Minutes for GLAST User's Committee (GUC) Meeting
GSFC, Building 2, Room 8 May 8-9, 2006

Committee members: Josh Grindlay (chair), Jim Buckley, Don Kniffen, Jim Ling, Reshmi Mukherjee, Rene Ong (by phone), Greg Stacy, Mark Strickman, Ann Wehrle

Ex Officio committee members: David Band, Neil Gehrels, Rick Harnden, Julie McEnery, Chip Meegan (by phone), Peter Michelson, Jay Norris, Steve Ritz, Rita Sambruna

Colleagues: Analia Cillis, Lynn Cominsky (by phone), Robin Corbet, Kevin Grady, Luis Reyes, Chris Shrader, Tom Stephens, Al Vernacchio, Nick White

Monday, May 8:

9:10: Meeting called to order. Nick White helped to welcome the Committee. Josh was delayed by a half hour due to blockage on the Baltimore-Washington Pkwy from BWI airport.

Mission Update—The View from HQ (Rick Harnden): GLAST is Rick's bright spot. The LAT completed the 'pre-ship' review. But there are issues, especially with the spacecraft. A budget status review is expected in June. The GI budget has not been affected by NASA's budget problems. Since GLAST is the bright spot, NASA is committed to launching the mission up on time and on budget. The search for new division director is underway.

Mission Status (Al Vernacchio): Both instruments are in I&T. The spacecraft is nearing completion of fabrication; various hardware issues remain, particularly with the Integrated Electronics Module. When a flight unit is delayed, an engineering model is used for testing to keep the project on schedule. The ground system is progressing. The ICD for the launch vehicle is nearly complete, after which construction of the rocket begins. Many other launch vehicle documents are in preparation.

Most of the mission elements are green/blue (note: green/blue/red denote NASA mission status judged to be nominal/marginal/problematic, respectively). The spacecraft has two red elements: the release mechanisms for the solar panels and Ku-band antenna, and the Integrated Electronics Module. A non-explosive release will be used; the new release mechanism is time-consuming to replace after being used in a test and thus using this mechanism may delay the schedule slightly. A number of spacecraft elements are yellow, requiring some reworking. Most likely there will be a delay of 1-3 months. The decision will most likely occur in the late summer. If the LAT delivery to Observatory I&T in September, 2006, is delayed, launch would also be delayed.

LAT Status (Peter): The LAT is integrated. Two spare towers (TKR+CAL) and an additional CAL unit will be used in a beam test in CERN. LAT leaves SLAC 5/11 and arrives at NRL on 5/16.

Mission Topics (Steve): GSFC scientists (listed in the presentation) have become LAT Affiliated Scientists.

There has been a GLAST presence at many conferences. Pat Nolan runs a website listing interesting conferences. A Great Observatories workshop will be held in Pasadena 5/22-24; the main purpose of the workshop is coordinated use of the three Great Observatories. The organizers were contacted to include GLAST as a related facility on the meeting announcement, but there will not be a GLAST member on the panel discussions. Peter will attend the meeting.. A 'Quantum to Cosmos' program will be held at the same time (5/22-24) in Washington, DC; Floyd Stecker will add some GLAST content to his invited talk; Steve will also attend. A GLAST workshop will be held at the Venice (San Servolo) GRB meeting. Steve requested a special GLAST session at the San Francisco HEAD meeting, and the project will also request one at the January AAS meeting. The GLAST Symposium is 2/5-8. This was discussed later.

Steve requested input from the GUC on other topical meetings that should have a GLAST workshop session.

Contacts with other facilities are ongoing. The contact with NRAO was reported at the last GUC meeting. There are discussions with ROTSE (Akerlof). GLAST has stated to NASA HQ the importance of ground-based capabilities. A telecon was held with Harvey Tananbaum and others on Chandra regarding coordination with Chandra's proposal cycle; this was discussed later.

