

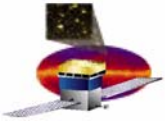
# GLAST

*Overview of Project Status,  
Collaboration Status,  
- Science Analysis Groups  
- Multiwavelength needs*

Peter F. Michelson  
GLAST LAT Spokesperson  
Stanford University  
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**GLAST LAT International Finance Committee**  
February 4, 2007



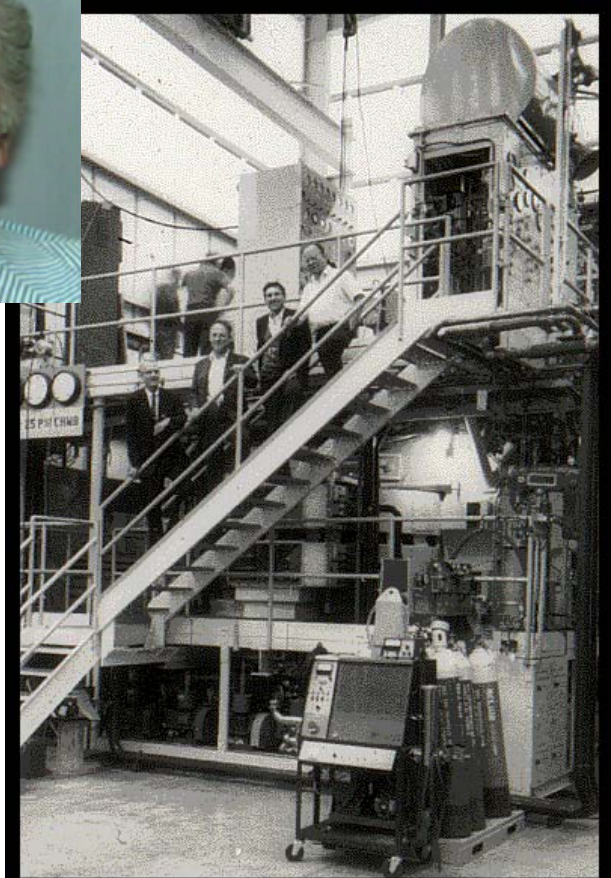
# Two early sources of inspiration and support



Herbert Gursky (NRL)



Joe Ballam  
(SLAC)



Pief Panofsky, Joe Ballam, Bob Watt, and Luis Alvarez  
(top to bottom) stand on the remodeled 72-inch  
(increased to 82-inch) bubble chamber after its transfer  
from Lawrence Radiation Laboratory to SLAC in 1967



# LAT is integrated with spacecraft

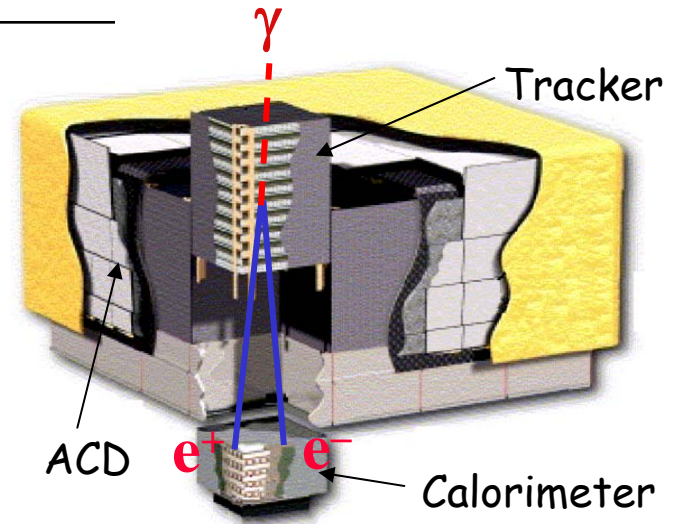
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# GLAST LAT Project Status

- ▶ **LAT integrated with spacecraft; observatory-level environmental testing planned for March;**
  - flight software testing continues;
  - beam tests of calibration unit at CERN and GSI completed; analysis by collaboration well underway
  - ISOC organization now well established; facilities being completed; operations planning with GLAST mission underway
- ▶ **LAT Collaboration now fully engaged in science analysis preparation and preparing for science operations**
  - 9 science analysis groups meeting regularly;
  - multiwavelength observing plans continue to advance
  - Data Challenges I & II very successful; now doing Service Challenge
  - Collaboration meeting frequency will increase; next meeting: March 26-29, 2007 at GSFC
  - launch party planning beginning



**Large Area Telescope:**  
20 MeV – >300 GeV



**GLAST Burst Monitor:**  
10 keV – 25 MeV



# 1<sup>st</sup> GLAST Science Symposium

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- ▶ **340 registered participants; most of the LAT Collaboration participating; 66 abstracts from the collaboration**
- ▶ **Symposium program includes sessions on**
  - *Mission and instrument overviews*
  - *Active Galaxies, EBL, and related topics*
  - *Surveys, Populations, and New Sources*
  - *Galactic Compact Objects and their Environments*
  - *Transients: Gamma-Ray Bursts and Solar Physics*
  - *Diffuse and Spatially Extended Emission*
  - *Dark Matter and New Physics Windows*
  - *Facilities*
- *satellite meeting on: The Future of Ground-base Gamma-Ray Astronomy*

*Frances C. Arrillaga  
Alumni Center*





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## GLAST LAT Collaboration status:

- collaboration demographics
- science analysis groups

multi-wavelength planning and needs



## collaboration demographics on Sept 4, 2006

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



# 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 [here](#).

Speaker's Bureau coordinators serve for 1 year  
Ronaldo Bellazzini  
Tuneyoshi Kamae  
Charles Dermer



# Status of Science Groups

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

<b>Group</b>	<b>Coordinators</b>	<b># participants</b>
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

- ▶ *rotation of coordinators will begin in March; discussion with SSAC next week*



# Summary of Important Multiwavelength Needs

Science Objective	GLAST provides	multi- $\lambda$ 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

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- ▶ *coordination efforts led by Dave Thompson, multi- $\lambda$  coordinator, and PI*
- ▶ *each collaboration science group is/has assessed needs*
- ▶ *reaching out to community for help; adding affiliated scientists as appropriate:*
  - *(e.g. Tony Readhead, Caltech, brings 40 m OVRO telescope for dedicated radio monitoring of  $\sim$ 1000 sources (blazars) per day for GLAST & SWIFT; opens opportunity for Keck and Palomar time)*
  - *Yasuo Fukui, Nagoya University, brings CO survey data from NANTEN-II survey*
- ▶ *in some cases, collaborating institutions have found resources to facilitate critical observational work;*
  - *e.g. completion of high-latitude CfA CO survey (SLAC & CEA)*
  - *1.5 meter telescope at Hiroshima University*
  - *“guaranteed” VLT-VSIR time for demonstration study of selected blazars (CEA)*
- ▶ *needs in other critical areas would be helped with modest additional resources;*
  - *e.g. pulsar timing (Parkes in Southern hemisphere is critical)*
- ▶ *collaboration prepared to generate proposals for competitively-awarded Guest observer time on facilities such as XMM-Newton and Chandra*



# Summary

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***T – 10 months and counting !!!!***