



GLAST LAT International Finance Committee Meeting

Telecon, May 23, 2008



Agenda

7:00 am*	Introduction	S. Kahn (5 min + 5 min)
7:10 am	Mission Status Summary	S. Ritz (5 + 5)
7:20 am	LAT Collaboration Status	P. Michelson (5 + 5)
	- science coordinators	
	- ISOC	
	- membership	
7:30 am	Analysis Coordinator Report	J. McEnery (7 + 3)
7:40 am	Computing Report	R. Dubois (10 + 5)
7:55 am	Proposed CY09 Budget	P. Michelson (10 + 5)
8:10 am	Updates from Agencies & Discussion	all (40 min)
8:50 am	Action Items and Next F2F meeting	S. Kahn
9:00 am	adjourn	

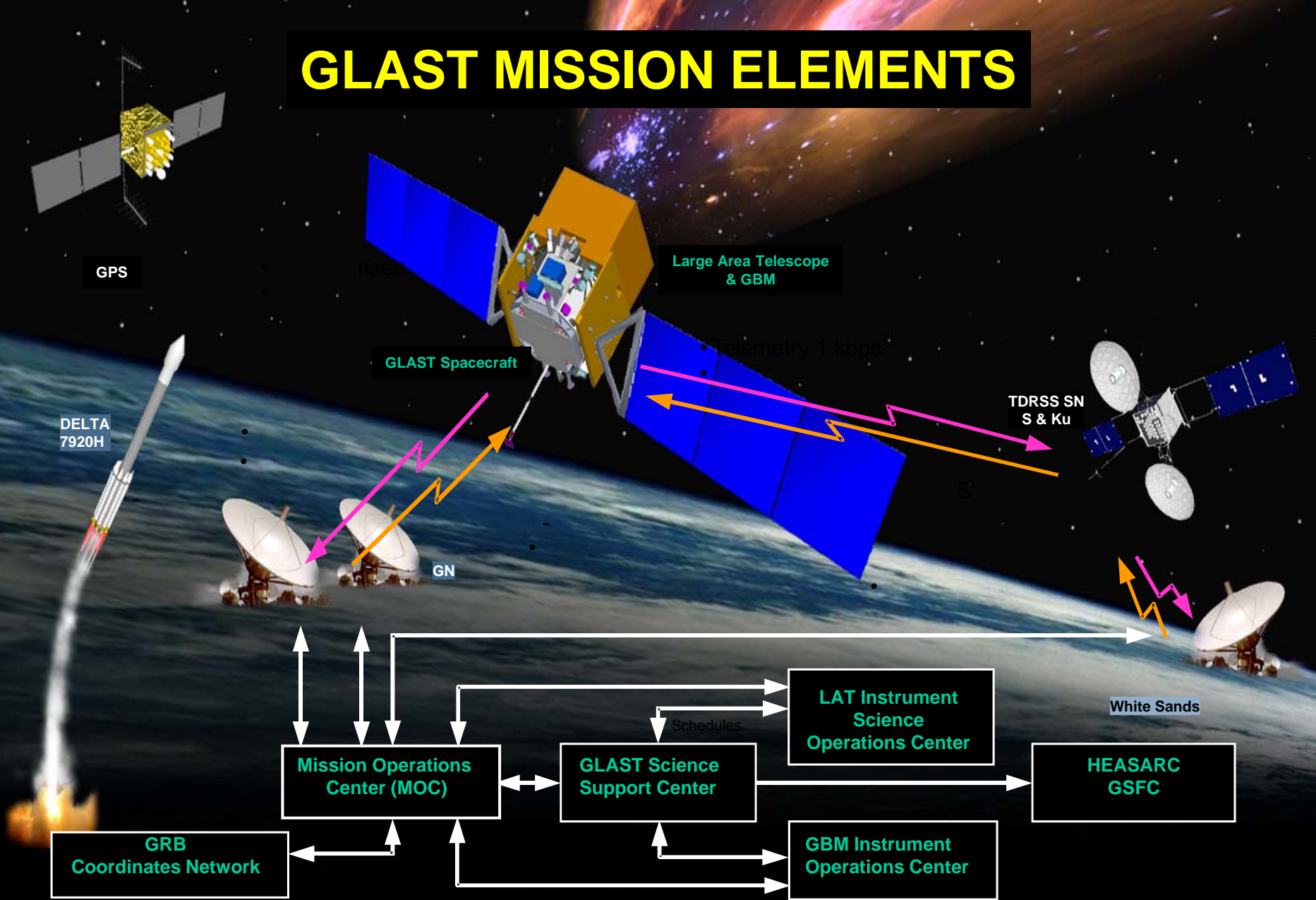
* Pacific daylight time



MISSION STATUS SUMMARY

Steve Ritz

GLAST MISSION ELEMENTS





GLAST Observatory, May 15, before moving to the Launch Pad





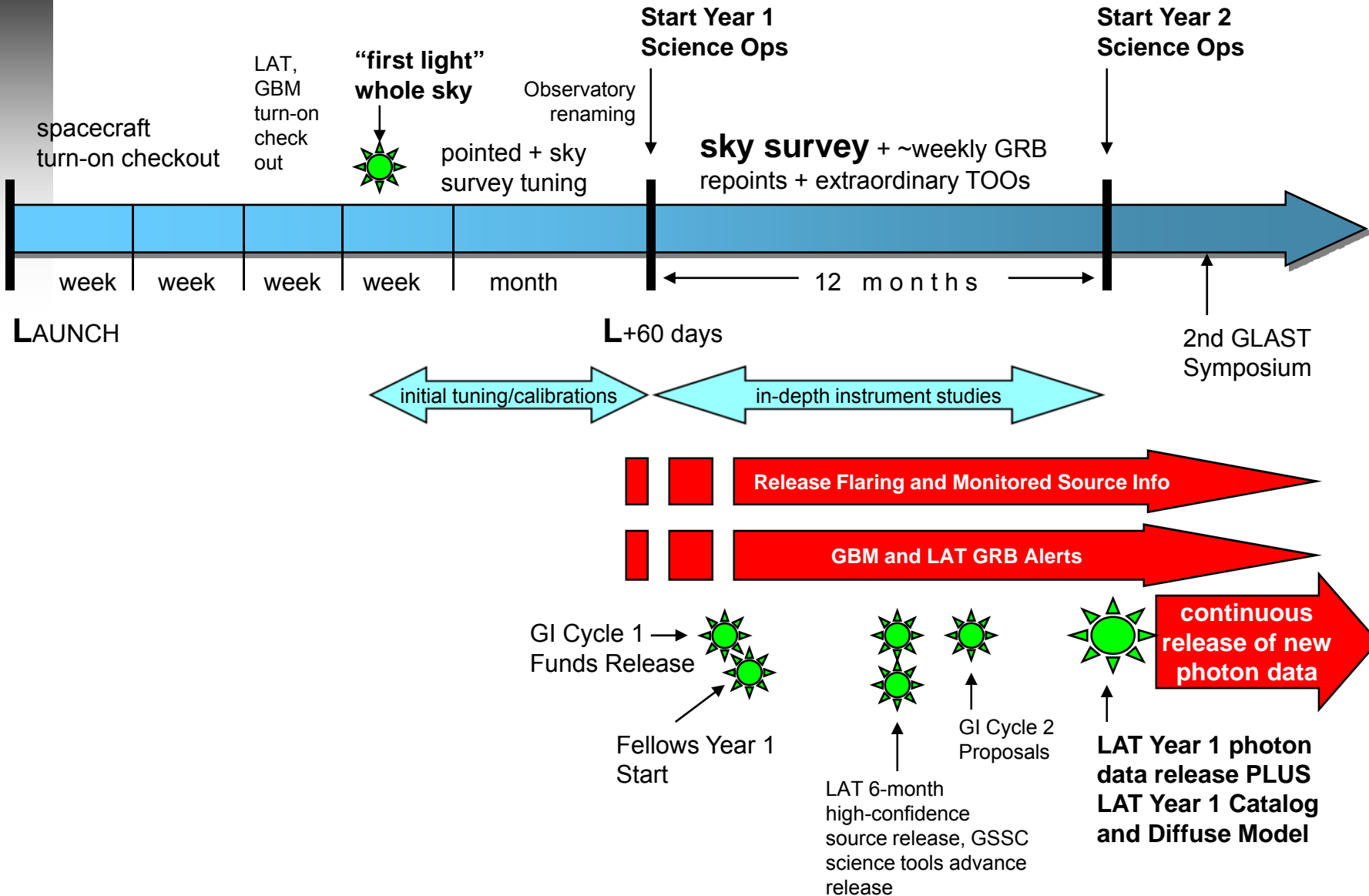


GLAST Status

- GLAST observatory now mated to the launch vehicle.
- Observatory testing is complete. Ready to go!
- Launch vehicle undergoing final testing, in preparation for June 3 readiness date.