The Mission Operations Review (MOR; 3/15-16) was highly successful. The orbital inclination will probably be lowered to ~25.4º using the launcher's excess lift capability; this will reduce particle precipitation events in the GBM. The project is working with the public affairs office on publicity for GLAST. Lynn Cominsky drafted a press plan; we need to accommodate all the different countries and agencies. For example a press release for the LAT's move to NRL has been in process. The Project is planning the press packet for the launch, along with other items both pre- and post-launch.

A trio of papers—LAT, GBM and the mission—are planned for submission this fall. The ApJ is amenable to publishing them in one issue.

GBM Status (Chip): The GBM finished EMI tests; the detected discrepancies will be granted waivers. The DPU attached to the whole system produces noise in the GPS band that is just slightly above the specification, but the specification is conservative and therefore a waiver is reasonable. When the system is integrated onto the spacecraft, the noise level will be a bit different, probably less (better). The Flight Software is doing well. Thermal vacuum testing will probably start tomorrow (5/9). The Quarterly Review was held, and went well. The team hopes to meet the 7/5 delivery date.

GSSC Status (Jay): The transition of GSSC Manager from Jay to Chris Shrader is announced at this meeting. The scientific staff level will stay flat, while the software staff has peaked. Tool development is tracked and is on time.

Neil suggested that the GSSC have two levels of TOO, one that wakes the team and one that does not (we should have a check-box on the RPS form). Josh also raised the issue of whether it

will be easy for a scientist to submit a TOO via RPS (in order for a TOO to be archived as if it were a "new" proposed pointing request).
The GUC congratulated Jay on successfully starting the GSSC and welcomed Chris Shrader as the next GSSC Manager.

Update on DC2 (Julie): Julie showed the DC2 movie and explained the different features. The background model includes different components; the validity of the different components varies. DC2 is demonstrating that data exploration tools are needed. A catalog was created without knowledge of the input sources. Sample analyses were shown. The analysis methods and scripts developed for DC2 will be evaluated for incorporation into the SAE. GUC members suggested many studies that could be done with these data. One of the LAT team's first tasks will be to study the backgrounds. The GUC was impressed overall by the planning for and progress thus far with DC2.

Demonstration of GRB analysis using SAE tools (David):

Consideration of Open Action Items:

AI#7. Science Policy Document (Steve): Very little has been done, although Steve has been collecting decisions. We need the document for the Cycle 1 NRA. The action item needs to be kept open. N ACTION ITEM: We need a method to add sources to list of 20 monitored sources, and to inform the community as to which sources are on the list. The GUC needs to be involved, but ultimately the LAT team will negotiate the sources on the list with the community. Josh suggested we generate a new action item to deal with the source list:

NEW ACTION ITEM: The list of ~20 sources to be monitored and for which preliminary data will be reported by the LAT Team during cycle 1 should be included in the NRA announcing the GI program for cycle 1. (David)
NEW ACTION ITEM: The 1st year data release policy and the list of 20 monitored sources should be posted on the GSSC website. (David).

AI#10b. Determine HQ policy for PDMPs (Rick): The PDMP requirements have not changed. The document should be signed a year before launch. Rick thinks the current document is OK. The current NASA policy applies to us, and any changes will not apply to us. David will respond to Rick's comments on the PDMP draft. Ann, Don and Greg will then be the GUC reviewers. The instrument teams will also review, and add text on data management within the instrument teams. AI#10b on review of PDMP policy is now closed. However a new action item is opened to ensure PDMP final draft is ready by the fall (Nov.) GUC meeting for final approval in time for any references to it in the upcoming NRA.

NEW ACTION ITEM: Prepare the PDMP for circulation to GLAST mission stakeholders. (David)

NEW ACTION ITEM: Review and revise the PDMP by Nov. 1 in advance of the Nov. 18 GUC meeting (David, Ann, Don and Greg).

AI#14. Description of end-to-end processing: status of text (David): Jim L. intends this to be a description of the flow of analysis. This should be in the detailed Software Analysis Environment manual (the 'Cicerone,' to be drafted by end of June). We modify AI#14 to now also include a link to current documentation. Comments should be funneled through the GSSC. This action item is closed.

