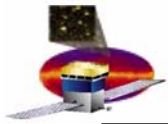


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# Introduction to the Workshop Series

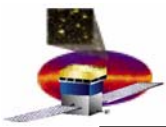
**Eduardo do Couto e Silva**  
**September 27 , 2004**



# Welcome and Thanks for Coming

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- **A reminder...**
  - This is NOT an I&T Workshop
  - This is NOT an SAS/offline Workshop
- **This is Workshop 2 of**
  - The Workshop series of the Instrument Analysis Group
- **It is a LAT Collaboration effort**
  - To support Flight Integration and
  - To develop ownership of the LAT Instrument



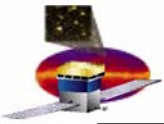
# Goals for this Workshop Series

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## Prepare for Instrument Data Analysis

- Familiarizing LAT Collaborators with the
  - LAT instrument
    - Front-End Electronics
    - Trigger and Data Acquisition
    - Data Analysis Software
  - Data taking plans during LAT integration using
    - Cosmic rays
    - Van de Graaff photons
- Create a forum to
  - exchange knowledge between all subsystems and “hardware and software oriented people”
- Use simulated and real Data to
  - exercise reconstruction algorithms (mostly with real data)
  - exercise the data analysis tools and provide feedback to developers
- Develop expertise to
  - uncover and quantify any instrumental effects that could have an impact on the LAT science data
  - start the work that will evolve into the Science Operations Group of the ISOC
  - create a core and trained group to participate in the beam tests analysis effort (after instrument delivery)

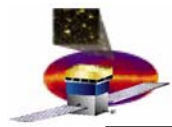
## Develop ownership of the LAT instrument



# The Workshop Series

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- **Instrument Analysis Workshop 1 (June 7-8, 2004)**
  - Kick off meeting
  - Homogenize the knowledge from people who will do the data analysis
  - Assign “projects” using Monte Carlo simulated data
- **Instrument Analysis Workshop 2 (September, 2004 - TBR)**
  - Discuss results from projects assigned during Workshop 1
  - Discuss results from projects derived from REAL data collected with the Engineering Model 2 (ACD, CAL and TKR) – **will start on Oct 1**
  - Develop a list of instrumental effects that could have an impact on science data analysis
  - Pretty much “our Readiness Review” for Flight Integration – **we are almost there...**
- **Instrument Analysis Workshop 3 (TBA 6 weeks before the meeting)**
  - Analysis of real data from the first two towers
- **Instrument Analysis Workshop 4 (Summer, 2005 - TBR)**
  - Analysis of real data from XX-towers (TBD)
- **“Instrument Analysis Workshop 5” – Collaboration Meeting (Full LAT- TBD)**
  - LAT Data Analysis (and to validate Monte Carlo simulation)



# Goals of Workshop 1 - June 7-8, 2004

















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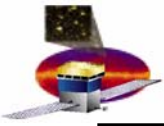
- The focus was on simulated data from the first Two Towers
  - Educate people on behavior and/or performance of
    - TKR Front-End Electronics
    - CAL Front-End Electronics
    - Trigger and Data Acquisition system
    - Reconstruction software
  - Provide hands-on experience
    - With SAS/I&T analysis files and tools
  - Use the knowledge acquired during the workshop to
    - Assign MC projects that will be due during Workshop 2
    - Provide input to data taking plans for LAT integration



# Workshop 1 - Project Assignments

A Truly  
International  
Effort

-  1. Implement dead channels in the tracker for imaging **Luca**
  -  2. Revisit the spectrum of sea-level cosmic rays **Toby**
  -  3. Define strategy for implementing Deadtime in MC **Steve/Richard/Elliott/Toby**
  -  4. Validate Energy Scales using CAL EM MC/DATA **Pol**
  -  5. Compare numbers from alignment procedure to those from metrology at SLAC **Larry**
  -  6. Calculate the tracking efficiency of each tower using track segments **Leon**
  -  7. Calculate residuals by comparing CAL and TKR locations **Leon**
  -  8. Make images of the CAL layers (to expose uniformity of response of the CAL) **Benoit**
  -  9. Make image of TKR layers to identify location of shorted strips and broken wirebonds **Bill**
  -  10. Implement simulated trigger primitive information into MC **Luis**
  -  11. How well do we find MIPs (e.g. at several angles, within a tower, across towers)? **David**
  -  12. What is the light output of tracks crossing diodes? **Sasha**
  -  13. What are the effects to the data when zero suppression is applied? **Traudl**
  -  14. What is a “clean” muon definition? **Claudia**
  -  15. Can we find gamma rays and  $\pi^0$  from showers? **SAS**
-  Will send a student as part of the long term plan– **Per/Staffan**



# Goals for Workshop 2

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## Prepare for Instrument Data Analysis