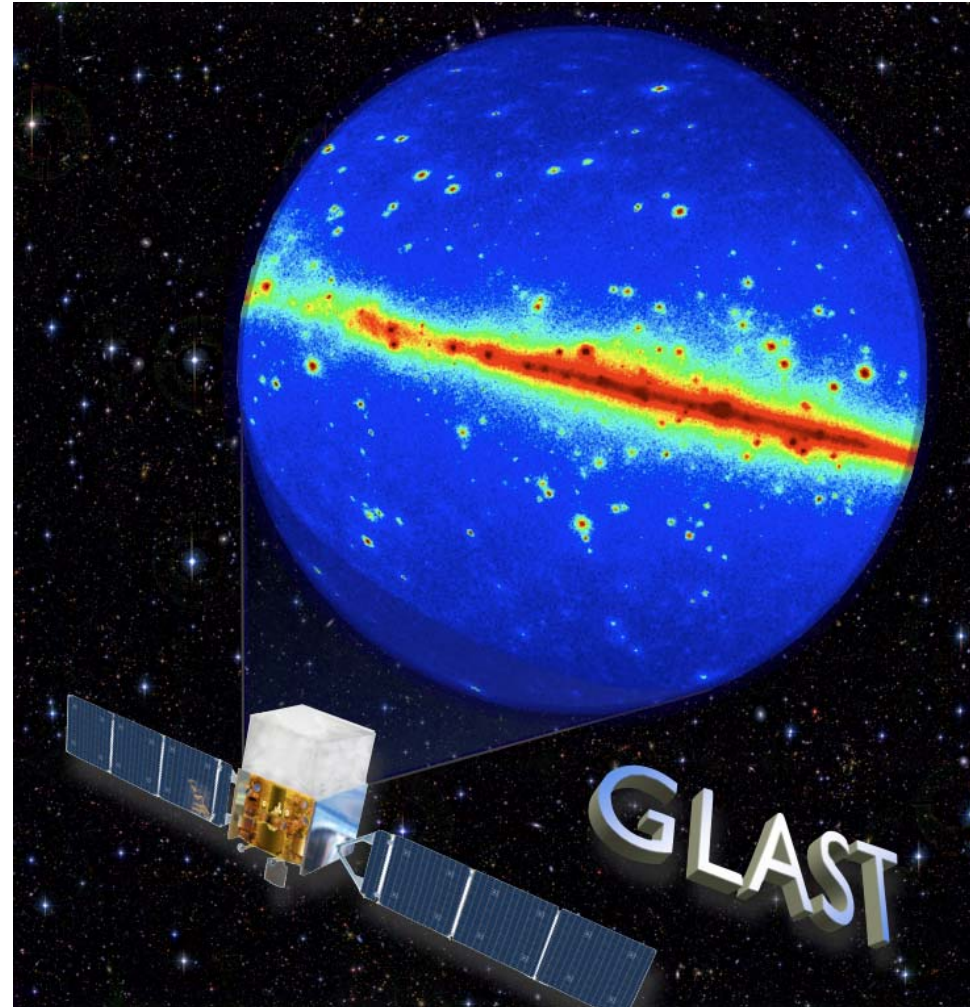


Year 1 Science Operations Timeline Overview





Looking Forward to Launch and All The New Results !



<http://www.nasa.gov/glast>



LAT COLLABORATION STATUS

Peter Michelson



Collaboration is ready for launch !

- We have come a long way (it has taken 16 years) from a mission and instrument concept in 1992 to the eve of launch in 11 days
 - International collaboration has made this possible; collaboration will yield the best science.
 - Thanks to all of you!
- Collaboration is ready: ISOC, science data processing pipelines, collaboration science analysis groups are ready
 - Collaboration meeting now scheduled for June 2-4, 2008 in Florida



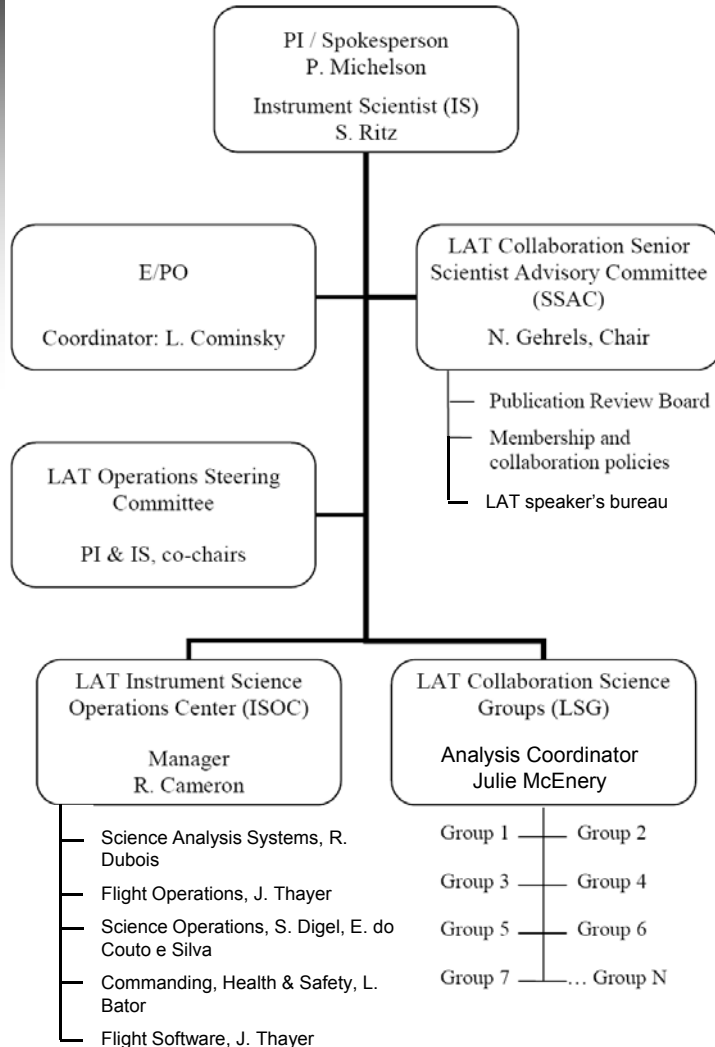
collaboration demographics (Sept 2007)

