

NASA Herschel Science Center Users Panel Report for the webex meeting on March 14, 2014:

To: Phil Appleton, NHSC Project Scientist & Task Lead,
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 on the phone:

NUP:

Joe Hora
Margaret Meixner
Andy Harris
Paul Harvey
Eiichi Egami

NHSC:

Philip Appleton
David Ardila
Robberta Paladini
Bernard Schulz
David Shupe
Pat Morris
George Helou
Lisa Storrie-Lombardi

Executive Summary:

The NUP is impressed as always with the dedicated support of the NHSC staff and the results pouring out of the Herschel mission. In particular, the data calibration is becoming mature as post-operations is coming to closure. The planning for continued user support in post-operations and archival phase is thoughtful. The plans for the archives are critical to the longevity of Herschel data for future generations. The new IRSA interface for some of user provided data Herschel products looks very promising and we encourage future support for this important endeavor. The NUP has included a question in the recent Herschel Users Group Archive questionnaire about the IRSA interface to get general user feedback on it.

User support priorities (new users)

The NUP supports the efforts by the NHSC to continue outreach efforts such as the newsletter and their presence at AAS meetings. Announcing the availability of data products from large programs as they become public, such as catalogs or calibrated mosaics, might help encourage usage of Herschel data by people who do not yet know how to reduce it themselves.

The remote computing support seems to be useful for many teams, and the NHUP recommends that this be maintained as long as practical so that researchers can continue to use this capability. The availability of this facility might also help encourage new users who do not have their own computer resources or ability to install the software to get started.

The NHSC is making a good effort to determine what the needs of the community are and tailoring their suite of support options (in-person workshops, webinars, on-line training resources and support) to the changing nature of the mission. At present, the publication of spectral data seems to be lagging behind other types, and there is apparently some interest in the community for training in this area.

The NHSC interest in getting new users for the Archive is good and smart. The Herschel mission provides the best “finding charts” for ALMA. Doing a shared workshop with ALMA or having ALMA invite NHSC to their meetings would be very beneficial to both endeavors. The suggested webinars for the introduction to the archive would be very useful.

Archive & source catalogs

The Herschel Science Archive now has all science data public. The focus now is the improved data in the archive. Of the 42 key programs, 16 programs have delivered and 9 are ingested into the archive. The project is considering the creation of uniform point source catalogs. SPIRE and PACS photometry catalogs would be a useful addition. The plan is not to avoid Key programs but to provide complementary catalogs to these user submitted data productions. For SPIRE, they would use the timeline fitter. Cutoffs for the source lists are under discussion. A band-merged list of sources will not be done because of the different resolutions. However, the NUP suggests that knowledge of a detection in another band could be a very useful way to determine if a source is real and could provide useful guidance on the signal to noise cutoffs on the catalogs. NUP agrees with the current strategy that the signal-to-noise threshold be set at an appropriately high level so that the resultant source catalog is robust and reliable.

IRSA interface

The Infrared Science Archive (IRSA) has provided a general Herschel data portal that looks slick and is easy to use. It has been populated with user provided data products for easier use and searchability. It seems to be a major improvement over the Herschel Science Archive. It would be good to have some feedback from the community on this interface and we have included a question on the HUG questionnaire to gain some feedback. Archive improvements include better PACS footprints for better searches. The goal is to integrate this Herschel portal in with the rest of the data.

In the post-operation phase, the usefulness of the archived Herschel data will largely be determined by how easy it is to search/download data (e.g., fully processed and calibrated maps) and associated information (e.g., source catalogs). In this regard, IPAC/IRSA has much experience (e.g., 2MASS, Spitzer, WISE), and the current IRSA interface looks superior to what HSC offers in many respects. NUP therefore recognizes that NHSC and IRSA together will have a large (and possibly leading) role to play over the coming years when it comes to developing a highly effective Herschel archive interface. Because of this, NUP recommends that NHSC and IRSA make it a high priority to keep improving the interface for the IRSA Herschel database, and that the necessary funding be provided to support this effort. We understand the need to maintain a collaborative and supportive relation with the HSC which is leading the development of the Herschel Science Archive (HSA). The NUP thinks it is important to go out to the user community, to advertise the IRSA interface to the user community, improve it in response to feedback in order to provide the best possible product to the user community.

Future plans: Herschel images on Firefly, searches by spectral band, improved footprint knowledge, cube viewer requirements.

NHSC Response: We have continued in the time since the last NUP to expand and develop the interface, and are currently working with IRSA to develop some new capabilities, including all high level mapping products being accessible through the Firefly interface (Like the UPDPs) and to develop a new spectral cube viewer which could read Herschel data. Footprints are now being added to IRSA.

