Overview

The SIRTF Users Panel held its eighth meeting at SSC Headquarters in Pasadena on 14 and 15 May, 2001. We heard presentations from SSC staff and management re the status of: (1) the IRS Long Low filter; (2) pipelines and calibration for SIRTF instruments; (3) Legacy Science Teams and their interaction with the SIRTF science center; (4) SPOT planning and visualization tools; and (5) the science environment at the SSC. SUP offers the following comments and recommendations to the SSC director and looks forward to his responses. We thank SSC management and staff for their efforts to organize an effective, information-rich meeting.

ISSUES

-- Potential loss/degradation of IRS LL Filter

The Long-Low module on SIRTF provides unique, scientifically essential and otherwise unrecoverable capabilities for low resolution spectroscopy in the heretofore little-explored 20-40 micron region. Specifically, IRS LL exploits SIRTF's unparalled sensitivity in this region to enable key science in three areas crucial to achieving fundamental Origins objectives:

-- study of faint, distant, optically-obscured galaxies thought to account for the IR background detected by COBE. IRS LL capabilities are critical both to enabling red-shift measurements in the range beyond z ~ 1.5, and characterizing such objects -- which represent a critical stage in galaxy assembly and early evolution.

-- characterization of debris disks surrounding stars spanning a wide range of ages. IRS LL is a primary tool for diagnosing such disks and characterizing their physical and chemical properties in the critical distance range between 5 and 30 AU. The loss of IRS LL would greatly reduce SIRTF's power to infer both planetary system architectures and the processes that transform pristine interstellar silicates ito the crystalline minerals that dominate a mature solar system.

-- observation and analysis of solid state features (e.g. those arising from crystalline and amorphous minerals and complex organics) in diverse solar system objects (comets, asteroids, planetary and satellite surfaces) to study those objects themeselves and to provide a baseline for understanding the evolution of extrasolar circumstellar environments. In this context, the long slit capability of IRS LL is critical to enabling analysis of extended solar system objects (e.g. cometary comae).

In addition, there are great potential losses in terms of:

-- the discovery potential of IRS Long Low that would for the first time enable precise, imaging spectrophotometry in the 20-40 micron range

-- the ability of GOs to carry out critical diagnostic spectroscopic followup of IRAC and MIPS sources.

Our comments are aligned with those developed in far greater detail in the Soifer-Werner white paper, and support their fundamental conclusion: that the loss of the long low filter would severely affect the science expected from SIRTF. It will not only reduce the analytical capabilities of SIRTF, but adversely affect SIRTF's discovery potential.

Since the SUP views the situation regarding IRS long low filter as serious, we eagerly await the results of future tests and analysis. If the filter remains stable with its current characteristics, the SUP believes that much SIRTF science could still be carried out, though at reduced efficiency. However, if the filter continues to degrade, the SUP believes the science loss is so major that the long low filter should be replaced

-- Contingency planning for pre-launch and on-orbit failures
++

We request that SSC management present a summary of extant policies and proposed processes for reassessing program viability and scheduling in light of failures or severe capability degradation either pre-launch or on-orbit. SUP believes -- as does SSC management -- that optimizing the scientific return from the SIRTF mission must be the over-riding factor in developing revised schedules and program mixes in response to such failures.

The degradation or potential loss of the IRS LL module underlines the importance of developing and having in place contingency plans that are understood and accepted by the community.

We urge that SSC prepare such a summary at least one month prior to our fall meeting. SUP would then work with SSC management to structure an appropriate discussion focussed on contingency planning for failures/degradations.

-- Policy regarding corrupted data
++++++++++++++++++++++++

Q/A assessment of incoming SIRTF data will inevitably reveal observations corrupted by solar storms, spacecraft anomalies or other factors beyond the control of observers.

We request a summary of extant policies and processes along with the likely timescales over which observations can/could be rescheduled in response to corrupted data.

We urge that SSC summarize same one month prior to our fall meeting.

-- Initial funding for Legacy Teams
++++++++++++++++++++++++

The Legacy Program is both (1) central to the overall science return of the SIRTF mission; and (2) a crucial element of efforts to provide the community with early demonstration of SIRTF's potential as well as databases critical to shaping GO programs. The Legacy teams are faced with the challenge of making their databases available within a few months of acquisition as well as carrying out coherent scientific programs. While the overall funding for Legacy Teams seems well-matched to these efforts, the funding profile is not optimal. In particular, it appears as if the current back-loaded funding for Legacy Teams severely undermines their ability to assemble the necessary infrastructure and meet task/schedule milestones to insure prompt release of Legacy science deliverables.

SUP urges that SSC work closely with NASA Headquarters to provide more funding for SIRTF Legacy during the next 6-12 months. Such funding is essential to ensuring that the teams will be able to deliver useful processed SIRTF data, derived catalogs and associated ancillary data in time for the broader community to use them for planning GO programs. This was always and remains one of the essential raisons d'etre of the Legacy programs.

-- Coordinated commentary from the Legacy Teams
++++++++++++++++++++++++++++++++++

The SUP applauds SSC efforts to involve members of the Legacy Teams in variety of working and management groups. Such involvement is critical to the success of the Legacy Programs and to integrating the fruits of their insights and efforts into broader SSC efforts to enhance SIRTF software, observing procedures, etc -- much to the benefit of the entire user community.

We believe it would be helpful to proactively seek commentary from this important user group particularly during the next two years, through launch, IOC and early operations. Toward that end, we propose tasking one of our members -- Dan Clemens -- to solicit such commentary and forward

concerns, issues, and opportunities as seen from the Legacy perspective for consideration by SUP in shaping its agenda.

