Spitzer Space Telescope

Cycle-6 Call for Proposals

Version 2.0 17 December 2008

Warm Mission General Observer Program

Key Dates:

Call for Proposals Version 1.0 Issued:	July 7, 2008
Call for Proposals Version 1.1 Issued:	July 17, 2008
Call for Proposals Version 2.0 Issued:	December 17, 2008

General Observer Proposals

- **Exploration Science Letters of Intent Due:** September 2, 2008
- **Exploration Science Proposals Due:** October 10, 2008, 5:00pm PDT
- **All other GO Proposals Due:** February 06, 2009, 5:00 pm PST

Cycle-6 Observations expected to begin: June 2009

http://ssc.spitzer.caltech.edu/

Issued by the
Spitzer Science Center, California Institute of Technology
Pasadena, California USA

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Document Change Control Record

Date	Version	Author	Description
2008 July 7	1.0	Lisa Storrie-Lombardi	Initial version issued.
2008 July 17	1.1	Lisa Storrie-Lombardi	Added section 4.9 describing Statistical Programs and made minor updates in section 6 to support this.
2008 December 17	**2.0**	Lisa Storrie-Lombardi	Added Appendix C listing the selected Exploration Science Programs. Modified section 1.1.2 and 4.3 to change the maximum regular GO proposal size from 500 hours to 150 hours. Modified section 1.1.2 and 4.3 to describe changes to the proposal review process. All regular GO proposals will be reviewed and ranked by topical science panels and the time allocation recommendations for small proposals (less than 50 hours) will be made by the panels. Highly ranked large proposals (50-150 hours) from all panels will be forwarded to the Time Allocation Committee (TAC). The TAC will recommend the allocation of time for the large proposals. The 1500 hours available for Cycle-6 regular GO programs will be divided between the small and large programs based on the distribution of the submitted proposals. A minimum of 500 hours will be allocated to large programs. Modified section 3.1 to specify that there are no restrictions on unsuccessful Exploration Science proposers submitting regular General Observer Cycle-6 proposals to do the same or similar science (on a smaller scale) as proposed in the ES program. Modified section 5.3.1 to specifically state that Cycle-6 regular GO proposers should review the selected Exploration Science programs listed in Appendix C and review the Observation Summary Tables available on the SSC website to avoid proposing duplicate observations. Modified section 6.2.1.1 to update how the review panels will be constituted. Modified sections 7.1 and 7.3 to reflect how the review panels were constituted for the Exploration Science proposals and how they will be implemented for the regular GO proposal review.

The Spitzer Science Center (SSC) is operated by the California Institute of Technology for the Jet Propulsion Laboratory (JPL) and the National Aeronautics and Space Administration (NASA).

1 Executive Summary

NASA has authorized the Spitzer project to plan for approximately two years of 'warm' Spitzer observations after the cryogenic mission ends. After cryogen depletion the observatory will continue operating utilizing only the 3.6 and 4.5 micron channels on the IRAC instrument with expected sensitivity unchanged from performance in the cryogenic mission. The longer wavelength IRAC channels (5.6 and 8.0 microns) and the MIPS and IRS instruments will be unavailable. Scheduling of the observatory is expected to continue to be highly efficient. In a two year warm mission we expect to execute ~13,000 hours of science observations. Based upon consultation with the science community (see http://ssc.spitzer.caltech.edu/mtgs/warm) the warm mission will focus on a new type of observing program called Exploration Science (ES). ES programs will have a minimum size of 500 hours and may be executed over two years.

For the two years of approved warm observations, ~10,000 hours will be devoted to Exploration Science and ~3,000 hours to smaller General Observer programs. In this call for proposals we solicit the entire 10,000 hours of ES programs for a two-year warm mission. In addition we solicit 1,500 hours of regular GO programs for execution during the first year of the warm mission. The Cycle-7 call for proposals will solicit additional regular GO programs for the second year of the warm mission. An overview of the warm mission schedule is provided in Appendix B.

The cryogen is expected to be fully depleted in ~April 2009. The transition from nominal cold to warm observations is expected to take 6-8 weeks. We therefore anticipate starting warm observations in ~June 2009. Assuming a successful transition to warm observations and the expected continued high science return from the Spitzer mission, the project will propose for an additional extension of warm operations during the next NASA Senior Review (expected in Spring 2010).

All time on the Observatory, exclusive of Director's Discretionary Time (DDT), is being made available through this call for proposals. No Archival or Theoretical Research proposals are solicited in this call for proposals. It is anticipated that archival research using the rich, publicly available Spitzer archive will be supported via other NASA programs. The SSC will advertise any such programs as they become available. No joint observing programs with other facilities are solicited. Cycle-6 Exploration Science proposals are due October 10, 2008. Anyone expecting to submit an ES proposal should submit a Letter of Intent by September 2, 2008 (see §4.2). Regular Cycle-6 GO proposals are due February 6, 2009. Observations in Cycle-6 are expected to begin in June 2009 after the checkout period for the Warm IRAC instrument and AOT. The CP schedule will support an earlier (or later) than expected cryogen depletion date.

1.1 Proposals Solicited

This Call for Proposals (CP) invites investigators worldwide to submit Spitzer Space Telescope Cycle-6 General Observer (GO) proposals in two categories with separate submission deadlines. All proposals must be submitted electronically to the Spitzer Science Center (SSC) by the appropriate deadlines.

1.1.1 Exploration Science Proposals

General Observer Exploration Science (ES) proposals are solicited in all science categories. Approximately 10,000 hours are available for ES programs to be executed over two years. ES proposals must meet the following criteria:

- 500 hours minimum observing program
- no limit on maximum size of observing program
- default is no proprietary period, maximum proprietary period will be 90 days
- sample AORs must be submitted with the program

The suite of selected ES programs must provide sufficient variety in the target visibilities to enable efficient use of the observatory. Therefore the schedule-ability of the programs may be taken into consideration as a final step in the review process.

It is anticipated that ~$3.8 million in data analysis (DA) funding per year for two years will be available to support the ES programs. No program should expect to receive more than 20% of the total DA funds even if they receive more than 20% of ES time. The additional funding to support creation of enhanced data products that was provided to Legacy teams during the cryogenic mission is no longer available.

Deadlines:

- Letters of Intent to propose due Tuesday, **September 2, 2008**, 5:00 pm PDT
- ES Proposals due Friday, **October 10, 2008**, 5:00 pm PDT
- Successful programs will be selected by early December 2008 and the initial delivery of Astronomical Observations Requests (AORs) for selected programs will be due in January 2009

1.1.2 Regular General Observer Proposals

Regular General Observer (GO) proposals are solicited in all science categories. Approximately 1,500 hours are available for regular GO programs in Cycle-6. These programs should execute primarily during the first year of warm operations. Cycle-7 will solicit additional regular GO proposals. GO proposals will be solicited in two categories (small and large). The 'medium' category designation has been dropped. All regular GO proposals will be reviewed and ranked by topical science panels and the time allocation recommendations for small proposals (less than 50 hours) will be made by the panels. Highly ranked large proposals (50-150 hours) from all panels will be forwarded to the Time Allocation Committee (TAC). The TAC will recommend the allocation of time for the large proposals. The 1500 hours available for Cycle-6 regular GO programs will be divided between the small and large programs based on the distribution of the submitted proposals. A minimum of 500 hours will be allocated to large programs.

Regular GO proposals must meet the following criteria:

- maximum proposal size is 150 hours
- small proposals (< 50 hours) must include full AORs with the proposal
- large proposals (>=50 hours) must include sample AORs with the proposal
- default proprietary period is one year (no embargoing of data will be done to protect GO data with proprietary periods)

It is anticipated that ~$1.5 million in data analysis (DA) funding per year will be available to support regular GO programs. The additional funding to support creation of enhanced data products that was provided to Legacy teams during the cryogenic mission is no longer available. Smaller GO programs will receive no direct funding. Specifically:

- selected programs >= 20 hours will be eligible for data analysis funding
- selected programs < 20 hours will receive no direct data analysis funding. The SSC will pay page charges for papers produced by the PI team utilizing these data.

Guidelines for the page charge support will be provided to all successful observing teams.

Deadlines:

- Regular GO Proposals due Friday, **February 6, 2009**, 5:00 pm PST
- Successful programs will be selected by May 2009 and AORs for selected large programs will be due in June 2009

1.1.3 Programs not available in Cycle-6

No joint observing programs with the Hubble Space Telescope, Chandra X-ray Observatory, NOAO and NRAO are available in Cycle-6. We anticipate that these will be available in Cycle-7 for regular GO programs.

Because of uncertainties in scheduling Exploration Science programs, regular GO programs to follow-up discoveries from Cycle-6 Exploration Science programs are not available in Cycle-6. Such projects should be available in the regular GO program for Cycle-7.

Archival Research (AR) or Theoretical Research (TR) programs are no longer available through the Spitzer program. It is anticipated that archival research using the rich, publicly available Spitzer archive will be supported via other NASA programs. The SSC will advertise any such programs as they become available.

High and medium-impact ToO observations cannot be included in GO proposals. They must be requested via Director's Discretionary Time.

1.2 Proposal Planning

This call for proposals (CP) provides an overview of the technical capabilities of the observatory (§2), eligibility criteria (§3), the current research opportunities (§4) and information on planning (§5) and submitting (§6) a proposal. The CP is accompanied by other technical documents (see §5.1). Interested scientists may retrieve digital copies of these documents from the Proposal Kit section of the Spitzer Science Center (SSC) website (http://ssc.spitzer.caltech.edu/propkit). An important component of the Proposal Kit is *Spot*, the Spitzer software required for observation planning and proposal submission. **All Cycle-6 proposals must be submitted with *Spot (version 18)***, a free software package available now within the online Proposal Kit. *Spot* must be downloaded to your computer. The visibility windows in *Spot* will be updated to support the warm mission by August 1, 2008.

In addition to handling proposal submission, *Spot* allows General Observers (GOs) to construct detailed Astronomical Observation Requests (AORs) by specifying observation parameters for the required observing modes. A new observing mode, IRAC Post-Cryo Mapping, is available in *Spot* to support warm operations. *Spot* also includes useful visualization tools to permit the GO investigator to see how proposed Spitzer observations will be laid out on the sky.

Questions pertaining to the Cycle-6 CP should be sent electronically to the Spitzer Helpdesk at *help@spitzer.caltech.edu.* Questions (and answers) that are deemed by the SSC to be of broad interest to Spitzer investigators are listed in the Frequently Asked Questions section of the SSC website.

1.3 Proposal Review

Proposals received by the relevant submission deadlines will be evaluated based on the criteria listed in §7.2 by Time Allocation Committees (TACs). The TACs will be organized by the Spitzer Science Center (SSC) and will recommend lists of programs to the SSC Director, who is the ultimate selection official for all Cycle-6 research programs.

Upon selection by the SSC Director, observing programs are entered into the Spitzer observations database for execution as part of Cycle-6, expected to commence in June 2009, 6-8 weeks after the end of the cryogenic mission.

1.4 Proposal Submission

A regular GO proposal requests Spitzer Space Telescope observing time and consists of these elements:

- A scientific justification for the program.
- A technical plan describing how the scientific investigation will be implemented, including an explanation of target selection and observing modes, and how the data will be analyzed.
- Detailed specification of Spitzer observations, through Astronomical Observation Requests (AORs) generated by *Spot*.

An Exploration Science GO proposal includes the elements listed above for GO programs and adds the following:

- Statement of technical feasibility and ability of the team to carry out the observations. *Proposers should explain the work they have done to validate the technical feasibility of their program and the expertise of their team since the SSC will have substantially fewer resources available for user support during the warm mission.*
- Description of the target provenance for programs requesting generic or ToO targets (e.g. "The targets will be selected from the first data release of the WISE all-sky survey, which is currently scheduled to occur on TBD."). In addition, a schedule should be provided showing when, within the Cycle-6 ES timeframe, the AORs will be available to schedule. Large quantities of time cannot be allocated to programs without known targets unless there is a clear plan for availability of the targets throughout the two-year Cycle-6 ES program.
- A description of the schedule-ability of the program, e.g. what constraints do the target visibilities and necessary science scheduling constraints place on the availability of the program for scheduling. For example, the targets may be spread across the sky and therefore something will be available at all times to schedule or the targets could be concentrated in a particular field that is visible from approximately May 15-June 15 and December 10-Jan 15.
- A statement that no proprietary period is requested for the data, or a request for up to 90 days of proprietary data rights with a justification.

No cost plans are required for Exploration Science or regular GO proposals. The science data analysis funding for approved and eligible investigators will be determined through formulaic means (§3.2).

In general, observations that are deemed to duplicate those previously executed or approved for execution on the observatory are strongly discouraged. Such observations may be proposed but must be specifically justified. The SSC Director may approve such observations based on the recommendation of the TAC and subsequent review. Proposers should consult the *Spitzer Space Telescope Warm Mission Observing Rules* to determine what constitutes a duplicate observation. The *Observing Rules* are also reproduced in their entirety in Appendix A of the current document. Proposers should use *Leopard*, the SSC archive interface tool, to search all observations that have been executed or approved for execution for potential duplications. The *Reserved Observations Catalog* is also available online in list form.

Spitzer uses a mainly single-phase proposal submission process. Proposers must utilize *Spot*, the SSC proposal planning and submission software, to specify their observations and calculate the observing time necessary to successfully complete the proposed program. For small GO programs a full set of AORs must be submitted with the proposal. For large and Exploration Science GO proposals, representative AORs that cover all requested observing modes as well as a complete target list and description of the proposed observations should be included (though a full set of AORs will also be accepted). The complete set of AORs will be required after the proposal has been approved. Supporting technical and programmatic documentation for this CP is listed in §5.1. These documents are all available online in the Proposal Kit section of the SSC website (http://ssc.spitzer.caltech.edu/propkit).

Only AORs utilizing the *IRAC Post-Cryo Mapping* Astronomical Observation Template (AOT) will be accepted for Cycle-6. This AOT is available in *Spot* (*Version 18)* and the fidelity of the resource estimates is expected to be very good.

All proposals should be submitted to the SSC electronically, using the proposal submission tool integrated into *Spot* (Version 18). Proposals must conform to all requirements and constraints described in this CP, in particular the newly revised format and page limits listed in §6.2. The proposal submission deadline for Exploration Science GO proposals is 5:00 pm PDT on Friday, October 10, 2008. The proposal submission deadline for small/large regular GO Proposals is 5pm PST, February 6, 2009.

Letters of Intent (LOI) for Exploration Science GO proposals are due 5:00 pm PDT on Tuesday, September 2, 2008. The purpose of gathering this information is to enable the SSC to identify proposal reviewers without conflicts for the Exploration Science proposal selection. The LOIs should be submitted as an email to the Spitzer Helpdesk (help@spitzer.caltech.edu) and should include the following information:

1. Principal Investigator + Institutional Affiliation
2. Co-Investigators + Institutional Affiliations
3. Proposal Title
4. Proposal Science Category (from the list in the Spot Proposal Submission Tool)
5. Brief Abstract

2 Mission Overview

This section briefly summarizes the scientific capabilities of the Spitzer Space Telescope. The reader is urged to consult the companion document, the *Spitzer Space Telescope Observer's Manual-Warm Mission (Warm SOM, hereafter)*, for complete technical details of the telescope and the one warm mission instrument - IRAC. The *Warm SOM* is available in the Proposal Kit section of the Spitzer Science Center (SSC) website (http://ssc.spitzer.caltech.edu/propkit).

The Spitzer Space Telescope is the fourth and final element in NASA's family of Great Observatories and represents an important scientific and technical component of NASA's astrophysics program. The telescope was launched from Cape Canaveral, Florida into an Earth-trailing heliocentric orbit on August 25, 2003. Spitzer is a 0.85-meter diameter telescope. After the cryogen is depleted, estimated in April 2009 (+/- 3 months), the 3.6 and 4.5 micron IRAC arrays will continue to be operational. The telescope will equilibrate at an ambient temperature of ~30K and Cycle-6 science observations will begin after approximately a 6-8 week checkout period of the IRAC instrument and Warm AOT.

