

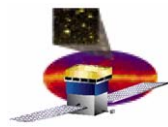
# GLAST Large Area Telescope

**WBS 4.1.B**

**Instrument Science Operations Center  
Monthly Status Review**

**1 Sept 2004**

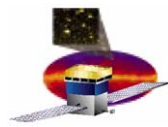
**Rob Cameron  
rac@slac.stanford.edu  
650-926-2989**



# July/August Accomplishments: Overview

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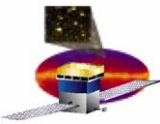
- ❑ **Completed successful CDR and GSDR reviews**
- ❑ **RFAs being addressed**
- ❑ **Refined Functional Organization and Architecture**
- ❑ **Staffing: new hires; future hires**
- ❑ **ISOC Level 2 and 3 Requirements in review and tracing**
- ❑ **ISOC Design and Development**
  - **Scoping of ISOC software: new development vs. re-use**
  - **Software and network architectures refined**
  - **Software development schedule**
- ❑ **Operations Planning**



# ISOC Reviews and RFAs

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- ❑ **ISOC Peer Review: 2 March 2004**
- ❑ **ISOC CDR: 4 August 2004**
- ❑ **GLAST GSDR: 18-19 August 2004**
  
- ❑ **CDR: very successful review**
  - **8 RFAs and 8 Recommendations received**
  - **4 RFA responses submitted for review**
