

GLAST

Overview of Project Status,

Collaboration Status:

- *changes to collaboration policies*
- *collaboration membership*
- *science groups*

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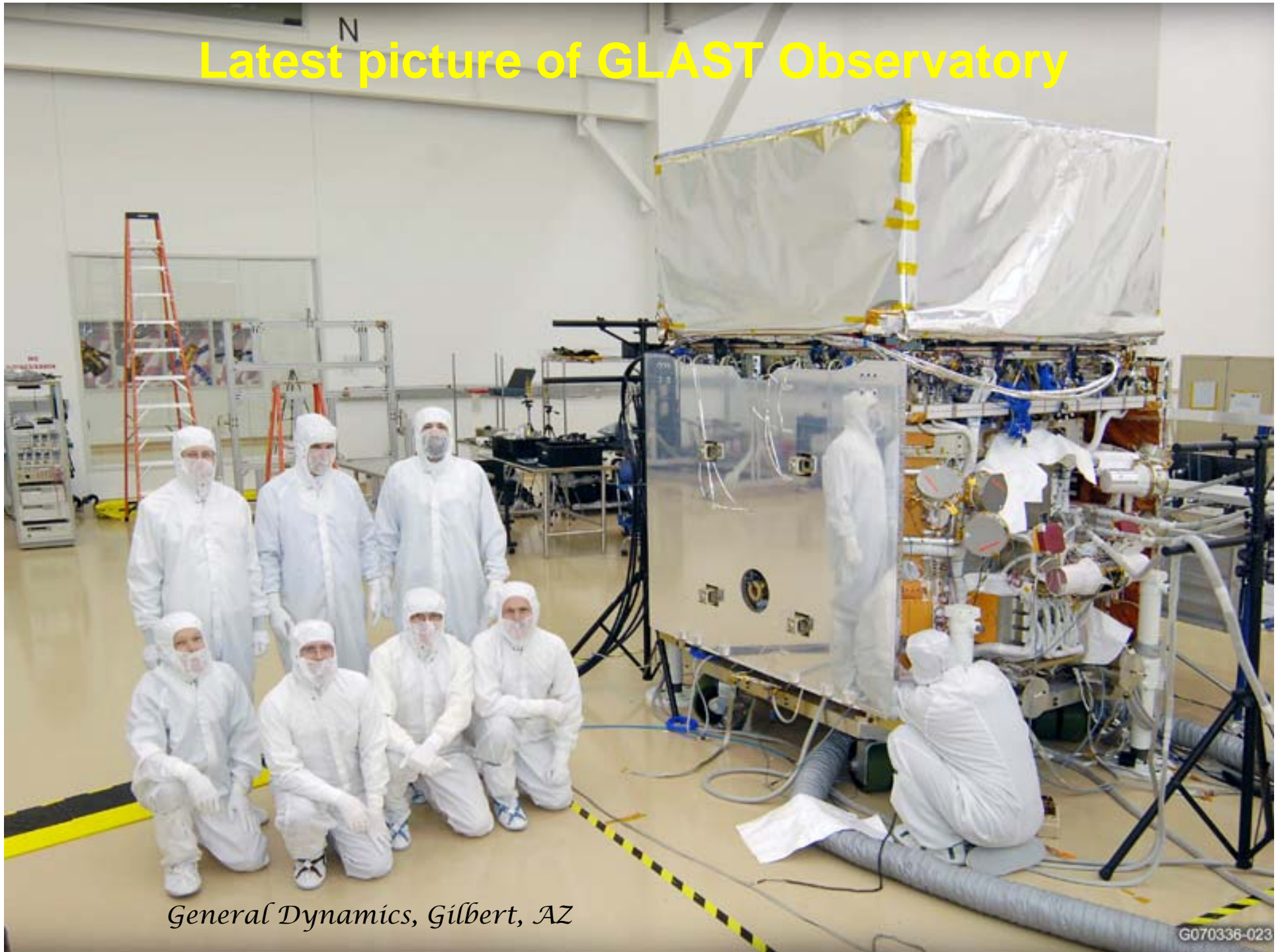
GLAST LAT International Finance Committee
Frascati Italy September 3-4, 2007