2.1 Telescope

The Spitzer telescope is of Cassegrain design, with beryllium optics, and operates during the warm mission at ambient temperatures ~ 30K. The telescope offers pointing accuracy of better than 1.0 arcsec (1-sigma radial rms), and pointing stability of 0.1 arcsec (1-sigma radial rms, 200 sec) with the star-tracker. An angular resolution of ~1.5 arcsec is achieved at the diffraction limit of 5.5 microns. The imaging field-of-view is ~5 arcmin square. Spitzer is capable of achieving tracking rates of ~1 arcsec/sec for fast-moving (e.g., Solar System) targets.

2.2 Orbit/Sky Visibility

The Spitzer Space Telescope is in an Earth-trailing heliocentric orbit with radius 1 AU, and is drifting away from Earth at a rate of about 0.1 AU per year. In this orbit, the telescope is in a benign thermal environment. Moreover, this choice of orbit substantially reduces the projection of the Sun-Earth-Moon avoidance zones on the sky, yielding high astronomical observing efficiencies.

The telescope's instantaneous visibility region is a 37.5-degree wide annulus, extending from 82.5° to 120° in solar elongation, and encompassing all ecliptic latitudes. The size of this region is constrained in two ways. First, the telescope cannot point within 82.5 degrees of the Sun, for reasons of thermal control. Second, the telescope cannot point more than 120 degrees from the Sun, in order to maintain sufficient illumination of the power-generating solar panels. About one-third of the entire sky is accessible to Spitzer at any given time. The visibility and observing constraints are basically unchanged in the warm mission with respect to the cryogenic mission.

The amount of time that any particular target is visible to Spitzer is a function of ecliptic latitude. Objects with |ecliptic-latitude| > 82.5° are located within the Continuous Viewing Zone, and those with 60° < |ecliptic-latitude| < 82.5° are annually visible to Spitzer in one continuous ~7-month time interval. Targets with |ecliptic-latitude| < 60° are observable twice per year in ~40-day windows. For any given target position, sky visibility is available using *Spot*, the Spitzer

observation planning software (§5.2). The visibility windows in *Spot* will be updated to support the warm mission by August 1, 2008.

2.3 Science Payload

In the warm mission the Spitzer Space Telescope science payload consists of just the IRAC instrument operating at an ambient temperature of ~ 30K.

The warm InfraRed Array Camera (IRAC) provides simultaneous ~5 arcmin square images in two channels ($\lambda / \Delta\lambda \sim 4$) centered at 3.6 microns (Channel 1) and 4.5 microns (Channel 2). The 256 x 256 focal-plane arrays use Indium Antimonide (InSb) detectors. The pixel size for each detector array is ~1.2 arcsec. Two nearby fields of view (FOV) are simultaneously imaged, with Channel 1 comprising one FOV, and Channel 2 the other FOV. The Principal Investigator for IRAC is Giovanni G. Fazio, Smithsonian Astrophysical Observatory, Harvard-Smithsonian Center for Astrophysics.

In the warm mission the performance of IRAC channels 1 and 2 is not expected to be significantly different than the performance in the cryogenic mission. All currently available modes and capabilities of IRAC channels 1 and 2 will be available during the warm mission, including high dynamic range and sub-array modes. We anticipate that the dynamic range will be the same for both channels as exists in the Cryogenic Mission. Proposers should use the cryogenic performance information when planning their Cycle-6 observations. Actual performance of the detectors will be measured after end of cryogen when the telescope reaches its equilibrium temperature. Cycle-6 observers will have an opportunity to review their observing strategy if the performance is significantly different from expectations.

2.4 Warm Mission Observing Mode

In the warm mission observations will be executed with one observing mode–IRAC Post-Cryo Mapping. Observers completely specify their observations through the use of an Astronomical Observation Template (AOT). The complete specification of targets and observing parameters is done using *Spot*, the software for Spitzer observation planning. The AOT in *Spot* provides observers with control of all the relevant parameters for their observation. An AOT with target information and observer-selected parameters specified becomes an Astronomical Observation Request (AOR), the fundamental unit of Spitzer observing. Details about the warm mission IRAC observing mode and the available choice of AOT parameters are provided in the *Warm SOM.*

For small GO proposals a full set of AORs must be submitted with the proposal. For large and Exploration Science proposals a representative set of AORs that fully describes the observing program must be submitted with the proposal, though the entire set may also be submitted.

The maximum duration for warm IRAC AORs is 24 hours. Longer observations must be constructed using Instrument Engineering Requests (IERs, see below).

2.4.1 Special Observing Modes - IERs

In special circumstances, observations that cannot be supported with the warm IRAC AOT may be executed with Instrument Engineering Requests (IERs). The longest continuous observation executed during the cryogenic mission was ~ 70 hours. The practical maximum observation length is ~96 hours. Due to the SSC resources required to support the creation and execution of IERs, these observations will be approved in a limited number of cases and only for very highly ranked science programs. **Any program that requires the generation of IERs should consult with the SSC well in advance of submitting the proposal.**

2.5 Observation Scheduling

During the warm mission the observatory will be scheduled using the same procedures utilized during the cryogenic mission. Interruptions for downlinks will be less frequent, scheduled every 24-48 hours. Interruptions for quick turn-around (high/medium impact) target of opportunity observations will be supported only through DDT (§4.6). Low-impact ToO observations with a 5-week lead-time will be supported through the proposal process (or through DDT). Observations of generic targets (i.e. the target position is known to within 2 degrees, see §4.7) can be proposed that require an update to the exact target position 2-5 weeks prior to execution (see §4.6).

Pilot observations of selected Exploration Science programs that establish and verify the observing strategies will be executed during the warm mission Science Verification phase.

2.6 Science Operations

An integrated team of personnel from the Jet Propulsion Laboratory (JPL), Lockheed Martin (Denver) and the Spitzer Science Center (SSC) conducts flight operations for Spitzer. Science operations activities are based at the SSC, on the campus of the California Institute of Technology, Pasadena. The SSC solicits research investigations through Calls for Proposals; organizes the peer review of the proposals by science experts; and administers supporting NASA research funds for investigations selected by the SSC Director. In addition, the SSC schedules all science observations (including instrument and spacecraft calibrations), conducts pipeline processing of all Spitzer Space Telescope data and places the data in the electronically accessible science data archive.

3 Eligibility

Investigators worldwide are eligible to submit a proposal in response to the Spitzer Space Telescope Cycle-6 *Call for Proposals*. The Spitzer Science Center (SSC) will offer NASA funding to investigators affiliated with U.S.-based institutions, subject to availability and the limitations cited below, to support the analysis of data from proposals selected by the SSC.

3.1 Who May Submit a Proposal

This solicitation for regular and Exploration Science General Observer (GO) proposals is open to investigators of any nationality. Each proposal must identify a single individual who will serve as Principal Investigator (PI) and will be responsible for the scientific and administrative conduct of the project. *The PI for GO proposals may have any institutional affiliation.* There is no limit to the number of Co-Investigators (Co-Is) that may appear on a proposal. The PI may designate a Technical Contact for purposes of communications with the SSC Science User Support Team.

Graduate students and post-docs can apply for Spitzer time as principal investigators. Before applying they should check with their advisors regarding any specific requirements of their home institution regarding proposal submission. *A graduate student planning to submit an Exploration Science proposal as the PI must have their graduate advisor send a letter of support to the SSC Helpdesk outlining why the graduate student is qualified to be the PI of the proposal.*

An administrative PI can be designated for funding purposes for any program. This information will be collected *after* the proposal is approved.

There are no restrictions on unsuccessful Exploration Science proposers submitting smaller General Observer Cycle-6 proposals to do the same or similar science (on a smaller scale) as proposed in the ES program.

3.2 Funding Support

The SSC will provide financial support for Cycle-6 investigators, subject to the availability of NASA funds and the eligibility guidelines described below. Investigators affiliated with U.S.-based institutions, regardless of nationality, are eligible for funding support. Investigators may be affiliated with educational institutions, non-profit non-academic organizations, industry, NASA centers and other government agencies.

The SSC cannot award NASA research funds to investigators affiliated with non-U.S. institutions. While non-U.S. based Co-Is are permitted on all proposals, no NASA funds may flow to them through the PIs. Therefore, researchers affiliated with non-U.S. institutions that propose investigations with Spitzer should seek support through their own appropriate funding agencies.

We expect the total funding for all data analysis support to be $5.5-6 million per year for two years, subject to the availability of NASA funds. *Funding to support creation of enhanced data products that was provided to Legacy teams during the cryogenic mission is no longer available.*

Funding awards will continue to be determined through formulaic means. For purposes of determining funding levels, the sum of the efforts by U.S.-based Co-Investigators on a proposal led by a foreign Principal Investigator cannot exceed 50%.

It is anticipated that ~$3.8 million in data analysis (DA) funding per year for two years will be available to support the ES programs. No program should expect to receive more than 20% of the total DA funds even if they receive more than 20% of ES time. It is anticipated that ~$1.5 million in data analysis (DA) funding per year will be available to support regular GO programs. **Smaller GO programs will receive no direct funding.** Specifically:

- selected programs > 20 hours will be eligible for data analysis funding
- selected program < 20 hours will receive no direct data analysis funding. The SSC will pay page charges for papers produced by the PI team utilizing these data.

Guidelines for the page charge support will be provided to all successful observing teams.

After the funding awards for each program are determined the principal investigator (PI) is responsible for providing the breakdown of funds between the eligible CoIs and providing the financial contact information necessary for issuing the contracts. *As in Cycle-5 this information will be collected via a web form after the proposals are approved.*

Please make sure that your Sponsored Research Office has a copy of your proposal so that if it is successful they are ready to handle the funding process.

The SSC will manage Spitzer research funds and will contract with the Jet Propulsion Laboratory (JPL) to administer the disbursement of most of the funds. The funding instrument used by JPL (not always a contract) will depend on the size of the award and the nature of the Principal Investigator's home institution. JPL is unable to issue grants. Additional details about the Spitzer research funding contracts are provided in §3.2.1.

3.2.1 Overview of Research Funding Instruments

3.2.1.1 RSA -- Research Support Agreement

The Research Support Agreement (RSA) is a simple Fixed Price, Advance Paid, subcontract provided through JPL that is used for basic research funding where scientific reports and technical data are the only deliverables and can be awarded to educational and non-profit institutions. RSAs amounts are determined formulaically or based on availability of funds for science, enhanced data product, archive and theory funding. **No budget submission to the SSC or JPL is required**, though your institution may require you to create a budget for internally handling the funds. Your institution is sent the RSA paperwork, returns the completed forms, and JPL then mails your institution a check for the entire award amount. The administrative overhead for executing RSAs is about half that of standard contracts so using these instruments allows us to send out more money for research and pay less for the administrative costs. We plan to issue the RSAs with a 3-year period of performance. No-cost extensions beyond three years from the start are generally not offered.

The only reporting necessary for RSAs is a final 'end of contract' report outlining the work done and listing publications from the research. The report does not need to be exhaustive but it is necessary that we receive them. RSA awardees will be notified of how to submit their final reports. The RSAs are the fastest contracts to execute and are therefore funded first in the cycle. The SSC does not have all the funding for the Cycle available when it starts, therefore the funding awards are issued over a period of several months.

Institutions that are eligible to receive RSAs but elect not to accept them will generally be issued cost-reimbursable contracts**. The additional cost in issuing these contracts, rather than RSAs, may be deducted from the science funding for those investigators eligible for RSA funding but whose institutions request a different funding instrument.**

3.2.1.2 CREI -- Cost Reimbursement with an Educational Institution

CREIs are a standard JPL contract that will be utilized for any contracts over $500,000. If an institution elects not to accept an RSA, utilization of CREIs will require institutionally endorsed budgets. These will be requested after the proposal is selected. Investigators receiving CREIs are generally funded after the RSAs (§3.2.1.1) have been issued.

3.2.1.3 Other JPL Contracts

If you are at an institution that cannot accept RSAs or CREIs (e.g. a for-profit institution) then you will be funded by JPL with the appropriate contract. These programs are typically funded after the RSAs have been issued. An institutionally endorsed budget may be required and will be requested after the proposal is selected.

3.2.1.4 Direct NASA Funding

Investigators affiliated with NASA Centers will receive their award of formulaically determined funds directly from NASA, following guidance provided by the SSC. The SSC and JPL provide NASA Headquarters with the investigators, institutions and formulaically determined funding amounts, and Headquarters sends these funds directly to the appropriate NASA centers.

4 Observing Programs

This *Call for Proposals (CP)* solicits proposals to conduct General Observer (GO) programs grouped in two categories: regular GO programs and Exploration Science GO programs. The Spitzer General Observer (GO) Programs allow investigators to conduct independent research programs utilizing new Spitzer Space Telescope observations. Ninety-five percent of the observing time in the warm mission is available for peer-reviewed GO investigations. The GO Programs are open to all investigators worldwide on a competitive basis.

The following sub-sections contain references to the *Spitzer Space Telescope Warm Mission Observing Rules*, which are reproduced in their entirety as Appendix A of this CP.

4.1 Observing Time Available

Cycle-6 is ~24 months in duration, expected to begin in June 2009, starting with normal science observations after completion of the warm mission IRAC instrument checkout phase of approximately 6-8 weeks. During the cryogenic mission we are scheduling ~7000 hours of science per year and we expect to schedule 6500-7000 hours per year during warm operations. This call solicits 10,000 hours in Exploration Science programs to be executed over two years and 1,500 hours of regular GO programs to be executed over the first year of the warm mission. Five percent of the observing time is reserved for DDT investigations.

4.2 Exploration Science General Observer Programs

General Observer Exploration Science (ES) proposals are solicited in all science categories. 10,000 hours is available for ES programs to be executed over two years. ES proposals must meet the following criteria:

- 500 hours minimum observing program
- no limit on maximum observing program
- default is no proprietary period, maximum proprietary period will be 90 days

The suite of selected ES programs must provide sufficient variety in the target visibilities to enable efficient use of the observatory. Therefore the schedule-ability of the programs may be taken into consideration as a final step in the review process.

Letters of Intent for Exploration Science GO proposals are due 5:00 pm PDT on Tuesday, September 2, 2008. These should be submitted as an email to the Spitzer Helpdesk (help@spitzer.caltech.edu) and include the following information:

1. Principal Investigator + Institutional Affiliation
2. Current Co-Investigators + Institutional Affiliations
3. Proposal Title
4. Proposal Science Category (from the list in the Spot Proposal Submission Tool)
5. Brief Abstract

The purpose of gathering this information is to enable the SSC to identify proposal reviewers without conflicts for the Exploration Science proposal selection.

4.2.1 Provenance and Availability of Targets

All ES proposals can include observations of targets for which the exact position is not currently known. These can either be classified as generic targets (position uncertainty of less than 2 degrees) or low impact target of opportunity (ToO) targets. Proposers must include a clear and concise description of how the targets for their program will be identified. This is to provide the TAC with confidence that the targets will exist and to resolve any conflicts between proposed observations and DDT proposals for targets discovered in the future. We anticipate that the majority of ES proposals will include full, well-defined target lists but recognize that this will not be the case for all science cases. Studies of newly discovered extra-solar planets are an example of such a science category.

If your proposed targets are not defined at the time of proposal submission you must provide a credible schedule for defining the targets and delivering the AORs throughout the 2-year warm mission. Details will be worked with all successful teams.

4.2.2 Scheduling Profile

The selected suite of ES programs must provide observations to schedule throughout the year. During the cryogenic mission the large number of selected programs provided this simply due to the diversity of the requested observations. By selecting ~75% of the observing hours in a small number of programs the impact on the scheduling pool throughout the year must be considered during the review process instead of after the programs are selected.

