

NASA Herschel Science Center Users Panel Report for meeting on March 2 & 3:

To: George Helou, Director of the NASA Herschel Science Center (NHSC)

From: Margaret Meixner, Chair of the NHSC Users Panel (NUP), on behalf of the NUP

In attendance:

Margaret Meixner, Chair

Paul Harvey

Joseph Hora

John Bieging

Andrew Harris

Eichi Egami

Ex/Officio: Paul Goldsmith , Rob Kennicutt (Chair of Herschel Users Group; HUG)

On phone: Moshe Elitzur

Executive Summary:

We applaud the NHSC and the whole Herschel Mission on the success of the mission and are quite excited by the data from Herschel. The NHSC staff's efforts with the Instrument control centers have paid dividends and have gained the US a significant foothold into this mission for the US community. They have prepared several US teams via data processing workshops and support of the helpdesk. We comment on both the NHSC and funding below. We then suggest improvements to the NASA Herschel Science Center on the following areas discussed in more detail below:

- Improvement to the Herschel Mission website a website including a good cross-indexed list of places to find the information. A search tool might be useful, but simply a well-laid out list of links to the documents astronomers need for calibration, reduction, and analysis is the starting point needed now.
- Continued improvement of data processing tools (HIPE), and data analysis will be needed.
- Support of the next AO will be an important opportunity to attract new users with small programs

NHSC support of the Herschel Mission:

Herschel science data are stunning. Congratulations to whole Herschel team of which NHSC is an integral part! NHSC staff's efforts at ICC and their software development for Herschel has really paid off. By being an integral part of the Herschel team, the NHSC staff have really gained the US more than we might have expected. We are impressed that despite their grueling travel schedules, the NHSC staff have accomplished a lot.

The NHSC staff are very experienced from their work on prior missions; e.g. Spitzer, and ISO, and their experience results in a smoothly operating science operations center. The NHSC is paying attention to the community and responds. For example, helpdesk responses are timely and informative. Moreover, the NHSC is excellent at anticipating upcoming issues for the community such as: providing an NHSC advocate for each of the open time key programs workshops, one-on-one interactions and data schools to get the US community up to speed on the data processing and community computing resources initiative to ensure everyone has access to appropriate computers to get the data processing accomplished.

Funding:

Current funding levels to the community are adequate for completion of the projects, but not much beyond the Herschel projects themselves. Theory and lab astrophysics are needed to support the efforts and soon archival funds will be needed to support Herschel archival research. The NUP would like assurance from NASA Headquarters that these activities have avenues for funding support.

The NHSC staff has been working flat out, since launch and the HIFI anomaly made it more demanding. NUP thinks the NHSC staff are stretched thin. The US community relies on this group and funding for them needs to be maintained or increased.

Suggestions for Future Improvement:

Directed to HSC & NHSC. The suggestions listed below are things we think all Herschel Mission users will want, so while we direct them towards the NHSC, we realize they will be cooperating on these things with the HSC, their European counterpart. These suggestions are meant as guiding.

Website Information Dissemination:

Problem: Investigators are in the midst of writing the first papers based on Herschel Demonstration Science Programs; however they are not able to find the basic information on a website to calibrate and evaluate the data: e.g. beam area sizes, flux calibration errors. Part of the cause is the rapid changes to these parameters early in the mission. However, the websites are also poorly organized and difficult to find pertinent information. This type of updated information will be essential for the next AO.

Suggestion:

1) A website with a good cross-indexed list of places to find the information. A search tool might be useful, but simply a well-laid out list of links to the documents astronomers need for calibration, reduction, and analysis is the starting point needed now. For example:

- Key calibration files/factors by instrument mode
- absolute flux calibration factors and uncertainties
- PSFs, models, details
- aperture corrections
- Cross-calibration comparisons
- Guidance on uncertainties on data pushed through pipelines
- flux calibration for extended sources vs. point sources

2) Email communication with Workshop participants when updates or changes occur on rapid timescale (e.g. Good example is wavelength switching issues, which changed on time-scale of weeks since last DP workshop).

