

GLAST Calorimeter

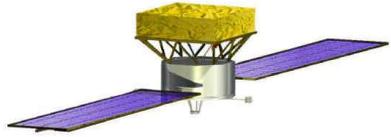
*Video Conference
14 January 1999*

GLAST Calorimeter
Status
14 January 1999

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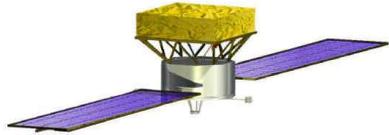
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Calorimeter Status Report

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- ❑ Procurement Status
 - PIN Diode
 - CsI Crystals
- ❑ CsI Development Status
- ❑ Electronics Status
 - ASIC
 - Front end digital
 - DAQ Interface
- ❑ Mechanical
- ❑ Management Issues
- ❑ Future Plans/Issues





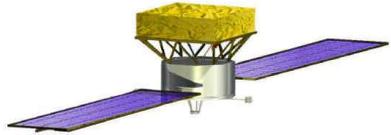
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Procurement Status

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- ❑ PIN Diodes - Hamamatsu
 - Takashi Ohsugi reports that Hamamatsu diodes to U. Hiroshima ships today.
 - He will examine them and ship to states (SLAC?) on 1/25.
 - NRL will see them on ???
 - Recent softness of \$US vs Yen now makes this method of procurement 4 months slower than originally planned AND more expensive (\$6K).
- ❑ CsI - Ukraine
 - First crystals have been shipped from STCU to NRL (have not arrived yet)
 - Order complete by Mar '99.
 - Ukrainian visit to NRL scheduled for Feb '99.
- ❑ CsI - Crismatec
 - Crismatec proposal cost was way outside reasonable (~ \$1250/log)
 - Philips convinced them to reduce cost and they submitted new proposal
 - SLAC has approved the procurement and fabrication is underway.
 - Contract calls for 4 crystals for test by 1/31 and the rest by 4/15.
 - NRL has received 3 prototype crystals from Crismatec (not part of contract) of various sizes (310 × 20 × 20 mm, 310 × 15 × 15 mm, 310 × 30 × 23 mm)





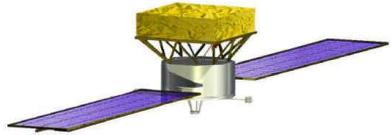
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CsI Testing and Development

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- ❑ NRL has received and adapted BaBar Crystal test equipment for use in acceptance testing of CsI crystals.
 - Still missing Mac and some measuring tools.
 - Motion control, PMT work. Standard crystal works.
- ❑ Compression test on Tetratek wrapping now has over 50 days of test.
 - Light yield down 5 - 15% (position dependent) during first 10 days, no change after that.
 - Now doubling pressure to ~20 g equivalent. Indicates additional 5% loss and then new plateau.
- ❑ Epoxy for gluing PIN diode to CsI has been selected and tested.
 - Flight-quality epoxy (low outgas) has been procured
 - Application technique using pipette for accurate quantity control has been developed and tested.
 - Need to fabricate fixture for accurate placement of PIN on CsI.



