

# **System Deliveries & Testing**

Detector/electronics integration test stands and  
projected schedule

Eric Oberla

20-May-2011

LAPPD Electronics + Integration GPC Review

# Outline

- **Present (~)chronological order of test benches for our electronics**
  - Hardware availability
  - Emphasis on integration with real detectors
  - Hardware requirements for each set-up
  - Estimated schedule

# PSEC-related readout hardware



← PSEC-3 eval revA 2x populated – 4 channels  
 (“discontinued”)



← PSEC-3 eval revB 2x populated – 4 channels  
 (6x blank boards)



← PSEC-3 ½ Analog Card+ revA digital card – 4 active channels  
 (parts in shop) per card + 8x SMA connectors



← PSEC-3 Analog Card + 2 revB digital card – 40 channels  
 (coming soon)

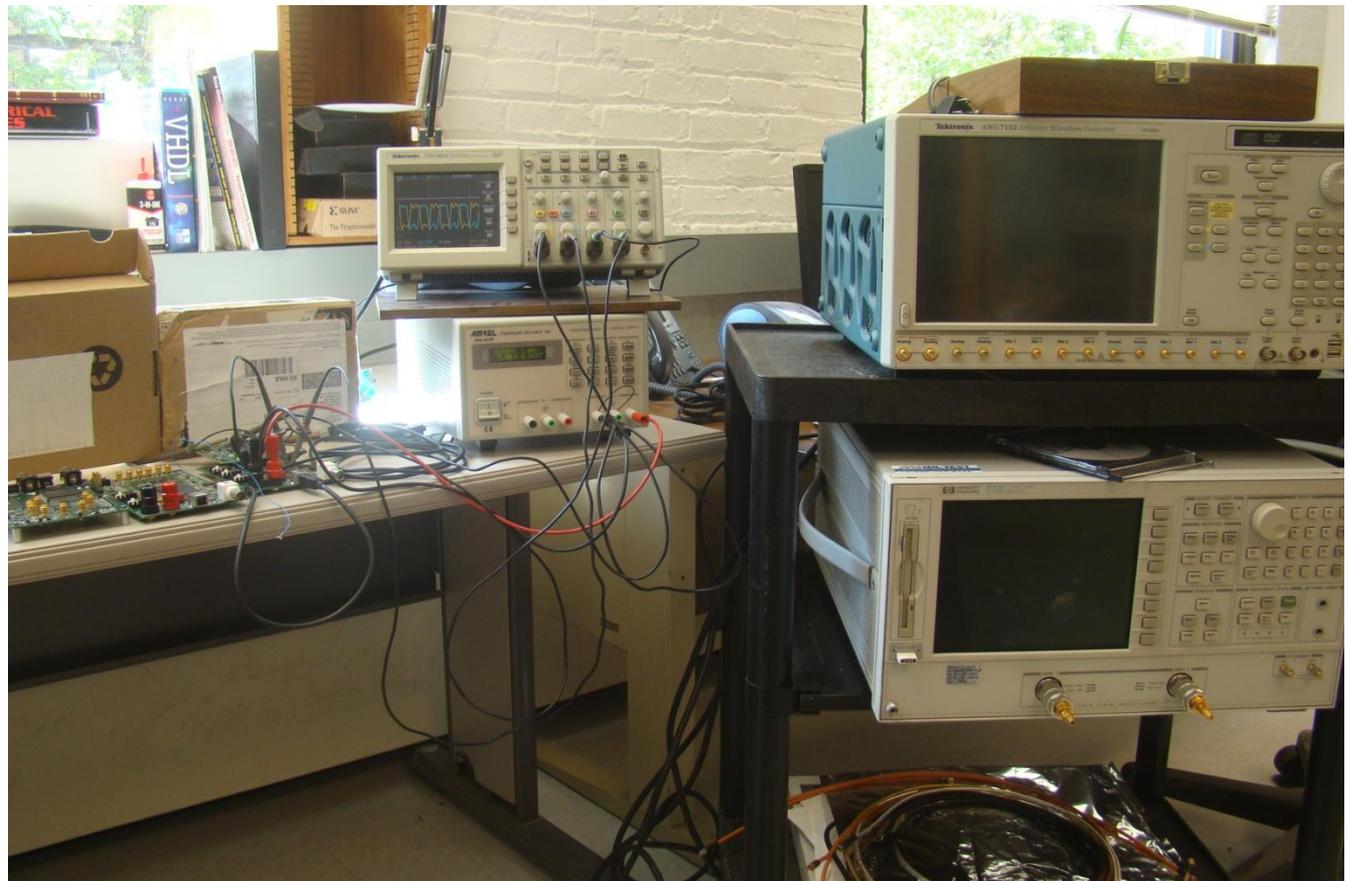
(Limited by # of PSEC-3 dies --total 36 unused dies = 144 channels)



