

January 27, 2011

Dr. Harry Teplitz and Dr. George Helou
IPAC
Caltech
Pasadena, CA 91125

Dear Harry and George,

This letter is the report of the IRSA User's Committee meeting of October 22, 2010. Some of the issues were also discussed in a committee-wide teleconference that was held in April, 2010. In addition to myself, the other Committee members who participated in the meeting and contributed to this report were: Tom Brown, Kelle Cruz, Mark Dickinson, Aaron Evans, Kevin Hufferberger, Robert Jedicke, Tom Megeath, Karin Menendez-Delmestre (not attending).

The full day Users Panel meeting in October consisted of presentations by yourself, Roc Cutri, Trey Roby, Steve Groom and Luisa Rebull, as well as extensive discussions among the Committee members, with IRSA staff and then in an executive session. The first main subject was what work IRSA is currently doing, what it is planning to do, and how these tasks are related to previous feedback, eg., from the 2008 review at NASA HQ, and the recommendations of the 2009 IRSA User's Panel report. Then discussions turned to what IRSA should do for its April 2011 proposal to NASA for the upcoming Senior Review.

The Panel came to a number of conclusions, both about what IRSA has already accomplished, and also about how it can best move forward:

- *Overall, the User Panel was convinced that IRSA (currently serving dozens of data programs) is playing a vital role in supporting astronomical research, and that its importance will continue to increase.* The IRSA data holdings continue to grow rapidly (by roughly a factor of two) every year. With 5 ongoing missions, even greater increases are anticipated (eg., with the arrival in 2012 of Spitzer, WISE, etc.) A review of the priorities advanced by the recent Decadal Survey indicates that Astronomy is indeed entering the 'Decade of the Infrared'.
- The previous User Panel set several priority tasks, and *progress has been made towards completing them, even though some priorities shifted over the last 3 years.* The process of improving and speeding up GATOR has started, and is continuing. Improving the inventory provided by RADAR is planned after the Version 2 release of the Spitzer Heritage Archive. It is also desirable to provide more curation of individual sets of follow-up data, even though other Archival centers are limited in how rapidly they can pursue this. It is turning out that accelerating and unifying software to work on multiple datasets is more challenging than is generally appreciated.

- Another recommendation was additional Finder Chart functionality. *This goal has now been essentially accomplished.* It is internally named *HYDRA*, a tool kit used to construct a configurable web interface to access IRSA data, working with the new IRSA ‘back end’. The Panel found the demonstration of *HYDRA*, which is designed to handle images from all missions, with a java-script that interacts directly with fits files, very impressive. It has a great deal of useful functionality in addition to finding charts.
- *Lower priorities were given to ‘add-ons’* such as ‘precovery’ capabilities (eg., to find asteroids and variable objects, though this is currently paid for by WISE), further cooperation with groups such as Pan-STARRS, tools to study multi-wavelength spectral energy distributions, and large-scale spatial structures.
- The 2008 over-guide request included ALL of the Spitzer data, without a very specific breakout of all tasks, required software and hardware. This may have given the appearance that the over-guide request for 9 FTE was ‘too expensive.’ A large number of FTE are required to maintain the expertise and ‘corporate memory’ for a wide variety of instruments and supporting data tools. For example, the *particularities of IRAC do require specialized tools such as APEX, and these need to be curated.* The Panel agrees that this is a nontrivial job. Some useful tools developed for Spitzer (e.g. *MOPEX, PAHFIT, BANDMERGE*) could possibly be applied to other datasets as well.
- *For the 2011 request, it is very important to present a clear rationale for which work belongs in the ‘in-guide’ and which in the ‘over-guide’ sections. After considerable discussion, the Panel felt that the in-guide request must support NASA’s infrared Survey Missions, with Spitzer as the top priority. In addition to the Spitzer Heritage Archive, this should include basic data from Herschel and Planck which emphasize imaging.* The specific user support requested for Herschel, Planck and WISE will need to be spelled out in some detail, especially because those missions have also received resources for their own data-handling as well. There are so many upcoming datasets anticipated, that the inclusion of a detailed time-line will be helpful. IRSA’s unique concentration of expertise on the many important infrared databases is important, as well as the availability of the most useful, science-enabling data tools. If the VAO is to bring Astronomy into the ‘Decade of Interoperability’, users will have even more need to get occasional help from the experts at IRSA.
- *The over-guide request should included better cross-matching capabilities and support of the Virtual Astronomical Observatory, as well as tools to study moving objects, and possible ingesting of more external data for the ADAP.* Compatible program interfaces are essential (even though this is difficult when the VO--or International VO--changes its standards). Examples of possible tools and functionality, especially those which are synergistic with databases at other wavelengths such as the VAO, should be given, along with some of the science they will enable. An upbeat discussion will emphasize the high usage and impact,

and point to the already-impressive annual rate of publications. (This may be more impressive than mere figures of data holdings). Another key strength of the IRSA archive is its flexibility to respond to and support NEW scientific investigations which have not yet even been formulated. The Panel agreed that reliable source-matching (eg., for the VAO) is a highly nontrivial but very important job.

- The metrics of success for a data archive are speed, ease of use, and reliability, all of which argue for buying sufficiently new and capable hardware. One of the IRSA staff summed up the situation very well: “You want the world to beat a path to your door. Then you have to buy a new door”. It would be helpful to *include some measures of speed and reliability for accessing some standard image in a sample data query.*
- *Some difficult trade-offs will be necessary. One possibility, for example, could be an earlier ‘ramping down’ of in-house expertise on Spitzer instruments, particularly IRS and MIPS.*
- The panel considered several ways to *broaden the familiarity of the astronomical community with the tools provided by IRSA.* In addition to demonstrations at AAS meetings, perhaps some workshop, and probably some simple educational on-line videos, should be considered, which explain how to use the archives. (As another example, some informal speculations were made about the possibility of exploring some cooperative work with GoogleSky and /or the WorldWide Telescope).
- The User Panel does support the idea that IRSA should *re-design their webpage to emphasize the most practical “bread-and-butter” search engine first.* Even if this is more of a “marketing” improvement rather than a fundamental change, it should be useful to many less experienced users.
- The User Panel agrees that some *brief mention of the role IRSA can play in providing IR data complementary to LSST would be worthwhile. And while ALMA is an NSF project, the synergies it will have with IRSA are also worth mentioning.*
- In summary, *the User Panel is optimistic about IRSA’s future prospects.* To insure that these are translated into strong support from the NASA Senior Review, a clear scientific case needs to be made in the upcoming April request. To this end, we would like to *arrange a conference telecon* after the panel members have seen a draft of the proposal. This would allow us to provide further inputs, with the goal of making this the strongest proposal possible.

Sincerely Yours,

Matthew Malkan, on behalf of the IRSA User Panel,
members: Tom Brown, Kelle Cruz, Mark Dickinson, Aaron Evans, Kevin Huffenberger,
Robert Jedicke, Tom Megeath, Karin Menendez-Delmestre