-- Science Environment at the SSC
++++++++++++++++++++++++++

The SUP was gratified to note the impending increase in staff at the SSC. Given the extraordinary pre-launch functional responsibility of the extant, largely young staff, it is essential that the service load be shared if they are to have any time to carry out science with SIRTF -- sine qua non for an effective SSC staff.

We are concerned, however, at the ramp up rate -- potentially 12 staff over the next year. To understate the problem: recruiting first rate staff in that number is 'a challenge.' We urge that SSC examine other options for simultaneously meeting functional needs and enhancing the science environment at the SSC, including the possibility of hiring long-term visitors who would serve as 'extended staff members' at the Science center.

We request that SSC provide an update on the SSC science environment, including assessments of functional loads for extant staff, and efforts to recruit additional staff.

-- Pipeline development issues
++++++++++++++++++++

SUP applauds SSC efforts to date to develop robust pipelines. We are particularly gratified to note the commitment to on the fly processing and to supporting a single pipeline version to support BCD products.

The SUP appreciates that (a) the SSC faces a major task in producing robust pipelines and implementing the archive in time for launch, and (b) that it may not be possible to distribute pipelines to all potential users and respond in detail to suggested revisions, alternative approaches, etc.

Nevertheless, we urge that over the next year, the SSC take full advantage of the insight, energy and manpower inherent in the Legacy teams both as 'beta testers' of pipelines and in developing key pipeline elements. The Legacy teams can in selected cases (e.g. those that push calibration procedures) serve as valuable complements to the GTOs in working collaboratively and cooperatively with SSC staff in developing more effective pipeline approaches that will ultimately benefit the broad community of potential SIRTF users.

The method of engaging the Legacy teams and the processes by which their input can be incorporated into a time- and manpower- constrained activity

is 'an exercise best left to the SSC.'

SUP suggests that in some cases, the SSC may wish to seek input from the Legacy teams via the GTO teams who are already intimately involved with SSC staff in pipeline development and who are developing close liasons with Legacy teams as well. Ultimately, we would prefer direct active involvement of Legacy team members in collaborative efforts to develop and/or test pipeline elements.

-- Calibration standards
++++++++++++++++++

The SUP recommends early distribution of proposed standards for instrument calibration when a solid, penultimate list is available. Community commentary and feedback could prove valuable in refining the list and ensuring the very best calibration approach.

-- Dark Calibration Strategy
++++++++++++++++++++

The SUP requests additional detail regarding the strategies for developing adequate dark and flat-field calibrations for SIRTF instruments.

-- Prioritization of user tools for data analysis
++++++++++++++++++++++++++++++++

Various user tools were discussed by SSC staff, but it was unclear to SUP what tools the SSC thought would be most needed by GOs when they begin to look at their data, and to what extent and on what timescale SSC is prepared to support them.

SUP requests that SSC prepare a list of needed and desirable user analysis tools/modules, how they will be acquired, documented, released and supported for the SIRTF user community. We would like as well the SSC's assessment of their relative priority so that we can provide advice regarding the timing and deployment of these tools at our next meeting.

-- Policy regarding assignment of spacecraft overheads
++++++++++++++++++++++++++++++++++++

The SUP recognizes the importance of and supports " full cost accounting" for any science observation. It also recognizes that relatively simple estimates of full cost accounting are important both so they can be understood by the community and also implementled straightforwardly.

However, there may be specific types of observations -- as one example, mosaicing programs with short exposures -- that may be inordinately disadvantaged by current practice of adding a fixed overhead. The SUP was encouraged that the SIRTF Science Center has suggested possible workarounds for proposers faced with this problem and urges that this activity continue. However, because such efforts consume SSC resources, SUP urges that they be initiated only in cases where significant efficiency gains can be realized. Moreover, optimization of a specific program should not negatively impact overall spacecraft efficiencies.

In future, we urge that the SSC remain open to working with teams of investigators, especially Legacy and potentially other large programs, in service of developing technical/operational approaches that minimize inefficiencies either through scheduling or modified AOTs and/or IERs -- thereby enabling important science that otherwise would be 'taxed' heavily, to be done efficiently (and as a consequence, with lower taxes!).

We recognize that this will be difficult between now and the beginning Cycle 1 and urge a 'best effort'. As SIRTF enters a more routine phase, we hope that a culture of openess to such cooperative efforts to develop efficient, 'low overhead' programs will have been encouraged and in place.

-- Public posting of SUP deliberations
++++++++++++++++++++++++++

The SUP would like to reinforce its past recommendation to make its report and the accompanying director's response available on the Web. Both the community and the SSC will benefit from wide public access to SUP deliberations and recommendations and the SSC response.

SIRTF Large Programs

In its 7th meeting, SUP recommended that large programs be encouraged in Cycle 2 and beyond. For "SUP 9" (our next meeting) we request a progress report regarding efforts to provide this opportunity.

==========

General Comments

-- We wish to note the exceptional progress on the development of SPOT planning and visualization tools, and compliment the SSC staff for a job well done!

-- We once again thank the staff at the SSC for preparing excellent presentations and making them, with few exceptions, available to the SUP in a timely fashion. As the project accelerates and the density of new information increases, it might be helpful to the SUP in future were the SSC staff to assume that SUP members have read and digested the material and, following a relatively rapid "memory jog", focus their verbal presentations on key issues or technical highlights. Doing so would allow more time for discussion, reflection and interaction between the SUP and the staff.

-- We would also like to encourage a science talk by an SSC staff member sometime during the meeting.