ES proposers should provide a description of the scheduling profile of their program. For example, a survey of hundreds of individual targets spread over the sky would be available to schedule at all times. A program of individual targets concentrated in a single region in the ecliptic plane would only be available for ~6 weeks, twice a year. See §3.2 of the *Warm SOM* and Figure 3.7 in that section for a detailed discussion of sky visibility and target viewing periods with Spitzer. We request that proposers provide this information to assist the TAC in ensuring that the complete suite of selected programs provides observations that can be scheduled throughout the year.

4.2.3 Ancillary Data

It is anticipated that ES programs may also include large ancillary data sets necessary to complete their proposed science. Given the substantial investment in Spitzer observing time that will go into each ES program, we encourage ES teams to provide the ancillary data to the community in the same spirit and to describe their plans for public release of their ancillary data in the proposal.

4.3 Regular General Observer Programs

Regular General Observer (GO) proposals are solicited in all science categories. 1,500 hours is available for regular GO programs in Cycle-6. These programs should execute primarily during the first year of warm operations. Cycle-7 will solicit additional regular GO proposals. GO

proposals will be solicited in two categories (small and large). The 'medium' category designation has been dropped. All regular GO proposals will be reviewed and ranked by topical science panels and the time allocation recommendations for small proposals (less than 50 hours) will be made by the panels. Highly ranked large proposals (50-150 hours) from all panels will be forwarded to the Time Allocation Committee (TAC). The TAC will recommend the allocation of time for the large proposals. The 1500 hours available for Cycle-6 regular GO programs will be divided between the small and large programs based on the distribution of the submitted proposals. A minimum of 500 hours will be allocated to large programs.

Regular GO proposals must meet the following criteria:

- Maximum proposal size is 150 hours
- small proposals (< 50 hours) must include full AORs with the proposal
- large proposals (>50 hours) must include sample AORs with the proposal
- default proprietary period is one year

Unsuccessful Exploration Science proposers are not prohibited from submitting revised proposals as Cycle-6 small or large GO proposals.

4.4 Multi-Cycle Observations

Exploration Science programs will be executed over two years (during Cycles 6 and 7) and are therefore multi-cycle by definition.

Regular GO programs may request multi-cycle observations that span Cycles 6 and 7. Investigations requiring long temporal baselines to study changes in one or more targets can be a component of a proposed GO investigation. These requests must be limited to cases where it is clearly required to optimize the scientific return of the project. The observations are presumed to be repeated visits to the same target(s). Examples include monitoring of variable stars or active galactic nuclei, and could also include astrometric observations. Proposals with multi-cycle observations should describe the entire requested program and provide a breakdown by cycle of the Spitzer observing time requested. Investigators with approved multi-cycle observations need not submit continuation proposals in Cycle-7. No more than 100 hours of Cycle-7 time will be allocated to multi-cycle, regular GO programs.

4.5 Second-Look Observations

Second-look observations (SLOs) are deemed to be a predictable element of an integrated Spitzer observing program, even if the specific targets cannot be provided at the time of proposal submission. Requests for SLOs must be included in the original proposal and must be described in as much detail as possible. For example, an investigator can propose for 80 hours of time to conduct one-hour observations of 30 targets and then ten-hour observations of the five most interesting of these based on criteria spelled out in the proposal. SLOs are an allowed component of regular GO investigations in Cycles 6 and 7. SLOs are not allowed in Cycle-6 Exploration Science GO proposals.

4.6 Targets of Opportunity

During the cryogenic mission, observations of phenomena whose exact timing and/or location on the sky were uncertain at the time of the proposal submission deadline (*e.g.,* a newly discovered comets, gamma ray bursts and extrasolar planets) have typically been submitted as a General Observer Target of Opportunity (ToO) proposals. **For Cycle-6 ToO observations classified as low-impact ONLY (see below and §11.5.1) can be requested.**

Targets of Opportunity are categorized by the extent to which the execution of such an observation affects normal scheduling and observing procedures. A *low-impact* ToO is one where the acceptable delay is longer than five weeks. There is no limit on the number of these low-impact ToO observations that can be approved for Cycle-6.

New for Cycle-6, generic fixed target observations that require only a late position update to the AOR may be submitted as low-impact ToO observations. **If all of the AOR parameters for a fixed generic target observation can be specified well in advance then a final update to the target position, 2-5 weeks prior to execution, may be supported. We anticipate being able to support up to 12 of these late-update generic target observations per year.** These observations should be marked as low-impact ToOs in the proposal and specifically described in the Summary of Scheduling Constraints/Targets of Opportunity section of the proposal (see §6.3.2.7).

High/medium impact ToOs must be requested via DDT proposals. The Spitzer project will support a limited number of such observations annually as permitted by available resources. We currently anticipate supporting 1-2 per year. Additional overheads are assessed for high/medium-impact Targets of Opportunity and are described in Appendix E. The special overhead must be specified using *Spot* when the AORs for the proposal are created. From within the AOR dialog click the **Special …** button and select the overhead for high or medium impact-one instrument from the list. *Spot* will calculate the required time and add it to the Total Duration returned on the main *Spot* AOR page

An approved ToO observation will be executed only in the event that the specified phenomenon actually occurs within Cycle-6. Additional information on Targets of Opportunity, including the procedures for activation of an approved AOR, can be found in Appendix A §(11.5). *Unexecuted ToO observations expire at the end of the cycle in which they are selected.* Exploration Science programs with ToO observations will remain valid for two years.

Observations of unanticipated phenomena can be requested through Director's Discretionary Time (DDT) procedures (see §4.10).

4.7 Generic Targets

Generic targets have more refined and predictive spatial and temporal information than a ToO. Generic targets can be described scientifically, but lack *precise* celestial coordinates or brightness estimates *at the time of the proposal submission deadline*. A generic target can be selected from a complementary observing program with Spitzer, or with any other telescope, but one where the conditional observations (assumed to be under the control of or clearly available

to the Spitzer Principal Investigator) are scheduled or will be scheduled with high likelihood, but have not been executed or analyzed prior to the Spitzer proposal deadline.

An investigator may propose observations of generic targets, describing them in as much detail as possible in the proposal. An AOR accompanying a generic target must contain a celestial position accurate to within 2 degrees (radial) for fixed targets. For a moving generic target (*e.g.,* Solar System object) proposers must submit an AOR with a target position 'to be determined' from Navigation and Ancillary Information Facility (NAIF) identification, or from orbital elements. In either case, the execution time must be specified to within a factor of 1.5.

The observations must be completed within the observing time allocation awarded when the proposal was approved. Examples of generic targets and additional details and limitations pertaining to their use can be found in Appendix A (§11.6).

Exploration Science Generic Targets: For Exploration Science programs a credible delivery schedule for AORs with generic targets must be provided. Details will be worked with all successful teams.

Regular GO Generic Targets: The targets and AORs for Cycle-6 generic targets must be completely specified by December 15, 2009.

4.8 Joint Observing Proposals

No joint observations with other facilities are supported in Cycle-6.

4.9 Statistical Programs

Statistical programs, where a specific number of observations are required for the science but the set of observations required is not unique, may be submitted as part of Exploration Science or Regular GO proposals. For example if your program requires observations of 10 targets in your sample and you have 20 targets total in the sample the proposal can be submitted with AORs specifying observations of 20 targets but time is only requested to observe 10 of them. This should be clearly described in the technical justification section of the science plan.

4.10 Director's Discretionary Time

Five percent of the total Spitzer observing time is allocated by the SSC Director as Director's Discretionary Time (DDT). This time is intended to facilitate proposals that address emerging scientific topics and unanticipated phenomena. Any observation requiring execution in less than 6 weeks from the time the phenomenon is identified must submit a DDT proposal.

Scientists wishing to request DDT can do so at any time during the year through the online DDT Proposal Submission form linked at this URL: http://ssc.spitzer.caltech.edu/geninfo/ddt/ . Investigators should not utilize DDT to resubmit all or part of a proposal that was rejected by the normal peer review process.

Additional details pertaining to DDT can be found in Appendix D (§13) and on the SSC website (http://ssc.spitzer.caltech.edu/geninfo/ddt/). Abstracts of approved DDT proposals are also available at the website.

4.11 Data Rights

For observations with a proprietary period, observers expect exclusive access to their science data, intended to facilitate the processing and scientific analysis of the data by the relevant investigator. The SSC will not have the resources to do duplication checks or embargo data from duplicating observations in the warm mission. **Therefore the SSC cannot ensure that all proprietary periods will be protected for observations taken in Cycle-5 onwards** (though we expect only a small number of observations to possibly be impacted by this.)

Note that each observation (AOR) has its own proprietary period. This means that the AORs within a program are, as their proprietary periods expire, released to the public regardless of how many unobserved AORs remain in the program.

Exploration Science programs will have a maximum proprietary period of 90 days. Regular General Observer AORs shall have a nominal proprietary data period of twelve months. The proprietary period commences when scientifically usable data from commissioned pipelines are made available to the Principal Investigator via the Spitzer Science Archive. Once the proprietary period for an AOR expires, the raw and pipeline-processed data enter the public domain and are available to anyone through the Spitzer Science Archive.

The SSC Director reserves the right to designate any Target of Opportunity or DDT data for early release when such a release is deemed to be in the interest of the community.

The Spitzer Time Allocation Committee may recommend a shorter proprietary period for individual proposals due to the high value of the data to the general astronomical community. As part of their proposal, observers may request that the SSC Director waive all or part of their proprietary period if the proposal is approved. This information should be provided in the coversheet information in the *Spot* proposal submission tool.

5 Proposal Planning

Before submitting a Spitzer Space Telescope Cycle-6 proposal it is important that investigators consult relevant technical documentation about the capabilities of the telescope, the sensitivities of the IRAC instrument and the nature of the pipeline-processed data delivered to investigators by the SSC. Proposals must include credible and justifiable estimates of requested observing time. *Spot*, the Spitzer observation planning and proposal submission software, and other online resources are provided for this purpose. All of these resources may be found within the Proposal Kit section of the SSC website (http://ssc.spitzer.caltech.edu/propkit).

The documentation listed in §5.1 provides details on how researchers can learn about the capabilities of warm Spitzer, plan and define their detailed observational program, check for possible duplicate observations, and modify their planned observations. Specific questions should be submitted electronically to the Helpdesk at help@spitzer.caltech.edu.

THE PROPOSAL TEMPLATES HAVE CHANGED FROM PREVIOUS CYCLES. BE SURE TO USE THE CYCLE-6 TEMPLATES FOR YOUR CYCLE-6 PROPOSALS. Proposals not using the Cycle-6 templates will be rejected outright.

5.1 Technical Documentation

The documents needed to plan, prepare and submit a proposal are listed below.

Spitzer Space Telescope Cycle-6 Call for Proposals (CP) *Version 1.0 (July 7, 2008)*

The *Call for Proposals* is the present document.

Spitzer Space Telescope Observer's Manual-Warm Mission *Version 1.0 (July 7, 2008)*

The *Spitzer Observer's Manual-Warm Mission (Warm SOM)* provides technical information about the telescope and the IRAC Instrument. It includes information on planning, editing and submitting Astronomical Observation Requests (AORs), the user-provided specification of individual observation parameters. The *Warm SOM* is an essential document for all GO investigators.

Spot User's Guide *Spot version 18.0 (June 18, 2008)*

The *Spot* User's Guide is a comprehensive guide to the Spitzer observation planning software package (see §5.2). All proposals must be submitted using *Spot*.

Leopard User's Guide *Leopard version 18.0 (June 18, 2008)*

The *Leopard* User's Guide is a comprehensive guide to the tool used to search for and download data from the Spitzer archive. Additionally, Leopard is the tool that proposers should be using to search the contents of the Reserved Observations Catalog (ROC).

Spitzer Space Telescope Warm Mission Observing Rules *Version 1.0 (July 7, 2008)*

The Observing Rules describe the rules and processes governing duplicate observations, the declaration and modification of AORs, and other policies governing Spitzer observations. This document is reproduced in its entirety as Appendix A (§11) in this *Call for Proposals*.

Spitzer Space Telescope Reserved Observations Catalog (ROC) *Version 10.0 (July 7, 2008)*

The *Reserved Observations Catalog* includes an itemized list of all executed and approved observations. Proposers should use *Leopard*, the SSC archive interface software package, to query for executed or approved observations. The ROC is also available online in ASCII text format.

Spitzer Space Telescope Observation Planning Cookbook *Version 8.0 (August 8, 2008)*

The Observation Planning Cookbook provides detailed examples of how to construct Spitzer observations.

The documents described above are available within the Proposal Kit section of the SSC website. The reader is urged to regularly consult the SSC Website for the latest news, technical information and telescope performance updates. The *Frequently Asked Questions (FAQ)* sections of the site, organized by topic, will be updated regularly with new questions and answers.

5.2 The Proposal Kit

The online Proposal Kit is the website that provides all of the information necessary for the prospective General Observer (GO) researcher. It includes each of the documents listed in §5.1 and can be found on the SSC website at http://ssc.spitzer.caltech.edu/propkit/.

The Kit also includes instructions for installing *Spot*, the Spitzer observation-planning tool, on the user's host machine. *Spot* is used to plan and prepare observations, and to submit all proposals electronically to the SSC. It allows observers to construct and edit detailed Astronomical Observation Requests (AORs) by selecting from a variety of preset instrument-specific functions. *Spot* also includes useful visualization tools to permit the investigator to see how proposed observations will be laid out on the celestial sky. These capabilities allow users to retrieve relevant images from other astronomical surveys and archives. It also describes how an investigator can obtain estimates of observing time for a proposed program.

Prospective GO investigators are strongly encouraged to download *Spot* and to start planning their observing programs well before the proposal submission deadline. Allow Spot to auto-update to the latest version (Options => Use Auto Spot Update), if you haven't already.

Spot allows prospective investigators to plan, develop and modify their proposal in an iterative manner. That is, a proposer can write a portion of their proposal and define their accompanying AORs, save the results locally, and then re-load those results at a later time for subsequent modification. The saved cover sheet information, proposal text and AORs can be modified repeatedly until the proposal is submitted to the SSC. The proposal can be resubmitted or updated at any time before the proposal deadline.

A separate section of the online Proposal Kit contains information specifically designed for Solar System researchers. It includes asteroid count estimates and tips for utilizing the HORIZONS database supported by the Solar System Dynamics Group at the Jet Propulsion Laboratory.

The Proposal Kit includes an Infrared Compendium, an online resource for professional scientists new to infrared astronomy. The Proposal Kit also contains a multitude of links to useful general-purpose astronomical tools (such as coordinate conversion), observation planning tools (e.g. IRSKY, Skyview), astronomical databases (e.g. IRSA, NED, SIMBAD) and archived datasets (e.g. 2MASS, ISO, DSS).

5.3 Additional Guidelines for Observers

This section contains additional guidelines and policies that investigators must know as they plan their GO proposal.

5.3.1 Duplicate Observations

In general, duplicate observations with the Spitzer Space Telescope are not permitted. *It is the responsibility of the investigator to avoid duplication of previously approved observations.* A list of all such observations is available in the *Reserved Observations Catalog* (ROC). Quantitative descriptions of what constitutes a duplicate observation can be found in the Spitzer Observing Rules (Appendix A, §11.2). Because of resource limitations in the warm mission, the SSC will not identify such duplications. Approved observers that identify potential duplications should submit these to the SSC, where the potential duplication will be reviewed and acted upon accordingly. For example, if the duplicating observation has not yet been executed it may be deleted from the program. In previous cycles, approved duplicate observations were generally embargoed until the proprietary period of the prior observation expired. Due to resource limitations this will not be done during the warm mission.

Cycle-6 regular GO proposers should review the selected Exploration Science programs listed in Appendix C and consult the Observation Summary Tables for the selected programs to avoid proposing duplicate observations. The Observation Summary Tables are accessible from the SSC ES program web page (http://ssc.spitzer.caltech.edu/geninfo/es/) by clicking on the program titles. The complete ES program AORs are unlikely to all be in the SSC database and searchable with Leopard and Spot prior to the regular GO proposal deadline. Please address any questions about the content of the selected programs to the Helpdesk.