  - **Responses for remaining RFAs to be submitted by mid-September**
  - **Recommendations: 7 completed, 1 in work**
  
- ❑ **GSDR: very successful review**
  - **Awaiting final list of RFAs**
  - **No ISOC-specific RFAs**
  - **Ground-system RFAs will be applied to ISOC as needed: command encryption; validation of L&EO ops procedures.**

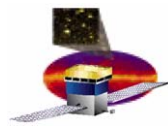


# CDR RFA Status

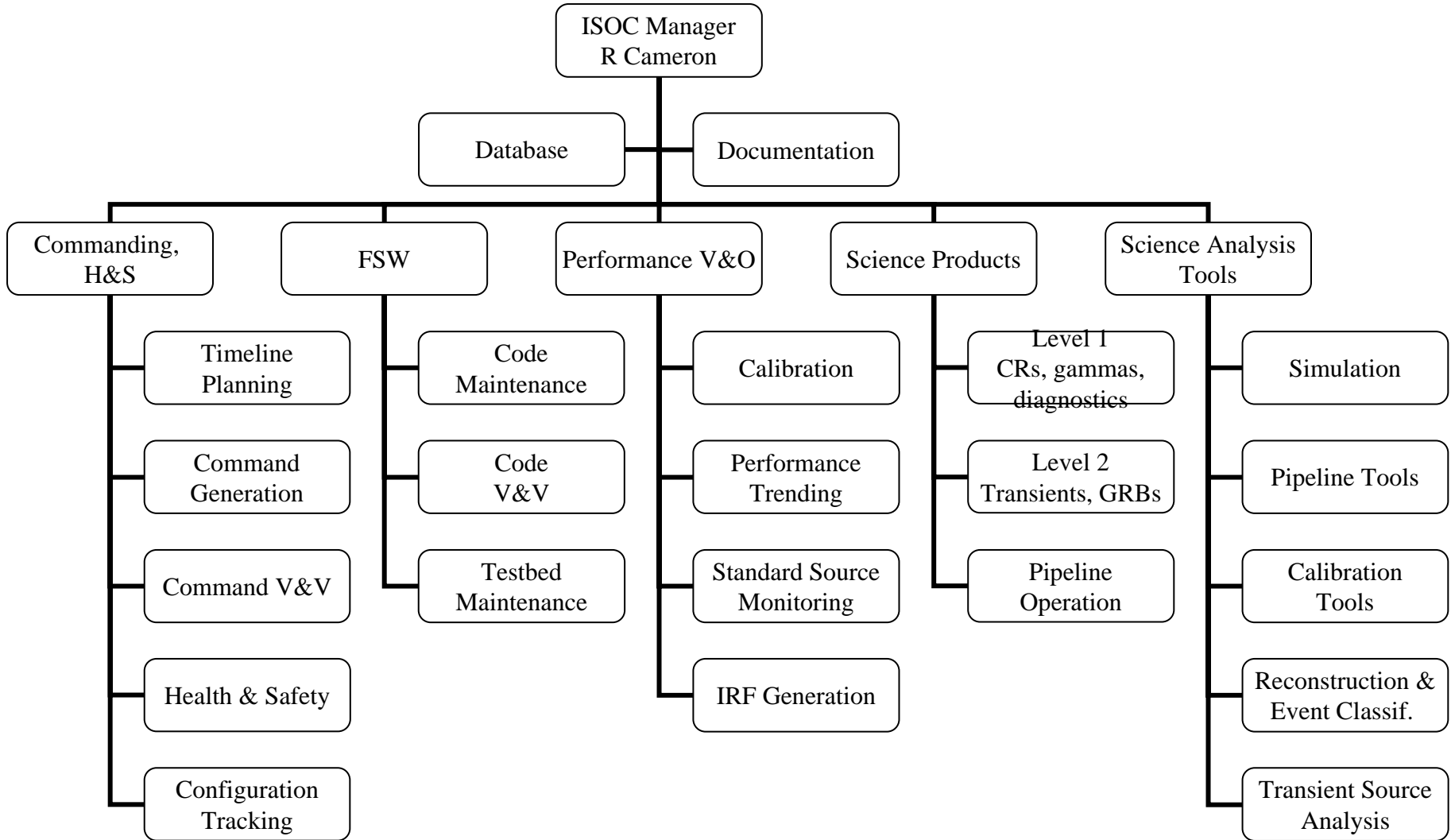
Section	RFA Title	Requestor	Actionee	ECD/Comments	Sent to Originator for Review	Submitted to Chairpersons	Closed
1	ISOC Documentation Tree	E. Andrews	L. Bator	Response submitted	8/12/04		
2	Requirements Traceability Tool	E. Andrews	B. Craig J. Martin	Response submitted	8/27/04		
3.1	Add ISOC Architecture Diagram	E. Andrews	B. Craig	Response submitted	8/16/04		
3.4	ISOC Requirements & Testing (Overall)	E. Andrews	J. Martin	9/15/04			
4.2	SAA Handling Approach	N. Johnson	L. Bator	Response submitted	8/30/04		
4.2	Launch Critical Support Pan	M. Rackley J. Leibee	S. Culp	9/15/04			
4.2	Red/Yellow Limit Philosophy	J. Leibee	L. Bator	9/10/04			
8	SAS Verification Approach	M. Rackley	J. Martin	9/10/04			