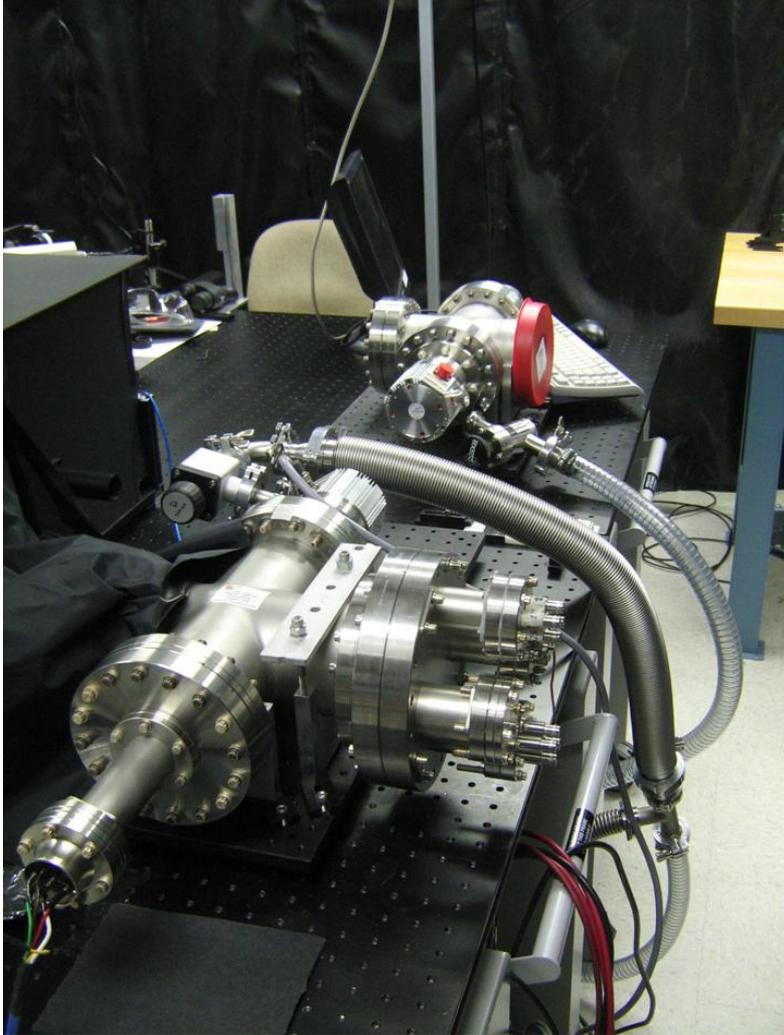
← PSEC-4 eval – 6 channels  
 (coming ~August)

# UChicago electronics shop

- First stop for all hardware
- Up-and-running – all the necessary tools in place (network analyzer recently acquired)