Update will be presented at September 2008 IFC meeting

Country	membership category		
	Full Member	Affiliated Scientist	Postdoc
France			
CEA	5	2	0
IN2P3	11	7	2
Italy			
ASI	2.5	16	3
INFN	13.5	10	14
Japan	6	4	5
Sweden	2	5	1
USA			
DOE	31	10	9
NASA	19	16	4
other	4	14	0
Australia		1	
Germany		4	
Great Britain		1	
Total	94	90	38



LAT Collaboration Organization



► Instrument Science Ops Center (ISOC)

- responsible for instrument operation (monitoring, configuration management, flight software, calibration, science analysis software, etc) and operation of Level 1 Data Pipeline
- ISOC had to accommodate cutbacks resulting from SLAC budget cuts in early 08
 - 3 involuntary staff layoffs

► LAT Collaboration Science Groups

- responsible for collaboration's analysis and extraction of science results from LAT data; including galactic diffuse model and source catalogs
- each science group has 2 coordinators
- day-to-day efforts coordinated by Analysis Coordinator, resident at Stanford-SLAC during sky-survey phase



Status of Science Groups

- ▶ *first rotations of coordinators occurred in March 2007, followed by other rotations in March 2008.*
- ▶ *Restructured groups: Unidentified sources group moved to catalog group and galactic sources group*
- ▶ *N. Omodei named Deputy Analysis Coordinator; will succeed J. McEnery in CY09*

Group	Current Coordinators
Catalog	D. Thompson, I. Grenier, J. Ballet**
Diffuse Radiation	A. Strong, T. Porter
Blazars & AGNs	B. Lott, G. Tosti
Galactic Sources	D. Smith, A. Harding
Unidentified Sources, Population Studies, and Other Galaxies	Group merged with catalog group and Galactic Sources group
Dark Matter & New Physics	J. Conrad, R. Johnson
Gamma-Ray Bursts	N. Omodei, V. Conaughton*
Solar	I. Moskalenko, F. Longo
Calibration & Analysis Methods	P. Bruel, L. Latronico

** catalog pipeline manager

* GBM team member

Most groups meet weekly on EVO

GLAST

LAT Speaker's Bureau
The Gamma-ray Large Area Space Telescope

ARCHIVE OF GLAST-LAT TALKS

UPCOMING CONFERENCES

COLLABORATION WEBPAGE

GLAST-PISA HOME PAGE

GUIDELINES

UPCOMING SPEAKERS

USEFUL LINKS

HOME

This web site concerns the activities of the GLAST LAT Speaker's Bureau to plan for LAT Collaboration participation in Conferences and Symposia.

As the LAT instrument nears completion and the LAT Collaboration is focused on preparations for science analysis and operations the necessity of guidelines concerning conference presentations has become of primary importance.

Main purpose is:

- to provide a process by which presentations that will report results generated within the GLAST LAT Collaboration are reviewed within the collaboration prior to presentation or release at a conference or seminar.
- to insure that opportunities for giving presentations are available on an equitable basis to collaboration members.
- to encourage participation in relevant scientific meetings in order to disseminate LAT results to the broader science community and to maintain the visibility of GLAST in the community.

A Draft of the GLAST-LAT Collaboration guidelines can be found [here](#).