AI#20. Configuration Control for Instrument Status and Operations Parameters (Steve): The LAT team has been working full-time to complete the instrument and is still developing the databases relevant to the action item. More time should be available over the next few months. The GSSC should have a copy of the parameters and when they were changed, as per previous presentations and discussions of this topic. This action item remains open.

AI#27. Statement on Pointing vs. Scanning (Jim B., Julie): The draft presented uses 'TAC,' which we were planning not to include. This function should be done by the peer review panel. A white paper is needed to demonstrate that survey mode is efficient and the burden of proof needed for a pointed observation. This action item is closed, substituting 'peer review panel' for 'TAC.' Steve will incorporate this into the SPD. However, a new Action Item is needed to ensure development of the White Paper on pointing vs. scanning and its posting on line for easy reference in the cycle 2 NRA.

NEW ACTION ITEM: Prepare a White Paper (~2 pages, max) on the scanning vs. pointing sensitivities and tradeoffs for GLAST and to specify how proposals must make clear their need for pointed observations. Due date: in time for cycle 2 NRA (Julie, Jim B.).

AI#28. Which SAE tools to release for GLAST Science Symposium? (David, Julie): The schedule was approved. This action item is closed.

Multiwavelength observations and planning/coordination

AI#26 report: Multiwavelength Task Force discussions/plans (Rene): VERITAS had a meeting and realized that VERITAS and GLAST have similar interests in ground based multiwavelength monitoring observations. The LAT team has a plan written by Dave Thompson; the GUC needs to decide how it can go beyond the LAT team's efforts. Usually, when observers are asked whether they are interested in participating, they ask whether money is available. Josh pointed out that the GUC does not have much direct representation within the pulsar timing community. A consensus exists that pulsar monitoring should start ~1/2 year before launch. Some weak radio pulsars need longer observations than provided by standard monitoring campaigns. Pulsar surveys should be completed. Peter's conceptual model is based on CGRO's interaction with the pulsar community—the pulsar community maintains a database of ephemerides. Steve stated that small amounts of funding to support multiwavelength monitoring may be available now. The NRA for the GI program can encourage support for multiwavelength observations. Do holes exist in the multiwavelength coverage? The GUC doesn't want to encroach on the LAT team's committee, or on the scientific community's plans. Peter asked whether data from observations supported by the GI program should be public. Ann answered that many optical programs do not archive their data. Chris Shrader noted that the pulsar community included an archive in their *CGRO* GI proposal. Don said that pulsar funding began before launch for *CGRO*; because pulsar monitoring is a necessity, perhaps it should be

funded directly by the GLAST mission. Previously, HQ wanted only 10% of the GI program for multiwavelength observations; Swift currently spends ~1/3 of its GI program budget on such observations. The GUC should write a statement in support of increasing the funding fraction.

NEW ACTION ITEM: The GUC Multiwavelength Committee shall write a draft statement on requested support for ground-based observing in direct support of GLAST. This will be considered at the November GUC meeting to allow any required statements to be incorporated into the Cycle 1 NRA (Multiwavelength Committee).

The first year GI funding is $4M (in subsequent years $8M), exclusive of the Fellows program. Small amounts (tens of thousand) might be available before launch; the LAT is supporting Readhead's telescope. The committee is uncomfortable with advocating support for pulsar monitoring in the NRA. Steve proposed a statement to NASA HQ that the GI program should support multiwavelength observations. Steve also suggested that we have Q&A sessions at scientific meetings about GLAST's multiwavelength observation needs. Jim B. mentioned that NSF may close some radio telescopes that are useful for GLAST. The Senior Review results are due soon.