LAT is integrated with spacecraft



N
Latest picture of GLAST Observatory



General Dynamics, Gilbert, AZ

G070336-023



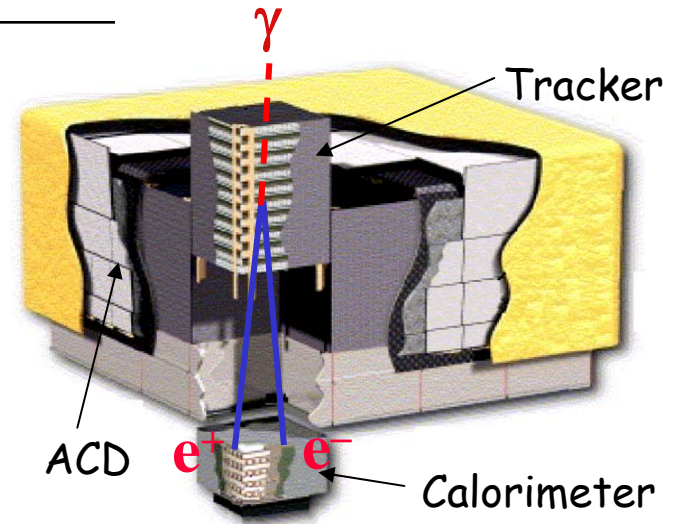
GLAST LAT Project Status

▶ **LAT integrated with spacecraft; observatory ready for environmental testing ;**

- LAT flight software ready;
- beam tests of calibration unit at CERN and GSI completed; analysis nearly completed (report by L. Latronico)
- ISOC organization now well established; facilities being completed; operations planning with GLAST mission underway (reports from R. Cameron, R. Dubois, S. Digel)

▶ **LAT Collaboration science and analysis groups very active (report from J. McEnery)**

- 9 science analysis groups meeting regularly;
- multiwavelength observing plans advancing
- Data Challenges I & II; Service Challenges very successful
- Collaboration meeting frequency increased:
 - July 30 – Aug 3 meeting at SLAC;
 - next meeting at NRL, Nov 13-16, 2007
 - meeting in Florida at launch (Feb 2008)



Large Area Telescope:
20 MeV – >300 GeV



GLAST Burst Monitor:
10 keV – 25 MeV



August 2007 Collaboration Meeting

- ▶ **focus on development of science analysis across science topics**
 - *transient analysis and moving sources*
 - *variability studies*
 - *catalog analysis and systematics of likelihood, etc.*
 - *extended source analysis*
 - *spectral analysis*
 - *periodic source analysis*
 - *diffuse analysis and cosmic rays*
 - *instrument performance & sensitivity studies*
- ▶ **multiwavelength context and other missions**
 - *multiwavelength coordinator's report*
 - *AGILE operating experience*
 - *INTEGRAL studies with EGRET and GLAST*
- ▶ **On Friday, Launch and Early Orbit (L&EO) operations planning**
- ▶ **analysis coordinator's report, and status reports on GLAST mission, LAT, service challenge**
- ▶ **discuss updates to collaboration policies (membership, publications, ..)**
- ▶ **SSAC report**



Highlights from Collaboration SSAC meeting

- ▶ *face-to-face meeting held on July 31, 2007*
- ▶ *conducted first annual review of activities of Affiliated Scientists*
- ▶ *adopted amendments to collaboration membership and publication policies*
- ▶ *considered proposals for new members*



Amendments to Membership Policy

- ▶ ***new affiliated postdoctoral and graduate student member categories created in recognition of postdocs and grad students who work under supervision of Affiliated Scientist member.***

Membership Category	Description
Full Member	Initially, this category includes the Principal Investigator and the Co-Investigators listed in the Flight Proposal of November 1999. Subsequently, this category shall also include scientists who are permanent staff members at a collaborating institution, spend at least 50% time on the GLAST LAT Project, and have well-defined, substantial responsibilities for either hardware, software, science analysis infrastructure, or team leadership at an institution with substantial responsibilities. Candidate new members must be proposed to and approved by the PI and accepted by the SSAC (see procedure below).
Postdoctoral Scientist	Postdoctoral fellows at a collaborating institution, working under the sponsorship of a Full Member, who spend at least 50% time on the LAT Project.
Graduate Student	Graduate students at a collaborating institution, working under the sponsorship of a Full Member, who conduct thesis research on GLAST science or LAT development at least 50% time.
Affiliated Scientist Affiliated Postdoctoral Scientist Affiliated Graduate Student	<p>Scientists with interest in the LAT science program that spend substantially less than 50% time on the LAT project or who contribute a capability (e.g. VLBI radio observations of a LAT-detected source) to a relatively focused area of the LAT science program. Initially, this category includes Associate Scientists designated in the LAT Flight Proposal who satisfy the above criteria for Affiliated Scientist. Candidate Affiliated Scientists must be proposed to and approved by the PI. Affiliated postdocs and graduate students are postdocs and graduate students supervised by an Affiliated Scientist. Their participation should be reported to the PI and the SSAC chair.</p> <p>In this document and in the Publication Policy document, these categories are sometimes collectively referred to as “Affiliated Scientists”</p>