Users Group (HUG) Questionnaire

We discussed the HUG questionnaire on the Herschel Science Archive. This resulted in adding two questions to the draft, one concerning the IRSA/Herschel archive . The anonymous questionnaire has already been circulated to the Herschel user community and can be found at:

<https://docs.google.com/spreadsheet/viewform?formkey=dEJFWU1TS1fQ1hsSmR2aE9xwXdaMmc6MA>

Publications

Publication statistics were shown to illustrate the time from data acquisition to publication for both the U.S. investigations and the total for Herschel. It was good to see that US investigators have similar publication rates as others. Both followed very similar trends with a "typical" time (for 50% of all programs) of a bit less than 3 years. Since Herschel is now in its post-ops phase, this number can only nominally increase, but as the reduction/analysis software reaches its ultimate state of ease of use, the time from "first look" at some data to eventual publication will likely decrease. So far, only 37% of Herschel Observations have resulted in a refereed paper. A large fraction of OT1/OT2 data remains unpublished.

NHSC Response: These numbers are slowly increasing and as expected, the OT1/2 papers are beginning to catch up.

Funding Status & staffing

Funding for the NASA Herschel Science Center appears to be maintaining expected levels during the ramp down in post-operations. People are leaving for other places. Staffing is moving focus towards archive content, finalizing HIPE development and final calibrations. The funding support for investigators was much lower than expected for the OT2 programs and will likely impact the ability of investigators to publish these results.

NHSC Response: We have used some NHSC funds to help several authors of OT2/p2 program publish by paying page charges. We had two such requests in 2014. Funding levels in 2015 as such that we may not be able to continue this next year.

Public Outreach

The updated public website for Herschel is very nice. NASA funding for E/PO has been a challenge, but press release work is still supported. Finding funding for the other endeavors has been harder. Perhaps it would be worthwhile to send an email out to the community that submissions for press releases is even more important to support the outreach efforts in light of these uncertainties.

NHSC Response: We modified the format of the NHSC newsletter with repeated notes about this, and we have had a steady of supply of press and news releases over 2014 and into 2015.

Documentation

Good documentation is a very important wrap up activity for the Herschel mission. How the data were taken, how instruments worked and how calibration was done will be important for current and future astronomers to understand the data. Cookbooks and recipes for the different modes will be useful for new users. Data mining techniques are also useful. As part of the NHSC-PACS led effort for spectroscopy cookbooks, 12-15 recipes are planned.

NHSC Response: Work on the cookbooks continues at a slower pace than one would like because of staffing reductions. However, they remain a high priority.

Spectral Data Cubes

HIPE has some nice tools to make a stand-alone spectral data cube and it may be the best on the market. Is it worth making these tools available to other data sets? Ds9 has some basic cube viewing capability. Radio astronomers spent a lot of time developing good tools and spectral data cube analysis. One example is the KVIS suite which can show movies as well as extract line profiles over specified areas. It may be worthwhile to have a more widely adopted software package for viewing spectral data cubes. having a discussion with the ground based IFU community and the ALMA science centers.
Herschel

NHSC Response: This is always a tricky topic because everyone has their “favorite” way of visualizing 3-d spectral cubes. DS9 now is able to read all flavors of Herschel datacubes and the more recent versions allow spectral extractions from “regions”. P. Appleton gave a demo at the October “Hitchhikers Guide” workshop on how to use DS9 to make extractions. The Herschel project as a whole is unlikely to develop a stand-alone tool, but NHSC is working with IRSA to develop a browse-quality viewer. PACS cubes in HIPE 13 include a constant interval (constant channel) in the wavelength direction that allows easy porting of the cubes to other packages.

PACS

The NUP was impressed with the improvements made and planned on PACS data

reduction in spite of the obvious decrease in staff time available within the current budget.

For the photometer side of the instrument, it was particularly helpful for the users that HSC and NHSC together conducted a thorough and extensive comparison between various map-making softwares and came up with a specific recommendation (i.e., UNIMAP as the best-performing map-maker). Although NUP is aware that a second-round of testing is on-going, which may change the outcome (the MadMap software, which has been a major contribution by the NHSC staff, has recently been improved to the point that it is now a valid contender for inclusion as a standard product for large-area maps), it makes things much simpler for the users if they receive a clear recommendation for which map-maker to use.

NHSC Response: The PACS ICC made a decision to drop MADMAP from the SPG processing track in HIPE 13, in favor of UNIMAP. Despite improvements in MADMAP, UNIMAP will be the second mapper (the first being JSCANM). MADMAP is still however available within HIPE as an iPipe script and so can be run by users. It remains to be seen what the final archive products will be at the end of the project.

The point- and extended-source calibrations for maps continue to be improved to levels at least as good as previous far-infrared missions. Spectrometer data analysis and calibration has always been more difficult than from the photometer, but significant improvements to the spectrometer pipeline will appear in HIPE 13, and the "SIMPLE" interface is likely to make both photometer and spectrometer data reduction significantly easier.

HIFI

Post operations work is progressing smoothly. Side band ratios are still a topic as are pointing reconstruction improvements. The electrical standing wave tool improves the data quality of 40% of the archive.

SPIRE

HIPE 11 was a major improvement to the SPIRE FTS spectrometer enabling us to see signal where before nothing was visible. The map making and stripe removal improvement on the SPIRE data is also an appreciated addition. Photometry data is good. Timeline extraction of photometry for point sources is worthwhile and interesting to pursue.

NHSC Response: The SPIRE team has made much progress in this area during 2014. Indeed tests have now shown that the timeline extraction method yields the most accurate results for point sources.