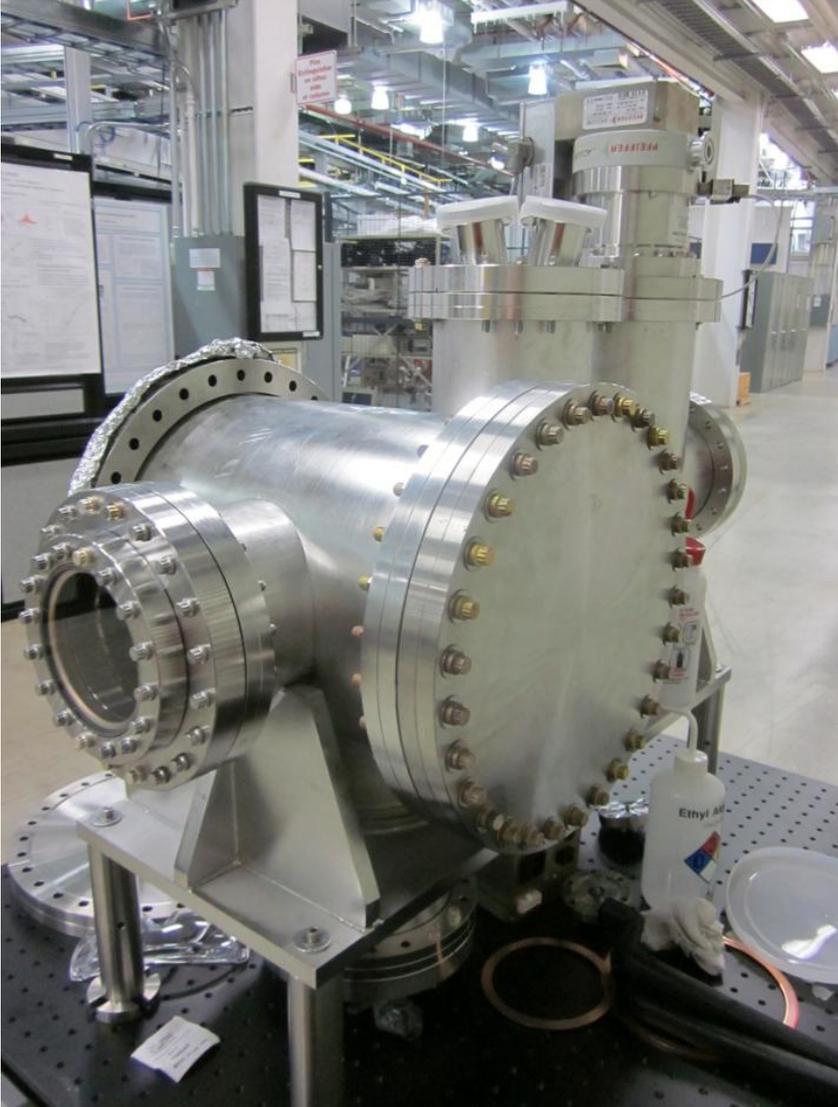


# Argonne 33mm test set-up



- Ready for PSEC-3 eval board interface
  - Priority! (start again next week)
  - Need to figure out system triggering
- 4 channels accessible outside of vacuum

# Argonne 8" test chamber



- Pump-down recently accomplished
- Anode + 8" plates testing underway soon
- ~8 channels accessible outside of vacuum

Matt Wetstein

# Argonne 8" test chamber

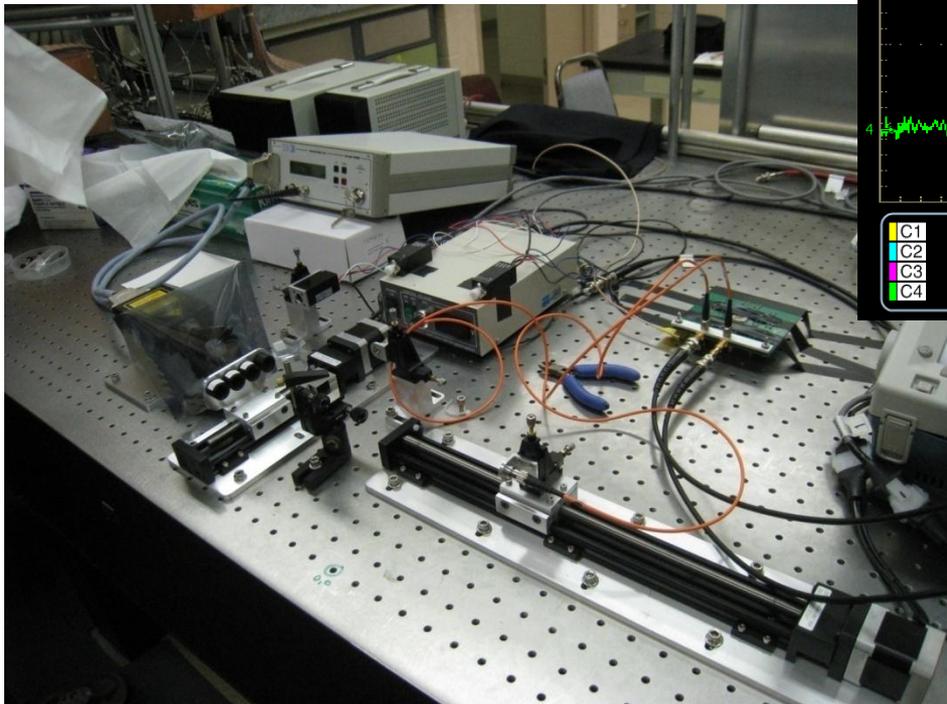


**8" anode plate w/ 33 mm MCP holder inside chamber**

Matt Wetstein

# UHawai'i piLas Test Stand

Single Photon Signal



- Everything ready\* for hardware testing + ASIC characterization

\* Plane ticket to Hawaii?

