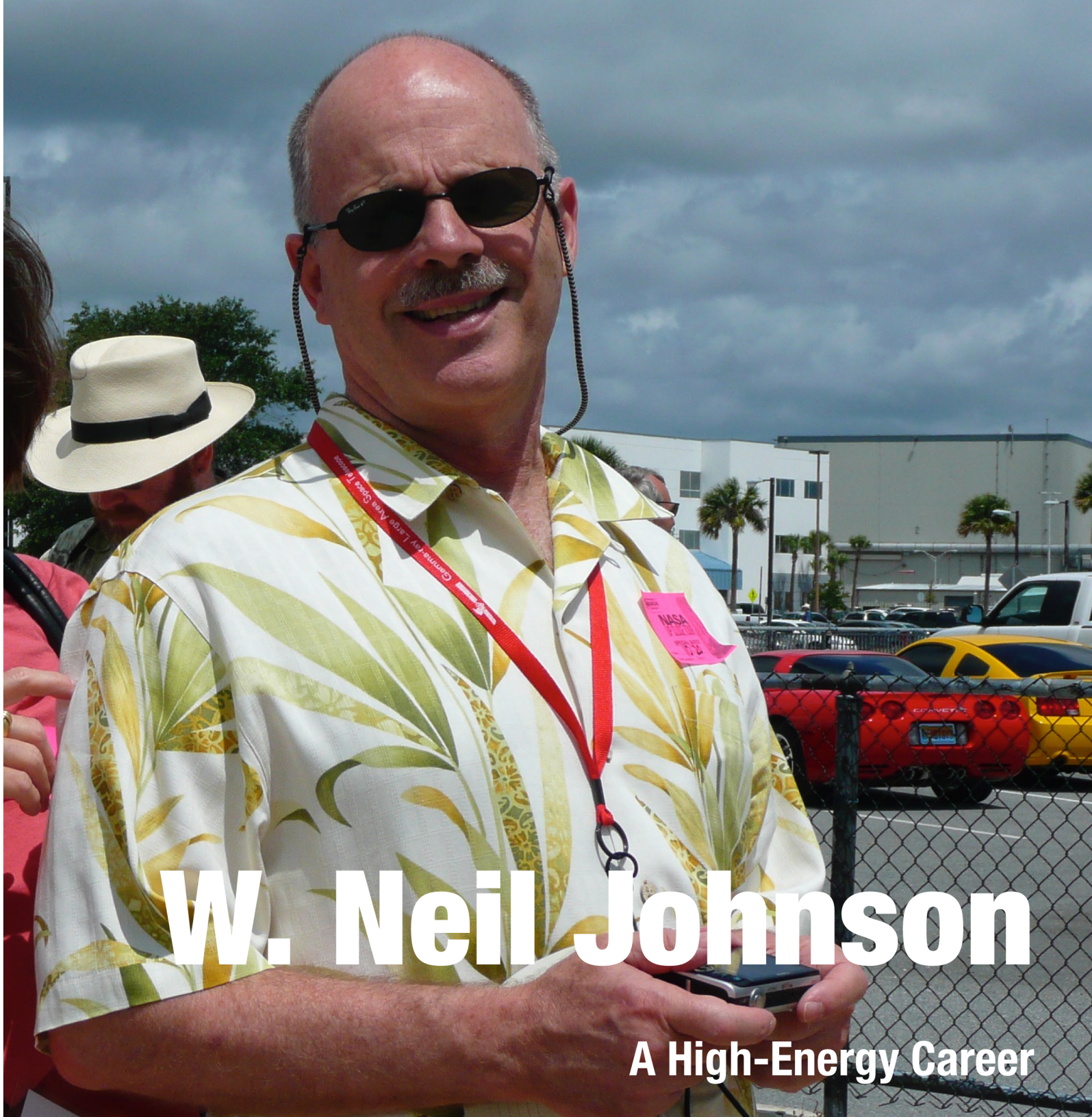
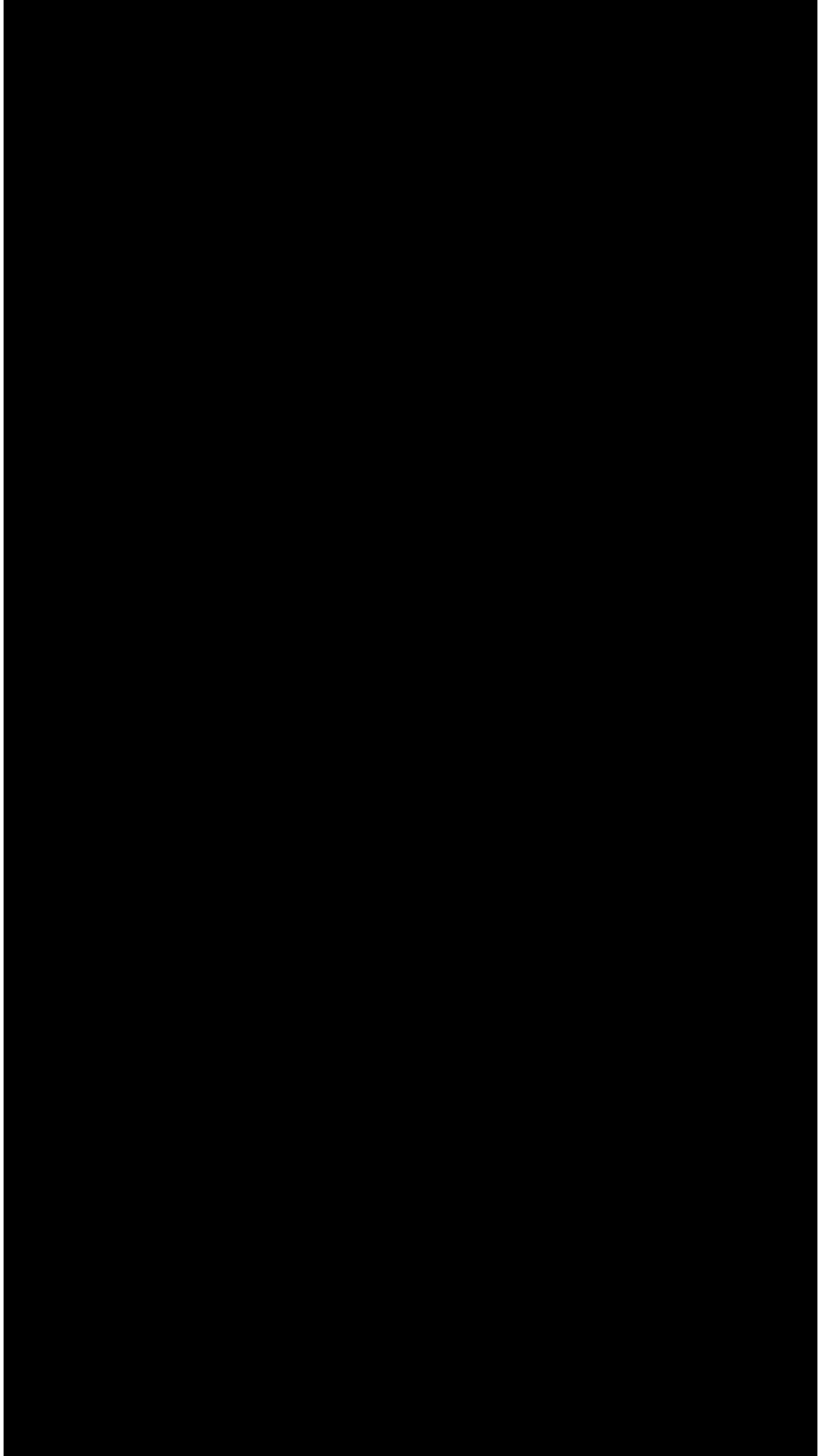