Publication Board meets weekly
SSAC chair (Gehrels)
Spokesperson (Michelson)
Inst. Scientist (Ritz)
Analysis Coordinator (McEney)
Deputy AC (Omodei)
PB secretary (Nolan)

Current Speaker's Bureau coordinators
Ronaldo Bellazzini, chair
Tuneyoshi Kamae
Charles Dermer
Analysis Coordinator (McEney)



ISOC Status

ISOC is ready for GLAST launch

- LAT Collaboration and ISOC readiness has been rehearsed in two very successful Operations Simulations
 - Ops Sim #1: 8-12 Oct 2007
 - 78 LAT participants
 - Ops Sim #2: 4-7 Mar 2008
 - 75 LAT participants
 - Rehearsed joint activities of LAT science teams and ISOC during the early mission
 - Stress tested data processing and monitoring systems
- LAT team members are partners in integrated mission simulations and tests





ANALYSIS COORDINATOR'S REPORT: SCIENCE GROUP ACTIVITIES

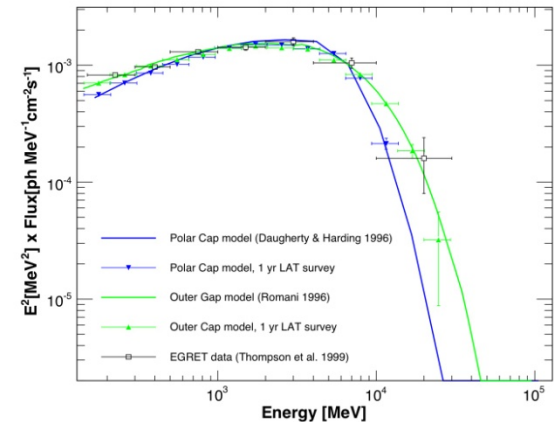
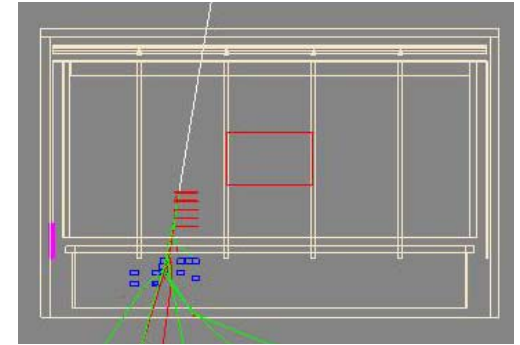
Julie McEnery



Analysis - getting from data to science

Low level analysis and instrument performance

- Finalized background rejection, event selections etc
- Incorporated inputs from beam-test group into instrument simulation and evaluated impact on science performance
- Updated and refined cosmic-ray background models



High level analysis including:

- Handling instrumental backgrounds (especially for pointed mode data)
- Methods to determine upper limits, significance of spectral features, variability indices etc
- Methods to fit/refine models of diffuse Galactic emission.

We are ready for launch. We have analysis tools in place and we have lots of practice working together on science analysis.



Routine Science Processing

- RSP group coordinates analysis development and optimizes resource across the entire collaboration for high level data processing needed by the science groups.
- These include topics such as:
 - Lightcurves - wide range of integration times
 - Additional temporal analyses (e.g. hour or day scale periodicity)
 - Source detection (on timescales intermediate between ASP and Catalog)
 - pulsar periodicity analysis (from ephemerides and blind search)
- Incorporate knowledge and experience from existing pipelines:
 - Catalog analysis is coordinated in a dedicated science group.
 - Careful systematic analysis
 - Automated Science Processing (quicklook analysis produced once in initial data processing)
 - Focus on time-critical science
 - Instrument monitoring



Papers - prelaunch

Closing out pre-launch papers

- Pre-launch estimates of LAT sensitivity to dark matter signals (submitted) (contact author: Jan Conrad)
- Pulsar timing paper (internally reviewed, about to be submitted) (contact author: David Smith, Lucas Guillemot)
- GRB science with LAT (advanced draft, likely to be released for internal review just before launch) (Omodei, Chiang, Longo)
- Calorimeter (Smith/Grove) and pulsar simulation (Razzano) papers likely to be released to collaboration just after launch
- LAT Instrument paper is imminent



First Science Results

- Galactic sources group (in cooperation with C&A and SO/ISOC) are making plans for analysis of science observations during LEO. Many people across the collaboration are involved with these studies.
 - Vela pulsar: timing, search for nebula, spectral cutoffs (initial model comparison) [contacts: Romani, Razzano]
 - 3EG 1835: bright EGRET source, opportunity to search for next “geminga” [contacts: Reimer, Kawai]
- Gamma-ray bursts
 - GRB group have set up a roster of burst advocates (LAT members from across collaboration to perform follow up analysis on GRB). Burst advocate has the responsibility to write the draft GCN circular.
- Flaring sources
 - AGN and Galactic sources group have set up a roster of flare advocates (LAT member to perform follow up analysis of LAT flaring sources). Flare advocate has the responsibility to write the draft astronomers telegram.
- We are prepared for the science we expect to obtain with the LAT in the first few months of the mission.



