

# APRIL 2018 REPORT OF THE HEASARC USERS' GROUP

## MEMBERS:

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This report is essentially an update to our previous report, submitted about a year ago.

## Overview

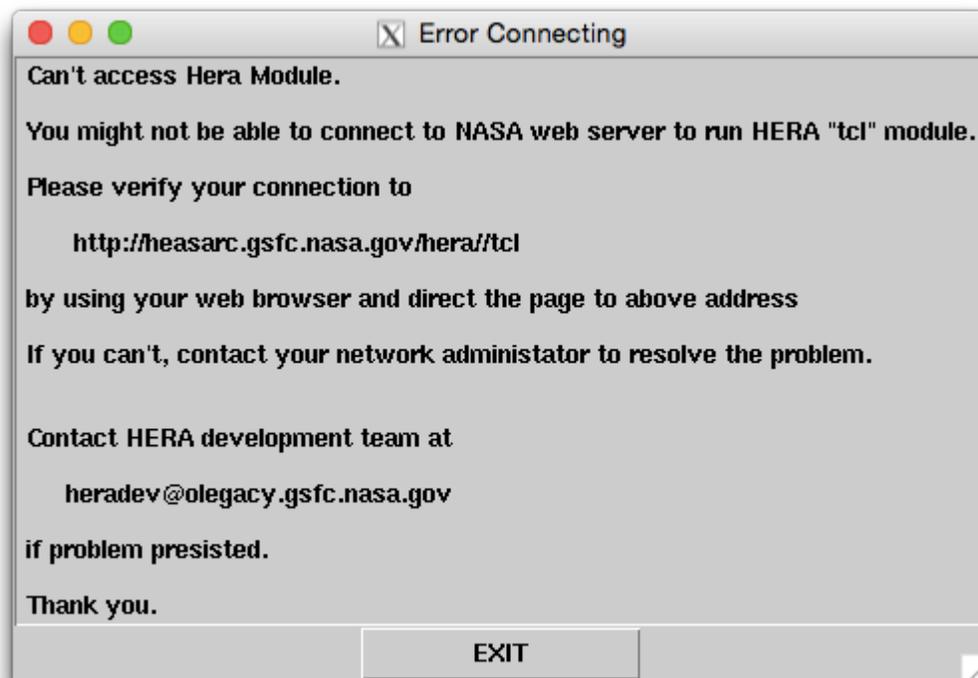
HEASARC continues to play a crucial role as an accessible data repository for the high energy astrophysics data from current and past NASA missions (as well as those where NASA was a partner). It is also involved, via the LAMBDA arm of HEASARC, in curating the cosmic microwave background data. HEASARC is also extensively involved in making public data from other facilities such as optical and radio telescopes accessible to the community. It is crucial that the facility continues to be supported. Below we have the following comments and specific recommendations which form an update to the March 2017 original report.

## General Feedback

- The committee recognizes that there is a large legacy code base, especially mission-specific FTOOLS from historical missions that are unfeasible to re-write. Keeping these codes maintained so that data from those missions remain accessible and analyzable for the long term is an important function of the HEASARC, and we applaud these efforts.
- Checking the quality of the archived data is a very valuable (and probably tedious) effort, but it is definitely worth the investment. The Users' Group agrees that this is a good way to use some HEASARC resources.
- We encourage the continued push to make interfaces that allow easy scripting of processes like queries and data analysis pipelines. Some of the FTOOLS interfaces lack flexibility, e.g., the PFILE structure of many tools can be a significant source of bugs when parallel scripting.
- The Users' Group strongly supports the increasing utilization of Python by the HEASARC in light of Python's rapid adoption and growth in the astronomical community. We encourage providing Python interfaces to HEASARC tools (e.g., PyXSPEC), initially using wrappers, and potentially later by rewriting certain tools and interfaces using Python (in the cases that performance would not be compromised).
- We also encourage the HEASARC programmers to use community developed, well debugged, Python libraries like NumPy and astropy (and others). Furthermore, where possible, HEASARC should contribute back to those projects (along the lines of what STScI did by contributing PyFITS to astropy.io.fits <[http://www.stsci.edu/institute/software\\_hardware/pyfits](http://www.stsci.edu/institute/software_hardware/pyfits)>). Having professional programmers contributing is extremely valuable for projects that are nearly all maintained by volunteers and of great benefit to the community.

## Mission- and Tool-Specific Feedback

- *AMON*: Collaboration between AMON and GCN needs to be established. At the moment, AMON seems to duplicate work being done under the GCN, now managed under HEASARC, and work by the various instrument teams. If the HEASARC is collaborating with AMON, we think ensuring that both HEASARC and AMON understand its relationship to the GCN and the instrument teams should be the focus.
- *NICER*: Inclusion of the NICER data in the HEASARC archive is a great addition and without a doubt, the scientific community will want to use NICER for long-term variability studies. This will require the calibration of the instrumental background, which is particularly important to understand for studies of faint sources. The Users' Group appreciates that it might be primarily the responsibility of the instrument team, but (if appropriate) encourages HEASARC to provide know-how to make such efforts feasible.
- *WebHera*: Users continue to report issues with WebHera launched via fv. Here are some specifics:
  - Shouldn't Hera launched via fv be using https protocol (see screen shot of error message below)? The url listed below typed into the browser window does not work.



- *LISA Pathfinder*: The committee wasn't sure how the LISA pathfinder DRS data relate to the HEASARC mission. If this is simply the most relevant archive for the engineering data, then this is reasonable. We understand that the engineering data have been used for micro-meteoroid studies, for example.

- *Athena*: Athena is the next big mission on the international high energy astrophysics horizon, and activity is ramping up. Are there any plans to include the Athena data in the HEASARC repository? It is very likely that the Athena team is already planning to use tools that conform to the OGIP standards, but we recommend starting that conversation if it is not taking place already. The goal of the HEASARC should be to make sure that the US community has the data access and tools it needs to make full use of the data.

### **Recommendations for the Next Users' Group Meeting**

- The Users' Group reiterates its suggestion from the last report that the HEASARC undertake a community survey both for users of HEASARC tools and data and (perhaps separately) for users of the VO functionality. We recommend regular, focused (and brief!) surveys to help understand the broader user base and obtain new ideas. We are willing to provide feedback on specific questions. The user survey could be publicized via the HEAD newsletter and other community forums.
- It would be valuable to add a person with a Virtual Observatory background to the Users' Group. Most of the current members are familiar with the Virtual Observatory, but not sufficiently expert to offer meaningful input. The Users' Group will recommend some possible new members.
- To set the context for the next meeting, we request some introductory material at the beginning of the presentation that includes retrospective (from the past ~3-5 yrs) and prospective (for the next planning period) budget and FTE allocations for HEASARC broken into its major activities. Understanding past and planned resource allocation will assist the Users' Group to make the best recommendations for prioritization of effort.