W. Neil Johnson

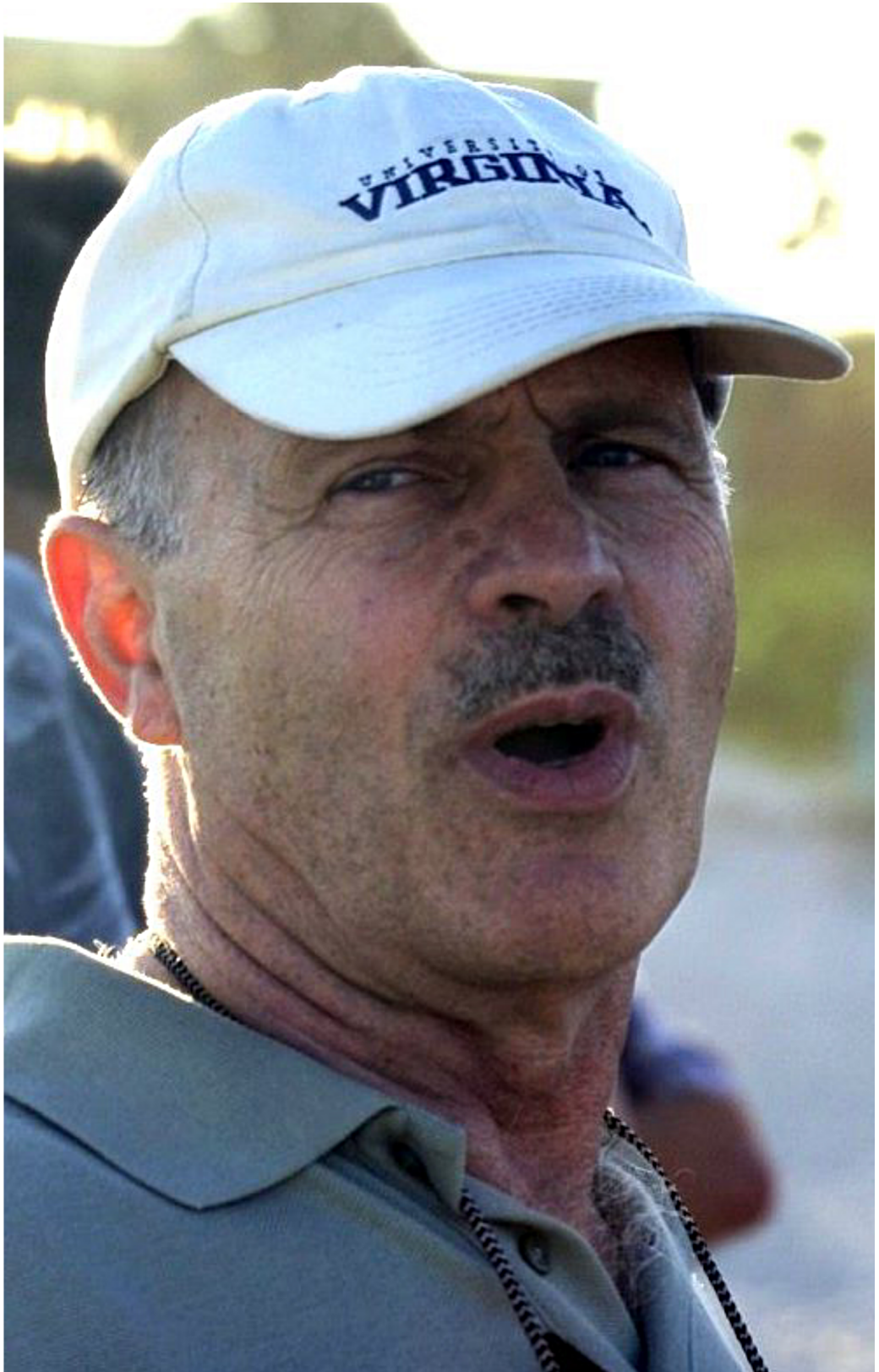
A High-Energy Career



W. Neil Johnson

A Career in Pictures

B.A. Mathematics and Physics, Rice University, 1967
M.S. Space Science, Rice University, 1972
Ph.D. Space Science, Rice University, 1973
Naval Research Laboratory, 1973 – 2014

