PROBLEM SET # 4

Astro 512 – Spring 2019
Extragalactic Astronomy

Problem 1: Reconstruct the Justification for a Proposal

During the quarter, you have been developing expertise in a topic of your choosing. For this assignment, I'd like you to use some of that expertise to develop the scientific justification that you'd use for a proposal (for funding or observing time) on that topic.

Rather than coming up with an idea from scratch, I'd like you to "reverse engineer" the justification for a 2-3 page proposal for an *existing* accepted science proposal from the last 3 years. (You are welcome to develop your own, if you are up for the challenge, but starting with an idea that has already been vetted as "compelling" is a good head start.)

For your proposal, I'd like you to include:

- One cover page giving the title, abstract, the organization that awarded the proposal (i.e., HST, VLA, etc), a very brief description of the awarded resources ("10 hours moderate resolution IFU spectroscopy of 10 AGN host galaxies", "$532K", etc), and a link to the proposal.
- 2-3 pages of text justifying the scientific impact of the proposed observations or funding (see more details below). Please use the "GO" templates from the most recent HST call for proposals (link below), but only fill out the "Scientific Justification" section. Do not adjust the margin or text size — as with a real proposal, you need to make your argument fit into the allowed space.

  `https://hst-docs.stsci.edu/display/HSP/HST+Cycle+27+Preparation+of+the+PDF+Attachment`
- Up to 1 page of supporting figures, if needed.
- Up to 1 page of references.

To help you write a proposal, please see the slide deck in the link below

`https://github.com/jdalcanton/Scientific-Writing-Workshop/tree/master/Week%2010`

There is also a collection of links here:
`https://supernovacondensate.net/2016/01/14/how-to-write-a-proposal-part-ii/`

I am happy to go over an outline of your argument with you before you write in earnest.

Finding Abstracts of Existing Proposals

There are a few easy places to find titles and abstracts for current proposals:

1. *Hubble Space Telescope*

   MAST (The Mikulski Archive for Space Telescopes) contains archives for HST and Kepler, along with several older UV missions. You can search abstracts at the link below

   `https://archive.stsci.edu/abstracts.html`

2. *The Spitzer Space Telescope*

   The recently-ended Spitzer mission has searchable abstract text at the link below. Click on the upper left sidebar entry for "Abstract Text" to search a string in the abstract.

   `https://sha.ipac.caltech.edu/`

3. *The National Science Foundation*

   The NSF funds theory and ground-based astronomy, usually in the form of 3 year grants of funding to carry out a research project. You can search for awards at the link below. Under "NSF Organization" in the "Program Information" box, select "AST – Division of Astonomical Sciences". Under "Additional Information", select "Active Awards" to make sure you're getting recent programs. You can use the "Keyword" box to enter in a relevant search term. Once you get a list of awards, you can click on their title to go to a page that gives the full abstract. Note that the NSF awards are typically larger scale projects than individual observing proposals, and thus may be harder to reconstruct a justification for.

   `https://www.nsf.gov/awardsearch/advancedSearch.jsp`

4. *ALMA*

   Title and abstracts for high priority projects can be found at the following link. The pull-down widget on the upper left can be used to select Cycles 5 or 6 (which are the most recent cycles; "DD" stands for "Director's Discretionary Time", which are usually awarded through other channels). The abstracts are hidden until you click on the word "(Abstracts)" after the "Title" heading at the top of the returned table.

   `https://almascience.nrao.edu/observing/highest-priority-projects#`

5. *The VLT*

   The VLT proposals can be searched in the form below. The abstracts for the most recent proposal period are not yet public, so enter "101" or "100" under "Period" to return proposals with visible abstracts. You'll then have to search the list of titles for proposal names that sound relevant to your interests, since it doesn't seem to have a searchable abstract option.

   `http://archive.eso.org/wdb/wdb/eso/approved_runs/form`

6. *Any other astronomy facility!*

   You are also welcome to find proposals for Chandra, Keck, the VLA, Arecibo, Kepler, Tess, etc, and do not need to limit yourself to the options above. You should think about your science topic and try to figure out what facility might be particularly promising (e.g., Chandra is probably a better fit to studies of gas in galaxy clusters than Kepler).