

# **GLAST Minutes September 5-6, 2003, SLAC**

## **SLAC**

Jonathan Dorfan  
Persis Drell  
Steve Williams  
Lowell Klaisner  
Charlotte Chang

## **DOE**

Kathy Turner

## **NASA**

Paul Hertz

## **Goddard**

Steve Ritz

## **Stanford University**

Peter Michelson

## **INFN**

Enzo Iarocci

## **ASI**

Fabio Bracciaferri  
Simone Di Pippo  
Carlo Bonifazi

## **CEA**

Roy Aleksan

## **IN2P3**

Stavros Katsanevas

## **Sweden**

Per Carlson

## **[Agenda](#)**

### **Jonathan Dorfan Talk - [Welcome](#)**

Comments:

None

## **Persis Drell - Events of the Past 6 Months; Goals for this Meeting**

Comments:

Minutes approved

ENZO IAROCCI: The CNES event and other issues caused the experiment to be re-baselined, now needing an additional \$17M. Is that correct? PERSIS DRELL: Yes

ENZO IAROCCI: Is the additional funding needed to increase the contingency or re-base the entire experiment?

PERSIS DRELL: Lowell will give details later. CNES pullout was also a real part of the new funding requirements.

ENZO IAROCCI: What amount was due to the CNES pullout? Lowell: The CDE production was about \$5M; he will explain details in a later talk.

## **Peter Michelson Talk – Project Overview and Collaboration Status**

Comments:

PAUL HERTZ: He hopes to do NASA Mission Confirmation Review in November, 2003.

PAUL HERTZ: Pointed out rapid response capability of GLAST to Gamma Ray Bursts.

STAVROS KATSANEVAS: He hasn't seen the NASA agency agreements.

PAUL HERTZ: NASA will generate International agreements. It was originally with CNES. The new drafts are with CEA and IN2P3. The drafts not ready yet.

STAVROS KATSANEVAS: Are there 60 scientists in collaboration?

PETER MICHELSON: Sixty is the number of people doing things for the LAT project. There is a broader group of affiliated scientists who don't participate directly but bring other wavelengths to analyze along with GLAST gamma ray data.

STAVROS KATSANEVAS: The procedure is to apply to the Collaboration? PETER

MICHELSON: Yes

ENZO IAROCCI: Compared to EGRET GLAST has 40 times greater sensitivity. How will it compare to other experiments in past, current or future?

PETER MICHELSON: Steve will discuss.

STEVE RITZ: AGILE will fly in 05. Other ground-based experiments - CELESTE, STACEE, VERITAS, HESS - are now running or will be run in the time frame of GLAST and start at higher energy and go higher. They, along with GLAST, will provide a nice overlap to compare spectra and collectively provide a more complete picture of the science.

PETER MICHELSON: Above 10 GeV GLAST has much higher sensitivity than Egret.

PERSIS DRELL: Do you have common members with the other experiments?

STEVE RITZ: Yes. Also there are multi-wavelength analysis groups to cover the overall science.

SIMONE DI PIPPO: She expects expect to have the ASI/NASA agreement by the end of October.

PETER MICHELSON: Is the legal boilerplate ok?

SIMONE DI PIPPO: Yes, we are just checking it over. We have been working on a different agreement which is now done, so we can turn to the ASI/NASA agreement and complete it.

PERSIS DRELL: Paul, is NASA ready to finalize? PAUL HERTZ: Yes.

### **Steve Ritz Talk – [Instrument Design and Science Goals](#)**

Comments:

PAUL HERTZ: The error circle for GLAST is very small compared to Egret. Do you know what fraction of the Egret ambiguous sources will be resolved? STEVE RITZ:

Probably a large majority. But have not quantified it.

STEVE RITZ: Oversight group includes Science Analysis Coordinator. The Science Analysis Software people will also be doing science. Try to avoid the outside physics groups doing their own tracking.

CARLO BONIFAZI: Do you have a physics study of hardware failures? STEVE RITZ: Yes. Failure analysis will involve killing bad tiles, etc.