5.3.2 Constrained Observations

If your program requires scheduling constraints to achieve your science goals, please use them judiciously. Contact the Helpdesk early in your planning process for advice on how to best utilize scheduling constraints. Constraints placed on proposed observations should be explicitly

stated and accompanied by a scientific justification. Apart from the obvious constraint of sky visibility (§2.2), there are various means by which an observer may place scheduling and relational constraints on proposed observations (see §5.5.3 of the *Warm SOM* for details). Constraints limit the flexibility of telescope scheduling and can reduce the overall observing efficiency but are essential for some scientific programs.

Proposers should carefully consider the impact of constrained observations. The SSC discourages investigators from placing undue constraints on proposed AORs. The SSC does encourage observers to use loose constraints when this substantially enhances the science. For example, a loose sequence or group-within constraint can be used to ensure that mapping AORs are done at a similar orientation. These are not difficult to support and will result in better science than mapping AORs that are completely unconstrained. Use the minimum number of constraints that you need for your science and provide a clear justification in the proposal. As a rule of thumb any constraint that involves a time range should be at least twice as long as the AORs you want scheduled within the time range. For example, if you have 10 hours of mapping AORs any timing or grouping constraints should allow a ***minimum*** of 20 hours for their execution.

In previous cycles a few programs were identified with timing constraints that had no scientific justification. If you are tempted to apply constraints in Cycle-6 simply to influence when the observations are scheduled, don't do it. Observations identified as having 'schedule-influencing' constraints will have those constraints deleted. This will likely delay the execution of the program.

Observing constraints must be specified in *Spot* and justified in the proposal text.

5.3.3 Calibration Observations

The SSC establishes and maintains the calibration of the science instrument to levels specified in the *Warm SOM*. Data resulting from these routine calibrations will generally enter the Science Archive upon processing and validation by the SSC.

The initial on-orbit calibration of the telescope was performed as part of the commissioning of each observing mode. The IRAC Post-Cryo Mapping AOT will be validated during the checkout phase after the depletion of the cryogen. The checkout expected to last 6-8 weeks. After the AOT is commissioned for general use, the SSC will continue to conduct the periodic observations necessary to maintain the calibration. Observations of celestial targets necessary used for calibration are not subject to rules regarding duplicate observations.

For investigations that require a higher level of calibration, it is the responsibility of the Principal Investigator to include those *special calibrations* as part of their proposal. The SSC will process such observations through its normal data processing pipeline(s), and the data will be subject to the applicable proprietary data periods (§4.11).

5.3.4 Bright Object Observations

Given the unprecedented sensitivity of Spitzer, it is perhaps not surprising that bright objects affect the detector arrays. While saturation will not permanently damage the detector arrays, latency effects will compromise subsequent observations.

Proposals that involve observations of bright sources will not be precluded. However, investigators should be aware of infrared sources that may saturate the Spitzer detectors, whether they are the intended target, or whether their celestial position is near the proposed target. Scheduling of observations of bright sources so as not to impact other programs has become a scheduling issue.

Programs with substantial numbers of bright targets (http://ssc.spitzer.caltech.edu/documents/brightobj/) will be identified as difficult to schedule by the SSC, and their evaluation will be affected accordingly.

The *Warm SOM* provides current estimates of the saturation limits for each wavelength. A list of bright celestial sources likely to exceed the saturation limits is provided in the online Proposal Kit. *Spot* also has a bright object search feature to check for bright objects near your target(s). Note that the SSC reserves the right to exclude some targets as a result of impacts that these bright objects might have on subsequent observations. Observers proposing observations of bright objects should discuss their impact in the technical plan.

5.4 Moving Target Ephemerides

The online Proposal Kit (http://ssc.spitzer.caltech.edu/propkit) contains a section specifically designed to support Solar System researchers. It includes asteroid count estimates and tips for utilizing the HORIZONS database supported by the Solar System Dynamics Group at the Jet Propulsion Laboratory.

To obtain an accurate estimate of the observing time required for your moving target observation, an ephemeris file for your target must be installed at the SSC. *Spot* can query the HORIZONS database at JPL for an ephemeris file if the SSC does not have the file installed locally. Spot will do this when you do a visibility calculation or calculate resource estimates. There is a slightly longer delay (on the order of ~5 seconds during 'normal' periods) for this transaction to occur. As with all internet-based resources, there are likely to be peak demand periods and times when the resource is not available due to unforeseen events. Proposers are encouraged to start early in planning their observations.

We note also that ephemerides can have large intrinsic errors, and the ensuing positional errors can be sufficiently large that the object has a very low probability of being acquired by Spitzer. We therefore *strongly* recommend that the observer check the available positional accuracy for a Solar System target before proposing to observe it with Spitzer. Instructions on how to do this can be found in the Horizons documentation in the Solar System section of the online Proposal Kit (http://ssc.spitzer.caltech.edu/propkit).

Late ephemeris updates (see §15), i.e. specification of the final ephemeris less than 5 weeks prior to scheduling, are no longer supported in GO proposals. Any observations requiring a late ephemeris update must be submitted via a DDT proposal.

5.5 SSC Assistance

All questions of a scientific, technical, programmatic or financial nature should be submitted electronically to the Spitzer Science Center Helpdesk (*help@spitzer.caltech.edu*). The SSC is committed to answering all questions as rapidly as feasible, and normally within two business days from the receipt of a query. Note that as the proposal deadline approaches, the turnaround times for an SSC response (particularly for definitive answers to complex technical questions) will likely increase. It is the responsibility of proposers to take this reality into consideration when submitting queries shortly before the proposal submission deadline.

Questions and answers deemed by the SSC to be of interest to the broader community will be archived as an anonymous Frequently Asked Question (FAQ) on the SSC website. Therefore, all questions and comments submitted to the Helpdesk become the property of the SSC and California Institute of Technology.

6 Proposal Submission

The Spitzer Cycle-6 submission process is one phase for small GO proposals. Investigators proposing a small GO program are required to submit all of their completed Astronomical Observation Requests (AORs) with their science proposal. These AORs should be the final set you expect to have executed if the proposal is successful. In the unlikely event that the post-cryogen performance of the IRAC instrument is substantially different than expected, observers will be given the opportunity to update their observing program.

The submission process is two phase for regular large GO and Exploration Science proposals. These investigators must submit representative AORs that clearly define the proposed observations. The proposal need not include the entire program of AORs. These proposals must include complete target lists and descriptions of the observations in the proposal. The final AORs for the successful proposals will be due approximately 6 weeks after the selections are announced. The SSC will work with successful Exploration Science teams to create an AOR delivery schedule that meets the SSC requirements for scheduling and the science requirements of each ES program.

All proposals must be submitted through *Spot*, a downloadable software package developed by the SSC. The AORs and cover sheet information are entered directly into *Spot* for transmittal. ***The science justification and all other required elements must be submitted as a single PDF file attachment.*** The AORs and cover sheet information created in *Spot* can be saved as text files on your local computer. The cover sheet information, the proposal PDF file and the AORs are all submitted electronically via *Spot*. ***Cycle-6 proposals must be submitted with the S18 (or later) version of Spot which is available to download from the Proposal Kit website.***

There is no limit to the number of proposals that may be submitted by a Principal Investigator or by Co-Investigators. Proposals should not contain classified information or depend on access or use of classified information or facilities for any portion of the proposed activities. The Principal Investigator may withdraw a proposal from consideration at any time prior to the completion of the selection process.

Cycle-6 proposal PDF files must be prepared with the SSC provided Cycle-6 templates. The templates are available in Latex and Microsoft Word formats in the online Proposal Kit. Proposals not using the Cycle-6 templates will be rejected outright.

6.1 Proposal Submission Deadlines

Exploration Science General Observer Proposals

-- Letters of Intent	**Tuesday, September 2, 2008, 5:00pm PDT**
-- Proposals Due	**Friday, October 10, 2008, 5:00pm PDT**

Regular General Observer Proposals

-- Proposals Due	**Friday, February 6, 2009, 5:00pm PST**

Letters of Intent to propose for Exploration Science programs should be submitted as an email to the Spitzer Helpdesk (help@spitzer.caltech.edu) and include the following information:

Principal Investigator + Institutional Affiliation
Co-Investigators + Institutional Affiliations
Proposal Title
Proposal Science Category (from the list in the Spot proposal submission tool)
Brief Abstract

The purpose of gathering this information is to enable the SSC to identify proposal reviewers without conflicts for the Exploration Science proposal selection.

Proposals must be submitted electronically via *Spot* prior to the deadline. Proposals received after the deadline will not be considered. **The proposal submission deadlines are firm**. If you need information from a source outside of the SSC that you do not directly control, particularly a service available via the Internet, then obtain this information well in advance of the deadline. There are periodic slow-downs in Internet service due to Internet worms, viruses, etc. Disks crash and computers are hacked. **Please plan your submission with these factors in mind because the submission deadlines will not be moved.**

If you experience computer or Internet problems just prior to the deadline such that you are not able to submit your proposal by 5:00 pm, do not wait for 3 or 4 hours to contact us. Call us at 626 395-8000 (SSC central phone line) before the deadline and let us know.

You may resubmit your proposal as many times as you want prior to the deadline. You must use the *Spot* software to submit your proposal electronically. If the SSC servers have started (or completed) processing of your proposal when the deadline is reached, the proposal will be accepted. There will be a clock on the SSC website that tells you what time it is at the SSC and you can therefore accurately gauge when the deadline is.

6.2 Proposal Components

6.2.1 Cover Sheet

For all proposals the Cover Sheet information is entered into *Spot* and then submitted electronically to the SSC. This information can be saved to your local computer as a text, PDF or html file. We recommend that all proposers start early. You can update the cover sheet information from *Spot* as many times as necessary prior to the proposal deadline.

6.2.1.1 Science Category

An important piece of information that is provided in the Cover Sheet is the **Science Category.** All proposals must include one, and only one, science category. This information is used to distribute the proposals to the panels for the review. Please select the science category that best describes your proposal. The categories are divided into three broad groups: Extragalactic, Galactic and Solar System. The Solar System category is for OUR Solar System. If your proposal is related to other solar systems, please select one of the Galactic categories, e.g. extra-solar planets. The Galactic group includes a category for proposals that are doing detailed stellar studies outside of our Galaxy. These proposals have historically ended up in extragalactic panels while the best expertise to review them is in the Galactic panels.

All proposals will be reviewed by two sets of very broad science panels: These are:

Extragalactic – all extragalactic topics (excluding stellar systems outside the Milky Way)
Galactic & Planetary Systems – all galactic topics (plus external galaxy stellar systems) and solar system topics

The regular GO proposal review will utilize parallel panels, as we have in previous cycles, so that proposers can serve as reviewers.

6.2.2 Astronomical Observation Requests (AORs)

The submission of Astronomical Observation Requests (AORs) is required for observing proposals. All AORs must be created using the IRAC Post-cryo Mapping AOT. The IRAC Mapping AOT used during the cryogenic mission will no longer be valid. GO investigators proposing *small* programs are required to submit all of their completed AORs with their proposal. For statistical programs (§4.9) this should include AORs for all possible targets. GO investigators proposing *large or Exploration Science* programs must submit representative AORs that clearly define all of their observations, but are not required to submit the entire program of AORs with the proposal.

AORs are created in *Spot* and then submitted electronically to the SSC. You create your AORs and save them to a text file on your local computer. When you are ready to submit the proposal, load the AORs into *Spot* and they will be automatically transmitted with the cover sheet and PDF attachment to the SSC. The cover sheet information, PDF attachment, and AORs can all be updated separately or all at once after your initial submission.

6.2.3 PDF Attachment

Templates in Latex and Microsoft Word formats are provided on the SSC Proposal Kit web page (http://ssc.spitzer.caltech.edu/propkit) and MUST be used to prepare your PDF attachment.

The Cycle-6 templates must be used to prepare your Cycle-6 proposal. Proposals not using the Cycle-6 templates will be rejected outright.

Additional details pertaining to proposal contents are listed in §6.3. All proposals must be written in English and a printable version must utilize fonts that are *no smaller than 12 point, and must adopt one-inch margins on all sides on 8.5 × 11-inch paper*. Color figures or tables can be included but proposers should confirm that they reproduce legibly in black and white. *The PDF file size limit for submission is 10 megabytes, so extremely large or complex color figures may not be acceptable.* No preprints or reprints should accompany the proposal as they will not be forwarded to the review panels.

Proposals will be provided to each panel and TAC reviewer as PDF files on a CD-ROM. It is the responsibility of the proposer to ensure that their PDF file is legible when opened with Acrobat Reader. Please see http://ssc.spitzer.caltech.edu/documents/makepdf.html for instructions on making legible PDF files.

If Exploration Science proposers wish to provide paper copies of their proposals for distribution to the reviewers they should send 25 copies of the proposal PDF attachment to the SSC to arrive by October 14, 2008. The paper copies must be identical to the PDF proposal file submitted by the proposal deadline. Proposers are not required to attach the coversheet. SSC staff will do this prior to distributing the paper copies to the reviewers.

All investigators should recognize that the peer review process (§7) utilizes external scientists organized into topical Review Panels. Reviewers are selected such that their expertise reflects the proportional mix of proposals submitted in previous cycles. A given Review Panel will necessarily span a wide variety of research disciplines. *Therefore, proposals should be written for a knowledgeable, but broad-based, audience.* For Cycle-6 we expect to distribute the proposals to panels as described above in §6.2.1.1. **The science category you select in *Spot* to characterize the science in your proposal will determine which panel reviews it.** Proposals will be evaluated according to the criteria listed in §7.2.

The page limits for each section in the PDF attachment depend on whether the proposal is Exploration Science or regular GO and are summarized in the sections below.

Proposals that exceed the page limits may be edited by the SSC, and the excess pages deleted or flagged for the peer reviewers as not meeting the section page limits. In previous cycles some proposals with flagrant violations of the page limits, font size, etc. were deemed 'not responsive to the Call for Proposals' by the panels and were rejected without review.

6.2.3.1 Page Limits for Exploration Science GO Proposals

Exploration Science proposals must include the following sections and adhere to the specified page limits:

The Science Plan = 14 pages

1. Scientific Justification ~ 5 pages
2. Technical Plan ~ 4 pages
    a. Details of planned observations
    b. Description of scheduling constraints
    c. Data analysis plan
    d. Proposer's analysis of why the program is technically feasible
    e. Provenance and availability of targets (see §4.2.1)
3. Figures, Tables and References ~ 5 pages

Exploration Science proposers can determine the exact size of each sub-section in the *Science Plan* but the total must be no more than 14 pages. Figures and tables can be embedded in the narrative or segregated into a separate sub-section.

The following sections are **required** and are subject to the listed additional page limits:

4. Scheduling profile of the proposed program (see §4.2.2) = 1 page
5. Brief Team Resume = 2 pages
6. Summary of Existing Spitzer Programs = 1 page

The following sections are required but are not subject to page limits.

7. Observation Summary Table
8. Modification of Proprietary Period
9. Summary of Duplicate Observations
10. Summary of Scheduling Constraints/Targets of Opportunity

6.2.3.2 Page Limits for regular GO Proposals

Regular GO small and large proposals must include the following sections and adhere to the specified page limits:

The Science Plan = 8 pages (small) or 10 pages (large)

1. Scientific Justification: small ~ 3 pages, large ~ 4 pages
2. Technical Plan: small ~ 2 pages, large ~ 3 pages
    a. Details of planned observations
    b. Description of scheduling constraints
    c. Data analysis plan
    d. Proposer's analysis of why the program is technically feasible
3. Figures, Tables and References ~ 3 pages

Regular GO proposers can determine the exact size of each sub-section in the *Science Plan* but the total must be no more than 8 pages for small GO and 10 pages for large GO proposals. Figures and tables can be embedded in the narrative or segregated into a separate sub-section.