Web pages detailed suggestions (meant as guiding):

- 1) The cookbooks and training information should be accessible from links on a single page that is on a direct link from the main page. This page should have up-to-date information on the latest version of the software. Right now this information seems to be available from links from the January 2010 workshop page, which takes several links from the main page to get to, and one has to know that "workshops" are not conferences but the training sessions, and which workshop date to look at. Right now if I search for "data processing cookbook" I find links to the April 2009 workshop.
- 2) Information could be organized according to Science Instruments: SPIRE, PACS and HIFI, or as a submode of the instrument with cross links under documentation, data processing and data products as needed.
- 3) Link to information in many different places, e.g., one could find PSF images by following many different paths. That way, one doesn't have to rely on mimicking the intuition of the website organizer to find information, and each user can instead follow his/her own path to the information.
- 4) Incorporate a search capability in the website, for cases where the website layout fails or some piece of information simply isn't linked anywhere.
- 5) The old documentation from previous workshops can be maintained, but should be noted somewhere on those wiki pages that they no longer should be used for the latest version of the software, etc.

Data Processing & Analysis:

Issue: Data processing is improving rapidly, but issues remain with data processing. Some data are now at the analysis stage but need more information or software to complete the task. Numbers of new users with smaller programs are on the horizon, but supporting them all effectively is a challenge.

Suggestions: Below are a list of suggested strategies, sometimes prefaced by a specific issue raised during the NUP meeting.

1) A smoother importing of data into HIPE is needed: PACS scripts developed by NHSC is a good example of easier methods.

2) Training larger number of users online:

- videos of the most popular AORs used (esp. small programs)
- Data set tutorials: example cases that work, try out standard examples and get from point a to point b on a new data set so a user can try it themselves and see that they get the same result.
- Detailed cookbook with detailed instructions is needed.

3) Data processing issues that remain to be solved:

- Cross calibration between instruments; esp. PACS vs. SPIRE photometers
- Pointing issues; global issue; maybe falling through the cracks... pointing in the scan mapping is one of them, scan leg lengths is another
- Observers need the effective beam areas; need a really good map of the beam
- Low surface brightness emission remains a difficulty, especially for PACS, but also for SPIRE.

4) Software availability: NUP appreciates the ability to use the latest version of HIPE, albeit shared risk, to test if data processing is improved for their case. However, they also appreciate the version controlled releases that are bullet proof. Probably for the average user, the latter may be best.

5) The effort to establish a compute server at NHSC for use by the community without access to high-end servers with sufficient memory will be extremely useful for some users. The availability of these should be publicized to the current teams when it is available to the outside world, then you will gain experience on the ease of use by outsiders and any problems that come up.

6) Establish forums for users to share ideas and problems on Herschel Data analysis:

- Data Processing Interface Groups (DPIGS?): HSC should try again to get PIs to nominate someone from their teams for membership, However, HSC should also

provide guidelines or charters for the leads of these groups in order to attract users to the cause.

- Data analysis and calibration workshop; e.g. HST or Spitzer calibration workshops: people can present results on doing photometry with different packages, cross-checking HIPE results with different packages.
- Summer schools for data processing: e.g. VLA data schools

Next AO, Information Dissemination:

Issue: Information on next AO call needs to be distributed beyond the current user group. Information in April would be useful.

Suggestions:

1) Website information: For proposals and the AO - it might be helpful if there were a "roadmap" document like HST provides (e.g., <http://apst.stsci.edu/apt/external/help/roadmap1.html>) with a high-level ordered list of steps for how to construct a proposal and submit.

In preparation for the AO, the observation planning site at <https://nhscsci.ipac.caltech.edu/sc/index.php/ObservationPlanning/HomePage#toc5> must be updated and enhanced. For example, we saw a lot of good information at NUP meeting on the in-flight instrument sensitivity, stability, etc. It would be useful if that info could be extracted and put on a one-page "fact sheet" or quick guide that would allow users to know if they could do their program, rather than having to install and make AORs in HSPOT.

3) Website pointers to A&A issue and conference will provide some background for users.

2) HSPOT needs to be current (but quick knowledge of the Observatory basics, e.g. sensitivity in a typical AOT, stability, etc., would be useful)

3) Advertise upcoming deadlines to get people thinking about ideas for proposals; AAS email distribution.

Future of NUP: Herschel Users Group (HUG) chair: Robert Kennicutt's visit to NUP was very much appreciated. Meixner will be part of HUG as full member. HUG will provide direct feedback to the Herschel mission and is expected to have extremely useful impact for the international community. Rotation for NUP seems reasonable but total number should not exceed 8 to 10 members.