Amendments to Membership Policy

5. Collaboration with persons or entities that are not members of the LAT Collaboration

For some investigations, the LAT collaboration science will be enabled or significantly enhanced with additional data obtained by other observatories (ground or space-based). In some cases, this data can be obtained by proposals made by LAT Collaboration members and the rules of the collaboration regarding publications and membership apply. In other cases, specific agreements may be necessary with non-LAT collaboration members or entities. Such agreements need to be approved by the Principal Investigator and should spell out the scientific objectives of the effort, the time-frame for the agreement, and understanding of how results will be published.



Amendments to Publication Policy

*With regard to authorship of scientific publications, the guiding principle is that initial publications of results from the LAT Science investigation, particularly during the 1st year sky survey phase, and for certain major papers during all phases, the author list will be relatively inclusive of members who have devoted substantial effort to the development of the LAT and to the work of the collaboration; that is, Full Members, postdocs, and graduate students (i.e., long author lists; see section 5). These papers are referred to as **Category I papers**; e.g., catalogs and papers reporting substantial discoveries. Typically, discovery papers are those that would be published in journals such as *Astrophysical Journal Letters*, *Physical Review Letters*, *Physics Letters*, *Astronomy & Astrophysics Letters*, etc. Affiliated Scientists will also be eligible co-authors on those papers that they have contributed to in a substantive way.*

*Subsequent papers on a particular topic that involve more in-depth, detailed analysis and modeling, will typically have shorter author lists involving those directly contributing to the analysis and interpretation of results reported in the paper. These **Category II papers** are also intended to recognize the need and provide means for younger scientists (e.g., graduate students and postdocs) to have the opportunity to demonstrate scientific independence.*



Amendments to Publication Policy

3. Management of LAT Publication Process

To facilitate the overall planning of LAT Collaboration papers and the tracking of the status of papers in preparation, the PI, the LAT Analysis Coordinator, the chair of the SSAC, the Instrument Scientist and a board secretary will serve as the Collaboration Publication Board and will manage the collaboration publication process. The board secretary and the Analysis Coordinator each serve for a term of one year and are appointed by the PI. The PI and the Analysis Coordinator will report regularly to the SSAC on the status of publications and will periodically review the status of publications with the science analysis coordinators group. The SSAC will periodically review (i.e. quarterly) the list of planned and published papers to maintain fairness.

The board secretary will maintain a password-protected webpage that lists all LAT publications and their status (i.e., proposed publication, in draft form, accepted for publication, published, etc.), as well as the proposed author list and the responsible science group and the lead person for preparing the paper. Generally, the analysis reported in a paper and the writing of the paper will be managed by the appropriate LAT Collaboration Science group. The group coordinators are responsible for regularly reporting the status of publications and proposals for new papers to the LAT Analysis Coordinator and the Publication Board and will immediately report any change in status of publications in preparation.



Acknowledgments of Agencies and Collaborators

- ▶ ***The LAT Collaboration Publication Policy requires that all LAT Collaboration publications (Category I an II) have the following acknowledgement:***

“The GLAST LAT Collaboration acknowledges the generous support of a number of agencies and institutes that have supported the GLAST LAT Collaboration. These include the National Aeronautics and Space Administration and the Department of Energy in the United States; the Commissariat à l’Energie Atomique and the Centre National de la Recherche Scientifique / Institut National de Physique Nucléaire et de Physique des Particules in France; the Agenzia Spaziale Italiana, the Istituto Nazionale di Fisica Nucleare, and the Istituto Nazionale di Astrofisica in Italy, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), High Energy Accelerator Research Organization (KEK) and Japan Aerospace Exploration Agency (JAXA) in Japan, and the K. A. Wallenberg Foundation and the Swedish National Space Board in Sweden.”