The following sections are **required** and are subject to the listed additional page limits:

4. Brief Team Resume = 1 page
5. Summary of Existing Spitzer Programs = 1 page

The following sections are required but are not subject to page limits.

6. Observation Summary Table
7. Modification of Proprietary Period
8. Summary of Duplicate Observations
9. Summary of Scheduling Constraints/Targets of Opportunity

6.3 Proposal Contents

Proposals must include the following sections and are subject to the page limits provided in §6.2. The required proposal templates are available from the Proposal Kit website. Proposals not using the Cycle-6 templates will be rejected outright. The required sections (except the AORs) must be combined into a single PDF file for submission with *Spot*.

6.3.1 The Science Plan

The page limits for the science plan are 14 pages for Exploration Science proposals, 10 pages for large GO proposals and 8 pages for small GO proposals. Proposers can decide how to distribute those pages between the following subsections.

6.3.1.1 Science Justification

Proposals must include a clear statement of observing goals and describe the general importance of the proposed project to the astronomical sciences. It should address why the Spitzer capabilities are uniquely important in advancing knowledge in the proposed area of research. The science plan and its underlying rationale should be readily comprehensible to broad-based scientists. It must include a justifiable and reasonably accurate request for observing time and must be based on the resource estimates calculated with *Spot*, the SSC proposal planning and submission software.

6.3.1.2 Technical Plan

The technical plan must include a description of the proposed observing strategy and information about target selection. For all observations the technical plan must include quantitative descriptions of the required sky/target position(s), expected target flux densities or surface brightness, required sensitivity/depth (1-sigma noise or S/N ratio), wavelength(s), and coverage strategy (including redundancies). The technical plan should also show that the proposers have checked the sky background brightness and saturation issues for their observations and provide the maximum expected flux densities or surface brightness in the fields of view. The proposal must define the photometric accuracy needed and any special calibration requirements.

All flux densities and surface brightness must be provided in correct flux units:

Point Sources **micro-Jy, milli-Jy, or Jy**
Extended Sources **MJy × sr^{-1}**

Telescope and scheduling constraints placed by investigators on proposed observations must include compelling scientific justification (§5.3.2). Observers proposing observations of bright objects (§5.3.4) should discuss their impact in the technical plan.

In all cases, the target list for Spitzer observations must be adequately justified and explained. Investigators should describe why the proposed targets were selected, and any assumptions made about their targets and/or sample. For proposals requesting time for targets that have yet to be discovered, the provenance of the targets must be explained. Particularly for Exploration Science proposals the reviewers must be able to determine the likelihood that the targets will be discovered and that the proposers have access to the necessary data.

Statistical programs (§4.9) should be explicitly declared and described in the technical plan. Proposers should explain how the sub-sample, rather than the complete sample, of targets is useful for achieving their science goals.

The technical plan should include a data analysis plan. Description of the IRAC pipeline can be found in *Spitzer Observer's Manual-Warm Mission*, *IRAC Data Handbook* and also the IRAC *Pipeline Description Documents*.

The technical plan should include a description of how the proposers have validated their particular technical strategy, e.g. from previous observations or modeling. This should be described in detail.

All ES proposals can include observations of targets for which the exact position is not currently known. These can either be classified as generic targets (position uncertainty of less than 2 degrees) and/or low impact target of opportunity (ToO) targets. Proposers must include a clear and concise description of how the targets for their program will be identified. This is to provide the TAC with confidence that the targets will exist and to resolve any conflicts between proposed observations and DDT proposals for targets discovered in the future. We anticipate that the majority of ES proposals will include full, well-defined target lists but recognize that this will not be the case for all science categories. Studies of newly discovered extra-solar planets are an example of such a case.

If your proposed targets are not known at the time of proposal submission you must provide a credible schedule for determining the targets and delivering the AORs throughout the 2-year warm mission. Details will be worked with all successful teams.

6.3.1.3 Figures, Tables and References

Figures, tables and references that support the science justification and technical sections should be included in the Science Plan. Figure captions and tables may be listed in 10-point font (rather than 12-point). **The Observation Summary table required for all observing proposals is not included in this page limit (it is a separate section, see below).** Color figures or tables can be included but should be legible when reproduced in black-and-white. They should be of adequate size to be comprehended by a reader. *The PDF file size limit for submission is 10 megabytes so extremely large or complex color* figures may not be acceptable.

6.3.2 Other Contents

6.3.2.1 Scheduling Profile – Exploration Science Only

The suite of selected ES programs must provide targets visible throughout the year. Since the majority of available time is being devoted to ES programs the schedule-ability of the programs may be considered as part of the selection process. Proposers should provide a description of when their program is available for scheduling to assist the TAC in this process.

For example, a survey of hundreds of individual targets spread over the sky would be available to schedule at all times. A program of individual targets concentrated in a particular region would be available to scheduling during the visibility window for that region of the sky. Proposers following up a new or ongoing survey may not have their targets defined at the beginning of the warm mission and should therefore provide a schedule for when the targets will be available.

6.3.2.2 Brief Team Resume

Describe briefly the qualifications of the Principal Investigator and key co-investigators and include a list of major publications related to the proposed research. Two pages for this section are allowed for Exploration Science proposals and one page is allowed for small and large GO proposals.

6.3.2.3 Summary of Existing Programs

Proposers must explicitly summarize their current involvement as a Principal Investigator or Technical Contact on existing Spitzer Space Telescope research programs. This applies to the PI and principal CoIs on the proposal. The proposer should indicate the status of each Spitzer GTO, GO, Legacy, DDT, Archival or Theoretical program and any publications resulting from the program(s). For observing programs, include the status of the data analysis effort.

Proposers that are the PI/Technical contact for multiple Spitzer programs are not required to provide a detailed status for every program. They should provide a summary that includes the number of programs, overall status (e.g. 75% observed, 50% data analysis complete, 20 papers published, 20 papers submitted, etc.) that will allow the reviewers to understand the state of the programs. This section should be a maximum of one page in length.

6.3.2.4 Observation Summary Table

An Observation Summary Table is required for **all** proposals. The Observation Summary Table is not subject to the proposal page limits. For each proposed observation the table must include all target position(s), imaging array(s) (e.g. 3.6 and/or 4.5 microns), integration time per array, and estimated source flux. The background flux, sensitivities and depth reached should be included in the technical plan and can optionally be included here. Low-impact targets of opportunity should be identified in the table. All flux densities and surface brightnesses must be provided in correct flux units:

Point Sources: micro-Jy, milli-Jy, or Jy

Extended Sources: $MJy \times sr^{-1}$

As discussed in §4.9 the SSC will accept 'statistical programs' in where a specific number of observations are required for the science but the set of observations required is not unique. For example if your program requires observations of 10 targets in your sample and you have 20 targets total in the sample the proposal can be submitted with AORs specifying observations of 20 targets but time is only requested to observe 10 of them. All of the targets should be described in the Observation Summary Table.

A Perl script that parses information from the AOR file into a format that can be reformatted into a table is available in the Proposal Kit.

6.3.2.5 Modification of Proprietary Period

If a proprietary period of other than zero days for Exploration Science proposals or less than 365 days for small/large GO proposals is requested, this should be specified here. There is a field specifying the number of days in the proprietary period in the *Spot* proposal submission tool. Any modifications should also be entered there. The standard period for small/large GO programs is 365 days and for Exploration Science GO programs it is 0 days. ES programs can request up to a maximum 90-day proprietary period. Note that each observation (AOR) has its own proprietary period. This means that the AORs within a program are, as their proprietary periods expire, released to the public regardless of how many unobserved AORs remain in the program.

6.3.2.6 Summary of Duplicate Observations

Briefly summarize the justification for any proposed duplicate observations. The details should have been provided in the Science Plan.

6.3.2.7 Summary of Scheduling Constraints/Targets of Opportunity

Briefly summarize the justification for any proposed scheduling constraints. The details should have been provided in the Science Plan. Also provide a summary of any ToO scheduling issues, particularly if requesting a late update of the final position for generic target AORs (see §4.6)

6.3.3 Astronomical Observation Requests (AORs)

Each *small* GO proposal must be accompanied by a complete list of Astronomical Observation Requests (AORs). For statistical programs (§4.9) this should include AORs for all possible targets. The submitted AORs should be the final ones you expect to have executed if the proposal is successful. *Large* and *Exploration Science* GO proposals must submit representative AORs that fully encompass the proposed observations.

All AORs are created in *Spot* and submitted electronically to the SSC. The AORs that you have loaded in *Spot* at the time you are submitting your proposal are the AORs that will be transmitted to the SSC and stored in our database. Do not include the AORs as text in the proposal PDF file.

You can create or edit your AORs in *Spot* at any time prior to submitting or updating your proposal. They can be saved as an ASCII text file on your local computer and then reloaded for editing or submission at a later time. The AORs include the total time required to execute a given observation with the telescope. **Each AOR includes an assessed overhead of 215 seconds to account for the average time required to acquire the target, regardless of the actual time utilized.** The average acquisition time is based on our experience to date. **Each moving target AOR is assessed an additional 300 seconds (515 seconds total) overhead per AOR.** Moving target AORs require an additional 5 minutes to execute compared to an identical fixed target AOR.

Providing robust, ready-to-execute AORs with your proposal is the fastest way to ensure that your observations get quickly into the scheduling pool. **Observers approved for Cycle-6 will not, in general, have any opportunity to make major modifications (see §11.4.1) to their AORs after selection unless the on-orbit post-cryo performance of IRAC is substantially different than expected. Proposers are urged to carefully plan and construct the AORs that accompany their proposal.**

6.4 Submission of Proposals

Proposals must be submitted to the SSC electronically through *Spot*, the Spitzer observation planning software (*Spot*; see §5.2), and must be consistent with the page and format guidelines listed throughout §6. The PDF file must be created using one of the templates available at the Proposal Kit website. Proposals not using the Cycle-6 templates will be rejected outright. Detailed instructions on using the software are available in the *Spot User's Guide*, and are summarized below.

6.4.1 Submitting your Proposal for the First Time

1. Download *Spot* from the Proposal Kit section of the SSC website (http://ssc.spitzer.caltech.edu/propkit) and install it on your host machine. Use the S18 version of *Spot*, which was released June 18, 2008. Turn on the auto-update feature to make sure you get any relevant updates.
2. Download a proposal template from the Proposal Kit website and use it to create the proposal PDF file.
3. Start up *Spot* and open the Proposal Tool (Tools -> Proposal Tool).
4. Enter the coversheet information or load any previously generated cover sheet information file, into the Proposal Tool.
5. Select the correct Proposal Type. All Cycle-6 proposals should select type '**GO**'.
6. For Observing Proposals:
    A. Enter the total observing time required.
    B. Make sure you have updated the proprietary period, if necessary.
    C. Load the AORs that comprise your program. Make sure you have updated the resource estimates for the AORs.
    D. For low-impact ToO proposals, check the Target of Opportunity box.
7. Click on the SUBMIT Menu in the Proposal Tool and select 'Submit proposal to SSC.'
8. Prior to the proposal submission deadline, proposals can be modified by using the 'Update Proposal at SSC' option.
9. The proposal PDF file, cover sheet, and any accompanying AORs that reside at the SSC at the time of the proposal submission deadline shall be defined to be the final version of the proposal.

Note that neither NASA nor JPL/Caltech will be responsible for any cost incurred in preparing or submitting a proposal.

6.4.2 Updating Your Submitted Proposal

At any time during the Call for Proposals you may modify any aspect of your submitted proposal, except proposal username and password. You can submit a revised justification, an updated set of AORs, or corrected coversheet information.

1. Start up Spot.
2. Load in new/revised set of AORs if you are updating the AORs.
3. Open the Proposal Tool under the tools menu in Spot.
4. Load in the coversheet file saved from your earlier submission (i.e. filename.cs) by clicking on File-> Open Proposal.
5. Make any desired changes to the coversheet information. Be sure the Hours requested is accurate and that the Proposal Tool is pointing to the proper justification file (if submitting an updated file).
6. Click on the Submit menu item and then Update proposal at the SSC.
7. Enter your password and email address when requested.
8. If you made any changes to the coversheet information, Spot will again require you to save your coversheet file.
9. Spot will inform you when it has successfully transferred your updated proposal to the SSC. You will also receive an email confirmation.

10. You may submit as may updates as needed prior to the proposal deadline. The software will automatically reject submissions after the deadline and Spot will return an error message.

6.4.3 Modifications to Proposals After the Deadline

Modifications to submitted proposals are not permitted after the deadline. The SSC receives numerous requests to correct the spelling of names, update titles, add CoIs to the coversheet, etc. after the proposal deadline. None of these requests will be supported for Cycle-6. Please proof read your proposal before the final submission.

6.5 Proposal Confidentiality

Proposals submitted in response to this Call for Proposals will be kept confidential to the extent allowed by the review process (§7). For approved investigations only, the SSC will make the titles, investigator names, and abstracts publicly available after the selections are announced. The remainder of the approved proposal, and the entirety of proposals not selected, shall remain confidential. In addition, AORs from the approved observing investigations will be incorporated into future versions of the Reserved Observations Catalog and will also be available to download from the Spitzer science operations database using *Spot* and *Leopard*.

If a proposal contains proprietary information that should not be used and /or disclosed for any purpose other than the proposal evaluation, it should be clearly marked by placing the following legend on a separate page that does not count against the proposal page limit:

"NOTICE: The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government and the Jet Propulsion Laboratory/California Institute of Technology ("Institute") in confidence with the understanding that it will not, without permission of the proposer, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal, the Government or the Institute shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's or Institute's right to use or disclose this information (data) if obtained from another source without restriction."

7 Proposal Evaluation and Selection

Spitzer Space Telescope Cycle-6 research programs will be selected through a competitive peer review process, using the evaluation criteria listed in §7.2.

7.1 Peer Review

Proposals received by relevant deadlines will be evaluated by topical science panels and Time Allocation Committees (TACs) using the evaluation criteria listed in §7.2. The reviewers will be members selected from the astronomical community-at-large. The TACs will provide recommendations to the SSC Director who will make the final selection.

7.1.1 Exploration Science GO Panels Panels & TAC

The Exploration Science GO proposals were reviewed in two very broad panels. These are:

Extragalactic – all extragalactic topics (excluding stellar systems outside the Milky Way)
Galactic & Planetary Systems– all Galactic topics (plus external galaxy stellar systems) and our Solar System

Highly ranked proposals in each panel were forwarded to the TAC. The TAC created the final ranked list of recommended programs for the SSC Director.

7.1.2 Regular GO Proposals Panels & TAC

Regular GO proposals will be reviewed with the same broad panels (Extragalactic and Galactic/Planetary Systems) as utilized for the Exploration Science programs. In order to minimize institutional, professional and personal conflicts of interest we plan to create parallel Panels for each broad-based topic.

All regular GO proposals will be reviewed and ranked by the topical science panels and the time allocation recommendations for small proposals (less than 50 hours) will be made by the panels. Highly ranked large proposals (50-150 hours) from all panels will be forwarded to the Time Allocation Committee (TAC). The TAC will recommend the allocation of time for the large proposals. The 1500 hours available for Cycle-6 regular GO programs will be divided between the small and large programs based on the distribution of the submitted proposals. A minimum of 500 hours will be allocated to large programs.

Proposals will be provided to each panel and TAC reviewer as PDF files on a CD-ROM. It is the responsibility of the proposer to ensure that their PDF file is legible when opened with Acrobat Reader. Please see http://ssc.spitzer.caltech.edu/documents/makepdf.html for instructions on making legible PDF files. For Exploration Science proposers that provide paper copies, these will also be distributed to the reviewers.

7.2 Evaluation Criteria

The Science Review Panels and Time Allocation Committee will base their evaluations of proposals on the criteria listed in this section. The numbered criteria are listed in descending order of importance.

(1) The overall scientific merit of the proposed investigation and its potential contribution to the advancement of scientific knowledge. In addition, for Exploration Science programs, the potential for enabling new and important types of scientific investigations

(2) The extent to which the proposed investigation requires the unique capabilities of the Spitzer Space Telescope.