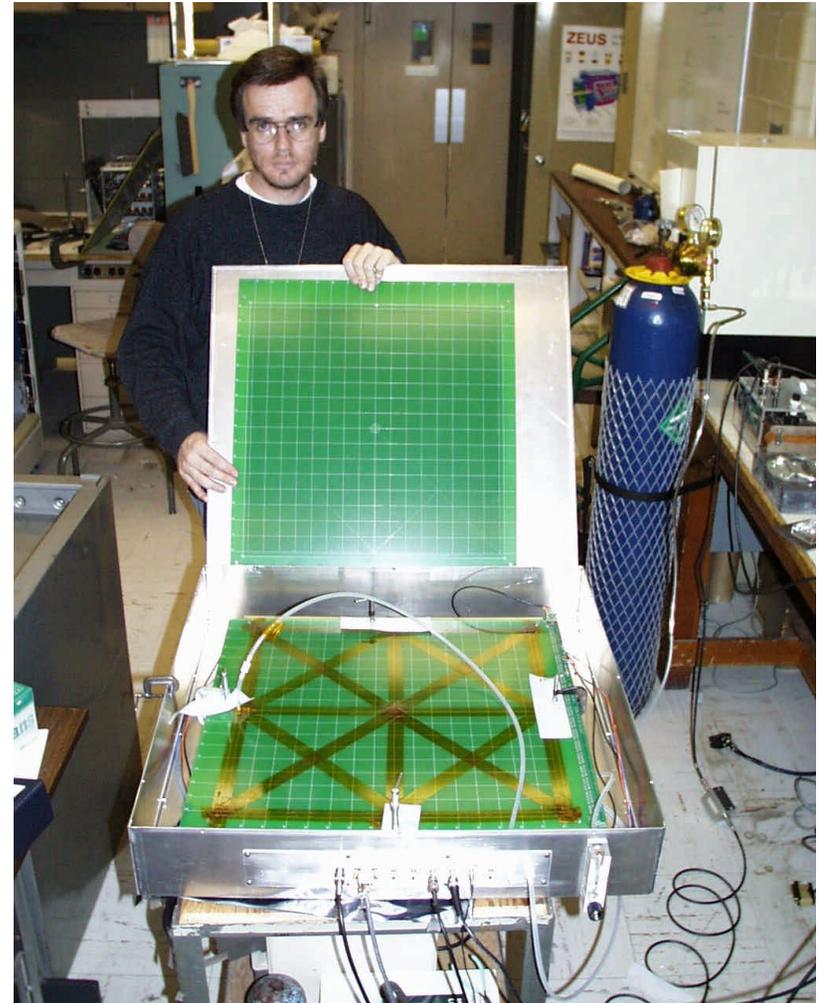


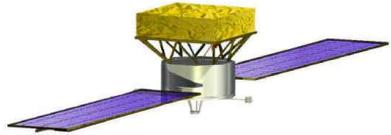
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Muon Telescope

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- ❑ Fabricated and tested first wire chamber for muon telescope
 - 50 cm × 50 cm active area.
 - Measured 1 mm (1σ) position resolution.
 - Pair of chambers will document tracks of muons through calorimeter in various states - individual logs to completed calorimeter modules.
 - Critical for testing and calibration of light asymmetry.





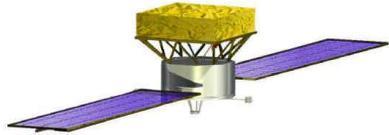
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Electronics Status

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- ❑ ASIC Front End (Ritz, Separate Report)
- ❑ ASIC - NRL
 - received 1st ASIC today, bond in quadpack tomorrow for mounting on test board with ADCs, etc.
- ❑ Prototype PCB
 - 1st prototype PCB - 2 columns of CsI logs with FEE ASIC, I-V ASIC, ADCs and readout controls completely placed and partially routed. Need clarification/relief on mechanical hole sizes and placement.
- ❑ Controller board designed and placed.
- ❑ DAC Interface presented at December meeting in France. Interface basics identified, detailed design is required.





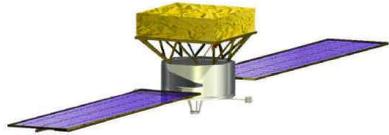
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Mechanical Status

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- ❑ Hytec has proposed a 2nd concept which relies more heavily on Grid walls for strength.
 - Considered a reduction in design complexity - cost.
 - Will not be used for beamtest prototype due to impact on electronics card design at this late date.
- ❑ Hytec expects to have detailed design drawings for manufacture at next week's meeting at GSFC.
- ❑ Considering fabrication of two units, if costs permit
 - one with dummy xtals for test assembly and environmental testing
 - one for real crystals and beamtest use.





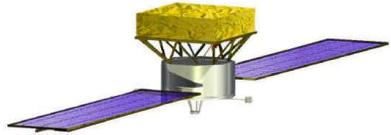
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Management Issues

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- ❑ NASA SR&T Program Funding
 - Lou Kaluziensi says he will be able to get to it in a week or so...
 - It's a 6 week process, so Mar 15 is a good date.
- ❑ French/Swedish Participation in Calorimeter Development
 - IN2P3 - Patrick Fleury, et al., are interested in mechanical design concept of calorimeter based on CMS carbon shells.
 - Saclay - are interested in front end electronics.
 - Saclay has ASIC development group with significant experience in relevant designs and technology.
 - Experience with rad hard DMILL process.
 - Busy now, but could be available in 6 - 8 months. Proposal support would definitely be available
 - Per Carlson is interested in procuring all the CsI for the flight





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Calorimeter Trade Studies

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- ❑ Instrument Configuration:
 - Calorimeter inside the Grid (Grove, Ponslet)
 - Calorimeter technology – CsI vs Scintillating Fiber (Grove, Ritz, Johnson)
 - CsI Imaging optimization – CsI dimensions, number of planes, logs per plane (Grove, Norris)
 - SSD Vertex with and without GAP (Grove, Norris, Fleury)
- ❑ Calorimeter Optimization:
 - CsI Mechanical Design (Phlips, Johnson, Ponslet)
 - CsI Light Collection – Wrappings, compression, tapering (Phlips, Grove)
- ❑ Calorimeter Readout
 - Required Dynamic range of electronics (Ritz)
 - Achieving dynamic range and calibratability (Johnson)
 - Front End design and ASIC (Johnson, Ritz, Singh)
 - Digital readout and DAQ interface (Johnson, Ampe)