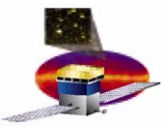
# CDR Recommendation Status

Section	Recommendation Title	Requestor	Actionee	ECD/Comments	Completed
2	Handling Data Gaps	M. Rackley	S. Culp	8/13/04	8/10/04
2	Requirements Verification Methods	E. Andrews	J. Martin	Changes completed	8/9/04
2	Handling LAT Alerts	M. Rackley	L. Bator	Answered at Ops TIM	8/5/04
2	Requirements Specification Tree Enhancements	M. Rackley	L. Bator	Handled by RFA (documentation tree)	8/12/04
3.1	Corrections to Interface Diagrams	M. Rackley	L. Bator	Corrections made	8/9/04
3.3	Transitioning SVAC I&T Tools to ISOC	M. Rackley	B. Craig	GSDR Presentation	8/19/04
6	SAS WBS/Subsystem Consistency	E. Andrews	B. Craig J. Martin	9/3/04	
n/a	FSW Test Team - Selection Process	B. Atwood	B. Craig	Search underway	8/20/04



# Refined ISOC Organization

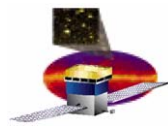




# ISOC Staffing

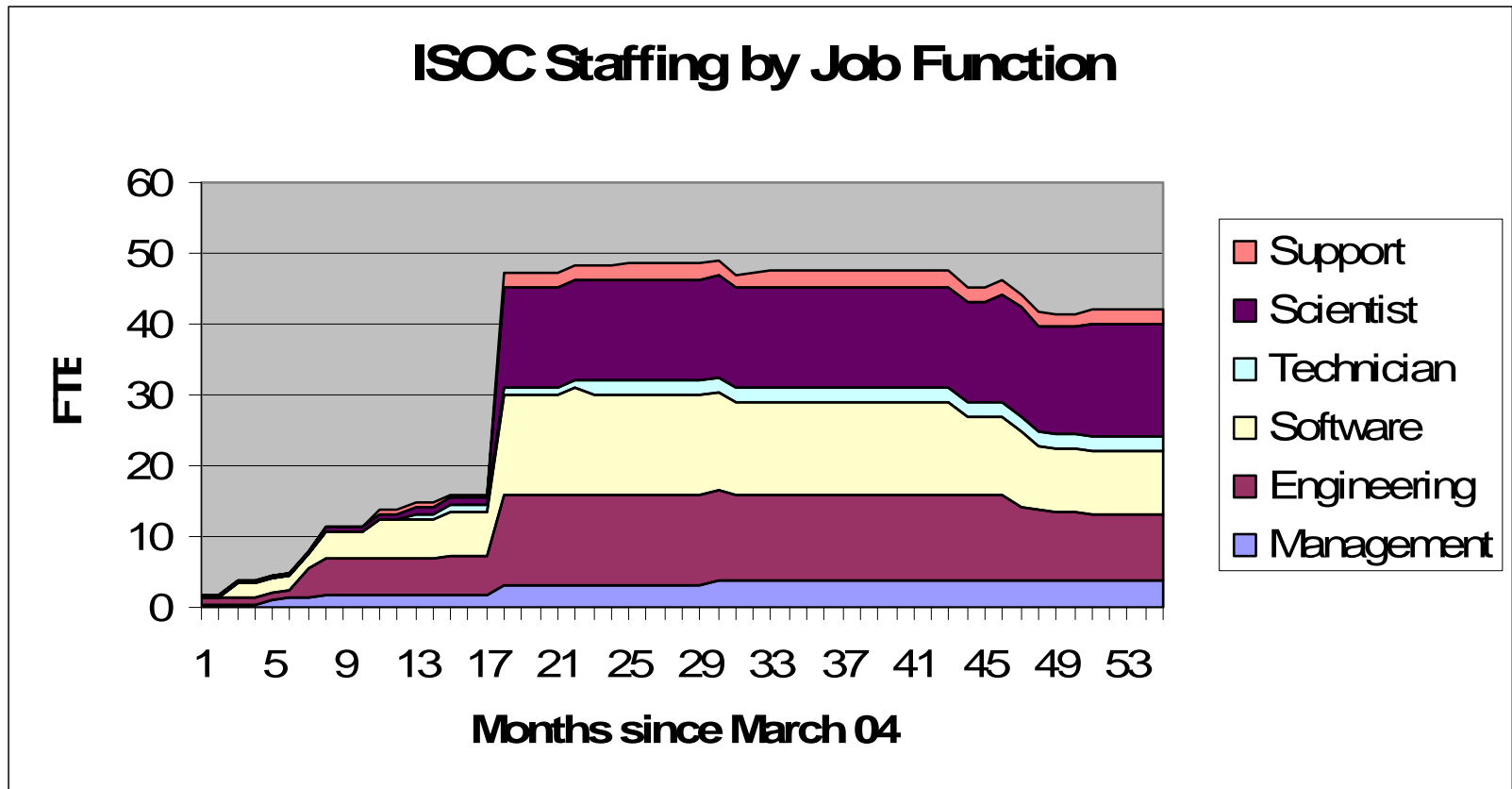
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- ❑ **ISOC staffing is ramping up**
  
- ❑ **New Hires:**
  - **Jim Lemon, Database developer, 2 August**
  - **Lee Steele, Technical writer, 23 July**
  - **Rob Cameron, ISOC Manager, 16 August**
  
- ❑ **Future hires:**
  - **Software developers: 2004, early 2005**
  - **Test Planner/Engineer: 2004**
  
- ❑ **Planning underway for merge of FSW, SVAC groups into ISOC**

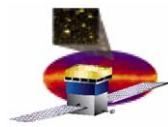


# ISOC Staffing Plan

- ❑ Projected staffing profile to be revisited and revised
- ❑ Includes SWG/SAC scientists



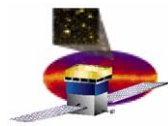




# ISOC Requirements – Review and Tracing

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- ❑ Level 2 and 3 requirements in review, preparing for signoff
- ❑ Level 2 and Level 3 moved to Doors
  - Includes SS-00015, SS-00020 (SAS), SS-00021
  - Will leverage LAT's use of Doors for the Instrument
- ❑ Have completed first round of traceability
  - L2 to GSRD
  - L3 to L2
- ❑ Refinements to both levels and to traceability over next few weeks
- ❑ Plan to include testing
  - test procedures and results