(3) The technical feasibility and robustness of the proposed observations.

(4) The extent to which the observations can be accommodated within routine Spitzer operations and the extent to which the overall science program enables an efficient use of the observatory.

(5) The long-term archival value of the proposed observations.

(6) The demonstrated competence and relevant experience of the Principal Investigator and any Co-Investigators as an indication of their ability to carry out the proposed research to a successful conclusion.

7.3 Proposal Selection

The SSC Director, the NASA-designated selection official, announced the results of the Exploration Science proposals in early December 2008. Cycle-6 observations will begin in approximately June 2009. Unsuccessful Exploration Science proposers are not prohibited from submitting revised proposals as Cycle-6 small or large GO proposals.

8 Contacting the Spitzer Science Center (SSC)

The mailing address is:

Spitzer Science Center
California Institute of Technology
Mail Code 314-6
1200 East California Boulevard
Pasadena, CA 91125 USA

The telephone numbers are:

Phone: +1-626-395-8000 Fax: +1-626-432-7484

The science community should consult the Spitzer Science Center Website at:

http://ssc.spitzer.caltech.edu/.

Questions about any aspect of the Spitzer Space Telescope, including the Call for Proposals, may be submitted electronically to the Helpdesk at:

help@spitzer.caltech.edu.

9 Publication and Dissemination of Science Results

The publication and dissemination of science results is critical in assessing the success of the Spitzer Space Telescope mission, and in assessing how effectively it meets the goals of NASA's strategic plans in space science. The Spitzer research community is reminded of the important responsibility inherent in utilizing this national resource, and in sharing the scientific results with the general public. In particular, investigators with potentially important and newsworthy results should contact the SSC as early as possible to help NASA plan appropriate news releases.

9.1 Science Publications

It is expected that useful scientific results obtained through Spitzer observations, archival research, and theory investigations will be published in the scientific literature. All publications based on Spitzer data or theory investigations must carry an appropriate acknowledgement. Investigators should consult the SSC website for the appropriate acknowledgement template(s) (http://ssc.spitzer.caltech.edu/approvdprog/ackn.html).

In papers describing Spitzer results, investigators should provide reference(s) to seminal papers describing the telescope, including the relevant science instruments. These references are posted on the SSC website (http://ssc.spitzer.caltech.edu/pubs/seminalobs.html). Moreover, the SSC advises investigators to accurately trace the original heritage of any Spitzer archival data. In particular, scientific results based on data from the Legacy Science Program during the cryogenic mission should cite appropriate references to the appropriate program (http://ssc.spitzer.caltech.edu/legacy/all.html).

9.2 Press Releases

Researchers who receive Spitzer Space Telescope observing time and/or NASA funding support are strongly encouraged to release Spitzer-related and newsworthy information through NASA channels. This does not preclude news releases by other institutions, although such parallel releases must be coordinated with NASA. The SSC utilizes the public affairs resources of NASA and the Jet Propulsion Laboratory to maximize the impact of discoveries and newsworthy items resulting from Spitzer research investigations. NASA has "first right of refusal" for such items and has a policy to distribute all information and news fairly and equitably. This policy also means that exclusive news releases are not supportable.

Scientists with potentially newsworthy observations should contact the SSC Director's Office via the Helpdesk (*help@spitzer.caltech.edu*). *Spitzer investigators should initiate such contact well before the expected publication of those results,* in order to allow the SSC, JPL, and NASA to prepare press releases and supporting materials. The contact may either be initiated by the Principal Investigator of the Spitzer investigation, or through the public affairs office of their home institution. For a potential press release, the SSC and NASA will coordinate with the PI and/or institutional public affairs office in the preparation of a draft news release and other supporting materials. In general, the press release date will be timed to coincide with acceptance of the research for publication in a science journal, or presentation at a major astronomical meeting.

For additional information on Spitzer public affairs, including guidelines on what may constitute a newsworthy result, consult the 'Got News' link on the SSC website (http://ssc.spitzer.caltech.edu/approvdprog/newsworthy.html).

10 Cycle-6 Checklist

1. For Exploration Science GO proposals, submit a Letter of Intent to propose by September 2, 2008 (§1.4).
2. Read a summary of the capabilities of the Spitzer Space Telescope (§2).
3. Download the *Warm SOM* from the Proposal Kit section of the SSC website (http://ssc.spitzer.caltech.edu/propkit) to obtain additional details about the telescope and **one** observing mode (IRAC Post-Cryo Mapping) available for Cycle-6.
4. Download and install the S18 version of *Spot*, the Spitzer proposal planning and submission software package, available in the online Proposal Kit, to your host machine. Allow *Spot* to auto-update to the latest version.
5. Download and read the *Spot User's Guide* and learn how to create and edit an Astronomical Observation Request (AOR), the fundamental unit of Spitzer observing.
6. Download and read the *Spitzer Space Telescope Observation Planning Cookbook*, also in the Proposal Kit, to see examples of typical observations.
7. Use *Spot* to create, edit and save AORs.
8. Determine whether to submit a small, large or Exploration Science GO proposal.
9. Be sure that your proposed observations do not duplicate (§5.3.1) existing Spitzer Space Telescope observations by consulting the *Reserved Observations Catalog* or searching the Spitzer Science Archive with *Leopard*. If duplicate observations are proposed be sure you have provided a strong scientific justification.
10. Contact the electronic Spitzer Helpdesk (*help@spitzer.caltech.edu*) for assistance, if needed.
11. Prepare your observing proposal according to the guidelines listed in §§6.1-6.3. Templates for preparing the PDF proposal attachment in Latex and Microsoft Word formats are available in the online Proposal Kit. Proposals submitted that do not utilize the Cycle-6 templates will be rejected outright.
12. Note the evaluation criteria listed in §7.2.
13. Note that NASA data analysis support for eligible investigators (§3.2) will be determined through formulaic means and that no cost plan is necessary. If you are expecting funding you will be contacted *after* the proposal is approved to provide data funding distribution and financial contact information.
14. Follow the steps described in §6.4 to electronically submit your proposal, cover sheet, and accompanying AORs to the SSC prior to the deadline of Friday, October 10, 2008 5:00 pm PDT for Exploration Science GO proposals and 5:00pm PST Friday, February 6, 2009 for regular GO proposals.
15. If you experience computer or Internet problems just prior to the deadline such that you are not able to submit your proposal by 5:00 pm, do not wait for 3 or 4 hours to contact us. Call us at 626 395-8000 (SSC central phone line) and let us know.

11 Appendix A: Spitzer Space Telescope Warm Mission Observing Rules

These observing rules pertain to all science observations made with the Spitzer Space Telescope during the warm mission, unless explicitly stated otherwise.

11.1 Definition of Science Observing Time

All of the wall-clock time required for the execution of a specific observation, by means of an Astronomical Observation Request (AOR), will be charged to that particular AOR. This assessment of observing time starts with the beginning of the sequence of events associated with the AOR and continues until the completion of the events in that AOR. Assessed time shall include all science integration time, readout time, internal calibrations, and routine instrument/spacecraft motions embedded within the AOR.

In addition, overhead is assessed with each AOR in order to distribute the time used for necessary Observatory activities among all science observations. For the Cycle-6 Call for Proposals (CP), each AOR will be assessed 215 seconds to account for telescope slew time, regardless of the actual time utilized. Moving target AORs are assessed an additional 300 second overhead to account for the additional commands required to schedule moving targets. The algorithm used to calculate observing time, including standard overheads, is integrated into the software time estimators that scientists use in planning observations. Overhead burdens are reevaluated from one observing cycle to another.

Target of Opportunity (ToO) observations requiring activation less than five weeks prior to execution will be assessed an additional overhead burden (§11.5.1). This overhead reflects the lost observing time that was allocated to other programs if the observations are executed, and will be factored into the proposal review. Proposals *must* include these overheads in the total requested observation time.

The total observing time assessed to a program shall consist of the sum of observing times for each of its constituent AORs, including applicable overhead burdens.

Note that Observatory engineering, calibration and telemetry activities are functions of the SSC, and the wall-clock time required to perform these functions is accounted for separately from the science observing time. Any estimates of General Observer time published as part of a *Call for Proposals* will refer to the science observing time, and will be derived after adequate time for facility activities is reserved.

11.2 Duplicate Observations

In order to ensure the most efficient use of the Spitzer Space Telescope, proposed observations that duplicate those already executed or approved for execution (and therefore in the Science Operations Database) are not permitted without the explicit approval of the SSC Director, or

designee. Archival data should be used whenever possible to accomplish the science goals of any proposed investigation.

11.2.1 Definitions

Given the large number of Spitzer observations annually (> 20,000), it is important to define quantitative thresholds which permit automated checking of AORs to identify candidates for duplication. Two or more observations are considered to be potential duplicates when, for a given channel, the following criteria are met.

1. The integration time per pixel for each observation agrees to within a factor of four (corresponding to a factor of ~two in sensitivity).

2. The areas on the sky covered by two proposed imaging observations overlap by more than 25% of either of the fields/areas being compared. Note that for very large programs, an area overlap of less than 25% could still translate into a significant amount of Spitzer observing time. Observations with area overlaps less than 25%, but greater than 10 hours of observing time, will receive additional scrutiny by the SSC and may be disallowed by the SSC Director.

Note that a lengthy observation within the same observing proposal may be segmented into multiple AORs because of operational constraints, and that the series of component observations are not deemed to be duplicates.

Newly proposed observations that are identified to be potential duplicates must be approved by the SSC Director. Approval will be contingent on a legitimate scientific justification for carrying out the new observations. Examples of observations that may be approved include: synoptic observations of time-variable phenomena and second-epoch (or later) observations searching for transient phenomena. Another example includes a large-area survey, where excising ("cutting out") a small area to avoid overlap with a previously cataloged observation is so inefficient that it increases the observing time for the affected observation. Finally, a proposed observation resulting from an evolution of the Spitzer AOTs and which leads to a demonstrably better observation strategy for a particular science goal will be considered for approval.

If a new candidate observation is less sensitive than a previously accepted observation and if it meets the area overlap criterion above, it will always be considered a duplicate since the science objective of the new program can be achieved using the deeper observation.

11.2.2 Procedures

It is the responsibility of any investigator to avoid proposing duplicate observations, apart from the exclusions listed in this sub-section. Each Call for Proposals is accompanied by a comprehensive list of targets and AORs previously approved (§11.3.2). All previously approved and executed observations can also be queried using *Leopard*, the SSC Archive software. Any newly proposed AOR meeting the criteria listed in §11.2.1 would be deemed a potential duplicate observation.

It is the responsibility of Principal Investigators of existing approved programs to check the Reserved Observations Catalog released after each completed proposal cycle to determine if any newly approved observations are duplications of any part of their program(s). The SSC should be alerted if any duplications are found.

One exception to the duplicate observation policy described in §11.2.1 is the case where a series of observations of the same target are intended to search for time-variable phenomena. In this case, a single observation of the same area of the sky will not disallow the time-series observations. On the other hand, if the time-series observations occur *before* the single observation, it may disallow the single observation (since the objectives of the single observation could be achieved by using data from the time-series observations).

Previously accepted observations (i.e., AORs already entered into the Science Operations Database, or SODB) will always take priority over newly proposed observations. A new or modified AOR that is found to be a duplicate of an existing AOR cannot be entered into the SODB without special permission granted by the SSC Director. To be granted this dispensation, the investigator who stands to lose a proposed duplicate observation must file a request to the Director, describing why the AOR already entered in the SODB cannot be utilized in the proposed investigation. Basing a request solely on the time lag associated with gaining access to data from an existing AOR (whose observation may not yet have been executed and whose data may not enter the public domain until proprietary rights expire) will be insufficient, unless such a delay will significantly compromise the timing and integrity of the proposed investigation. [Affected investigators can always contact the Principal Investigator of the original AOR to seek access to the required data.]

Investigators must describe their observations unambiguously by completing AORs. In general, the TAC shall not recommend observations that duplicate approved observations from a previous Cycle. The final program for a Cycle recommended by the TAC and approved by the SSC Director may include programs with intra-Cycle duplications. These observations will in general be executed by the SSC as approved.

The SSC Director shall have final authority to either allow or disallow duplicate observations.

11.3 Declaration of AORs

As a general rule, the earliest description of an approved observation -- via completion of a valid Astronomical Observation Request (AOR) -- shall reserve priority rights in the case of duplication(s).

11.3.1 Definition of Approved Programs

For General Observer (GO) investigations, the approved programs will consist of abstracts and either of the following: (i) all of the original AORs submitted as part of a GO proposal that has been accepted without any modifications recommended by the TAC, or (ii) a revised list of AORs that has been modified in response to specific TAC recommendations.

For Director's Discretionary Time (DDT) observations, the approved programs consist of the AORs based on approved DDT proposals and the corresponding abstracts.

11.3.2 Reserved Observations Catalog

Each Call for Proposals (CP) is accompanied by a *Reserved Observations Catalog (ROC)*, a tabular list of targets and observing modes excerpted from the Science Operations Database. The ROC includes all AORs previously approved through all Spitzer observing programs. It also includes AORs resulting from time awarded through the Spitzer Fellowship Program, science quality In-Orbit Checkout/Science Verification observations and the instrument calibrations AORs.

During the time when a CP is active (i.e., between the release of the CP and the selection of observations for the pertinent observing cycle), no major changes are permitted in the ROC. *An exception to the ROC freeze during active CPs may be granted to successful Spitzer Fellowship applicants that are awarded observing time as part of their fellowship.*

11.4 Modification of AORs

To accommodate the inevitable need of investigators to modify and refine their approved observations, procedures are established to allow for this process. The intent of these procedures is to allow adequate flexibility in modifying a Spitzer observing program to maximize the scientific value of an approved observation. The guiding principles underlying these procedures are:

- All programs executed by the Spitzer Space Telescope are properly reviewed and approved. The approval process described below is intended to ensure that the modified program, as executed, is approved and avoids duplicate observations.

- All modifications shall be such that the program stays within its originally allocated observing time.

The procedures described here exclude the procedures that will be followed in the catastrophic loss of a major instrumental or telescope function.

11.4.1 Types of Modifications

The Principal Investigator, according to the precepts and schedule outlined below, can modify an Astronomical Observation Request (AOR) in the Science Operations Database (SODB) electronically. Once an AOR has been scheduled for observation, typically five to eight weeks before execution, it cannot be modified without approval (which will be rare) of the SSC Director.

All requests for modification of approved AORs must be approved by the SSC Science User Support Team, which will characterize the request as one of two types. Minor modifications consist of small changes of target parameters, typically a few arcseconds in celestial coordinates, or small changes in AOR execution time (< 20%), subject to the total observing time in an investigation remaining constant. Minor modifications could also include small changes of other parameters in the AOR (e.g., change to high-dynamic mode in the IRAC AOR), as long as the changes do not alter the scientific content or intent of the original AOR.

Major modifications to an individual AOR consist of those changes that would substantially alter the scientific content or intent of the AOR. Examples of major modifications include:

- Changing the execution time of an AOR by 20 percent or more, thereby increasing the probability that duplicate observations might arise.
- Changing the sensitivity by a factor of 1.5 or more.
- Changing the target coordinates, or boundary area, by an astronomically significant amount.
- Changing the target to a different target judged by the investigator to be scientifically equivalent to the original target.

The execution of an approved observation may become infeasible (§11.12) or prove to be scientifically useless because of unanticipated circumstances. If these events occur, and if an observer can a priori demonstrate that the approved AOR will yield useless data, the Principal Investigator can submit a request to make major modifications to the AOR. The proposed modifications must be consistent with the original scientific intent of the approved observation and the observing time granted. In addition, it cannot duplicate any other approved observation, and must be approved by the SSC Director.