ROY ALEKSAN: Are you doing more beam tests? STEVE RITZ: Yes, LAT spare module at SLAC and calorimeter at GSI.

### **Lowell Klaisner Talk – [Project Status: Technical and Cost](#)**

Comments:

STAVROS KATSANEVAS: (Re: LAT Equipment Fabrication Funding slide) There is some confusion. Some personnel costs have not been included.

PERSIS DRELL: We need to discuss how we agree to represent people versus material.

LOWELL KLAISNER: We generally include labor but not all (e.g. faculty, scientists, post docs are not included).

STAVROS KATSANEVAS: Sometimes the costs are given to a company and sometimes they stay in laboratory. These would be reflected differently.

ENZO IAROCCI: The 2000 is part of 5000 silicon detectors from Italy? LK: Sorry it was a typo. Total number needed is 11500. ENZO IAROCCI: There are 2000 more than he thought – Lowell/Enzo will check. There is some confusion on the slide versus understandings. LK & EI will talk offline.

PER CARLSON: Correction – we won't deliver the 1920 calorimeter crystals until 2004 – about February.

CARLO BONIFAZI and FABIO BRACCIAFERRI: They requested information on space mission support people/organization/spacecraft vendor from the space craft coordination point of view. STEVE RITZ: I will provide.

CARLO BONIFAZI: How are you using the engineering model, qualification model and flight models in preflight testing of all. He would like to hear more about these plans.

CARLO BONIFAZI: What are rules for proto flight testing?

FABIO BRACCIAFERRI: How will you provide test tools for spacecraft flight relevant tests?

CARLO BONIFAZI: There are some questions about terminology on commissioning versus testing phases.

LOWELL KLAISNER: It is a mixed environment between detector world versus spacecraft world.

SIMONE DI PIPPO: She wants to verify funding figures over next few days.

CARLO BONIFAZI: We need to discuss the meaning of the funding information.

## **Roundtable Discussion:**

### **NASA**

PAUL HERTZ: The Columbia accident report will affect everything NASA does. The priority is to return shuttle to operation and complete the space station. Hubble funding delays will add to costs also. The Confirmation Review commits to funding and schedule to complete. We weren't ready and so we delayed to November. The cost impact of LAT delay is \$8.6M out of the \$17.2M is NASA. Other issues – the cost of slip to rest (non LAT) of mission - \$12-15M! Also communications scheme is a risk – if we can't count on Malindi. We would need \$4M next year to switch to KU band. The switch would cost \$1.7M/year for 5-10 year mission. Total increase: \$30M. We don't have a plan in place but it will be needed for Confirmation Review. Might have to consider canceling other missions. Also the propulsion system on GLAST needs to be defined. When GLAST falls out of sky is another problem. It might need controlled re-entry, i.e. additional control capacity. NASA is committed to solve issues but we don't have budget and schedule to cover everything now.

### **DOE**

KATHY TURNER: HEP has many projects to balance – DZero, CDF, Babar, LHC construction, MINOS, GLAST. We have been flat funded for ten years budgets remain tight. NASA is in charge of the overall mission; DOE is partnering with NASA on LAT fabrication and science. DOE has approved increased funding on the LAT from \$37M to \$42M. The commissioning and operations is in \$17.2M committed through the SLAC budget. DOE will be challenged. We feel that we have forged a strong relationship with NASA and expect that to continue on this exciting project.

ENZO IAROCCI: He doesn't see that the delay cost is real. PAUL HERTZ: No! That is only true if operating cost rate is same as development rate. But in actuality the standing army costs for GLAST are much higher than in the operation phase. So it's real. Mission cost is higher.

LOWELL KLAISNER: We really do reduce staff at the completion of the LAT. ENZO IAROCCI: He was thinking of the researchers – yes that's flat.

PER CARLSON: A question for Paul. Since you have said that the Shuttle is first priority, what if congress says no more money? PAUL HERTZ: I just don't know. The Shuttle return to flight is \$1.5B (about 10% of the budget). It would be better to cancel other missions (or delay) rather than cutting.