courtesy of Gary Varner

# UHawai'i X-Ray generating FEL

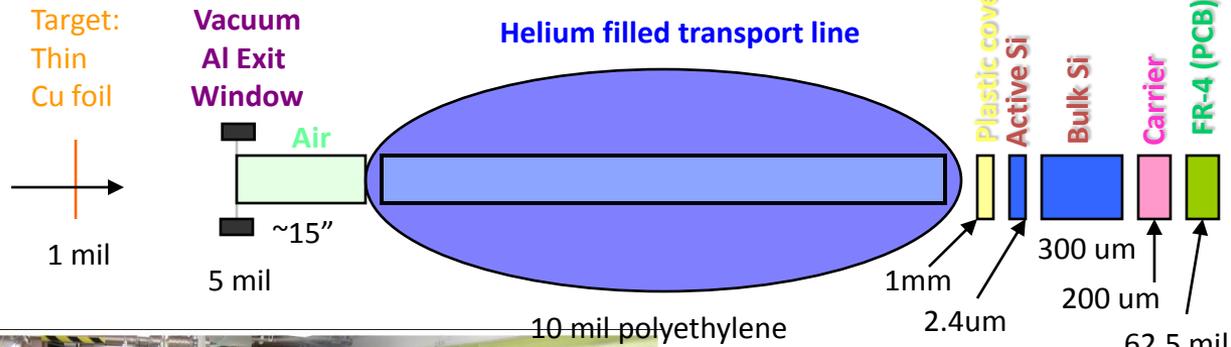
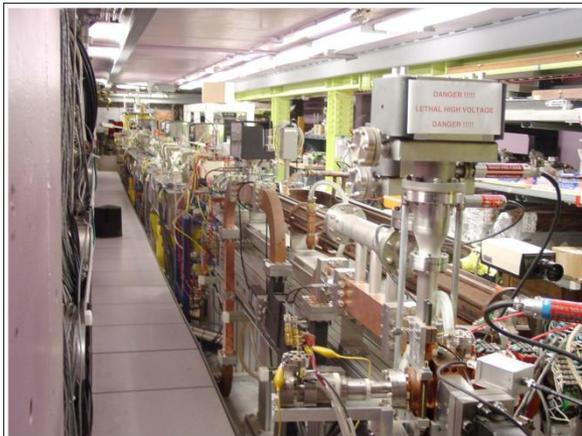
- Test beamline in Watanabe Hall commissioned Fall 2010
  - **intense flux, ~1ps timing**
- Access to an array of high quality RF test equipment, including our own anechoic chamber on campus, as well as piLas laser
- Excellent facilities for
  - ASIC input coupling studies
  - System timing performance
  - Integrated detector results
- **Ready for hardware testing/characterization**

courtesy of Gary Varner

# UHawai'i X-Ray generating FEL

## Bremsstrahlung x-ray source: UH FEL

50MeV max. (40MeV typ.)