Japan GLAST Collaboration has offered to host a
LAT Collaboration meeting in September 2008



Wooden Shrine gate in Miyajima



When: September 08 (2nd or 3rd week)

Place: Hiroshima City or
Miyajima (World heritage, wooden galleria
standing on sea shore, 1000 years old)

Plan (Monday to Friday)

One day symposium “ multi-wavelength observation”

Four day collaboration meeting

Weekend plan before or after the meeting,

Kyoto and Nara is the best place to visit.

The most convenient airport will be Osaka/Kansai

Airport which is located one hour distance to Kyoto

And Nara. To Hiroshima, it takes 3 hour by ordinary

Train and Shinkansen train from the airport.



GLAST LAT Collaboration status:

- collaboration demographics
- science analysis groups

multi-wavelength planning and needs



collaboration demographics (Sept 2006)

Country	membership category		
	Full Member	Affiliated Scientist	Postdoc
France			
CEA	4	4.5	0
IN2P3	9	1.5	2
Italy			
ASI	2.5	14	2
INFN	13.5	9	14
Japan	5	3	3
Sweden	1	6	0
USA			
DOE	30	10	6
NASA	19	13	0
other	4	14	1
Australia		1	
Germany		4	
Great Britain		1	
Total	88	81	28



current collaboration demographics (Sept 2007)

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 Speaker's Bureau

GLAST

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

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



Status of Science Groups

- ▶ *science analysis coordinator: Julie McEnery*
- ▶ *websites established and linked to Collaboration webpage*
- ▶ *groups meet regularly*

Group	Initial Coordinators	# participants
Catalog	S. Digel, I. Grenier	21
Diffuse Radiation	S. Digel, I. Grenier	30
Blazars & AGNs	P. Giommi, B. Lott	50
Pulsars, SNRs, & Plerions	R. Romani, D. Thompson	46
Unidentified Sources, Population Studies, and Other Galaxies	P. Caraveo, O. Reimer	37
Dark Matter & Exotic Physics	E. Bloom, A. Morselli	47
Gamma-Ray Bursts	J. Norris, N. Omodei	62
Solar	G. Share	10
Calibration & Analysis Methods	W. Atwood, S. Ritz	66

on average, each collaboration member participates in 2 to 3 science groups

- ▶ *coordinators serve for approximately 1 year; rotations staggered*



Status of Science Groups

- ▶ *first rotations of coordinators occurred in March 2007*

Group	Current Coordinators
Catalog	S. Digel, I. Grenier, J. Ballet
Diffuse Radiation	I. Grenier, T. Porter
Blazars & AGNs	B. Lott, G. Tosti
Pulsars, SNRs, & Plerions	R. Romani, A. Harding
Unidentified Sources, Population Studies, and Other Galaxies	P. Caraveo, O. Reimer
Dark Matter & Exotic Physics	J. Conrad, R. Johnson
Gamma-Ray Bursts	N. Omodei, V. Conaughton*
Solar	G. Share, F. Longo
Calibration & Analysis Methods	P. Bruel, L. Latronico

coordinators in red began between March and June, 2007

*** GBM team member**



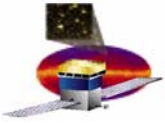
Summary of Important Multiwavelength Needs

Science Objective	GLAST provides	multi- λ requirements
Differential measurement (vs Z) of extragalactic background light to $Z \sim 5.5$	Measurement of blazar spectra in band where cutoffs are expected from $\gamma + \gamma_{\text{ebl}} \rightarrow e^+ + e^-$	Broadband contemporaneous / simultaneous spectral measurements (radio, optical, X-ray, TeV) of blazar spectra, particularly around the synchrotron peak;
Resolve origin of particle acceleration and emission mechanisms in systems with relativistic jets, supermassive black holes	All-sky monitoring coverage of blazar flares and GRBs	radio and optical surveys of flat-spectrum radio sources to extend blazar catalogs
Reliable model of Milky Way diffuse emission required for accurate source localization and to facilitate search for dark matter	Mapping of cosmic ray interactions with all forms of interstellar matter.	Extend CO surveys to high galactic latitude; survey special directions (eg. spiral arms, galactic center) with optically thin tracer (e.g. $C^{18}O$)
Understand particle acceleration and emission mechanisms in extreme environment (gravity, electric and magnetic fields) of rotating neutron stars	Spectra and light curves resulting from primary interactions of the most energetic particles.	Contemporaneous radio and X-ray pulsar timing observations



