Astronomy 230 Fall 2006
Homework #10
Due in Class: Friday, Nov. 30

Note: This homework should be typed.

The Drake equation can be written as:

$$N = R_* \times f_p \times n_e \times f_l \times f_i \times f_c \times L$$

N   <u>Number</u> of advanced civilizations that can contact us in our Galaxy today (stars)

R$_*$ Star formation <u>rate</u> in the Galaxy per year (stars/year)

f$_p$ <u>Fraction</u> of those stars with planets (planetary systems/star)

n$_e$ <u>Number</u> of Earthlike planets (average) for each of those systems
        (Earthlike planet/planetary system)

f$_l$ <u>Fraction</u> of those Earthlike planets with basic life forms (basic life/ Earthlike planet)

f$_i$ <u>Fraction</u> of intelligent life on those planets with basic life forms
        (intelligent life form/basic life)

f$_c$ <u>Fraction</u> of that intelligent life that can communicate (communication /intelligent life form)

L   <u>Lifetime</u> of the intelligent life's alien civilization (average) that can communicate (years)

Write down the Drake equation and a personal estimate on the number of civilizations with which we can communicate today. For each term write 4-6 sentences. To get full credit you must address:

- At least 1 scientific reason you chose the value, i.e. facts from class.
- Are there limits on the value? What are they?
- Do you think the number is well known?

Compare your new value for N to HW 1. How did it change? Do you feel better about your new estimate?