### **IN2P3**

STAVROS KATSANEVAS: It is a difficult year – we have had a 10% cut. However GLAST remains a very attractive mine of information. They will try to cover some of CNES with their own budget. He thanks DOE and NASA for their help of GLAST this

past 6 months. Fallout: interactions with CNES are normalized. CNES did not take their decision lightly.

### **CEA**

ROY ALEKSAN: It is a difficult year for us too. Cut \$2MEuro in 2003. However the science case for GLAST is strong. He also thanks DOE and NASA for their help - especially for keeping CEA people involved with GLAST. We will be doing crystal tests at CERN. Unfortunately next year looks worse. We expect severe reduction in investment money and have been told we will have to reduce their personnel – never done before. Fortunately we can continue with current motivated people – software and tests. PERSIS DRELL: What will 04 impact be on GLAST? ROY ALEKSAN: Don't know, too early. LOWELL KLAISNER: Will delivery of structures be delayed? RA, SK: No. no. absolutely not.

### **SLAC**

PERSIS DRELL: The year 2003 was challenging but we minimized the impact on GLAST. HEP staff took a week without pay, some voluntary retirements, and we forced vacation for year be taken during the year. GLAST kept those freed up resources within the project. We have cut other programs. Look for opportunities to help the GLAST project. E.g. during re-baselining – we will use operating funds to support Instrument Operation Center.

JONATHAN DORFAN: The Lab is excited and supportive about this project; committed. We want to see it up in the sky and working. I do not like slipping schedules. We give high priority to the science.

### **Japan**

TUNE KAMAE: Funding from Japan is different; it derives from the University based program. There are long term agreements of US Japan collaborations but it has diminished quite a bit. Our flat funding made the silicon purchase difficult. In the future university funding is no longer national so there is some uncertainty about funding level. Also University professors will not be civil servants anymore.

### **Sweden**

PER CARLSON: Sweden is committed to construction and operation. Major funding is from a private foundation. We have the money and will finish next year. In the next phase – integration and testing – we will need money from research council and faculty money. PAUL HERTZ: Is it annual? PER CARLSON: No, typically 3 years.

### **ASI**

SIMONE DI PIPPO: We have had to face transition phase since new government is now in place; we must review all programs, etc. We have an agreement with INFN. Regarding the SLAC/ASI/INFN agreement, we expect to complete in a few weeks. Regarding the Malindi question: Planning document 2003-2005 does not include providing Malindi to GLAST. This will be reviewed in next 6 months. It is possible to reconsider. Can we save money (12M over 5 years – includes upgrades) by sharing (Malindi) with other projects? Is it possible to consider sharing the cost (here)? Even a small amount. PAUL

HERTZ: He not sure it is legal for NASA. Only if NASA can buy services or provide equipment. NASA can't fund other agencies. PERSIS DRELL: If Malindi funding is part of operating common fund will NASA allow? PAUL HERTZ: I don't know.

## **INFN**

ENZO IAROCCI: We have the same difficulty in Italy. A second year like this one would be a disaster. There is a possible problem in the future. He thanks NASA and DOE for their help in recovering the financial difficulty of re-baselining over the past 6 months.

PAUL HERTZ: DOE and NASA appreciates the kind words. We worked very well together. Somehow after this litany of woes – we all believe we will complete that LAT.

PETER MICHELSON: On behalf of the project – Thanks for being true believers. The collaboration appreciates IFC's commitment.

PERSIS DRELL: Issues to be further discussed in this meeting – ground station, decisions by NASA Confirmation Review, OCF – what is it, silicon order, agreements, financial table discussion.

## **Lowell Klaisner Talk - Project Issues**

Comments:

PERSIS DRELL: What can the committee do to help the silicon order?

SIMONE DI PIPPO: We need an accommodation in schedule. We have Italian/ASI government regulations to respect. The simplest is to give a contract to INFN. ASI can't do it alone. Otherwise months delays. December is the right time frame.

A statement is needed that the ASI order through INFN is critical and that the need date is October 1. Slippage will be a month per month starting in December, resulting in standing army costs. That would be \$1.8M/month on LAT plus rest of mission burn rate.