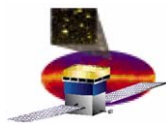


# Scoping of ISOC Software

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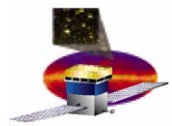
- ❑ **L3 Requirements mapped to software resources**
- ❑ **Each requirement was identified as:**
  1. **Procedural (non-software)** **42**
  2. **Existing software (commercial or other well-established software -- i.e. implementation Done!)** **277**
  3. **Under development by SAS (mostly done, refer to SAS for status)** **39**
  4. **To be developed by others (I&T, FSW, ITOS)** **21**
  5. **Remaining new development** **88**

**total      467**
- ❑ **Some requirements map to multiple categories or SW tools, so total exceeds total number of L3 Rqts (379)**

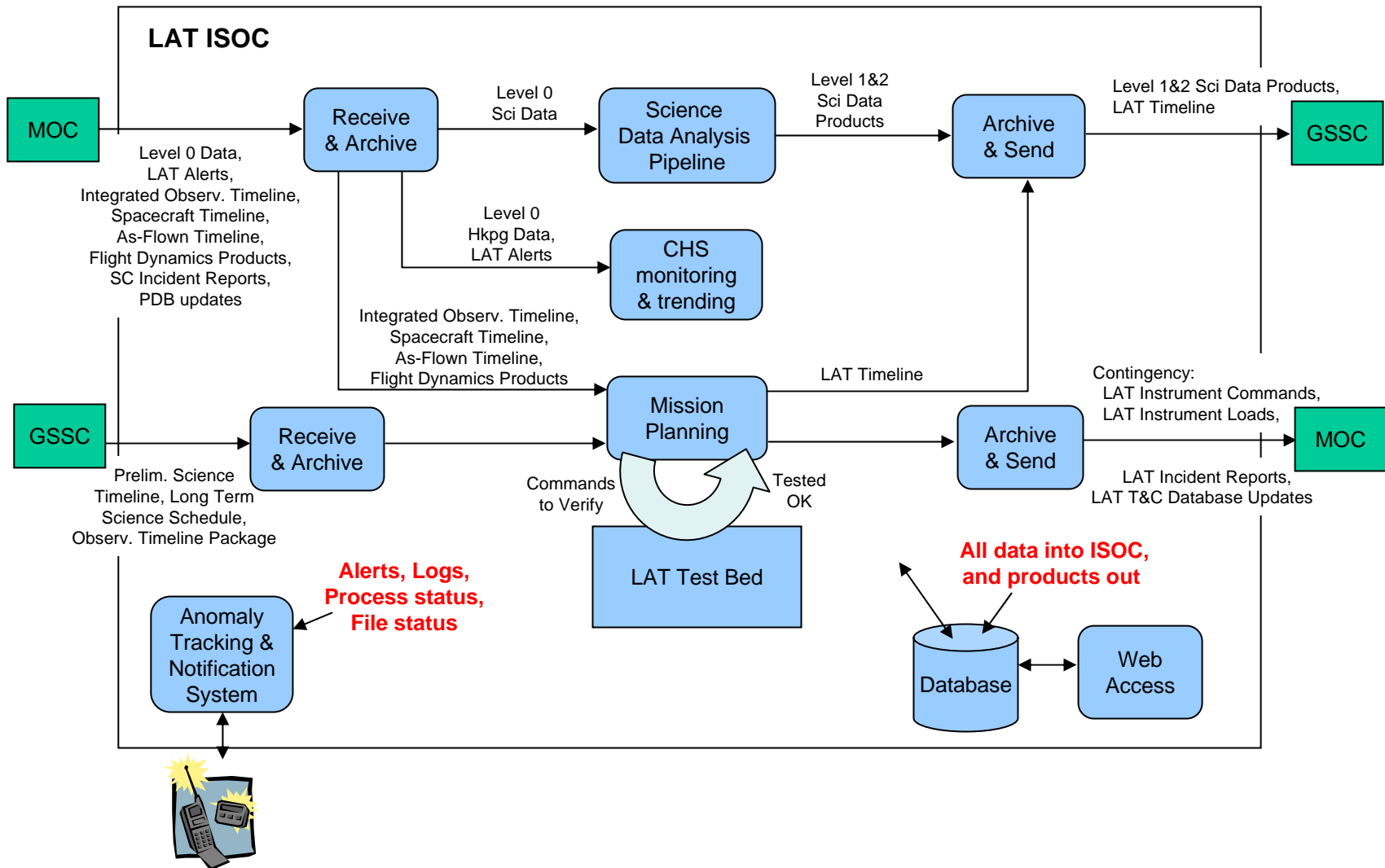


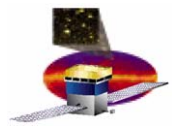
# ISOC Software: to be developed

Tool Name	Description	# Level 3 Reqts	% of Reqts	Comments
PLOTTOOL	plotting	28	6.0%	combination of existing tools (e.g. ROOT, HippoDraw, JAS, IDL) & new dev
TRENDTOOL	trending	16	3.4%	combination of IDL, DTAS (used by MOC), and/or TAPS (GSFC)
PLANTOOL	mission planning	6	1.3%	generate timeline and commands for LAT operation
CONSTRAINT TOOL	check command sequences against constraints	12	2.6%	
DB	database definition and implementation	10	2.1%	partially done by SAS, I&T, FSW - coordinating dev with SAS, I&T, FSW, SCS
DBIN	ingest ISOC data	7	1.5%	
WEBTOOL	provide web access to data products	9	1.9%	
<b>Total</b>		<b>88</b>	<b>18.8%</b>	

