEWORK SHEET #8

Due 1.00 pm, Thursday Oct 2 2008

Bring to lecture or tutorial or leave with the Rosalie in room 705, Physics and Astronomy

1. William and Caroline Herschel were the first to produce a model of Our Galaxy based on observations.
Give an account of how they did this.
Explain whether their model was successful or not.

2. Explain what produces the red light seen coming from an emission nebula (also known as HII region).

3. If the Sun were situated at a distance of 10 parsec it would appear much fainter – the flux of light we would receive would be much less. In fact the Sun would be just visible to the unaided eye.

Astronomers use the distance of 10 parsec as a standard distance: we standardize the brightness of any star by giving its brightness (flux of light) that we *would* receive from that star if it were placed at a distance of 10 parsec. So the "standard Sun" is the flux of light that we would receive if the Sun were 10 parsec away.

(a) A Cepheid variable star is measured to have a pulsation period of 30 days.
What is its Luminosity (compared to the Sun)?
For the answer - use your textbook, the library, web etc.

(b) That Cepheid has an observed flux that is 14,400 times less than the standard Sun.

(i) How far away (parsec) is this star?
(ii) Compare your result with the size of our Galaxy.