Steve had a telecon (2/21) with Harvey Tananbaum about Chandra. Cooperation between the missions can be through joint proposals, most likely for GLAST funds and Chandra time. Josh pointed out that TOOs with Chandra are now difficult, if not impossible. As a general principle, Swift or Suzaku should be used if possible. Chandra does not want observing time set-asides but suggests that GLAST should contribute reviewers to the Chandra peer review. An issue is synchronization of the Chandra and GLAST peer review cycles. The joint peer review panel would grant both Chandra time (and money) and GLAST money. In the telecon, Steve and Harvey also discussed having GLAST talks at the CXC to make the GLAST mission opportunities more widely known to the Chandra community. .
Joint observations with Swift will probably be more likely. Also, a Swift observation may justify subsequent Chandra observations. Discussions should be held with XMM, Suzaku and Spitzer. A decision will have to be made on how much GLAST GI program funding should be made available to the peer review of joint proposals with other missions (Chandra, Swift, etc.). This will be considered at the November, 2006, GUC meeting when decisions must be made if this is to be implemented in the Cycle 1 GLAST NRA (e.g., for Swift observations, with GLAST-GI funding support, for targeted or TOO observations of, say, the 20 sources monitored during Cycle 1).

Josh suggested that Steve discuss a Swift-GLAST program with Neil.

GLAST should also look into contacts with NOAO, NRAO, VERITAS, HESS, and small university telescopes. We need to make sure that we don't just become a cash cow for other wavelengths.

The GUC Multi-wavelength Committee should advise Steve about the priority of contact with other missions.

Neil stated that the GRB followup observers are independent and don't take direction. The observers appreciate affiliation with the mission to support their proposals.

Tuesday, May 9:

Update on GLAST Science Symposium Planning (Steve, Peter): The IOC for the meeting has been formed. The date is February 5-8, 2007, at Stanford. The attendance is estimated at 250-400. The IOC will have another telecom. Publicity for the meeting is beginning (e.g., in the HEAD newsletter). E-mail lists are being gathered for circulars announcing the meeting. The first circular should have a link to a website with a pre-registration form. There should be two general e-mailings. A top level schedule has been developed that includes a great deal of time for mingling and looking at posters. Only one afternoon is devoted to parallel sessions, as suggested by the IOC (3-4 at a time in 2 sessions). A banquet and a public lecture are scheduled. The last plenary session will include summary talks. The afternoon of the last day is unscheduled to support possible teacher workshops and satellite meetings. The plenary talks (~30 minutes each) will be devoted to the mission, GLAST science, and a visionary talk. How many posters will be proposed? The organizers guessed 100, but the committee guesses more (e.g., ~80% of attendees who are not team members and who are not making oral presentations). The parallel sessions will be devoted to analysis techniques, future missions, other facilities, and more details about GLAST science topics. The GSSC will have a booth with workstations showing the website, demonstrations of the proposal tools, etc. A leaflet on how the proposal tools are used and inviting attendees to visit the GSSC booth will be in the registration packet. The proposal is that no proceedings will be produced, but a website will be available for people to upload a file about their presentation. The abstracts for all contributions and slides from the oral talks will also be posted. Whether there should be a proceedings was debated. Some wanted the proceedings for a record of predictions and instrument details. Others saw no need if the talks are posted on a website. Yet others emphasized publishing papers about the instruments and the mission if there are no proceedings. [See the later discussion]

The meeting will be in the Frances Arrilliga Alumni Center. An LOC has been formed drawn from Stanford organizations. Accommodations will be in the Guest House and local hotels; the committee recommends that more rooms be reserved, some with costs within the government per diem. Registration will be approximately $300 and $60 for the banquet.

Miscellaneous User Support Items—RPS forms, TOOs (David): The committee advocates that scientists enter sources they are going to analyze even if they don't ask for pointed observations.

NEW ACTION ITEM: The GUC will try out the RPS forms at the Spring, 2007, meeting in time for planning for the Cycle 2 NRA. (David).

Planning for GUC-Beta Testing in NOVEMBER 2006 (Julie, David): The issue is the balance between the testing done before the testers arrive and testing during the meeting at GSFC. Ann suggested that we provide a list of questions that we want the testers to evaluate. The focus is the testing the usability of the tools, and not testing their validity.