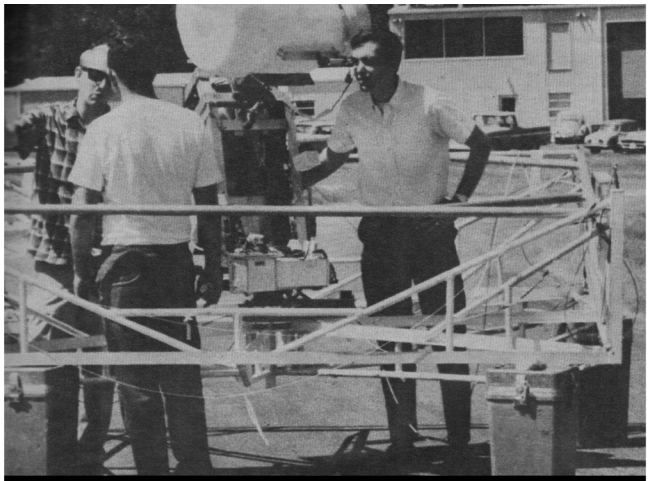


Hard X-ray Balloon Flights

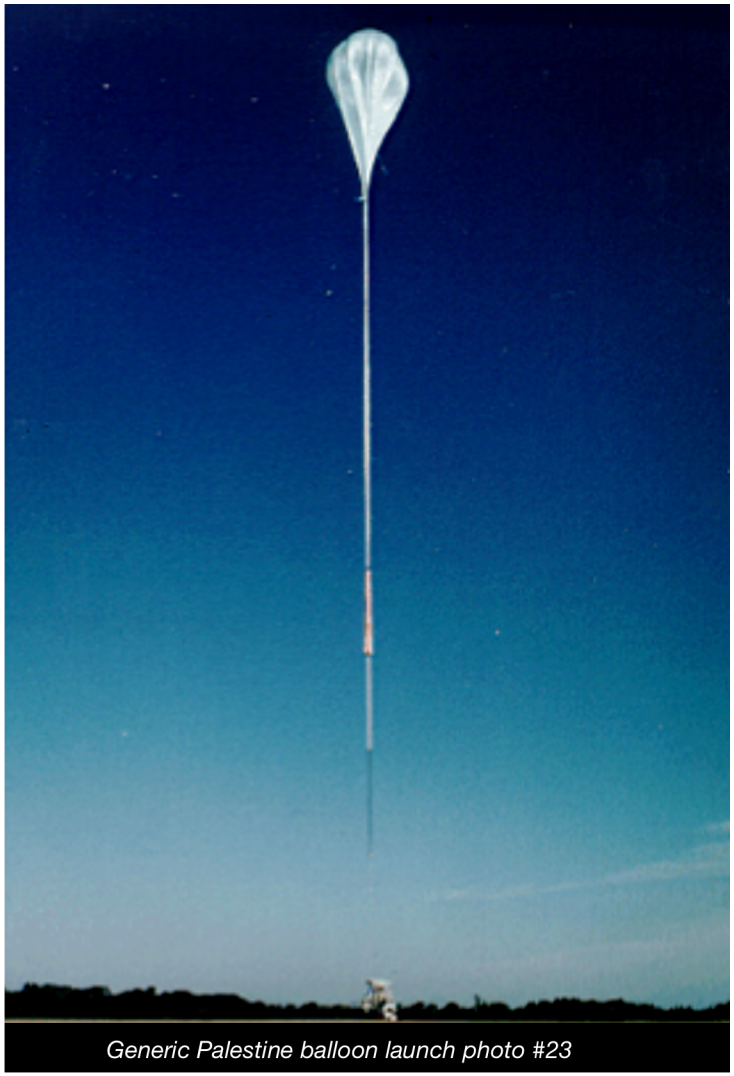
Back in the days when flying instruments was fun. Except in Malden, Missouri.

