REPORT OF THE SOFIA USERS GROUP (SUG), SEPTMBER 17, 2012

1.0 INTRODUCTION

The second meeting of the SOFIA Users Group (SUG) took place on September 17, 2012 at the SOFIA Science Center, Building N322, Conference Room 203, NASA Ames Research Center, Moffett Field, CA. The SUG replaces the former SOFIA Science Steering Committee (SSSC) and 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, the agenda and presentations for the September 17, 2012 SUG meeting, the archive of materials associated with previous meetings, and the SUG membership may be viewed and downloaded on the internet at:

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

Members attending the September 17, 2012 SUG meeting were John Bally, Bob Gehrz, (chair), Lee Armus, Imke de Pater, Jochen Eislöffel, Urs Graf, Al Harper, Luke Keller, and Keith Noll (by 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 is encouraged by the progress that the project has made since science flights began in the fall of 2010. SOFIA made 35 flights during 2011, including 22 that involved the user community during the Short and Basic Science Programs. We are gratified to see that the unique scientific potential SOFIA is being demonstrated to the scientific community by the prompt publication of results from the Short Science and Basic Science 2 (GREAT) Program. These 6 flights have already resulted in 24 papers on FORCAST and GREAT science in special issues of Astrophysical Journal Letters and Astronomy and Astrophysics. Additional technical papers describing SOFIA, its instruments, and its operation also appeared in these special issues. We look forward to seeing the results from the Basic Science 1 Program (FORCAST) in print.

The Project has developed a realistic plan for ramping up to full operational capability by 2014. We note that the major cockpit upgrade and upgrades to the MCCS are proceeding satisfactorily and that the aircraft is expected to be ready for Cycle 1 science observations with GREAT by mid-November. We are pleased that the program to improve image quality is on track to meet the level one specification by 2014. The SOFIA Pointing Optimization Team (SPOT) has made significant progress in understanding and improving the pointing and tracking abilities of the telescope assembly. Further improvements will be possible with the installation of the upgraded focal plane imager. The plans for completing the development of the remaining first generation Science Instruments (SIs), EXES, FIFI-LS, and the upgraded HAWC, were presented and the schedule for their commissioning seems reasonable.

Overall Cycle 1 observing call has resulted in the award of 193 hours and 35 hours respectively to observers applying to the US and German queues. The high oversubscription rate of a factor of 5 in the number of hours requested shows that the recent efforts on the part of the SOFIA Project to arouse community interest in exploiting SOFIA has been highly successful. We are

pleased to see that the new user friendly SSPOT AOR planning tool is undergoing final revisions and should be ready soon for Cycle 1 Phase II observation planning.

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 Announcing Up-to-date Information about the Timetable for Proposal Selections

During the processing of the proposals ingested as a result of the Cycle 1 Call for Proposals, the proposers were told that proposal selections would be announced to them in April, 2012. The unexpected delay of the announcement until the end of August, 2012 was not communicated to them for a couple of months, and many proposers were unhappy about not being informed.

It is important for the proposers to know when they will be notified, because the successful ones will have to work on their Phase 2 proposals soon thereafter. Since this often entails substantial work, they need to be able to plan and organize their own workload accordingly. To allow for this, unforeseen changes in the announced schedule should be communicated to the proposers promptly and an updated schedule should be given.

3.2 Maintaining Flexibility to Allow GIs to Alter Observational Programs in Flight

In order to maintain the versatility and flexibility of SOFIA observations, which is 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. We point out that observations of transient events cannot be repeated at a later date, so that it is particularly important that observations of such objects be optimized to maximize the scientific return. The *Spitzer* Space Telescope observing rules (http://irsa.ipac.caltech.edu/data/SPITZER/docs/spitzermission/observingprograms/proposalcycles/observingrules/) provide a good example of how such guidelines might be crafted.

3.3 Information about Accepted GI Proposals

We noted that the list of accepted GI proposals did not contain information about the amount of time awarded to each program. This information should be provided so that future proposers can better understand the scientific priorities of the Project. (During the preparation of this report, time awarded information was added to the US queue list but not to the German queue list.)

3.4 Helping Observers to Get the Most out of their FORCAST Data

Maximizing the scientific impact of SOFIA requires that Guest Investigators (GIs) who are not SI specialists be able to get the most out of their data and to be able to publish important new results promptly. It was noted that published results from Basic Science 1 with FORCAST are taking longer to appear than is desirable. We encourage the Project to make it a high priority to deliver usable FORCAST data products to GI observers.

3.5 Shared Risk Observations with New Science Instruments

The SUG was apprised of plans to offer EXES and FIFI-LS during Cycle 2, with the understanding that observations will be considered to be "shared risk." 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 prosing "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.

3.6 Doing Science on the way to the Southern Hemisphere

We were told that there were no plans to obtain observations on the way to New Zealand during the Cycle 1 deployment of SOFIA to the southern hemisphere. We believe that this deployment provides a unique opportunity to demonstrate the ability of SOFIA to obtain extended observations of a single source by flying in one direction and encourage the Project to develop a science flight plan that will demonstrate this capability during the deployment

3.7 Non-sidereal Tracking Issues

Planetary science is a high priority for NASA. It is important for NASAs major observatories to be fully capable of making observations of solar system objects. We believe, therefore, that it is imperative for the Project to implement non-sidereal guiding in the telescope control software as soon as possible. Furthermore, the SSPOT software needs to be capable of showing the overlays that are associated with planning non-sidereal observations.

3.8 Outreach

We note that the Speakers Bureau page needs to be kept up to date by promptly posting the most recent SOFIA talks. We also believe that the Project needs to be more aggressive about getting invited to give exciting SOFIA presentations at large conferences, both in the US and abroad.

3.9 The SOFIA Water Vapor Meter

The SOFIA water vapor meter obtains data that are crucial for the analysis of data from many of the SOFIA SIs. Expediting the development and use of this instrument should be of the highest priority.

3.10 The Scheduling Process

The scheduling process that leads to the observing sequences for each observing cycle is very complicated. A white paper should be posted on the "Information for Observers" web page so that GIs can better understand the constraints on their proposed observations.

Respectfully submitted on behalf of the SOFIA Users Group,

Robert D. Gehrz, Chair October 3, 2012