Joint GLAST-Ground Based Source Lists (Jim B.): The VERITAS multiwavelength committee gave the Swift team a list of sources to be monitored by the BAT. Jim B. has identified sources that GLAST should monitor. Even blue blazers are worth monitoring with

GLAST since GLAST will see the rising part of the spectrum. Peter stated that the choice of 20 as the number of sources to be monitored is arbitrary, and the list will probably grow. Steve stated that the initial number should be kept low enough that humans can perform the monitoring if an automated pipeline fails. The list of sources that will be monitored should be posted.

NEW ACTION ITEM: The GUC should maintain a longer, prioritized list of sources that the LAT should consider monitoring (Multiwavelength Committee).

Report on GLAST E/PO (Lynn, by telecon): A mapping was created between the GLAST Science Goals and the E/PO Goals, as requested by NASA HQ. There are currently 10 GLAST educator ambassadors (19 total over all missions); 22,000 teachers have been trained since 2002 in more than 240 workshops. GPO requires NASA approval to print E/PO publications, but NASA approvals have essentially come to a halt for the past ~2 years. Lynn is looking for technical reviewers of the supernova poster. The PBS special will be on NOVA on 9/26/06. The planetarium show will start at Chabot planetarium in Oakland; perhaps there can be special Stanford, HEAD meeting or GLAST showings. The planetarium show will be adapted for small portable domes. The show is being marketed by Spitz, the planetarium manufacturer. GTN has 8 telescopes and is monitoring ~25 AGN.

Science and lessons learned from INTEGRAL *(Chris Shrader):* Lessons learned: INTEGRAL was hurt by inadequate ground calibrations. The community should be engaged as early as possible; the INTEGRAL core program encompassed too much key science. The problems with calibrations and backgrounds delayed data release, hurting the mission. Software development was dominated by computer jocks. Archive and theory research in the US GI program was supported for a short time, but is no longer. One pre-launch symposium is advisable (INTEGRAL held 5).

Steve: Early results clearly help excite the community. GLAST is planning first-light calibration observations that should also result in some splashy quicklook results.

Discussion:

January AAS Session: The GLAST session at the January AAS should probably have a mission talk, a science talk geared towards multiwavelength science, and a panel of instrument and GSSC representatives who will present information and answer questions. The project will make this proposal for the special session prior to the 15 May deadline.

GLAST Symposium Proceedings: Ann thinks the Symposium should have a proceedings as a record of a major conference. We can require that submissions to the conference's website also be posted on astro-ph. But then how will the paper be referenced? An electronically posted paper can have no page limit. Julie points out conference proceedings are not easy to get unless posted on astro-ph, so proceedings are not necessarily more useful than internet posting. Proceedings may be useful if the actual papers can be accessed through ADS (some publishers permit this, other charge a fee). David pointed out that the papers resulting from the plenary talks could be significant statements of the current state of various fields of GLAST science. After much discussion, the GUC agreed there should be published proceedings (10 pages for

invited papers, 4 for contributed and 2(??) for posters). Every effort should be made to minimize costs and thus impact on conference registration fees, and the proceedings should be made available in full form (not just Abstracts) through ADS.

Next GUC meeting: Thursday-Saturday 11/16-18, 2006.

The next GUC telecom: Thursday, July 20, at 11am EDT.
2:00 Adjourn

Action Items Closed: AI#10b, AI#14, AI#27, AI#28.

New Action Items:

AI#29—We need a method to add to the list of 20 monitored sources, and to inform the community as to which sources are on the list. Assigned to Steve and Peter. To be closed at the 11/06 meeting.

AI#30—The list of ~20 sources to be monitored and for which preliminary data will be reported by the LAT Team during cycle 1 should be included in the NRA announcing the GI program for cycle 1. Assigned to David. To be closed at the 11/06 meeting.

AI#31—The 1st year data release policy and the list of 20 monitored sources should be posted on the GSSC website. Assigned to David. To be closed at 7/06 telecon.