Requests for major modifications to any approved observing program or AOR must be made to the SSC Science User Support Team through the Helpdesk (help@spitzer.caltech.edu), and must be accompanied by adequate justification. Modifications are contingent upon approval by the SSC Director, or designee. Once the request for a modification is approved, the requestor may modify the AOR/program, with assistance provided by SSC Science User Support Team. The latter is responsible for insuring that the modifications are implemented as approved.

11.4.2 Blackout Period

There is a blackout period during which no *major* modifications to approved AORs or programs can be performed. The contents of the *Reserved Observations Catalog (ROC)* are frozen, and major modifications are not permitted while a solicitation for proposals for a new observing Cycle is active. This time period runs from the date the Call for Proposals is issued until the proposal submission date passes. An exception to the ROC freeze during active CPs may be granted to successful Spitzer Fellow applicants that are awarded observing time as part of their fellowship.

11.5 Targets of Opportunity

Targets of Opportunity (ToO) are transient phenomena whose timing and/or location on the sky are unpredictable. They include objects that can be generically identified before the onset of such phenomena (e.g., recurrent novae, variable stars) and predictable phenomena that can be expected, although whose precise timing cannot be specified *a priori* (e.g., newly discovered comets, novae, supernovae, gamma-ray bursts, extra-solar planets).

Predictable phenomena whose exact timing may remain uncertain at the time of proposal submission should be submitted in response to a General Observer Call for Proposals (CP). Observations of completely unanticipated phenomena can be requested through Director's Discretionary Time (DDT) procedures.

Starting with Cycle-6 only low-impact targets of opportunity may be included as part of GO proposals. High/medium impact ToOs must be requested via DDT proposals. At the time of proposal submission, investigators will classify each ToO request, based on the degree to which the execution of such an observation affects normal scheduling and observing procedures (see below).

A General Observer proposal must include a valid Astronomical Observation Request (AOR) for each predictable ToO observation, or representative AORs for proposals requesting > 50 hours. The AORs should be completed in as much detail as possible, lacking perhaps the precise target positions (i.e., a "null target") and refined integration times. The proposal must present a detailed plan of observations that will be implemented if the specific event occurs. Moreover, it must also provide an estimate of the probability of occurrence of the specified event during the relevant Spitzer observing cycle(s).

The SSC Director reserves the right to designate any ToO data for early release when such a release is deemed (by the Director) to be in the interest of the community.

11.5.1 Classification of Impact

At the time of proposal/AOR submission, investigators must classify each ToO observation into one of three categories based upon the impact that the observation will have on the normal scheduling and observing procedures (if approved). The classification scheme is based solely on the time elapsed between the activation of a Target of Opportunity AOR (§11.5.2) and the execution of the corresponding observation:

High-Impact	**< 2 weeks**
Medium-Impact	**2-5 weeks**
Low-Impact	**> 5 weeks**

High/Medium impact ToO observations are not allowed in Cycle-6 GO proposals. These observations must be submitted via a DDT proposal.

A nominal *low-impact* ToO is one where the acceptable delay from activation to execution is longer than five weeks. There is no limit on the number of these low-impact ToO observations that can be approved for Cycle-6.

New for Cycle-6, generic fixed target observations that require only a late position update to the AOR may be submitted as low-impact ToO observations. **If all of the AOR parameters for a fixed generic target observation can be specified well in advance then a final update to the target position, 2-5 weeks prior to execution, may be supported. We anticipate being able to support up to 12 of these late-update generic target observations per year.** These observations should be marked as low-impact ToOs in the proposal.

Apart from the overhead burdens applied to all Spitzer observations (§11.1), the SSC will impose no additional overheads on low-impact ToO observations. The SSC has developed a separate calculation of the observatory overhead to be assessed against the high/medium-impact category

of ToO observations. These special overhead burdens are described in Appendix E (§15). DDT proposals for high/medium impact ToOs must include the overhead in the total requested observation time.

An investigator will self-determine the appropriate category, based upon the maximum delay (in their judgment) that is scientifically acceptable between the activation of an approved AOR and the execution of the observation. This information will be useful in permitting the SSC and the reviewers to scientifically assess the value of the ToO observation vis-à-vis other approved observations.

11.5.2 Activation of AORs

For an approved ToO, the Principal Investigator (PI) must electronically submit a request for AOR activation to the SSC Director via the Spitzer Helpdesk (help@spitzer.caltech.edu). Following the request for activation, the SSC will ascertain the feasibility of conducting the ToO observations, taking into account sky visibility and the existing science schedule. The observer will also submit a revised AOR(s), with precise coordinates and integration time. If the observation(s) cannot be conducted on a schedule requested by the investigator, the SSC Director may consult with the Principal Investigator on the scientific utility of later observations. The SSC Director must issue final approval for any high/medium-impact ToO observations requiring an interruption of the onboard observing schedule.

An approved ToO observation will be executed only in the event that the specified phenomenon actually occurs within the relevant observing cycle. If the triggering event for an approved ToO observation does not occur during the observing cycle, the AOR will be deactivated at the end of the cycle. Cycle-6 Exploration Science ToOs will be valid for two years. In the event that a ToO observation expires without execution, the allotted observing time will be returned to the General Observer pool.

For a nominal low-impact ToO, the fully specified AOR must be available for scheduling in the SSC operations database a minimum of five weeks prior to its anticipated execution week. As discussed in §11.5.1, if all of the AOR parameters for a generic target observation can be specified well in advance then a final update to the target position, 2-5 weeks prior to execution, will be allowed. We anticipate being able to support up to 12 of these late-update generic target observations per year.

11.5.3 Regulation of Observations

The SSC Director will rely on the recommendations of the reviewers to assess the benefits of a proposed ToO observation against any disruptions to the efficient planning and scheduling of science observations with the Spitzer Space Telescope. The *SSC expects to support a small number of high/medium impact ToOs on an annual basis (currently expected to be one or two per year) during the warm mission.*

11.6 Generic Targets

Generic targets denote observations that fail to qualify as Targets of Opportunity (i.e., they generally have more refined and predictive spatial and temporal information than ToOs), and can be scientifically described, but lack precise celestial coordinates or brightness estimates *at the*

time of Spitzer proposal submission. A generic target can be selected from a complementary observing program with Spitzer, or with any other telescope, but one where the conditional observations (assumed to be under the control of or clearly available to the Spitzer Principal Investigator) are scheduled or will be scheduled with high likelihood, but not yet executed or analyzed prior to the Spitzer proposal deadline.

An investigator may propose observations of generic targets, describing them in as much detail as possible in a Spitzer observing proposal. The investigator must submit AORs with celestial positions accurate to within 2 degrees (radius), and with integration times specified to within a factor of 1.5. After the complementary observations are obtained and analyzed, the Principal Investigator must modify the generic target AOR and include the precise celestial coordinates and integration time before the observations can be scheduled. The observations must be completed within the observing time allocation awarded when the proposal was approved. If your proposed targets are not known at the time of proposal submission you must provide a credible schedule for determining the targets and delivering the AORs. Details will be worked with all successful teams.

For nominal generic targets the AOR must be fully specified 8 weeks prior to execution. For Cycle-6 we will support up to 12 'late-update' generic fixed target observations per year (as discussed in §11.5). An example of a generic target requiring a late update would be a target culled from a ground-based supernova search program. In this case the investigator can fully specify the AOR parameters, except the exact target position, 8 weeks prior to execution of the AOR. The investigator will then update the final target position 2-5 weeks prior to execution. The AORs with late-update generic targets should also be classified as low-impact ToOs when the proposed. No additional overhead is required for these observations.

11.6.1 Necessary Conditions

Proposals seeking to observe generic targets will be accepted for consideration through the normal processes if the following (relevant) conditions are satisfied:

- Rules pertaining to duplicate observations and priority of target selection (as specified in §11.2) apply. The basic principle is that the first observer who specifies the AOR with sufficient completeness to permit execution of the AOR has priority for the observation.

- The generic target observations are specified in celestial coordinates to < 2 deg (radius) in the initial AOR/proposal (see §11.6.2 for an exception pertaining to moving targets). The reason for submitting approximate coordinates is to enable the SSC to properly assess the over-subscription of various areas of the celestial sphere in making the observing time allocations.

- The generic targets are selected from datasets to which the proposing investigator has clear access.

11.6.2 Moving Targets

Generic moving targets meet all of the criteria above, except that the target positions for observations cannot be specified within 2 degrees because these objects move significantly in

position on the sky between their discovery and subsequent Spitzer observation. Proposers must submit an AOR for a generic moving target with a target position 'to be determined' (from Navigation and Ancillary Information Facility identification, or from orbital elements).

Generic moving targets, like the analogous celestially fixed targets, must be selected from observations under the control of the investigator. The proposer must estimate the number of such targets to be observed with Spitzer, based on well-defined criteria. Examples of generic moving targets include near-Earth asteroids, main-belt asteroids, Centaurs and Kuiper Belt Objects. Because of the time urgency of observations, comets near perihelion should be treated as Targets of Opportunity (§11.5).

11.7 Second-Look Observations

Second-look observations (SLOs) are deemed to be a predictable element of an integrated Spitzer observing program, even if the specific targets cannot be provided a the time of proposal submission. Requests for SLOs must be included in the original proposal and must be described in as much detail as possible. For example, an investigator can propose for 80 hours of time to conduct one-hour observations of 30 targets and then ten-hour observations of the five most interesting of these based on criteria spelled out in the proposal. SLOs are an allowed component of regular GO investigations in Cycles 6 and 7. SLOs are not allowed in Cycle-6 Exploration Science GO proposals.

11.8 Commissioning of AOTs

During the cryogenic mission, commissioning of the multiple Astronomical Observation Templates (AOTs) was carried out during the first year of the mission. Each AOT was commissioned before it was used for routine science observations. During the warm mission the IRAC post-cryo Mapping AOT will be commissioned during the 6-8 week checkout period after the cryogen expires. The AOT will be deemed commissioned when the SSC has verified the execution of the spacecraft command sequences, the operability of warm IRAC and the output of calibrated data by the warm IRAC processing pipeline at the SSC.

11.9 Routine Calibrations

The SSC establishes and maintains the calibration of the Spitzer science instruments to levels specified in the individual instrument chapters contained within the *Spitzer Observer's Manual – Warm Mission*. Routine calibrations are executed by the SSC on behalf of the community as described on the SSC website at the time of each *Call for Proposals*. Data resulting from routine facility calibrations generally enters the public domain immediately upon processing and validation by the SSC.

Calibration of the IRAC post-cryo Mapping AOT will begin during the 6-8 week checkout phase that occurs after the cryogen expires. After the AOT is commissioned for general use, the periodic observations necessary to maintain the instrument and AOT calibration will be obtained. Observations of celestial targets necessary to establish and maintain the calibration of the AOT are not subject to rules regarding duplicate observations.

Expected and achieved calibration accuracy for AORs processed with the normal calibration pipelines is published as part of the *Spitzer Observer's Manual – Warm Mission*. For observations that require a higher level of calibration, and therefore special calibration observations (see §11.10), it is the responsibility of the requesting investigator to include those special calibration observations as part of their proposed observational program.

11.10 Special Calibrations

Any additional calibration(s) that are not included as part of routine calibrations (§11.9) conducted by the SSC will be regarded as special calibrations, and are the responsibility of the approved investigator. The observing time required to conduct such special calibrations will be charged against the observer's allocation and must be included in the original science proposal. The SSC will process such observations through the normal data processing pipeline(s). The investigator is responsible for using these data for the special calibration requirements of their program. The normal proprietary data period applies to special calibration data that are part of an approved science program.

All Spitzer Space Telescope data, including routine and special calibrations, can be accessed and analyzed by appropriate SSC instrument specialists to assess instrument performance and to develop improved or necessary instrument calibrations. For such use of special calibration data, strict confidentiality will be maintained throughout the normal proprietary period.

Proposers are encouraged to consults with the Science User Support team via the Helpdesk when planning to propose special calibrations.

11.11 Use of Parallel Observations

All of the science data obtained via a single Astronomical Observation Request (AOR) is considered to belong to the requestor of the observation, and is subject to the same proprietary data rights as the explicitly requested data. That is, the proprietary rules and periods apply to all of the data collected via a specific AOR, whether or not the observer explicitly requested it as part of their proposed science program.

11.12 Infeasible or Non-Schedulable Observations

All approved observations are accepted with the understanding that there can be no guarantee that the observations will actually be obtained. In specifying observations through the completion of Astronomical Observation Requests (AORs), the front-end graphical user interface to the Astronomical Observation Template (AOT) will not process invalid parameters. Therefore, a completed AOR represents a 'doable' observation, in principle. In practice, however, it could turn out that the actual execution of some observations could prove to be highly difficult or impossible. For example, on-orbit events may conspire to restrict the range of acceptable or safe AOT parameters, and thereby make previously approved observations infeasible. If the AOR can be modified to make the observation feasible, the Principal Investigator will be given the opportunity to make these modifications. Otherwise, the AOR will be abandoned without execution. The SSC Director will determine the usage of abandoned time from all investigations.

11.13 Failed Observations

A failed observation is one that cannot be calibrated, or where a significant fraction of the data is lost or severely corrupted, or where the data processing system (the "pipeline") is incapable of processing the observation. Some failures may result from instrument anomalies, while other failures may be due to the loss of data in transmission.

If an investigator believes that an observation has failed or has been seriously corrupted or degraded he/she can submit a written request to the SSC Science User Support Team via the Helpdesk (help@spitzer.caltech.edu) for a repeated observation. Any request for a repeated observation must be filed within **two months** of the investigator's data being made available to the investigator. If the SSC concurs with the request, attempts will be made to repeat the observation. The SSC Director reserves the right, in cases where the request for a repeated observation is approved, to place the failed/degraded observations into the public archive immediately. The request for a repeated observation will not be granted when the PI has committed an error in specifying the AOR.

If an investigator has obtained more than 90% of the data in a planned and approved observing program, and the missing data are not uniquely important for scientific goals of the program, then the request for a repeated observation will not normally be granted.

11.14 Data Rights

Observers may have exclusive access to their science data during a proprietary period, intended to facilitate the processing and scientific analysis of the data by the relevant investigator. For regular General Observer programs, Spitzer observations shall have a proprietary data period of twelve months, commencing from the time that scientifically usable data from fully commissioned pipelines are made available to the Principal Investigator via the Spitzer Science Archive. For Exploration Science General Observer programs, Spitzer observations shall have a maximum proprietary period of three months. Once the proprietary period expires, the raw and pipeline-processed data will enter the public domain and be available to anyone through the Spitzer Science Archive. **The SSC does not anticipate having resources to do duplication checks or embargoing data from duplicating observations in the warm mission. Therefore the SSC may not be able to ensure all proprietary periods for Cycle-5 and Cycle-6 observations.** Only a small number of observations are likely to be affected.

The SSC Director reserves the right to designate any Target of Opportunity data for early release when such a release is deemed to be in the interest of the community.

Because observations obtained through Director's Discretionary Time (DDT) are assumed to be urgent and of interest to the broad scientific community, proprietary periods for DDT observations will not exceed three months. The SSC Director reserves the right to make all raw and calibrated data publicly available immediately as a condition for approving a DDT request, particularly where the data involves an unexpected Target of Opportunity.

The Spitzer Time Allocation Committee may recommend a shorter proprietary period for individual proposals, particularly from the Large category, due to the high value of the data to

the general astronomical community. As part of their proposal, observers may request that the SSC Director waive all or part of their proprietary period if the proposal is approved.

11.15 Publication and Dissemination of Science Results

It is expected that scientific results obtained through Spitzer Space Telescope observations, archival research, and theoretical investigations will be published in the scientific literature. All publications based on Spitzer data must carry an appropriate acknowledgement. Investigators should consult the SSC website for the appropriate acknowledgement template(s) (http://ssc.spitzer.caltech.edu/approvdprog/ackn.html).