courtesy of Gary Varner

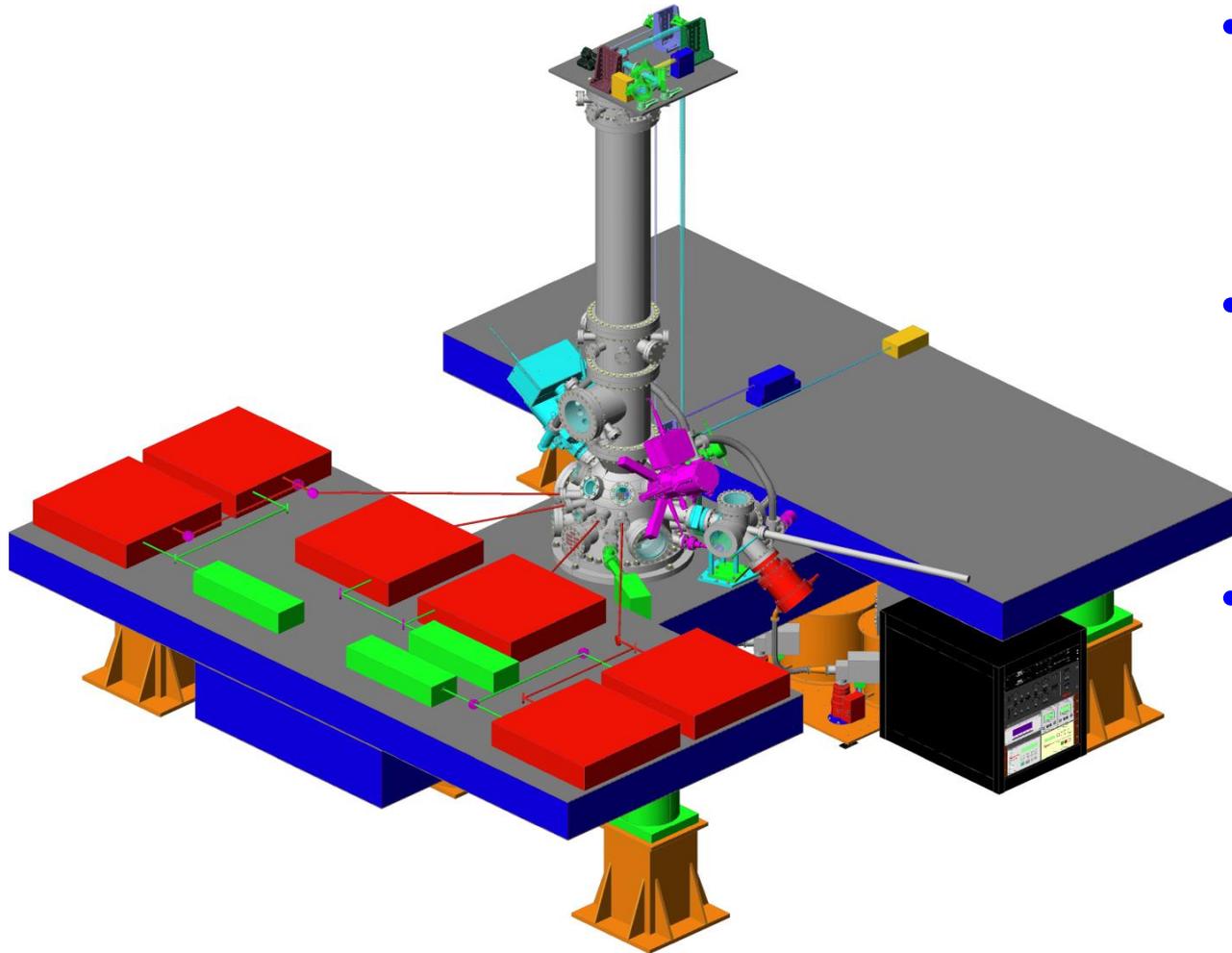
# Argonne Mock-tile testing

- Mock-tile 1 cracked upon pump-down
- Once successful vacuum achieved, good test bench for tray electronics
- New fan-out board under development