AI#32—Prepare the PDMP for circulation to GLAST mission stakeholders. Assigned to David. To be closed at the 11/06 meeting.

AI#33—Review and revise the PDMP by Nov. 1 in advance of the Nov. 18 GUC meeting. Assigned to David, Ann, Don and Greg. To be closed at the 11/06 meeting.

AI#34—Prepare a White Paper (~2 pages, max) on the scanning vs. pointing sensitivities and tradeoffs for GLAST and to specify how proposals must make clear their need for pointed observations. Assigned to Julie and Jim B. To be closed in time for the Cycle 2 NRA.

AI#35—The GUC Multiwavelength Committee shall write a draft statement on requested support for ground-based observing in direct support of GLAST. This will be considered at the November GUC meeting to allow any required statements to be incorporated into the Cycle 1 NRA. Assigned to the Multiwavelength Committee. To be closed at 11/06 meeting.

AI#36—The GUC will try out the RPS forms at the spring, 2007, meeting in time for planning for the Cycle 2 NRA Assigned to David. To be closed in spring, 2007.

AI#37— The GUC should maintain a longer, prioritized list of sources that the LAT should consider monitoring. Assigned to the Multiwavelength Committee. To be closed at the 11/06 meeting.

Agenda for GLAST User's Committee (GUC)
GSFC, Building 2, Room 8 May 8-9, 2006

Monday, May 8:

8:30 Coffee, conversation

9:00 Welcome and Introductions (Josh, Steve)

9:05 Review November '05 meeting and Feb. '06 Telecon Minutes (Josh)

9:15 Mission Update – the view from HQ (Rick)

9:25 Project update, including Spacecraft progress (Steve and/or Kevin)

9:45 LAT status and schedule, upcoming milestones (Peter)

10:15 GBM status and schedule, upcoming milestones (Chip)

10:30 Break

11:00 GSSC status and schedule (Jay)

11:20 Mission schedule and activities (Steve)

11:40 Update on DC2 (Julie)

12:00 Lunch (in conference room) – pick up lunch and munch over GSSC tools:

12:15 Demonstration of GRB analysis using SAE tools; RPS forms; TOOs (David)

1:30 Consideration of Open Action Items
- 7. Science Policy Document: current draft from outline (Steve, Roger)
- 10b. Determine HQ policy for PDMPs (Rick)
- 14. Description of end to end processing: status of text (David)
- 20. Config. Control for Instrument Status and Ops. Parameters (Steve)
- 21. Statement on Pointing vs. Scanning (Jim B., Julie)
- 22. Which SAE tools to release for GLAST Sci. Symp.? (David, Julie)

3:30 Break

4:00 Multiwavelength observations and planning/coordination
- AI#26 report: Multiwavelength Task Force discussions/plans (Rene)
- Incorporating Swift followup team for GLAST (Neil)
- Coordinated mission AO's or reviews (e.g. GLAST-Chandra, etc.) (Steve)

4:45 Update on GLAST Sci. Symp. Planning, User Communications (Steve, Peter, David)
- Upcoming talks/posters (all)
- How to further increase GLAST awareness & community (all)

5:15 Discussion session of Committee
- general discussion and possible new action items

5:45 Adjourn

6:30 GUC Dinner at local restaurant, TBD. Directions will be provided

Tuesday, May 9:

8:30 Coffee, rolls to feed conversation/collaboration…

9:00 Remaining discussion on any open AIs (Josh)

9:45 Summary of SWG Activities (Steve)

10:00 Planning for GUC-Beta Testing in Oct. (?) 2006 (Julie, David)

10:30 Break

11:00 New business?

11:30 Report on GLAST E/PO (Lynn, by telecon)

12:00 Lunch (in conference room) and *Science Talk* (continued, GUC day2 lunches)*:*
Science and lessons learned from INTEGRAL (Chris Shrader)

1:00 Open discussion by Committee
- NEW business; what else should we be focusing on?
- action items; writing assignments; issues raised for Project/GSSC
- date for next GUC meeting

2:30 Adjourn