Collaboration and multiwavelength needs

- ▶ *coordination efforts led by collaboration multi- λ coordinator (D. Thompson), and PI*
- ▶ *each collaboration science group is/has assessed needs and is involved in planning*
- ▶ *reaching out to community for help; adding affiliated scientists as appropriate*
- ▶ *in some cases, collaborating institutions have found resources to facilitate critical*



Radio

AGN

- Summary Web page
http://www.slac.stanford.edu/~lott/radio_blazar_revised.html
- Greg Taylor, Matthias Kadler, and Lars Fuhrmann leading
- VIPS, MOJAVE, USNO, Marscher programs for VLBI
- Michigan, Metsahovi, OVRO, Effelsberg/IRAM monitoring
- Australian VLBI counterpart of MOJAVE proposal submitted

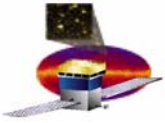
Pulsar Timing

- Parkes, Jodrell, Nançay have large timing programs
- Arecibo and Green Bank proposals submitted (not LAT team)

Other

- VLA (Frail) for GRB follow-up
- MOST, (Gaensler) for unidentified source follow-up
- Ryle, (Pooley) for LSI +61 303 monitoring
- CfA (Dame), NANTEN (Fukui) for diffuse/molecular clouds
- NRAO joint proposal opportunities

Readiness Status – Excellent!



Infrared

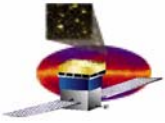
Far-IR (Space-Based) – primary interest AGN

- Spitzer: despite heroic efforts by Ann Wehrle and Jennifer Carson, we were not awarded any Spitzer time from our proposals. Next opportunity (last with cryogen) this Fall.
- AKARI (ASTRO-F): conducting all-sky survey, concluding this Fall. May provide an archive.
- Herschel: launch in second half of 2008, will have GI program.
- WISE: launch in 2009, all-sky survey

Near-IR (Ground-Based) – AGN, GRB

- Magdalena Ridge (J. Norris): proposal in progress
- ESO/VLT- VIZIR (Chatay)
- Other near-IR coverage from some optical facilities

Readiness Status – Not So Good



Optical

AGN

- WEBT (Tosti), GTN (Sonoma), other groups (e.g. Carini, Hiroshima) – monitoring and follow-up
- HET (Romani), maybe SALT – redshift measurements
- Swift UVOT

GRB

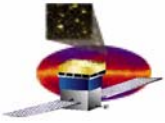
- ROTSE, RAPTOR, others associated with GCN and Swift

Unidentified – Surveys, Time Variability

- PanSTARRS (Wood)
- SKYMAPPER (contact through Cameron)
- SDSS (Anderson)

General – NOAO joint proposal opportunities

Readiness Status - Good



X-Ray

AGN

- **Swift BAT and XRT** – discussions underway with Swift PI & team
- **Suzaku** – one proposal accepted. MW campaign
- **RXTE** – six proposals accepted, TOOs and Planned Intensive Campaign (PIC)
- **INTEGRAL** – four proposals accepted.
- **XMM** – two related proposals accepted

GRB

- **Swift**

Pulsars - Timing

- **RXTE** – four proposals accepted

Unidentified – Surveys, Time Variability

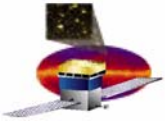
- **Swift** – interested
- **Chandra** – one proposal accepted
- **INTEGRAL**- three proposals accepted
- **Suzaku** – LSI +61 303 proposal accepted

Near Future

MAXI - Japanese all-sky monitor (2009)

ASTROSAT - Indian MW satellite (2008/09)

Readiness Status – Good – but not enough for 1000 blazars



TeV

TeV telescopes are the nearest neighbors to LAT in the electromagnetic spectrum. They share nearly all our scientific interests.

We have close contacts with all the TeV groups.

H.E.S.S. has been working closely with us to develop a written agreement.

VERITAS science groups have been actively discussing cooperative efforts; no written agreement yet.

Informal, close contacts with MAGIC, CANGAROO, and MILAGRO.

Readiness Status - Excellent



Summary

T – 4 months and counting !!!!