## **Peter Michelson Talk - Issues for Commissioning and Operations**

We need to finalize agreements

Other needs:

During I&T and commissioning phase, the agencies need to support scientific collaborators travel to SLAC to participate and help with these tasks.

Comments:

SIMONE DI PIPPO: Which people to you want next year? We need to know soon.

PETER MICHELSON: Elliott Bloom is putting together a plan.

JONATHAN DORFAN: The Collaboration needs to develop plan, logistics, travel, etc.

Put together plan for next meeting.

TUNE KAMAE: We need 3-6 months of specialist in space-mission-experienced experts.

STAVROS KATSANEVAS: We may need cost sharing with SLAC.

PETER MICHELSON: During the first, commissioning year the data is available to the commissioning collaboration, but then the data is open. Then the Guest Observer program is peer reviewed, quality controlled.

PERSIS DRELL: At next meeting we need a short report on affiliated science output, QC.

PERSIS DRELL: We need to develop an agreed upon agency funding reporting format.

PAUL HERTZ: What 's the purpose? PERSIS DRELL: It will be a measure of meeting commitments.

JONATHAN DORFAN: A narrative description of the agencies contribution is needed - a page per country written narrative that can be referenced.

ENZO IAROCCI: But you need a number in the end. PERSIS DRELL: Yes but only for OCF. It is not the same for construction.

CHARLOTTE CHANG: Do we ever have to provide this number? JONATHAN

DORFAN: Yes. We don't want to understate a partners contribution. We might use factor of 1.5 for Europe (to reflect different accounting practices in other agencies). The Babar detector construction project was finally valued at \$120M in this way.

CARLO BONIFAZI: For ASI, we need to know the total cost and who will get the return from the investment? This is needed for decision making. E.g. adding new young people. The goal is to justify the investment by the return. Each institution needs it but for different reasons and uses.

STAVROS KATSANEVAS: You have to produce something including labor not scientists. This is submitted to project manager. There is a similar discussion at Auger board.

STEVE RITZ: He sees the need within each agency but not why to normalize across agencies.

ENZO IAROCCI: You will need it sooner or later, even though flawed. For example the Russians need to point to the value of in-kind contributions.

PERSIS DRELL: Her proposal – accountability will be done with each agencies coinage and project manager. She likes the multiplier to help normalize the integrated table.

PAUL HERTZ: This would be useful for the Confirmation Review.

STAVROS KATSANEVAS: My concern is for instance SNAP, which is a \$700M project. Frances \$10M is not very visible at such a low value.

JONATHAN DORFAN: We could use capital investment plus Full-Time-Equivalents.

PERSIS DRELL: We have the ground station issue. Common Fund might be used KU vs X band could be considered in the Common Fund. Simone needs partner contributions/payments for service from Malindi. Common fund has other identifiable operating expenses – tapes, gases, software FTEs(people), computing equipment costs (maybe too small for GLAST), downlink services is also a candidate.

PAUL HERTZ: NASA has no baseline operations for ground station, but it can buy equipment.

PERSIS DRELL: Others have been asked to consider CF. Is this a useful concept for your agencies?

CHARLOTTE CHANG: We can describe common expenses in a budget to be approved by the IFC. Then invoices issued based on PhD count, for instance.

PER CARLSON: It is natural to identify running costs and to define in this committee how to pay it.

ROY ALEKSAN: We need to have the committee review expenses. CHARLOTTE CHANG: Of course.

PAUL HERTZ: Downlink would cost \$1.7M/year for six 8 minutes downlinks per day.

STEVE RITZ: Is it a problem to have downlink funding renewed year by year.

JONATHAN DORFAN: SLAC doesn't charge for beam time.

PERSIS DRELL: What is the NASA priority? PAUL HERTZ: ASI/Malindi. PAUL HERTZ to draft action.

PERSIS DRELL: We can discuss SLAC/INFN/ASI agreement tomorrow. Simone some problems with new Italian procedures.

Action item on silicon.

PER CARLSON: In his experience with a major international facility, a running cost of approximately 10,000 sf/person is "common".

**Saturday Session: [Action Items](#)**