Greenville, South Carolina, 1983

Palestine, Texas, 1976



Jerry Fishman with Rice University payload

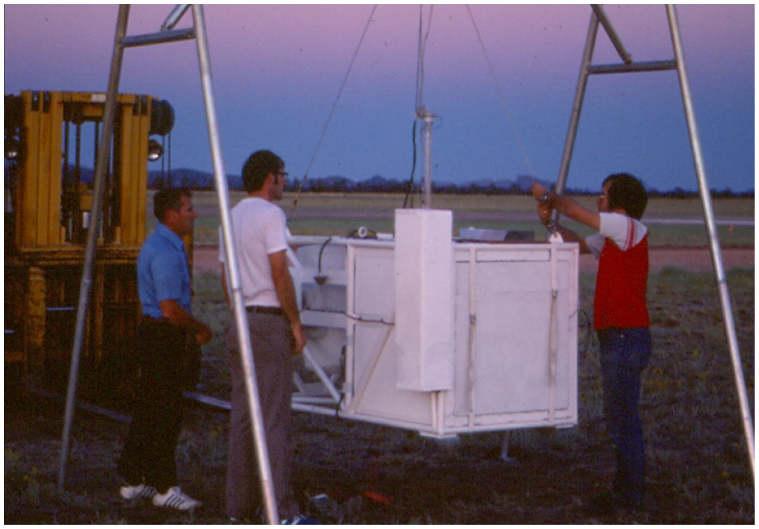


Generic Palestine balloon launch photo #23

Del Saulnier, Palestine, 1976

Palestine, 1976

Australia 1977



Jim Kurfess and Neil pose for GQ

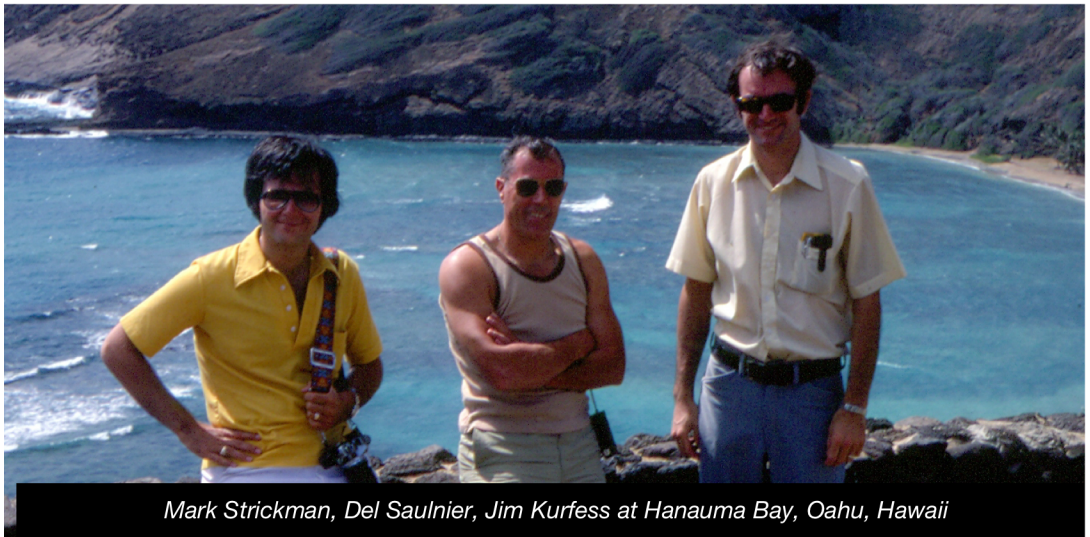
Two balloon flights from Alice Springs, Middle of Nowhere, Australia.

Really. 800 miles from the nearest city ….

Payload and Land Rover Recovery

Two vehicles, 60 miles, vapor lock, running into ditches at speed. Please can I fly back to Alice Springs? Did I say please?

Manly Beach, Sydney, Australia. Any chance for recovery here?



Mark Strickman, Del Saulnier, Jim Kurfess at Hanauma Bay, Oahu, Hawaii

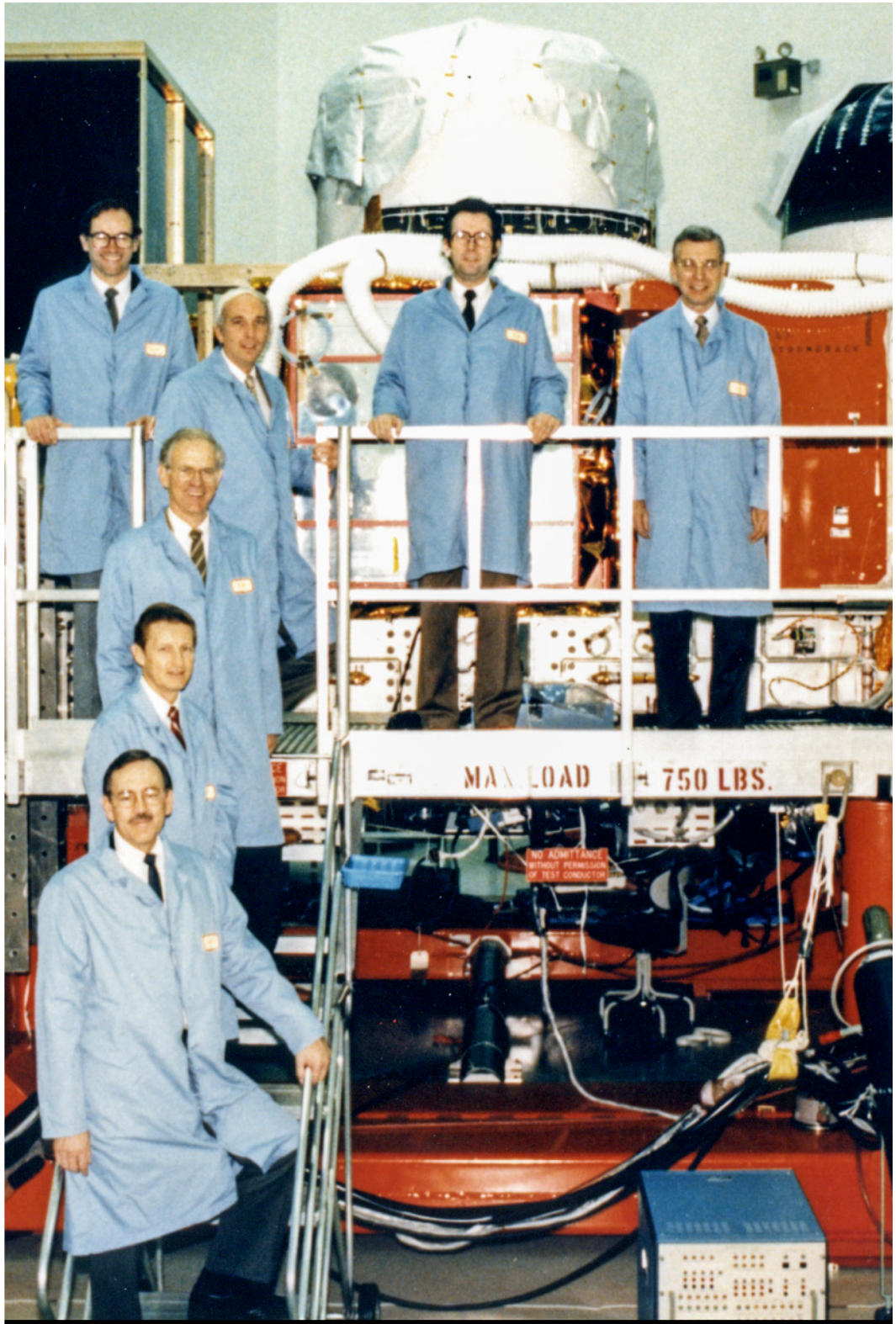
All Work and No Play?

Scouting potential recovery locations is hard work. An important task. No, really.

