Assignment 5.

Due date: 4.00pm Monday 21st May

Question 1: Write a computer program or an Excel spreadsheet that calculates the signal-to-noise ratio reached when taking broad-band images of a point-source.
Variables you will need to include are:

- The filter you are using.
- The brightness of the target
- The diameter of the telescope's primary mirror.
- The total throughput of the atmosphere+telescope (ie. the fraction of photos hitting the upper atmosphere which go on to hit the detector).
- The Quantum Efficiency of the detector.

You should provide me a copy of the program/spreadsheet, together with sufficient instructions on how I run it (which may be in the form of comments within the program or notes within Excel).

Question 2: Take an optical or IR image of some part of the sky. You may either use one of your own, or one I provide at the following link:
http://www.mso.anu.edu.au/~pfrancis/ObsTech/data/
(this is an R-band image taken with the 2.3m telescope).

Pick a fairly bright star in your image: one that has enough counts so that its signal-to-noise ratio is high, but not so many that it is saturated.

Write a program to compute the amount of flux detected from this star in a circular aperture of given radius *r*. You will need to subtract off the sky brightness in some way to do this.

Make these measurements for a number of different values of *r* and plot the results.

You will find the tutorial listed here (and on the web page) very useful:
http://www.mso.anu.edu.au/~pfrancis/ObsTech/data/

Your write-up should consist of your plot, the program, and an explanation of any tricky things you've done.