

Dr. Harry Teplitz (IRSA lead)  
Dr. George Helou (Director of IPAC)  
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Dear Harry and George,

This letter is the report of the IRSA User Panel meeting on October 7, 2011. The members who attended and contributed to this report were Kelle Cruz (Hunter College), Mark Dickinson (NOAO), Aaron Evans (Virginia), Kevin Hufferberger (Miami), Matt Malkan (UCLA), Tom Megeath (Toledo), and Sachin Shenoy (ARC). Tom Brown (STSCI) also participated remotely. The full day meeting consisted of presentations from yourself, Steven Groom, Vandana Desai, Peter Capak, Trey Roby, and Luisa Rebull. The meeting was also attended by George Helou, director of IPAC.

The panel wants to reiterate the importance of IRSA to NASA and the astronomy community. IRSA's primary mission is to archive data from NASA's infrared missions and to facilitate the community's access to this data. In the last few years, the holdings of IRSA have exploded with the deployment of the Spitzer Heritage archive, the WISE archive and the Planck archive. These infrared data archives are the result of phenomenal advances in infrared astronomy driven by the launch of several space based IR observatories in the last decade. The data from these observatories has impacted virtually every area of astrophysics, and they are of central importance to several highly active areas of astrophysics, including exoplanets and planet formation, the search for very low mass brown dwarfs, galactic and extragalactic star formation, and surveys of the high-Z universe. IRSA will also provide (with the completion of the Planck archive) full sky coverage in 20 wavelengths bands, a unique resource in the history of astronomy. The current and upcoming data archives curated by IRSA will not be superseded in the foreseeable future.

Over the last few years, IRSA has met the challenge of deploying these massive new archives admirably. This required several simultaneous activities. IRSA is revamping its architecture, including the adoption of a new database management software needed to reduce costs. It has developed a new, unified interface for finding, displaying and accessing the data and they continue to enhance the usability and the power of this interface. A feature to track moving targets is impressive and of great value for solar system astronomy. IRSA is also curating enhanced data products, many of them produced by the community, as well as ancillary data taken at ground-based observatories to support the interpretation of data from NASA missions. The value of the archive and its ease of use was demonstrated by the submission of two papers using WISE data within 1 month of being released. Overall, the number of IRSA queries has increased by a factor of three between 2009 and 2010 and is expected to rise another 30% in 2011. *The user panel is deeply impressed by these achievements.*

We are also quite pleased with the results of the senior review and its “very good” rating. This has given IRSA the resources it needs to archive the data, provide the community efficient access to the data, and maintain a level of expertise needed to support the use of the data by the community.

Given the recent success in the senior review, the user panel felt that its charge should be providing recommendations that may help guide IRSA to an “excellent” rating during its next senior review. The recommendations are as follows:

IRSA should continue developing tools for more efficiently searching through IRSA’s holding. Currently, there are excellent interfaces for retrieving data from a particular mission. Future interfaces should have the capability to search through the entire holdings of IRSA in a single search, including the ability to efficiently specify a variety of search parameters (position, fluxes, colors) and enhanced visualization of the search results. The search should also return enhanced data products as well as data from the primary archives. Currently, this function is filled by RADAR, and the planned enhanced version of RADAR is strongly endorsed by the panel.

IRSA should be a leader, and not a follower, in the development of tools needed to establish a virtual observatory. Although, IRSA should avoid duplication with the VAO, given IRSA’s enormous experience with infrared data, the panel feels that IRSA is uniquely situated to play a leading role in bringing infrared data into the VAO. We recommend that IRSA continue to develop tools that specifically enhance the access, visualization and analysis of the infrared data. We also encourage continued participation in ADEC as a way of bringing a more integrated approach to searching NASA archives for data spanning the electromagnetic spectrum.

Cultivating a user base should be a priority of IRSA. It is important to expand the usage of IRSA data by actively educating the community about its holdings, interfaces and software. The IRSA team should explore ways to more efficiently educate the community about its holdings and tools. The panel endorses IRSA’s plan to have intro-level workshops/demos at the biannual American Astronomical Society meetings, and we also suggest that they explore using hands-on workshops in Pasadena, webinars and web-casts. These should include introductory material suitable for graduate students at the beginning of their thesis research. The webinars could be scheduled to help proposers incorporate IRSA holdings into NASA’s ADAP proposals. An opt-out email to IRSA Users that regularly informs them of new holdings and tools would also be valuable.

Public outreach is important. NITARP, an IPAC led program to engage high school teachers in research utilizing primarily IRSA data, is an efficient means of encouraging high schools to include IRSA products in their science curriculum. We endorse this activity, and recommend IRSA to participate in this program as long as it continues to be funded at an adequate level by NASA.

Data products generated by the community can be of great value. These could include both enhanced reduction and analysis of the NASA data, models used to interpret the data, and ground-based data taken to support the NASA mission. We recommend that IRSA continue to solicit for such data products and to adopt strategies for efficiently incorporating community data sets. The inclusion of such data promises to continuously enhance IRSA's holdings.

Currently, IRSA efforts are focussed on the deployment of new data. In the next 5 years, the rate of data being ingested into the archive may abate somewhat as current missions draw to a close. It is important that IRSA continue to maintain its expertise in infrared astronomy, particularly since IRSA's expertise may contribute significantly to missions such as SOFIA, Euclid, WFIRST as well as Explorer missions. IRSA data will also be invaluable for planning and analyzing JWST observations. Maintaining an active and vital group of astronomers and software developers dedicated to advancing infrared astronomy may be challenging as the WISE, Spitzer, Herschel and Planck efforts at the SSC and IPAC ramp down.

One potential way to maintain the vitality and relevance of IRSA would be to increasingly direct effort towards enhancing the data products in the archive and the tools with which the IRSA data are analyzed. After the current missions end, the expertise maintained by IRSA will be needed to continually enhance the value and usability of NASA's infrared data holdings. Another activity would be integrating the IRSA data and analysis tools into the VAO. IRSA is uniquely qualified to perform these activities and by doing so, maximize the scientific gain from NASA's infrared missions. We recommend that IRSA develop a 10 year plan so that it can respond to upcoming challenges and effectively pursue new opportunities.

Sincerely,

Tom Megeath  
Chair