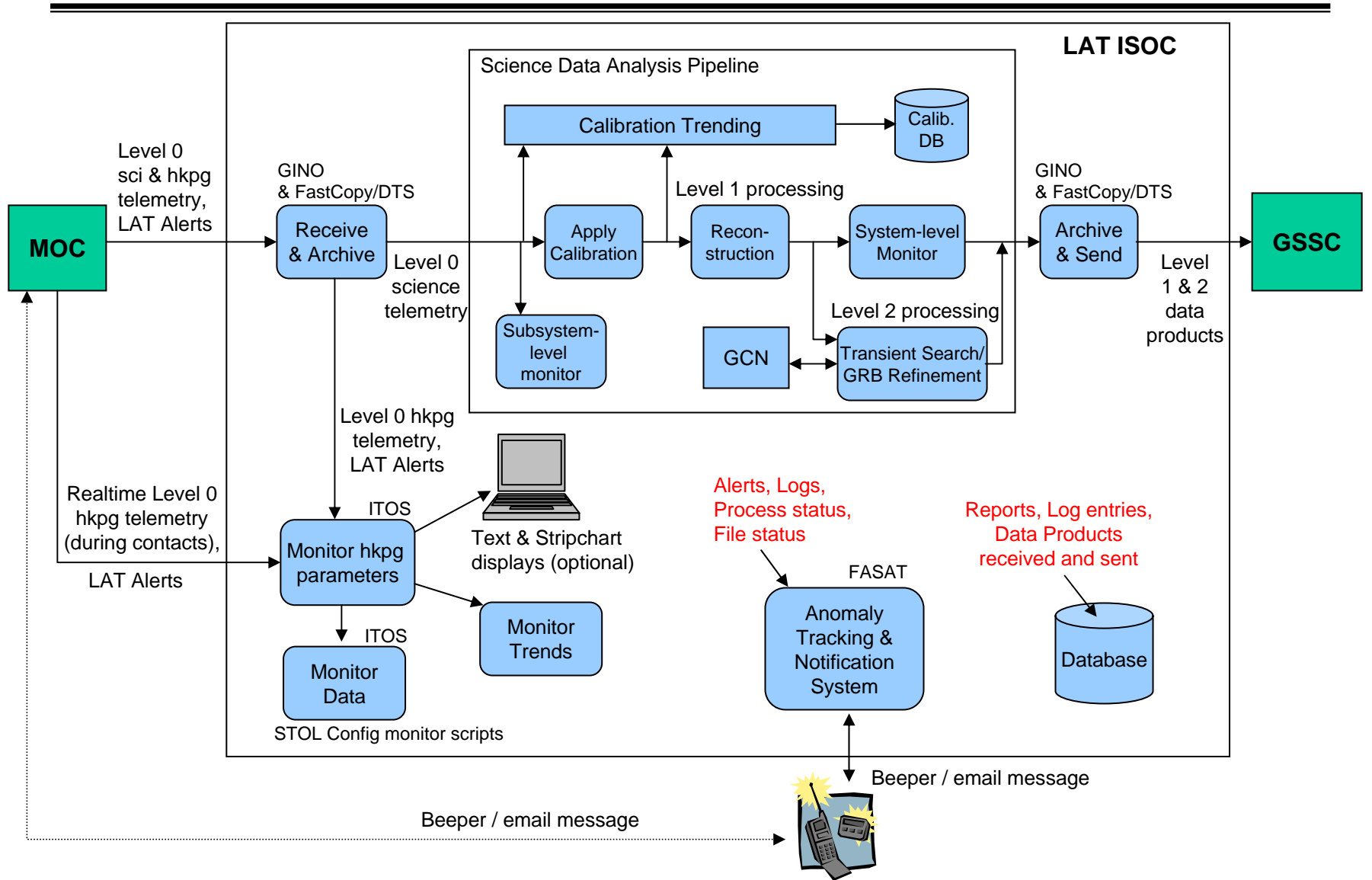


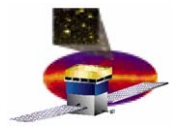
# Software Design: Primary Data Flows



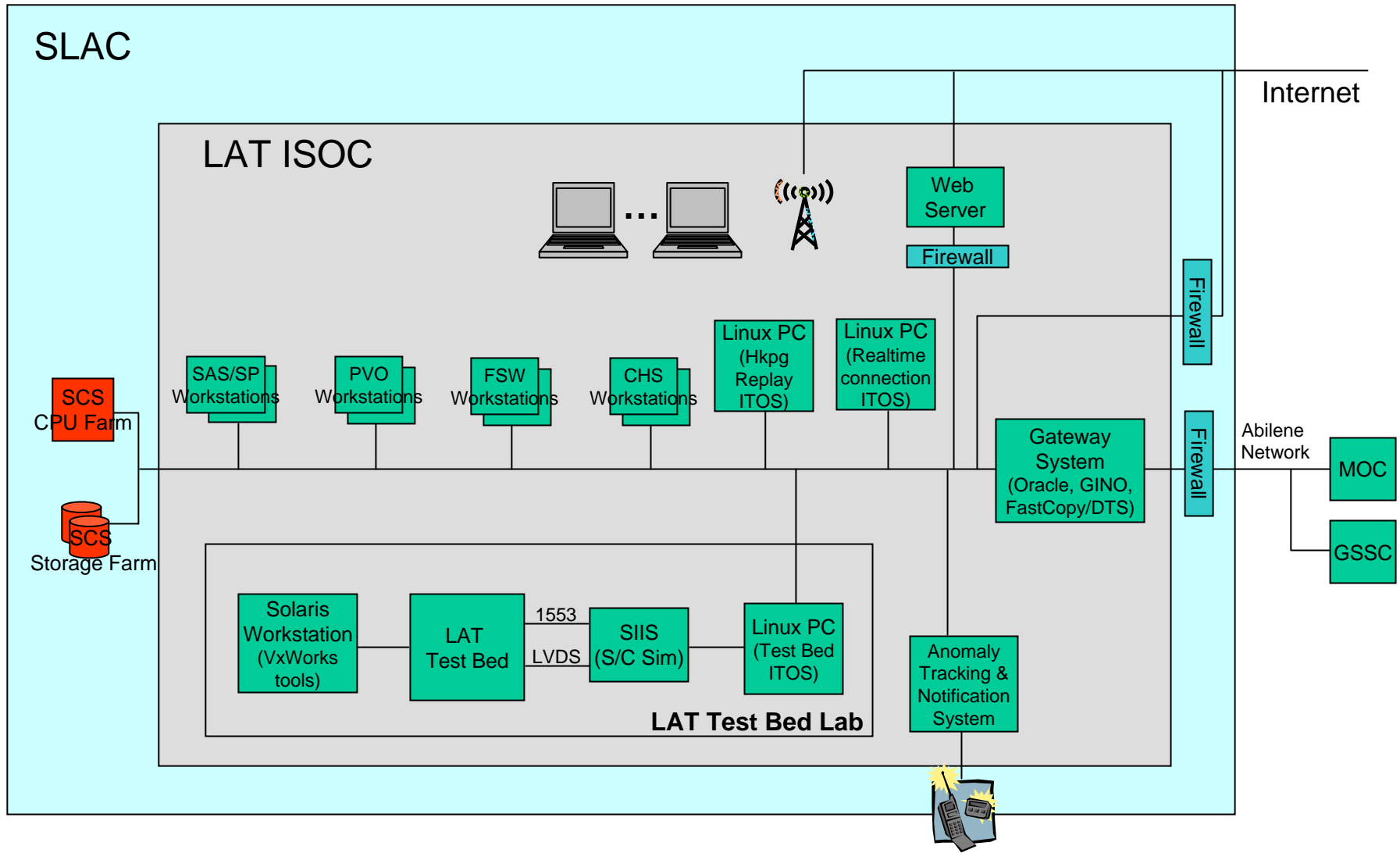


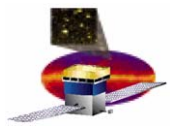
# Software Design: Telemetry Processing





# ISOC Network and Hardware Architecture

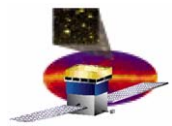




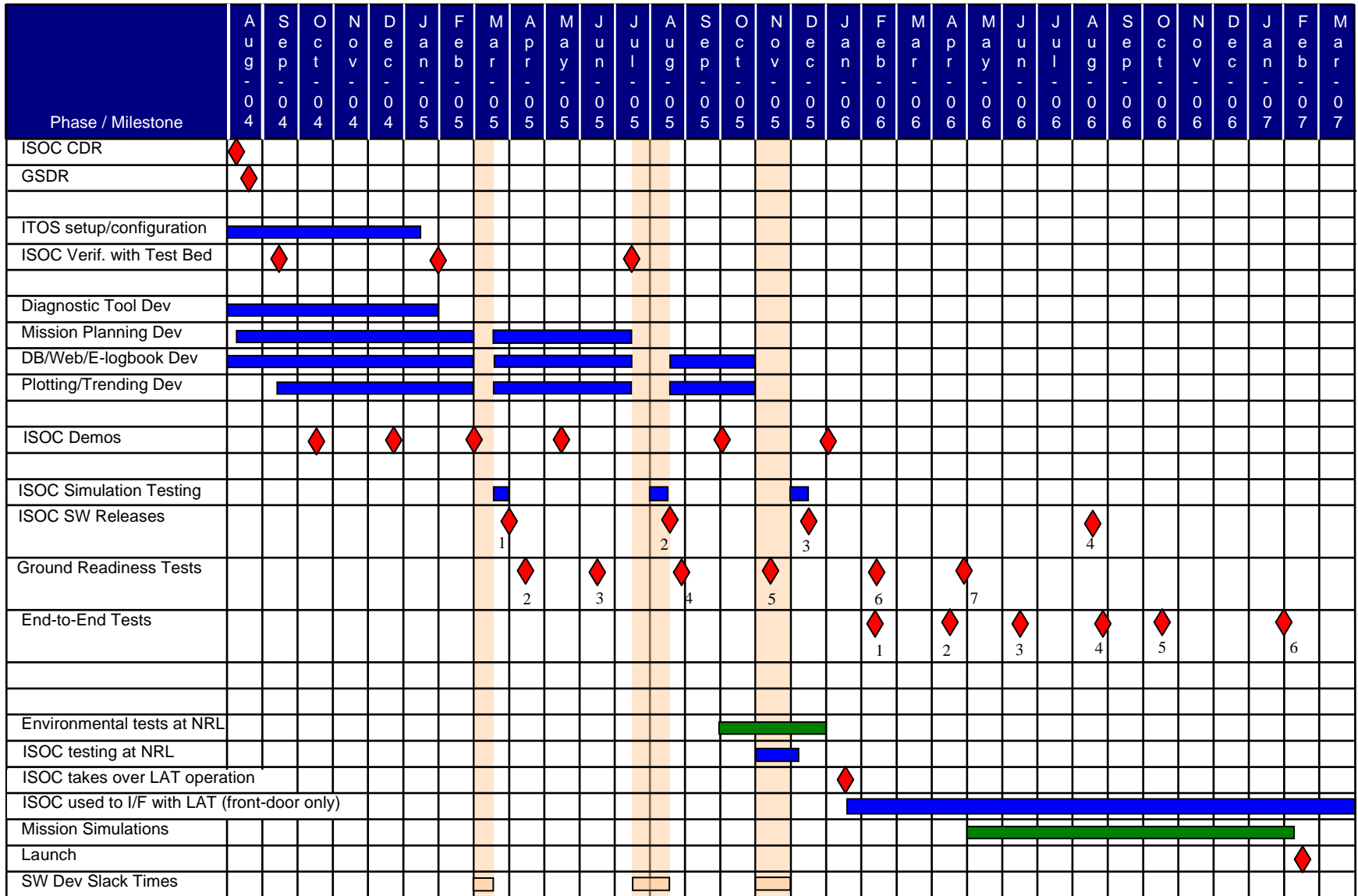
# ISOC Software Release Schedule

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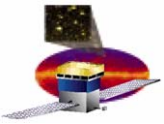
- ❑ **New software architecture in place, centralizing all software releases; eliminating the various separate software release schedule as in the PDR schedule**
- ❑ **The schedule has been coordinated with GSFC Ground System plans**
  - **ISOC Software Release 1 (April 1, 2005)**
    - **Support Ground Readiness Test (GRT) 2 and 3**
  - **ISOC Software Release 2 (August 15, 2005)**
    - **Support GRT 4 and 5**
  - **ISOC Software Release 3 (December 15, 2005)**
    - **Support End-to-End 1, ETE 2, ETE 3, GRT 6, GRT 7, and Mission Sim**