GRO & OSSE

February 21, 1978 to June 4, 2000

Proposed at $8.5M, OSSE had a final cost to US taxpayers of $60M. That's only about a factor of three after inflation!



The four PIs: Jim Kurfess, Jerry Fishman, Volker Schönfelder, Carl Fichtel

A RESEARCH PROPOSAL SUBMITTED TO THE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Real men don't use word processors

21 February 1978

A 0.1-10 MeV GAMMA RAY EXPERIMENT FOR GRO

I. INVESTIGATION AND TECHNICAL PLAN

E. O. HULBURT CENTER FOR SPACE RESEARCH
Naval Research Laboratory
Washington, D.C. 20375

and

NORTHWESTERN UNIVERSITY
Evanston, Illinois

Principal Investigator

James D. Kurfess
James D. Kurfess
Naval Research Lab
Tel. 202-767-3028

H. Friedman
H. Friedman
Chief Scientist
E.O. Hulburt Center for
Space Research

Co-Investigators

Melville Ulmer
Northwestern University

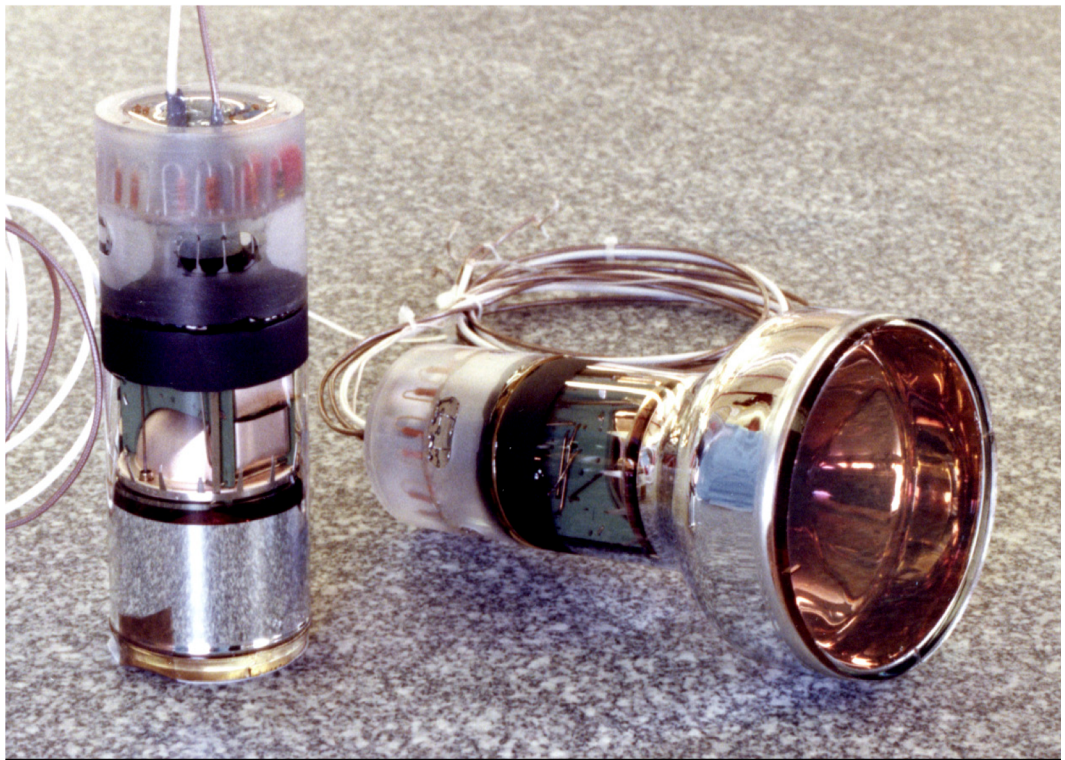
W. Neil Johnson
Naval Research Lab

Robert L. Kinzer
Naval Research Lab

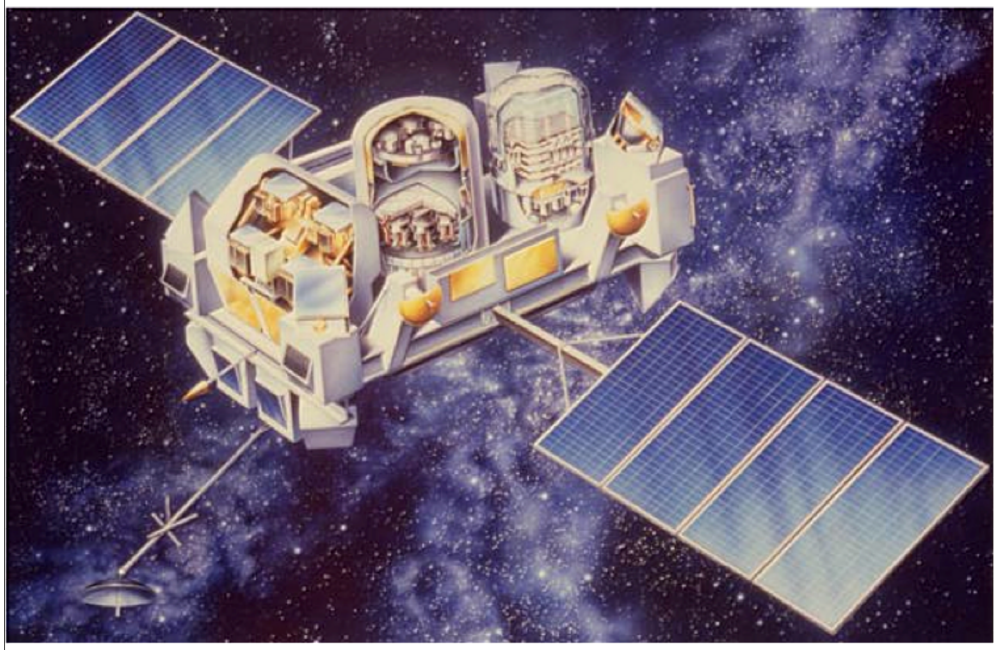
Gerald H. Share
Naval Research Lab

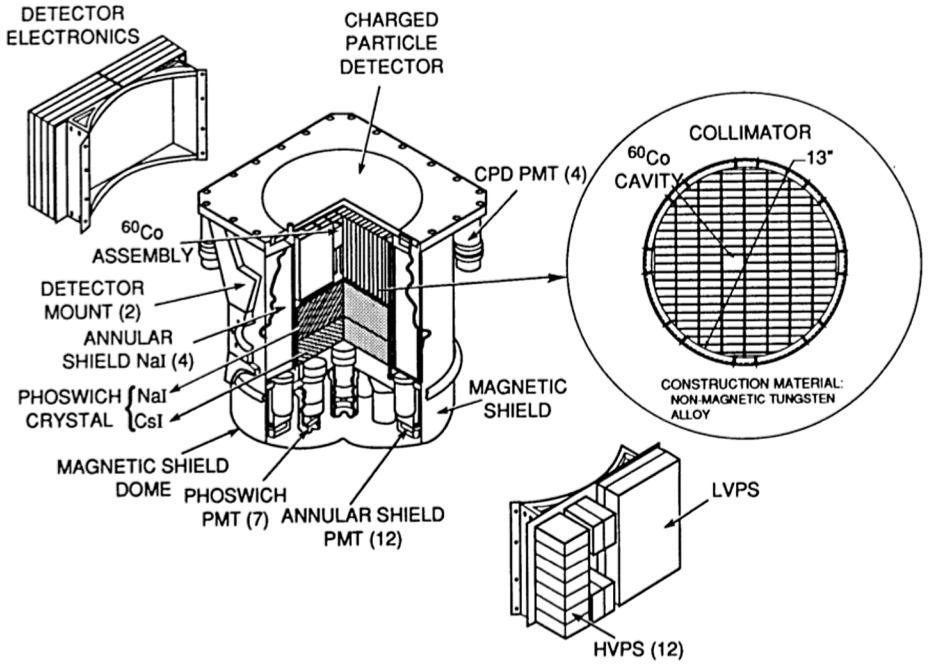
Scientific Consultant
Clive Dyer
Royal Naval College

The gang from Rice together again at the pre-launch party: Jim Kurfess, Jerry Fishman, Bob Haymes, and Neil