First year papers and science

- Each Science group has produced a prioritized list of year 1 papers.
 - Papers coinciding with release of 6-month high confidence source list (e.g. some population studies, radio galaxies, perhaps a first pulsar catalog, papers on interesting individual sources)
 - Papers associated with planned multiwavelength campaigns (several blazars, microquasars)
 - Papers coinciding with 1 year data release (catalog, diffuse model, Galactic center, Cygnus region and many more)
 - In addition, there will be papers on GRBs, flaring blazars, Galactic transients and individual interesting sources.
- Each planned paper coordinated by science groups
- We have a well defined plan for producing the main science papers after launch. Not all papers and results can be predicted (fortunately!)



COMPUTING REPORT

Richard Dubois



Current Activities

- Ready for Launch
 - 800 cores + 150 TB disk + 250 TB tape available
- Level 1 processing + ASP
 - OpsSim2 + stress tests showed need for ~300 cores to turn around downlink promptly
 - 55 day run showed ASP taking ~50 cores
- We are routinely doing simulations using 1000+ cores for weeks at a time
- Routine Science processing needs not scoped out yet
 - Resources for the Science Groups to do automated analyses on timeframes intermediate between ASP and Catalogue.
 - Expecting a need for 200-300 cores
- Reprocessing
 - A year's full reprocessing would take (for example: new calibrations) roughly 3-4 weeks with 1000 cores
 - Expect to call on SLAC's general queues to help in such cases.



Needs for 2009

Folder
/MC-Tasks/ServiceChallenge/backgndSC-GR-v11r2/ru

Name	Type	Files	Events	Size	Created	Links
merit	Group	21599	31,681,038	22.5 GB	09-May-2007 10:50:37	Files
mc	Group	21599	31,682,566	1.7 TB	09-May-2007 10:50:37	Files
digi	Group	21599	31,682,566	62.9 GB	09-May-2007 10:50:37	Files
recon	Group	21599	31,682,566	259.8 GB	09-May-2007 10:50:37	Files
relation	Group	21599	31,682,566	51.7 GB	09-May-2007 10:50:38	Files

Total "data" ~ 450 GB/day => ~160 TB

Folder
/ServiceChallenge/Interleave55d-GR-v11r12/runs

Name	Type	Files	Events	Size	Created	Links
merit	Group	7920	1,813,577,206	1.2 TB	03-Jul-2007 07:30:02	Files
mc	Group	7920	38,976,220	562.8 GB	03-Jul-2007 07:30:04	Files
digi	Group	7920	38,976,220	52.2 GB	03-Jul-2007 07:30:04	Files
recon	Group	7920	38,976,220	284.0 GB	03-Jul-2007 07:30:04	Files
relation	Group	7920	38,976,220	19.0 GB	03-Jul-2007 07:30:04	Files

MC ~ 25 TB per yr of simulation (WAG)

Estimates are for ONE copy of the data: sizes verified in OpsSim2

We will have to get smarter by the time of the first major reprocessing

Request 250 TB/yr to contain data & MC needs

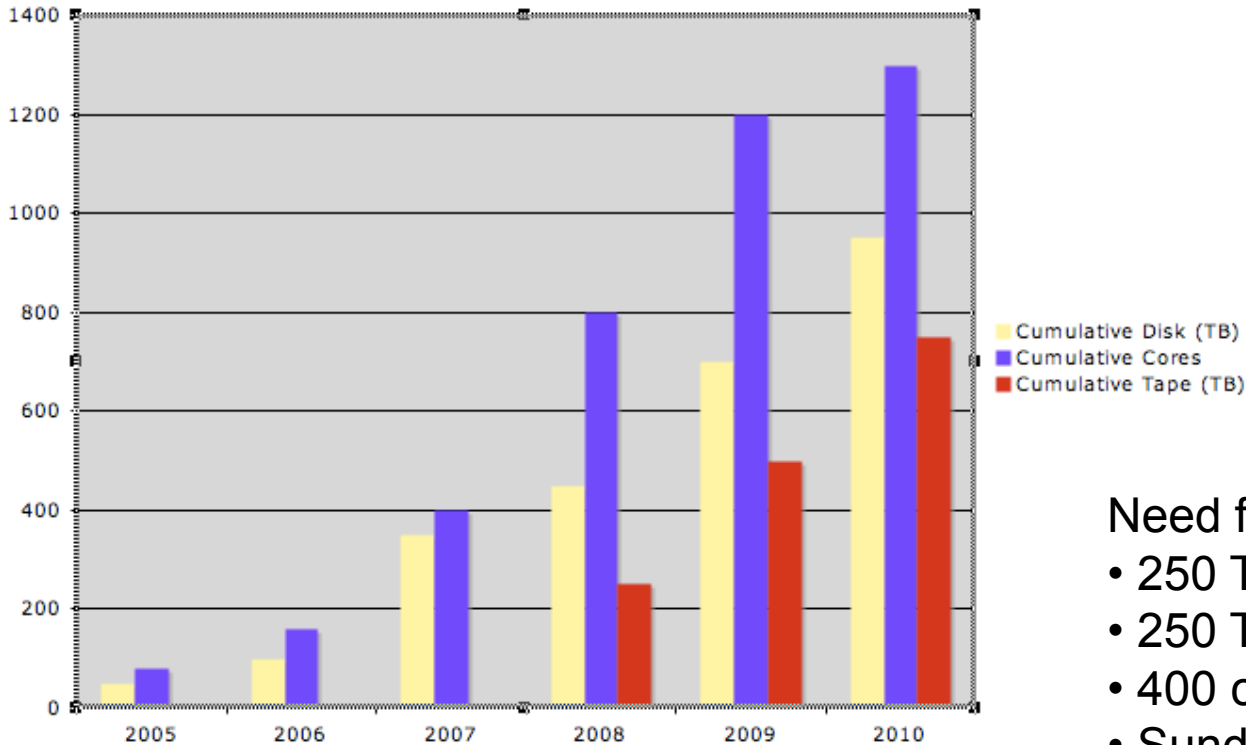
Still not plateaued: buy 400 more cores for data/MC load