  - **ISOC Software Release 4 (July 25, 2006)**
    - **Support remaining ETE's 4, 5, and 6**



# ISOC Development Schedule



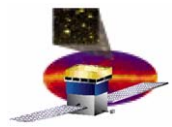




# LAT Operations Planning

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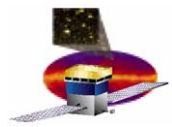
- ❑ **Continuing to finalize details of operations timeline and commanding process with GSSC and MOC through**
  - **Weekly GOWG meetings**
  - **Ops TIMs. Latest on August 5**
  - ***Operations Data Products ICD (492-MOC-009)***
  - ***Operations Agreement***
- ❑ **LAT operations planning documented in *ISOC Operations Plan (LAT-SS-01378)***



# Cost & Schedule Status

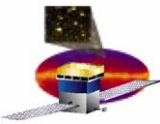
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- ❑ **ISOC effort is off project**
- ❑ **Development schedule produced from software scoping**
- ❑ **Overall staffing and resources being scoped to allow smooth transition of SAS, SVAC and FSW groups into ISOC**



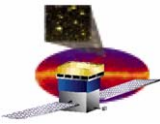
# Backup Slides

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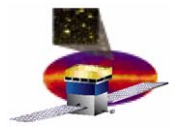
# ISOC Risk Status

Number	Date	Rank	Originator	Description	Mitigation
ISOC-0001	5/15/04	1	B. Craig	ISOC lacks accepted architecture and plan for software implementation.	Trade study between possible front ends to be completed by 6/15/04. Hires into s/w architecture position. Successful CDR retires risk
ISOC-0002	5/15/04	3	B. Craig	Slow response to PDR RFAs	Schedule and track RFA's weekly. 3 remain as of 8/02
ISOC-0003	5/17/04	2	B. Craig	Inadequate staffing plan for ISOC.	Draft staffing plan complete. Culp, Lemon, Steele hired, S/W developers needed in Sep/Oct
ISOC-0004	5/21/04	4	B. Craig	No facility location identified for ISOC	Long-term solution identified, short term space to be requested from SLAC management.



# ISOC Risk Status (2)

Number	Date	Rank	Originator	Description	Mitigation
ISOC-0005	5/21/04	2	B. Craig	No requirements levied on I&T and Flt S/W subsystems	Mechanism in place with I&T and FSW Final disposition after joint requirements review.
ISOC-0006	5/21/04	1	B. Craig	ISOC will be unable to hold schedule due to staffing delays and unscoped work	Definition of work plan follows architecture development. Additional support supplied as requested but need to balance new hires vs transfers from other subsystems.



# Issues and Concerns

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- ❑ **Frontloaded software support needed.**
  - **Need to limit hires to account for expected transfers from other subsystems.**
- ❑ **Database architecture not as well developed as we would like**
  - **Need to deliver I&T databases soon while retaining an overall structure that makes sense for the ISOC**
- ❑ **Requirement completeness,**
  - **risk of missing requirements, mitigation in work (DOORS and full requirement review)**
- ❑ **Many software elements need to interoperate smoothly**
  - **Early testing reduces problem, and certainly easier than writing the code anew**