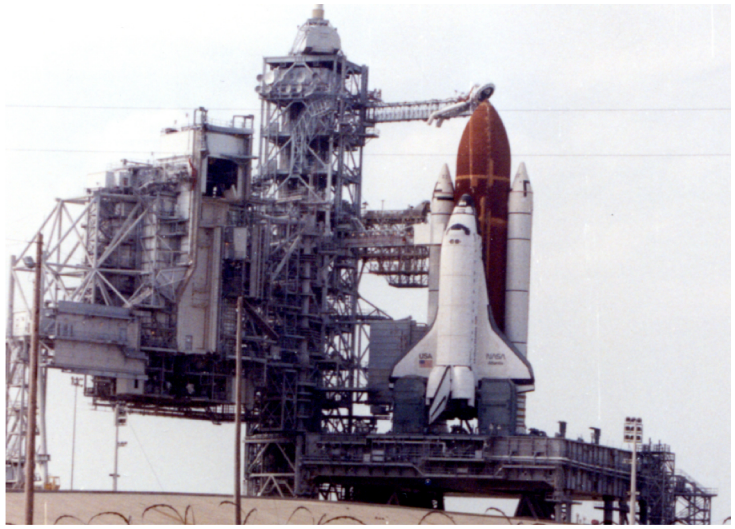


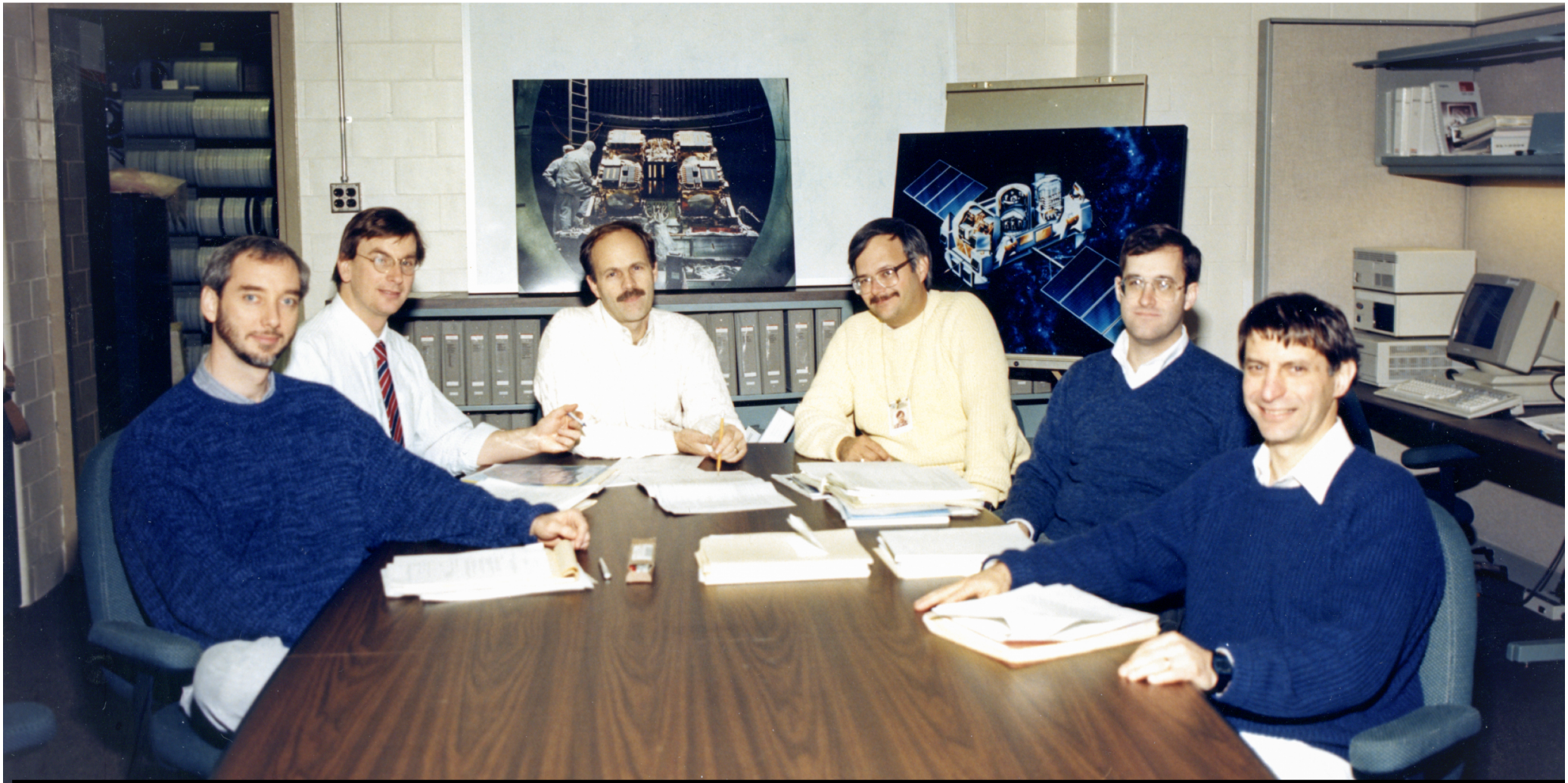
Breaking phototubes was part of the fun



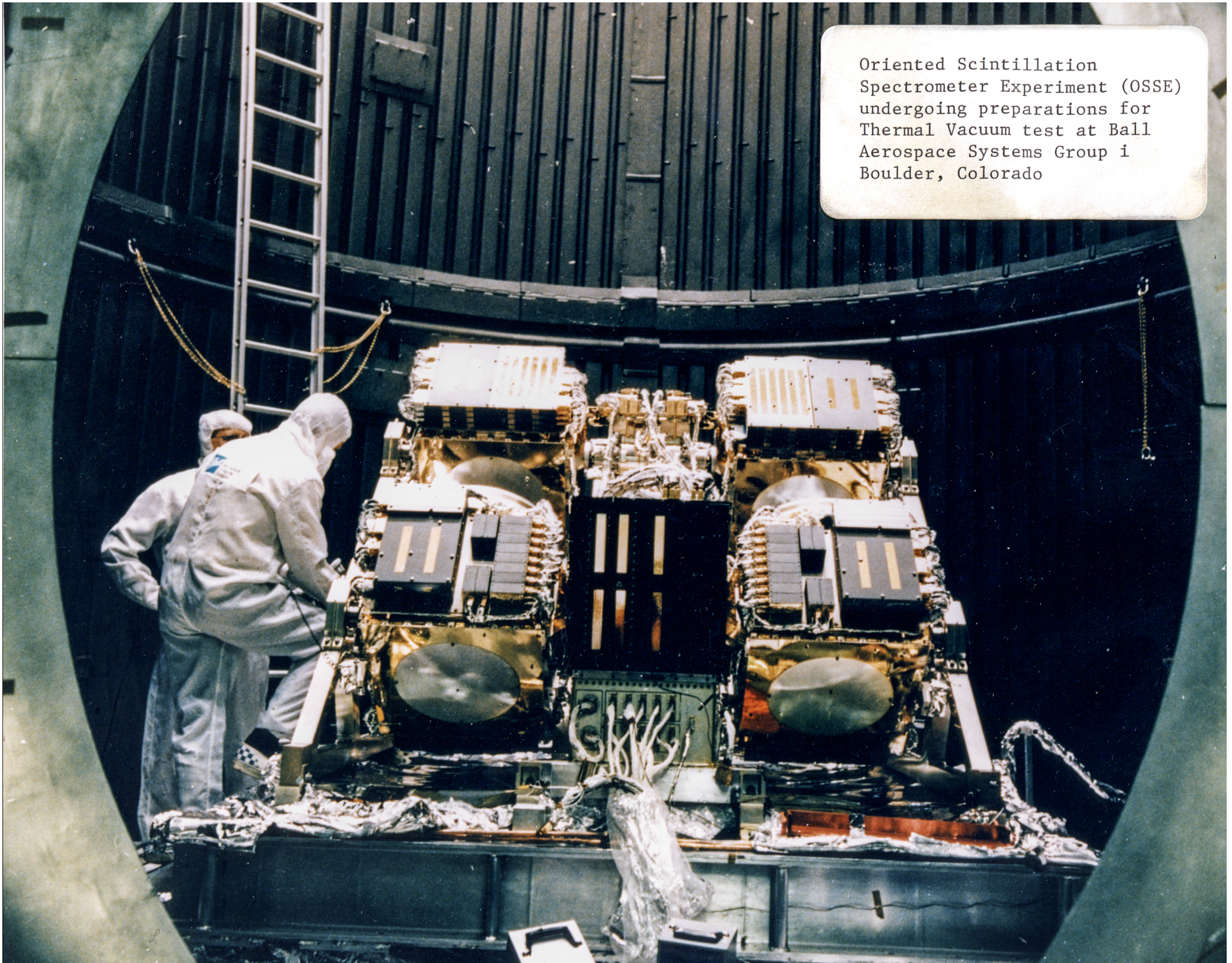

DETECTOR ELECTRONICS
CHARGED PARTICLE DETECTOR
COLLIMATOR
^{60}Co CAVITY
13"
CPD PMT (4)
^{60}Co ASSEMBLY
DETECTOR MOUNT (2)
ANNULAR SHIELD NaI (4)
PHOSWICH CRYSTAL NaI CsI
MAGNETIC SHIELD
CONSTRUCTION MATERIAL: NON-MAGNETIC TUNGSTEN ALLOY
MAGNETIC SHIELD DOME
PHOSWICH PMT (7)
ANNULAR SHIELD PMT (12)
LVPS
HVPS (12)

