GLAST
Collaboration Meeting
March 20-22, 2000

Scott Lambros
GLAST Project Formulation Manager
NASA/Goddard Space Flight Center
GLAST Instrument Selected
February 25, 2000

- GLAST Large Area Space Telescope, P.I. Dr. Peter Michelson, Stanford University.
- Gamma-ray Burst Monitor, P.I. Dr. Charles Meegan, NASA/MSFC.
- IDS Investigators selected:
  - Dr. Chuck Dermer, NRL
  - Dr. Brenda Dingus, UW
  - Dr. Martin Pohl, U. of Bochum, Germany
  - Dr. Stephen Thorsett, UCSC

CONGRATULATIONS!!
## GLAST Long-Term Schedule

### Project Flow

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### Project Milestones

- MCR
- SRR
- NAR
- PDR
- CDR
- New Start
- Inst. Del.
- PER
- PSR
- LAUNCH

### Instrument Technology

- Instr. Tech. NRA

### Instrument Concept Development

- Instrument Concept Development

### Flight Instrument

- Instr. AO
- Instr. Selection
- Long Lead Procurements

### Spacecraft

- S/C Accom.Study
- S/C Accom.Study
- S/C Selection
- Design
- Build
- I & T

### Ground System

- Design
- Build
- I & T

### Launch Vehicle

- Launch Vehicle Procurement

### Revised 2/28/00
Schedule: Changes/Issues

- SRR moved from April to September 2000.

- Independent Assessment: moved to April 1 through October 15, 2000 (straddles SRR).

- Phase B start moved to October 1, 2000.

- Mission PDR moved from April 2002 to August 2001, just prior to NAR.

- Spacecraft Procurement moved from Sept. 2001 to September 1, 2002; Accommodation Studies done once per year before then.
Completed Project Activities

- System Peer Review, June, 1999.
  - Independent Review Panel within GSFC.

- Completed draft Mission System Specification.
  - Specifies requirements for complete mission.
  - Flowed down from Science Requirements.
  - Expands on some requirements.
  - Needs to be reviewed by instrument teams and Science Working Group (SWG).

- Updated Operations Concept Document.
  - Needs to be reviewed by instrument teams and SWG.
  - Includes list of issues to be resolved.

- Updated Interface Requirements Document (IRD) for AO: next update at this meeting.
Completed Project Activities
(continued)

• Launch Vehicle/Inclination trade study: baseline remains the same, Delta 7920, 28° inclination.

• Spacecraft Procurement Trade Study.

• Independent Science Operations Center configuration study.

• Mission Operations Center: investigated (including initial cost estimates) CSOC and industry options. This will be an ongoing activity.

• Completed Spacecraft Specification: to be used in Spacecraft Accommodation studies.

• Implemented requirements database tracking system, using DOORS software.
  – Possible to expand to multiple organizations.
GSFC Contracts

• Letter contract with Stanford being implemented; goal for full contract June 15, 2000.
  – P.I. Responsible for entire instrument development.
• Inter-agency agreement with NRL; funds transfer to GSFC code 600.
  – Per P.I.’s instructions.
  – Statement of work developed by Stanford.
• List of deliverables being negotiated.
• Items in selection letter must be negotiated.
• Individual contracts with Interdisciplinary Scientists (IDS).
• Contract has basic period for Formulation Phase. Option for Implementation Phase contingent on successful completion of NAR and HQ approval for new start.
• Foreign participants on a no-exchange-of-funds basis, but ….. ITAR.
International Traffic in Arms Regulation (ITAR)

- U.S. Law.
- All spaceflight activities and activities leading to a space flight are included in the ITAR list.
- Governs control of technical data exported to foreign countries.
- NASA agreements/exemptions do NOT cover contractors.
- Will need a NASA agreement (e.g., MOU) with each foreign partner.
Spacecraft

• Using Goddard’s Rapid Spacecraft Development Office (RSDO) “catalog” spacecraft.
• Developer under contract 09/01/02 (3 years before launch).
• “Accommodation Studies” performed each year for the next three (3) years.
  – To help define interfaces to instrument, ground system.
  – Each succeeding year supplies more detail; concentrates on specific interface problems.
  – Approximately 2-3 vendors selected each year: for 3-5 month study used to bound the configuration possibilities.
• Project determines interface requirements to instrument and to spacecraft, using inputs from both, and engineering team.
Accommodation Study - 2000

- Preparations underway (see schedule).
- ATD final report used as instrument background information.
- Controlling documents to the spacecraft are the IRD, Spacecraft Specification, and Mission system Specification.
- Request list of instrument major components and materials, with mass and dimensions, for re-entry analysis.
- Communication with study contractors will be blacked out during proposal stage, then after winners selected, through GSFC Project to alleviate confusion and conflicting direction.
- Spacecraft Accommodations study web page on Project website: http://glastproject.gsfc.nasa.gov/scaccomm.htm
• Independent study @ GSFC defined strawman SOC configuration.
  – Assumed long-term archive at HEASARC.

• Differences between SOC Study and Instrument Proposal.
  – Need to negotiate an agreed upon architecture.
  – Both documents can be used as a starting point for discussion.
  – Needs to include Science Working Group.

• Forming team to resolve issues and recommend a Ground System configuration
  – Some issues resolved before contract signing, others before SRR.
  – Timeframe is now through July; longer if lingering issues.
  – Chairperson is Steve Tompkins.
  – Needs approval from SWG.
Reviews

• Working on agreed plan with the Project, Instrument Team, GSFC Code 300 (Systems Review Office), and DOE.

• To cover:
  – Major reviews (PDR, CDR, Operations & Readiness Review, Independent reviews, etc.).
  – Instrument quarterly reviews.
  – Technical working meetings.
  – Reporting requirements.

• An attempt will be made to combine reviews wherever possible.
Upcoming Reviews

- System Requirements Review (SRR): will probably be a combined instrument and mission review.
- Independent Assessment: long-term (April - October, 2000) assessment of project preparedness. Instrument team participation is unclear. Review performed by independent team from Langley Research Center. Chair is also NAR Chair.
- Preliminary Design Review (PDR): instrument and mission reviews at about the same time (August, 2001), so probably will be combined.
- Non-Advocate Review (NAR), August, 2001: gateway to “New Start” and continuation of contract option. Usually same week as PDR.

- Other:
  - NASA Red Team Review.
    - Timing is TBD.
Planned Activities

• Systems Engineering Integrated Product Team.
• Schedule audit.
  – 1 - 2 week activity reviewing all schedules.
  – Product is an indication of schedule mis-matches and potential problems.
  – Probably in April - May timeframe.
• Technical Resource Management.
  – Need a formalized process for managing (tracking, controlling, and reviewing) technical resources such as mass properties, power, volume, and data rate.
Near-Term Plans

- Negotiate and complete Fight Instruments and IDS contracts.
- Update IRD and MSS.
- Spacecraft Accommodation Studies.
- Prepare for SRR.
- Initiate Ground System Team activities.
- Independent Assessment.
- Negotiate Mission Assurance Requirements.
- NASA - DOE MOU.
### Near Term Schedule

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### Diagram

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- Instr. Contract
- Collaboration Mtg
- SWG
- SRR
Near Term Schedule
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