- Discuss results from projects assigned during Workshop 1
  - Advertise improvements in the infrastructure
- Narrow down the work needed for data analysis with real data from the first two towers
- Bonus from subsystems:
  - Some highlights of hardware tests prior to delivery to I&T

**Develop ownership of the LAT instrument**

# Agenda - Workshop 2

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- 08:00-08:30 - Registration
- 08:30-08:40 - Overview of LAT Project Schedule - Steve
- 08:40-09:00 - Introduction to the Workshop 2 – Eduardo
- **09:00-12:30 - Session 1 - Infrastructure, Trigger and Deadtime**
  - - 09:00-09:15 Data Taking Plans for Cosmic rays and VDG photons - Gary/Eduardo
  - - 09:15-09:30 Data Analysis files and info: where to go to get them? - Warren
  - - 09:30-09:45 Overview of distributions for offline reports - Xin
  - - 09:45-10:00 Calibration Trending Database - Xin
  - - **10:00-10:20 Coffee break**
  - - 10:20-10:25 Instrument Data Analysis Primer- Eduardo/Lee
  - - 10:25-10:40 Update on Event Display: FRED - Anders/Riccardo
  - - 10:40-11:00 How will we handle SAS code updates during I&T - Richard
  - - 11:00-11:20 Overview of trigger tests and muon telescope - Martin/Su Dong
  - - 11:20-11:30 Trigger Studies - Luis
  - - 11:30-12:00 Instrument Data Analysis Variables (GEM/TEM): Update - Anders
  - - 12:00-12:15 Deadtime in Monte Carlo - Toby
  -
- **13:30-18:00 - Session 2 - TKR and CAL offline analysis for 2 Towers**
  - - 13:30-13:50 Latest and greatest from offline analysis with real TKR data - Michael/Luca?
  - - 13:50-14:20 TKR Recon update - Tracy
  - - 14:20-14:50 TKR Alignment in Gleam - Leon
  - - 14:50-15:05 How Does Calibration Flow Through the New Single CDE CalRecon and Digi? Mark
  - - 15:05-15:15 CAL Calibration Operations during I&T - Eric
  - - 15:15-15:25 CAL Crosstalk Issues and their Implications - Sasha
  - - 15:25-15:40 Crystal Imaging with TKR - Benoit
  - - 15:40-15:50 Light Collection Near the Ends of CDEs - Sasha/Andrey
  - - **15:45-16:00 Coffee break**
  - - 16:00-16:20 MIP Selections - Sara/Dario
  - - 16:20-16:40 Data Analysis 101 - Bill
  - - 16:40-17:00 List of Data Analysis Tasks: what, who and when - Eduardo/Bill
  - - 17:00-18:00 Discussions and assignment of projects – All
- **19:00 Laser tag to relieve stress...organized by SAS ( thanks Heather)**



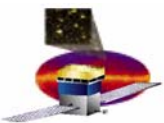


# Lessons Learned from Workshop 1

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- The learning curve to use the SAS software is steep...
  - Analysis at all levels were performed requiring different skills
    - “Experts” and “non-experts” provided valuable contributions
- There were improvements in the infrastructure since workshop 1:
  - New TKR Reconstruction
  - Improved Event Display FRED
  - GEM information in TDS and in the analysis files
  - SAS Workbook (soon to be available)
  - Instrument Data Analysis Primer
    - A draft will be released during this Workshop
      - » Thanks to ISOC for supporting this project
  - New CAL Calibrations
  - Additional manpower to the Trigger group
  - Planning evolved: Overview of End-to-End LAT tests with particle data

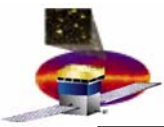
**Develop ownership of the LAT instrument**



# Special Thanks to

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- Everyone who has helped to debug and improve the infrastructure
  - Thanks SAS for the support and patience with our requests usually due tomorrow...
    - Sure we want more...we will always do
- European Collaborators who are providing substantial contribution to keep projects going
  - Keep the flame alive when away from SLAC...
    - Come to SLAC if you are feeling lonely...
- NRL and Pisa for providing the whenever-you-can support during this important construction phase
  - We appreciate the XX% donations in the weekly meetings
    - but we need you at a 100% level to understand the instrument!
    - ..and you all came to give talks in both Workshops: thank you !
- Everyone working with the “new Kid on the block” : Trigger
  - We are getting the infrastructure in place
  - We need to get you some data, MC land is too dry...
- Bill and Steve for the guidance
  - Couldn't do it without you !
- Anders, Xin and Warren
  - Hard-working and dependable: the fuel for this engine
    - Hope you will be able to get a break to analyze data too...



# We need more people

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- There are people out there who think they can not do much
  - Pay attention to the talks
    - there is room for everyone
  - Motivation is more important than skills
- We will help everyone who wants to learn
- Come talk to me, Bill or Steve during this week
  - bring your idea
    - We will do the best to make it fit in the plan
  - bring no idea
    - we will have one for you