Tutorial: Data Fitting

This tutorial is intended to give you some idea of how to approach basic data fitting problems, how to translate between IDL and python, and how to use object-oriented graphics.

If you continue in astronomy at all, you're almost guaranteed to need to do all of these things.

Setup

As usual, `git pull` in the `ASTR2600_materials` directory. Then, copy the folder `tutorial22_datafitting` into your personal `tutorials` directory using `cp -r` (`-r` means "recursive", which is necessary when you want to copy over a whole directory).

Next, we need to download the `mpfit` package. Do the following:

```
cd
mkdir mpfit
cd mpfit
wget http://www.physics.wisc.edu/~craigm/idl/down/mpfit.tar.gz
tar -xzvf mpfit.tar.gz
ls
pwd
```

That last command should print out the full path to the `mpfit` directory, which should look like `/home/astr/ugrad/username/`. Note it and copy it (you'll paste later).

Now, using a *different terminal*, `cd` to your `tutorials/tutorial22_datafitting` directory. Open the two files `tutorial22_datafitting.pro` and `tutorial22_functions.pro` in either `gvim` or `idlde`.

The quick gvim command is: `gvim -p tutorial22_functions.pro tutorial22_datafitting.pro`

In the `tutorial22_datafitting.pro` directory, add the following line after `.full_reset_session` (**but make sure you replace username with your username!!**:
`!PATH = !PATH+":/home/astr/ugrad/username/mpfit/`
The `:` is important; don't leave it out.

Last, open the lecture notebook from one of these links (you get to choose):
http://keflavich.github.io/astr2600_notebooks/Lecture23_DataFitting.html (slideshow mode)
http://nbviewer.ipython.org/urls/github.com/keflavich/astr2600_notebooks/raw/master/Lecture23_DataFitting.ipynb (notebook mode)

Using IDL's "New Graphics" to replicate the lecture

Start a journal file.

From `tutorial22_datafitting.pro`, paste each code block, one at a time, and look at the results. Compare them to what you saw in the ipython notebook.

Turn in your journal file.