

REPORT OF THE SOFIA USERS GROUP (SUG), November 18, 2013

1.0 INTRODUCTION

The fourth meeting of the SOFIA Users Group (SUG) took place on November 18, 2013 at the SOFIA Science Center, Building N232, Conference Room 103, NASA Ames Research Center, Moffett Field, CA. The SUG is charged with providing input to the SOFIA Project by a representative sample of the scientific community of users and potential users. The SOFIA Users Group Charter and the agenda for the November 18, 2013 SUG meeting and the SUG membership may be viewed and downloaded on the internet at:

http://www.sofia.usra.edu/Science/advisorygroups/sug/SUG_004/index.html

Members attending the November, 2013 SUG 4 meeting were Lee Armus (by speaker phone), John Bally, Jochen Eislöffel (by speaker phone), Bob Gehrz, (chair), Urs Graf, Matt Greenhouse, Al Harper, and Luke Keller (by speaker phone).

The SUG thanks the SOFIA Project personnel involved in supporting the meeting and preparing the informative presentations.

2.0 OVERVIEW OF THE STATUS OF THE SOFIA PROJECT

The SUG was pleased to see with the progress that the project has made on many fronts since our last meeting. We appreciated receiving a detailed report at the outset of the meeting summarizing the Project's responses to the issues that were raised in the previous SUG (3) Report. This item should appear at the top of the agenda at each future SUG meeting. The data processing plans seem well developed. The Project is to be congratulated on the very successful deployment of GREAT to the southern hemisphere, a highlight of Cycle 1. We are especially impressed with the progress that has been made in implementing the non-sidereal tracking mode. We congratulate the Project on having developed a realistic and functional plan for ramping up to full operational capability by 2014. The plans for bringing on new first generation science instruments (SIs) and for increasing flight hours continue to appear reasonable. We were pleased to see that preparations for the Cycle 2 observations appear to be going well.

3.0 ISSUES ARISING DURING THE SUG DISCUSSIONS

We review here issues identified during SUG discussion that we would like the SOFIA Project to consider for action.

3.1 Serious Loss of Flight Hours during Cycle 1

It appears that much of the Cycle 1 program of observations has been gutted by unforeseen problems. A helium leak in the FLITECAM dewar resulted in its being struck from the manifest until March, 2014. TCS problems prevented a full FORCAST grism observation of the brightest nova in 20 years in September and the government shutdown caused elimination of most of the remaining FORCAST flights. A power supply failure and problems with fasteners in the telescope cavity caused the loss of 6 GREAT flights. Our recommendation at the SUG 4 meeting

was to insert as many makeup flights as possible into the schedule prior to the end of December. Regrettably, subsequent to the meeting, we have learned that recently discovered damage to one of the first stage turbine blades in engine 2 will require an engine change so the damaged engine can be returned for analysis and repair and that the program office has decided not to pursue additional science flights in 2013. A policy for finishing high priority observations that are incomplete at the end of a cycle should be drafted. We would like to hear about Program's re-planned schedule as soon as possible.

3.2 Metrics for Success

We were pleased to learn that the Project is developing a set of metrics to measure success and improve performance. We wish to see ongoing reports on the analysis of these metrics as part of the general overview at future SUG meetings. As a start, we ask that at the next SUG meeting (SUG 5) the science center present the current status of science impact metrics for SOFIA (e. g., number of journal papers, a metric for the science impact of these papers, such as citations, PhD theses, and the fraction of data published, etc.). In addition, we would also like to hear how the data reduction pipelines are improving the quality of the delivered data, and suggest that a regular feature of the SUG meetings be a discussion of the most important ("top 5") data quality, or data reduction issues. This will become more important as the number and complexity of the available modes/instruments increases in future cycles. These top data reduction or analysis issues could be contributed by the instrument teams, the instrument scientists at the science center, or the GI community via the helpdesk. Maximizing observing time is of the essence, and we would like to see a "lego" chart schedule at future SUG meetings to help us understand whether engineering flights are being utilized to do science when possible.

3.3 Calibration Issues

A major calibration effort is required to understand how to deal with the water vapor monitor (WVM) data and to compare it with water vapor measures obtained with GREAT, FORCAST GRISMs, and ground-based observatories. First, the monitor needs to be repaired so reliable data can be extracted. Simon Radford at Caltech should be consulted regarding water vapor measures extracted from ALMA. A report on the long-term calibration plan should be presented at the next SUG meeting. If uncertainties in the atmospheric modeling prevent the release of accurately calibrated water vapor data, the WVM should at least provide a reliable stream of brightness temperatures and line shapes of the observed water line.

3.4 Non-Sidereal Tracking Mode

As noted above, we are pleased with the progress that has been made in implementing the non-sidereal tracking mode and note that this mode has the potential to enable scanning modes that will enable more efficient data acquisition with several SIs. We encourage the Project to implement these modes without delay.

3.5 Deployments to the Southern Hemisphere

The success of the recent deployment with GREAT was noted above. We encourage the Project to investigate the possibility of deploying multiple SIs on a given southern hemisphere visit and doing scientific observation on the deployment legs. Flights to Hawaii and major airfields in Central and South America should also be investigated as options that might minimize ferry time for observations of southern targets of opportunity.

3.6 Information about Visits to the DAOF

The presentation about information given to DAOF visitors was quite complete and should be incorporated into the next DAOF visitor's manual.

3.7 Shared Risk Observations with New Science Instruments

The Project should be conservative in representing the capabilities of new SIs until their performance has been evaluated fully in flight. We believe that the Project needs to draft a statement that clearly defines the meaning of "shared risk" so that GIs proposing for such observations clearly understand the ground rules. Strong consideration should be given to making it mandatory for GIs proposing "shared risk" programs to consult with the SI PI during the proposal preparation phase. It might be desirable to require GIs proposing "shared risk" observations to include the SI PI or the PI's designee as members of the proposal team. The project should also ensure that sufficient resources are available to SI PIs and SOFIA instrument scientists to adequately support proposal preparation and data reduction and analysis for the shared-risk observations.

3.8 Ability of the GIs to Change Observations in Flight

In order to maintain the versatility and flexibility of SOFIA observations, one of the defining advantages of the airborne platform, the SUG recommends that the director of science operations draft guidelines for enabling "on the fly" changes in observing plans based on unforeseen changes in observation parameters. In particular, we suggest that all information relevant to SOFIA observations (past and present) of targets on a given flight manifest be researched thoroughly, and be provided to the instrument scientist and GI before the flight. When in doubt, changes suggested by a GI should be acted upon even if there is a conflict that results in the data being assigned to another GI team post-flight.

Respectfully submitted on behalf of the SOFIA Users Group,



Robert D. Gehrz, Chair

December 13, 2013