Gamma-ray Large Area Space Telescope

GLAST Large Area Telescope

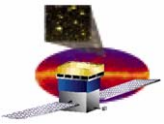## WBS 4.1.B
Instrument Science Operations Center
Monthly Status Review
## 2 March 2005

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Management

❑ **Current planning activity, for FY2006 and beyond**

– **LAT operations and staffing profile is being reworked to align with SLAC funding allocation model**

• **Clear separation of LAT operations activity from LAT science activity at SLAC, although some people will work in both areas**

– **Ensure continuity of LAT program from development phase to operations phase. Specific tasks:**

• **Accommodate project rebaseline and associated schedule change. Applies to both activity and transition of people from project funds to ops funds**

• **Ensure no necessary tasks are delayed or missed**

• **Avoid cost spike in FY2006 during the transition**

• **Coordinate work performed external to SLAC, at NRL, GSFC, Italy, France, …**
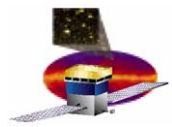
ISOC Facility

❑ **Present**

– **Offices in Building 210 now being used by ISOC for staff and development lab**

– **First 2 ISOC development workstations have been delivered, and installed in 210 development lab. ITOS, LATTE, and other software is proceeding**
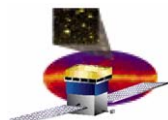
❑ **Future**

– **Costing process has been completed for ISOC facility in new KAVLI: $135K for barewalls build out of area**

– **working on Plan B: to use office space in Building 84 vacated by KIPAC, plus additional lab space for operations area**

– **working with SLAC management about utility of KAVLI build-out for other purposes, e.g. LAT scientist and visitor accommodation**
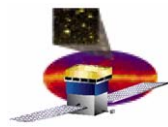
February Activity

- ❑ **ISOC software systems design**
  - – **Review of ISOC data flow diagrams has been completed. These diagrams are now being used to guide allocation of software development tasks, and also estimate developer FTE needs.**

- ❑ **Supported Ground Operations TIM at GSFC**
  - – **Progress on definition of ground tests with MOC, GSSC**
  - – **ISOC schedule refined to better match ground tests and LAT schedule**
  - – **Planning development of LAT procedures and scripts to be used by ISOC and MOC for: routine ops; LAT activation and checkout; LAT contingency ops**
  - – **Defining LAT GSE reqts (hardware and software) in MOC: Coordinate inputs from sub-systems via Systems Eng and I&T**

ISOC Development Schedule

| Phase / Milestone	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
ITOS/Latte setup/config.	████████████████████																															
DB/Web/Logging Dev	██████████████████████████																															
Plotting/Trending Dev	████████████████████████████████																															
Pipeline/File Transfer Tool Dev		████████████████████████████																														
Mission Planning Dev		████████████████████████████																														
Diagnostic Tool Dev											██████████████████████████████████																					
ITOS/Latte Verif. with VSC/Testbed							◆1		◆2																							
Demos	◆1			◆2			◆3		◆4	◆5		◆6											◆7									
Data Challenges							2 ▬▬▬▬▬						3 ▬▬▬▬▬▬																			
SW Testing & Releases					▮ ◆ 5/17 1							▮ ◆ 12/9 2				▮ ◆ 4/17 3									▮ ◆ 11/30 4							
Ground Readiness Tests					◆ 6/15 2		◆ 8/15 3		◆11/1 4		◆ 1/17 5				◆ 5/17 6		◆ 7/12 7															
End-to-End Tests								◆ 2/8 1		◆ 5/4 2	◆ 6/15 3		◆ 8/24 4	◆ 10/16 5														◆ 5/1 6				
Environmental tests at NRL										███████																						
ISOC available to I/F with LAT (front-door only)										██																					
Mission Simulations													██																			
Major Milestones							◆ 1/17 MOR																		◆ 12/15 FOR			◆ 3/28 GS Freeze		◆ 5/28 Launch		

February Activity (cont.)

❑ **Fastcopy**
- – **Fastcopy has been successfully installed on GLAST02 and GLAST03 servers. No testing to other GLAST elements outside SLAC yet.**

❑ **ITOS and ITAR**
- – **exploring option of limited-function ITOS, to potentially avoid ITAR issues**
- – **rely on CCSDS packet transmission of commands and telemetry**
- – **compatible with VSC interface**
- – **not compatible with SIIS interfaces**
- – **technical details being worked, before addressing ITAR issues**

❑ **System development**
- – **Moving data from Building 33 to the pipeline: ISOC is cooperating with I&T/Online to have I&T data transferred in flight-like CCSDS format, to exercise realistic data ingest and processing**
- – **Stage 1: move HK data into ISOC HK db using pipeline** ✔
- – **Stage 2: Process HK data in CCSDS/L0 format**
- – **Stage 3: Process Science data in CCSDS/L0 format**
- – **Ideally, this process should continue for LAT at NRL and SASS**
- – **See Demo**
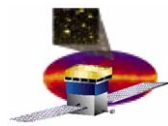
February Activity (cont.)

- ❑ **SAA region definition using TPM radiation model from SEE group at NASA/MSFC**
  - – **installed and tested**
  - – **advertised as being more accurate than older AP8 model**
  - – **but not ideally constructed for GLAST needs**
  - – **TPM runs in 2 stages:**
    - • **1. An orbit propagator takes orbit elements and generates a binary file of the propagated orbit**
    - • **2. binary orbit file is input to model code to generate trapped proton fluxes for each orbit position**
  - – **large discontinuities seen in output orbit position data, which prevents mapping the complete SAA region**
  - – **further investigation is in progress**
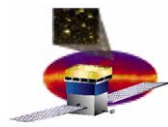
Issues and Concerns

- ❑ **LAT diagnostic data**
  - – **FSW uses diagnostic APIDs for TCS monitoring, HK dwell, command echo and potentially other purposes**
  - – **potential conflict of continuous diagnostic telemetry with real-time alert telemetry on alert-initiated TDRSS MA downlink, causing delay of alert data**
  - – **limits to use of LAT diagnostic data?**
  - – **other technical solutions: separate priorities of alert and diagnostic APIDs?**
- ❑ **PROC development and validation platform**
  - – **need an agreed platform for pre- and post-launch PROC development**
  - – **Hotbench + ISIS may not be adequate**
    - • **uncertain long term joint availability**
    - • **ISIS is not a complete LAT emulation**
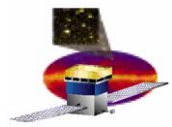
Near Future Activities

- ❑ **ISOC software release #1: 15 May 2005**
  - – **scoped to support GRT #2, #3**
- ❑ **GRT #2: 15 June 2005**
- ❑ **GRT #3: 15 August 2005**
- ❑ **Also support for interface tests with GSSC (GSTs)**