We now estimate ~300 cores to reconstruct a downlink in 1-2 hours



Computing Resource Projections

LAT Computing Resource Projection



Need for/in '09:

- 250 TB disk: \$225k
- 250 TB tape: \$100k
- 400 cores: \$200k
- Sundry servers: \$50k

Total: \$575k

Current pricing: \$0.90k/TB disk; \$0.40k/TB tape; \$0.5k/core



The LAT Computing “GRID”

- SLAC
 - Pipeline2 configured originally to run at SLAC
 - 800 LAT cores now in batch farm
 - Hope to add 50% this coming year
- Lyon
 - P2 ported to Lyon
 - Stress testing operation there now
 - Plan to transfer all files to SLAC to minimize disk commitment at Lyon
 - Have demonstrated 500 cores with no file xfer to SLAC



Miscellaneous

- Bought 2 new Oracle servers in 2008
 - Old server was too old - demonstrated in Big Run
 - Leveraged smaller disk purchase, and lower prices to fund it
 - Only bought 150 TB for '08
 - Cleaning off old disk to partly compensate
- Upgrades to Event Display and Code Development gui
 - One time cost of \$25k - propose to fund from 2008 OCF under-run
 - Upgrade these tools by software house (authors have moved on to this outfit)
 - Subsequently, take over maintenance in the collaboration



CY2008 OCF STATUS AND PROPOSED CY2009 OCF BUDGET

Peter Michelson

Table 1. GLAST Operating Collaboration Fund
 - Budget vs. Actual 2007 (through December 2007)

	A	B	C	D	F	G	
	Budget Assumption	Calendar 2007 Budget	Calendar 2007 Costs @SLAC	% Cost & Commit (12 Months 100%	Total CY07 Costs (col C+col E)	Total CY07 Cost - Budget (col B - col F)	Comments
1. ISOC Core Staff (CHS) Cost*		\$ 333,554	\$ 295,817	89%	\$ 295,817	\$ 37,737	Under run due to 1 staff departure
Software Engineer Annual Base Salary	\$ 100,080						
Benefit and Leave Factor	\$ 41,159						
Subtotal	\$ 141,239						
Special Overhead	\$ 18,361						
Annual Total With Overhead	\$ 159,601						
Operations Engineer Annual Salary	\$ 109,080						
Benefit and Leave Factor	\$ 44,861						
Subtotal	\$ 153,941						
Special Overhead	\$ 20,012						
Annual Total With Overhead	\$ 173,953						
2. Computing - SAS		\$ 395,500	\$ 382,669	97%	\$ 382,669	\$ 12,831	
Disk (100 TB)	\$ 350,000						
Subtotal	\$ 350,000						
Special Overhead	\$ 45,500						
Total With Overhead	\$ 395,500						
3. Publication		\$ 10,170	\$ 1,353	13%	\$ 1,353	\$ 8,817	
Page charges	\$ 23,250						
Special Overhead	\$ 3,023						
Total With Overhead	\$ 26,273						
4. Living and Travel Expenses		\$ 29,832	\$ 6,913	23%	\$ 6,913	\$ 22,919	Cost Estimates provided by NASA
1 Analysis Coordinator	\$ 26,400						
Special Overhead	\$ 3,432						
Total With Overhead	\$ 29,832						
Total		\$ 769,056	\$ 686,752	89%	\$ 686,752	\$ 82,303	Total Under Run

Table 2. GLAST Operating Collaboration Fund
- Proposal for Budget for 2009 - 2010