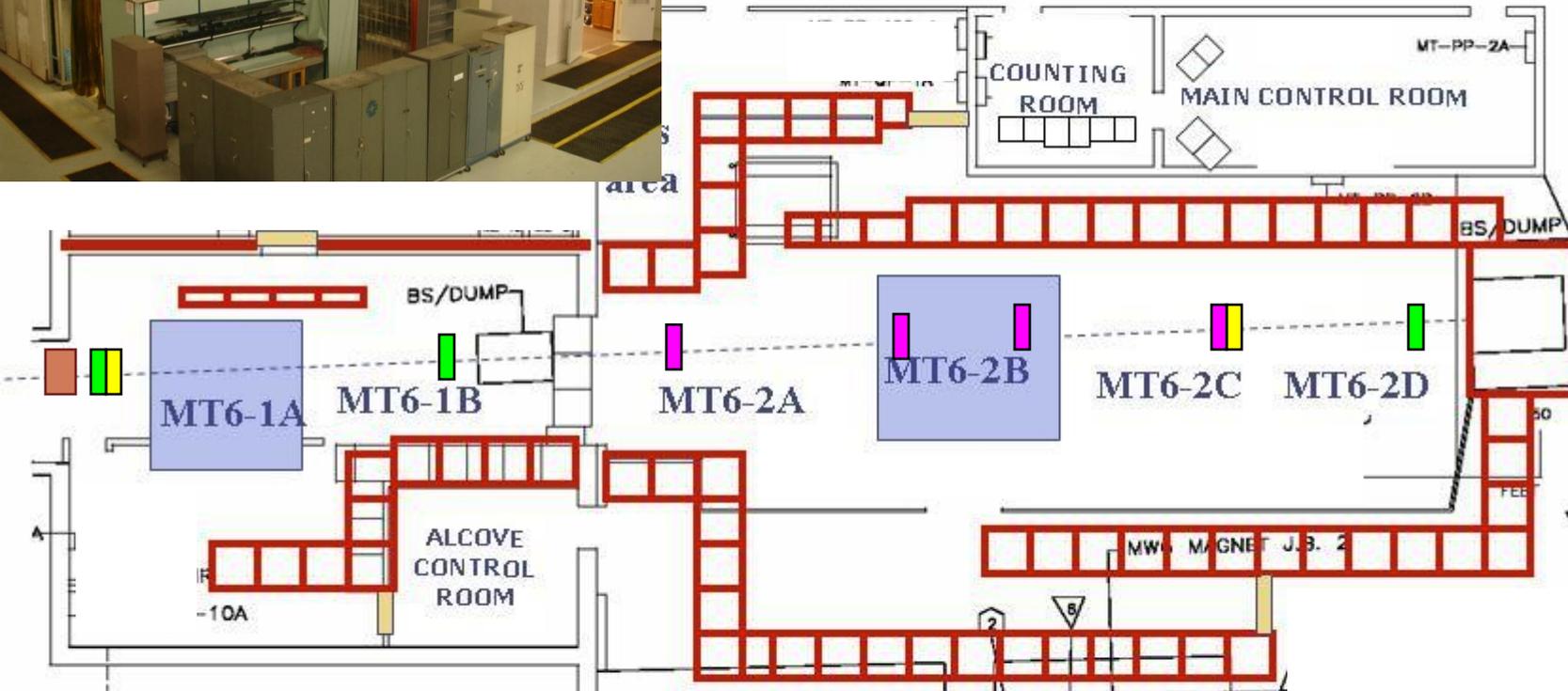
Herve Grabas

# Geophysics TOF Mass Spectrometer (UC)



- Currently working on design of 33mm MCP+transmission line readout
- Attempt to use PSEC-4 for front-end electronics
- A few months away

# Fermilab MTEST



TOF    
  PWC    
  Swic    
  Cerenkov

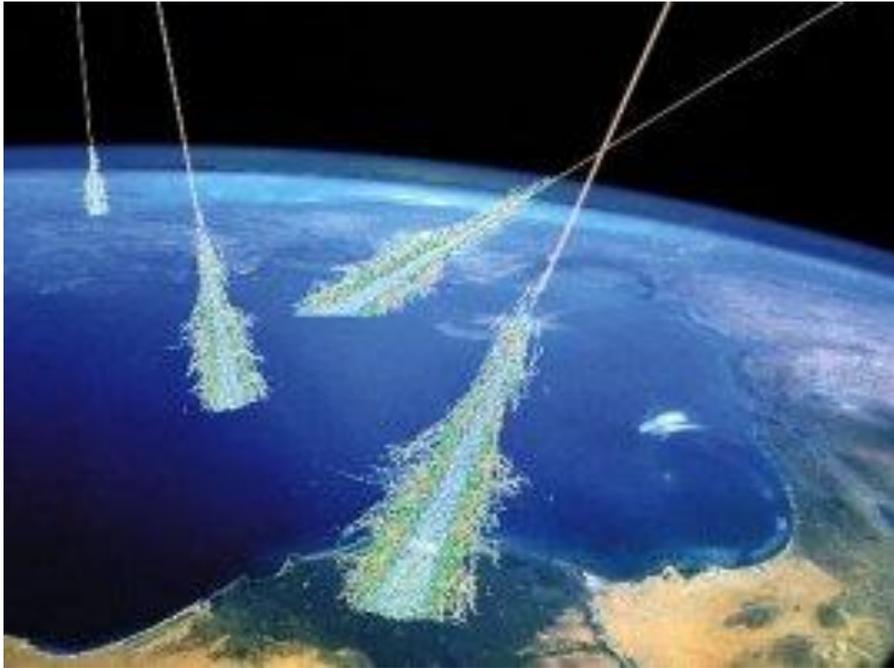
**Testing dependent on working 8" device**

20-May-2011

Electronics & Integration GPC review

courtesy of Erik Ramberg

# UChicago Cosmic Ray Test Stand



NASA

- Yau Wah plans to build cosmic ray test stand at UChicago
- Future 'in-house' tray detector/electronics application

# Summary

- **Test benches currently available to integrate with current hardware**
  - 33mm testing, Hawai'i facilities, etc..
- **Integrating electronics with real signals a priority**
  - restart 33mm MCP PSEC-3 testing in next weeks
  - 'forced' concurrent software/DAQ development
- **Tray electronics under development**
  - Integration to mock-tile/real-tile highly dependent on MCP deliverables