In papers describing Spitzer results, investigators should provide reference(s) to seminal papers describing the Observatory, including the relevant science instruments. These references are posted on the SSC website at [http://ssc.spitzer.caltech.edu/pubs/seminalobs.html]. Moreover, the SSC encourages investigators to provide reference(s) to seminal Legacy Science project results, where appropriate (http://ssc.spitzer.caltech.edu/legacy/all.html).

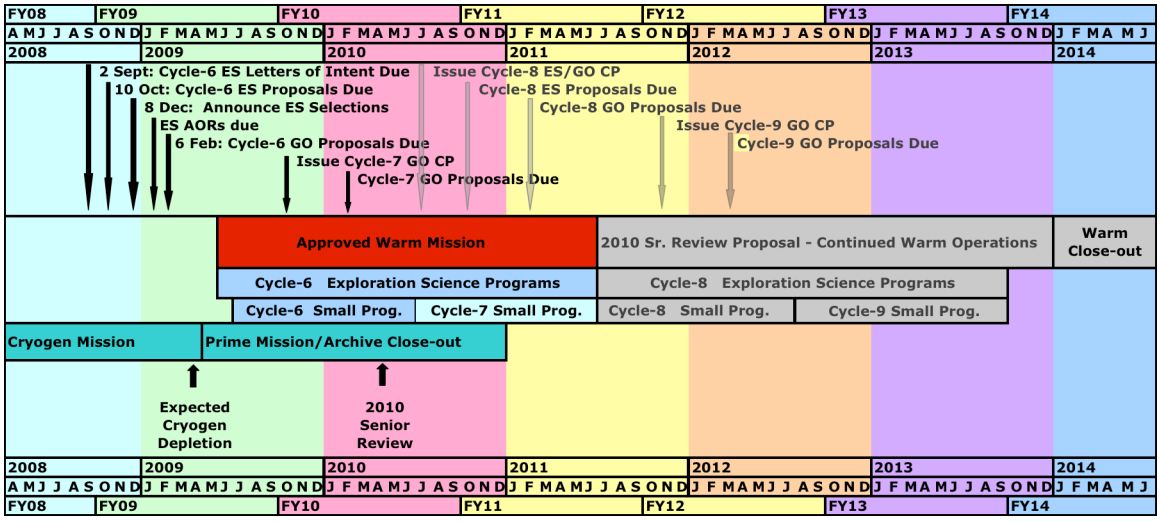
The publication and dissemination of Spitzer science results is critical in assessing the success of the mission, and its contributions to NASA's strategic plans in space science. The Spitzer community is reminded of the important responsibility inherent in utilizing this national resource, and in sharing the scientific results with the general public. The SSC Director encourages investigators with newsworthy results to utilize the resources and services of the SSC, JPL and NASA to help disseminate important results to the mass media and to the general public.

12 Appendix B: Spitzer Space Telescope Science Schedule

The monthly calendar of Spitzer events pertaining to the science user community is available at the SSC website (http://ssc.spitzer.caltech.edu/geninfo/sched/). Major events include:

July 2008	Cycle-6 Call Exploration Science/GO Call for Proposals Issued
September 2, 2008	Cycle-6 Exploration Science Letters of Intent due
October 10, 2008	Cycle-6 Exploration Science proposals due
December 2008	Select Cycle-6 ES programs
Jan/Feb 2009	ES AORs due to SSC
February 6, 2009	Cycle-6 Regular GO proposals due
April 2009	Expected end of cryogenic mission
May 2009	Select Cycle-6 GO programs
May 2009	Warm mission science verification phase
June 2009	Expected start of Cycle-6 warm operations
October 2009	Cycle-7 Call for regular GO proposals issued
February 2010	Cycle-7 regular GO proposals due
April 2010	NASA Senior Review -- proposal for additional warm operations
May 2010	Select Cycle-7 GO programs
June 2010	Expected start of Cycle-7 warm operations

Pending Sr. Review/NASA approval of additional warm operations, the second Exploration Science/GO Call for Proposals would be issued in July 2010 for observations beginning in June 2011. The schedule for the approved warm operations and what will be proposed for future warm operations is shown below.



13 Appendix C: Cycle-6 Exploration Science Programs

Thirty-five Exploration Science proposals were submitted requesting a total of 38,050 hours. Ten proposals were selected using a total of 10,345 hours of Spitzer observing time, to be executed over two years. The selected programs are listed below and additional information about the programs, including observations summary tables, is available at the SSC website (http://ssc.spitzer.caltech.edu/geninfo/es/).

PID	Science Category	PI Institution	Title	Hours
60010	cosmology	Wendy Freedman *Carnegie Observatories*	The Hubble Constant	**705**
60022	high-z galaxies	Giovanni Fazio *SAO*	SEDS: The Spitzer Extended Deep Survey	**2108**
60024	high-z galaxies	Mark Lacy *Spitzer Science Center*	SERVS: the Spitzer Extragalactic Representative Volume Survey	**1400**
60034	high-z galaxies	Eiichi Egami *University of Arizona*	The IRAC Lensing Survey: Achieving JWST depth with Spitzer	**526.4**
60007	nearby galaxies	Kartik Sheth *Spitzer Science Center*	The Spitzer Survey of Stellar Structure in Galaxies (S4G)	**637.2**
60021	exoplanets	Heather Knutson *Harvard University*	Dynamic Studies of Exoplanet Atmospheres	**1138**
60028	exoplanets	David Charbonneau *Harvard University*	Confirmation and Characterization of Kepler Mission Exoplanets	**800**
60020	galactic structure	Barbara Whitney, SSI *Space Science Institute*	GLIMPSE360: Completing the Spitzer Galactic Plane Survey	**1980.3**
60014	young stellar obj.	John Stauffer *Spitzer Science Center*	Young Stellar Object Variability	**550**
60012	near-earth objects	David Trilling *Northern Arizona Univ.*	The Warm Spitzer Near Earth Object Survey	**500**

The Cycle-6 Exploration Science time allocation committee also recommended two exoplanet programs for Director's Discretionary Time awards. These are listed below.

PID	PI Institution	Title	Hours
60003	Joseph Harrington *Univ. of Central Florida*	The Spitzer Exoplanetary Atmosphere Survey	200 DDT
60027	Michael Gillon *Geneva University*	Detecting the Transits of Nearby Super-Earths	100 DDT

14 Appendix D: Director's Discretionary Time

During the warm mission the SSC Director will continue to allocate five percent of the available Spitzer Space Telescope observing time as Director's Discretionary Time (DDT). It is intended to facilitate observations that address emerging scientific topics, areas missed in the proposal review process, and time critical target of opportunity observations. Investigators wishing to request DDT can do so at any time during the year, by using the DDT submission form and procedures described on the SSC website (http://ssc.spitzer.caltech.edu/geninfo/ddt).

The primary utilization of DDT will be in support of community-proposed requests that are based on exceptional, time-critical observing opportunities that cannot be accommodated with the regular cycle. Other DDT usages may include innovative observations that extend the scientific capabilities of Spitzer, and extraordinary events and opportunities that necessitate -- in the view of the SSC Director -- observations to be obtained with Spitzer for the benefit of the astronomical community. Requests for DDT must be submitted electronically to the SSC Director via the online form on the SSC website (http://ssc.spitzer.caltech.edu/geninfo/ddt). All questions should be sent to the Helpdesk (help@spitzer.caltech.edu).

The DDT requests must include a strong scientific justification, completed Astronomical Observation Requests (if possible) and must specify why the request could not be submitted via a proposal to the regular GO program. A proposal for DDT might be appropriate in cases where a truly unexpected transient phenomenon occurs or when developments since the previous Spitzer proposal deadline make a time-critical observation necessary. *Requests for DDT cannot be used to resubmit all or part of a proposal that was rejected by the normal peer review process.*

Recognizing the limited lifetimes for major space astronomy facilities such as the Hubble Space Telescope, the Chandra X-ray Observatory and the Spitzer Space Telescope, DDT proposals for rapid follow-up of new discoveries will also be considered. In such cases, the proposing investigator must demonstrate that the observations will provide a critical link in the understanding of the phenomena and that carrying them out quickly is particularly important for planning future observations with major facilities. They should then also indicate their plans for quickly making the scientific community aware of their discoveries, to enable subsequent wider community follow-up.

A request for DDT observations is predicated on the assumption that the proposed observations are deemed to be urgent and will be of interest to the broad scientific community. Therefore, proprietary data periods for DDT observations will be no more than three months, at which point the data will enter the public domain. The SSC Director reserves the right to make all raw and calibrated data publicly available immediately as a condition for approving a DDT request, particularly where the data involves an unexpected Target of Opportunity.

15 Appendix E: Special Telescope Overheads

Resource limitations in terms of staff during the warm mission preclude continued support for medium and high impact ToO programs, as well as late ephemeris updates for solar system observations, as part of GO proposals. These observations may be submitted via DDT proposals. The Spitzer project will support a limited number of such observations annually as permitted by available resources. We currently anticipate supporting 1-2 per year.

Special overhead burdens are applied to high/medium-impact Targets of Opportunity (ToO). This special overhead is added to the normal overhead applied to each Astronomical Observation Request (AOR) computed by *Spot*, the software required for Spitzer observation planning and proposal submission. It accounts for the time required to prepare for the observation and to return the Telescope to its nominal schedule. As described in §11.1 of the *Spitzer Space Telescope Warm Mission Observing Rules* (Appendix A), the special overhead is intended to reflect the observing time lost in other programs as a result of executing the relevant observation(s).

In evaluating ToO proposals, peer reviewers will assess the value of observations with special overhead burdens against other proposed observations. Proposals *must* include these overheads in the total requested observation time. The relevant special overheads during the warm mission are:

High-Impact Target of Opportunity, Single Instrument: 6.5 hours
This overhead will be applied to the first AOR in a *group*, *chain* or *sequence* of AORs to be executed consecutively during a single observing session on a single ToO with one science instrument. For observations that are constrained with a *follow-on* constraint, the overhead must be applied to every AOR individually. The *group*, *chain* or *sequence* constraints mean observations can be scheduled contiguously and therefore have less impact on the schedule than those constrained with a *follow-on* constraint.

Medium-Impact Target of Opportunity, Single Instrument: 2.6 hours
This overhead will be applied to the first AOR in a *group, chain or sequence* of AORs to be executed consecutively during a single observing session on a single ToO. For observations that are constrained with a *follow-on* constraint, the overhead must be applied to every AOR individually.

These overheads must be specified using *Spot* when the AORs for the proposal are created. From within the relevant AOR dialog click the **Special …** button and select the overhead from the list. *Spot* will calculate the required time and add it to the Total Duration returned on the main *Spot* AOR page.

16 Appendix F: Allowable Costs

Detailed budgets are not required to be submitted with any Cycle-6 proposals. If you are at an institution that requires a detailed budget prior to the issuance of your funding contract then the guidelines provided below for allowable costs will apply.

16.1 Salaries and Wages

Direct labor costs for eligible project investigators should be included and itemized. Spitzer Space Telescope funds may not be used to pay more than a person's full-time salary or to pay more than an individual's hourly wage rate. An investigator may not normally be reimbursed for consulting or other work in addition to a regular full-time institutional salary covering the same period of employment. For faculty members in academic institutions, Spitzer funding will normally be limited to no more than two months of summer salary support. Exceptions for released time during the academic year (e.g., "buying back" teaching time) may be permitted, but such costs must be fully justified in the proposal and the compensation requested must be reasonable and consistent with each employee's regular full-time salary or rate of compensation. Released time for project investigators working in non-academic institutions may be proposed, provided the compensation requested is reasonable and consistent with each employee's regular full-time salary or rate of compensation.

It is assumed that most scientists will be affiliated with institutions that will make substantial support available for project activities (e.g., computer facilities, collaboration with other scientists, students, or research assistants).

16.2 Research Assistance

Direct labor costs for graduate students, post-doctoral associates, data aides, and secretarial and technical support should be included and itemized. For post-doctoral associates and other professionals, each position should be listed with the number of months, percentage of time that will be spent on the project, and rate of pay (hourly, monthly, or annual). For graduate students and secretarial, clerical and technical staff, only the total number of persons and the total amount of salaries per year in each category are required. All such salaries must be in accordance with the standard policies of the institution assuming responsibility for the project.

16.3 Fringe Benefits

If an institution's usual accounting practices provide that its contributions to employee "benefits" (Social Security, retirement, etc.) be treated as direct costs, funds may be requested for all applicable fringe benefits. In this case, proposers must break out the associated costs and list them as a separate cost component within the direct labor element.

16.4 Publication Costs

Reasonable costs for publication of research results obtained from a Spitzer research investigation should be included as a component of "Other Direct Costs."

16.5 Travel

Itemized transportation and subsistence costs for project personnel to plan, obtain, analyze, and disseminate direct results of a Spitzer research investigation should be included. Proposers must include origin/destination, number of travelers, number of trips, and costs associated with each, and include this information as a component of "Other Direct Costs."

16.6 Computer Services

The itemized costs of computer time and software for the analysis of Spitzer data should be included. Details of the services and software that will be used must be fully described and justified in the proposal, and included as a component of "Other Direct Costs."

16.7 Equipment

Itemized equipment costs, including computers or related hardware, should be included and accompanied by a detailed justification in the budget narrative. In general, the title to approved equipment purchased for $5,000 or less will be vested with the Contractor (i.e. the investigator's institution). The title to equipment costing in excess of $5,000 will be vested with the U.S. Government, unless JPL and/or NASA indicate otherwise in writing. In either case, if the proposer seeks title to the equipment, it must be noted in their budget narrative.

16.8 Materials and Supplies

The itemized costs of materials and supplies directly related to the Spitzer research investigation may be included, provided such costs are not already reimbursed through indirect costs or some other means. These costs should be included as a component of "Other Direct Costs."

16.9 Indirect Costs (IDCs)

Indirect costs may be proposed, provided that the IDC rate used in the budget is based on a Negotiation Agreement with the Federal Government, or its designated agent.

17 Appendix G: Acronyms and Abbreviations

2MASS	Two-Micron All-Sky Survey
AAS	American Astronomical Society
AOR	Astronomical Observation Request(s)
AOT	Astronomical Observation Template(s)
AR	Archival Research
BIC	Baseline Instrument Campaign schedule
Co-I	Co-Investigator
CP	Call for Proposals
CREI	Cost Reimbursement with an Educational Institution
CXC	Chandra X-Ray Center
CXO	Chandra X-Ray Observatory
DDT	Director's Discretionary Time
DSS	Digital Sky Survey
EPO	Education and Public Outreach
ES	Exploration Science
FAQ	Frequently Asked Questions(s)
FOV	Field of View
GO	General Observer(s)
GTO	Guaranteed Time Observer(s)
HST	Hubble Space Telescope
IBC	Impurity-Band Conductor(s)
IDC	Indirect Cost(s)
IER	Instrument Engineering Request(s)
IOC	In-Orbit Checkout
IPAC	Infrared Processing & Analysis Center
IRAC	InfraRed Array Camera
IRS	InfraRed Spectrograph
IRSA	InfraRed Science Archive
ISO	Infrared Space Observatory
JPL	Jet Propulsion Laboratory
MIPS	Multiband Imaging Photometer for Spitzer
NAIF	Navigation and Ancillary Information Facility
NASA	National Aeronautics and Space Administration
NED	NASA/IPAC Extragalactic Database
NOAO	National Optical Astronomy Observatory
NRAO	National Radio Astronomy Observatory
OSS	Office of Space Science
PDF	Portable Document Format
PI	Principal Investigator
ROC	Reserved Observations Catalog
RSA	Research Support Agreement
SA	Science Archive
SED	Spectral Energy Distribution(s)

SIMBAD	Set of Identifications, Measurements and Bibliography for Astronomical Data
SLO	Second-Look Observation(s)
SODB	Science Operations Database
STScI	Space Telescope Science Institute
SOM	Spitzer Observer's Manual
SSC	Spitzer Science Center
TAC	Time Allocation Committee
ToO	Target(s) of Opportunity
TR	Theoretical Research
Warm SOM	Spitzer Observer's Manual – Warm Mission