	Revised Budget Assumptions 09	Calendar 2008 Approved Budget	Calendar 09 (Proposed)	Notes
1. ISOC Core Staff (CHS) Cost*		\$ 334,016	\$ 324,346	
(Based on staff rates in ISOC CHS)				
Software Engineer Annual Base Salary	\$ 98,618			
Benefit (27.9%)	\$ 27,514			
Subtotal	\$ 126,132			
Special Overhead (13%)	\$ 16,397			
Annual Total With Overhead	\$ 142,529			
Operations Engineer Annual Salary	\$ 125,802			
Benefit (27.9%)	\$ 35,099			
Subtotal	\$ 160,900			
Special Overhead (13%)	\$ 20,917			
Annual Total With Overhead	\$ 181,817			
2. Computing - SAS		\$ 485,900	\$ 649,750	Details below need to be revised
Disk, boxes, servers, and tapes	\$ 575,000			* 225k for disk
Subtotal	\$ 575,000			* 100k for tape
Special Overhead (13%)	\$ 74,750			* 200k for cores
Total With Overhead	\$ 649,750			* 50k for sundry servers
3. Publication		\$ 10,170	\$ 16,950	
Page charges	\$ 15,000			\$150 per page (Ap. J.);CY09,100 pgs
Special Overhead (13%)	\$ 1,950			
Total With Overhead	\$ 16,950			
4. Living and Travel Expenses		\$ 29,832	\$ 95,698	
1 Analysis Coordinator	\$ 84,688			Nicola Omodei - Local Living at 4736 per month for 12 months w/ Benefit @27.9%.
Special Overhead (13%)	\$ 11,009			Travel - 2 Foreign and 4 Domestic ~12K
Total With Overhead	\$ 95,698			
GLAST OCF Per Annum		\$ 859,918	\$ 1,086,744	
"Sustaining Engineering Support"				
DAQ-NYCBm(\$244/hr)	\$ 87,840	\$ 24,119		
Special Overhead (13%)	\$ 11,419			
Total With Overhead	\$ 99,259			
Sys & Thermal Eng (\$145/\$122/f	\$ 125,760	\$ 83,891		
Special Overhead (13%)	\$ 16,349			
Total With Overhead	\$ 142,109			
GLAST OCF Total		\$ 967,928	\$ 1,086,744	
CY07 Underrun		\$ 82,303		

Table 3. Contribution to the Operation Of GLAST

Based on OCF Collaborative Membership Count As of Sept 2007

- When using SV = 6500, calculated Common Fund in 2009 USD should be = \$967200
 Proposed Budget for OCF 2009 = \$ 1,086,744

A. Collaborator	B. Membership Category			C. Fractional Share of OCF	D. Share of OCF		E.	F.	G.	H.
	Member	Affiliated Scientist[1]	Postdoc	Full Member + 0.2*Affiliated Scientists + Postdocs	# of Collaborators[2]	If @\$6,500/Share	CY 2009 Invoice Based on Budget Proposed	Allocate 07 Under Run	2009 Invoice Modified by UnderRun	2009 Effective \$/Share
France CEA IN2P3	16	9	2	13%	19.8	\$ 128,700	\$ 144,607	\$ 10,952	\$ 133,655	\$ 6,750
	5	2	0	4%	5.4	\$ 35,100	\$ 39,438	\$ 2,987	\$ 36,451	6,750
	11	7	2	10%	14.4	\$ 93,600	\$ 105,169	\$ 7,965	\$ 97,204	6,750
Germany										
Italy ASI INFN	16	26	17	26%	38.2	\$ 248,300	\$ 278,989	\$ 21,129	\$ 257,861	\$ 6,750
	2.5	16	3	6%	8.7	\$ 56,550	\$ 63,539	\$ 4,812	\$ 58,727	6,750
	13.5	10	14	20%	29.5	\$ 191,750	\$ 215,450	\$ 16,317	\$ 199,133	6,750
Australia										
Great Britain										
Japan	6	4	5	8%	11.8	\$ 76,700	\$ 86,180	\$ 6,527	\$ 79,653	6,750
Sweden	2	5	1	3%	4.0	\$ 26,000	\$ 29,214	\$ 2,212	\$ 27,001	6,750
USA DOE NASA & Other	54	40	13	50%	75.0	\$ 487,500	\$ 547,754	\$ 41,483	\$ 506,271	\$ 6,750
	31	10	9	28%	42.0	\$ 273,000	\$ 306,742	\$ 23,231	\$ 283,512	6,750
	23	30	4	22%	33.0	\$ 214,500	\$ 241,012	\$ 18,253	\$ 222,759	6,750
Total	94	84	38	100%	148.8	\$ 967,200	\$ 1,086,744	\$ 82,303	\$ 1,004,441	\$ 6,750

*Note: [1] 6 Affiliated Scientists from Germany (4), Australia (1) and Great Britain (1) are not included in the invoice calculation.