Ron Murphy, Dan Messina





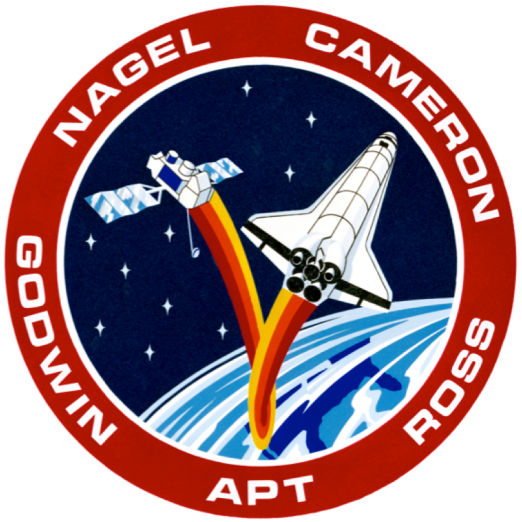
Bill Purcell, Rob Cameron, Neil, Mark Strickman, Steve Matz, Mel Ulmer



Oriented Scintillation Spectrometer Experiment (OSSE) undergoing preparations for Thermal Vacuum test at Ball Aerospace Systems Group i Boulder, Colorado

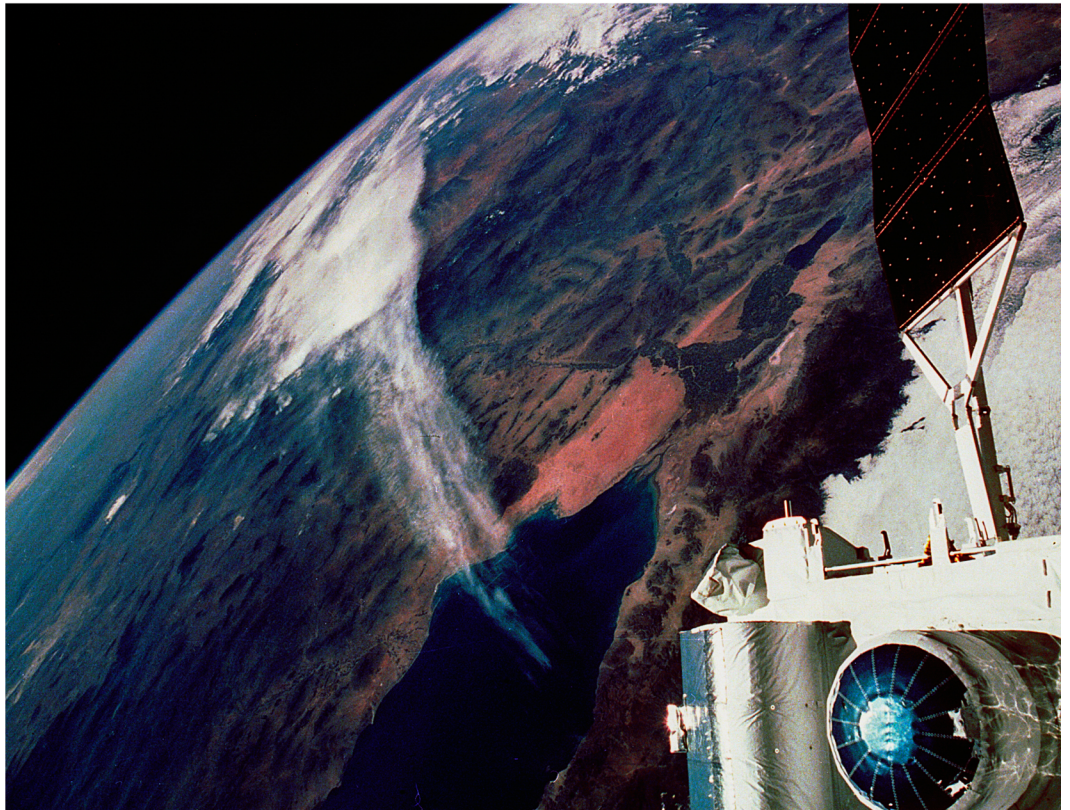
Neil paces at the VIP viewing site, waiting ...

... for that picture-perfect launch on April 5, 1991

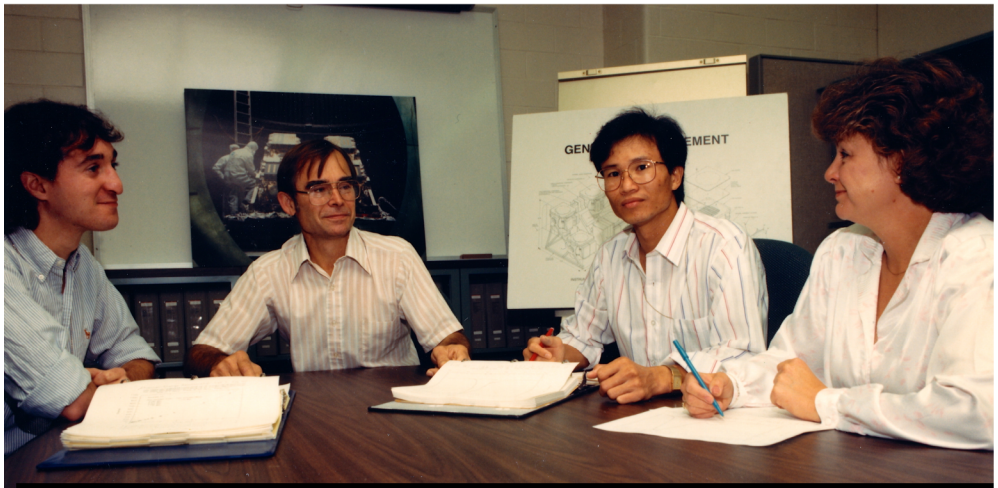


Neil, Rob Cameron, Dave Kuo

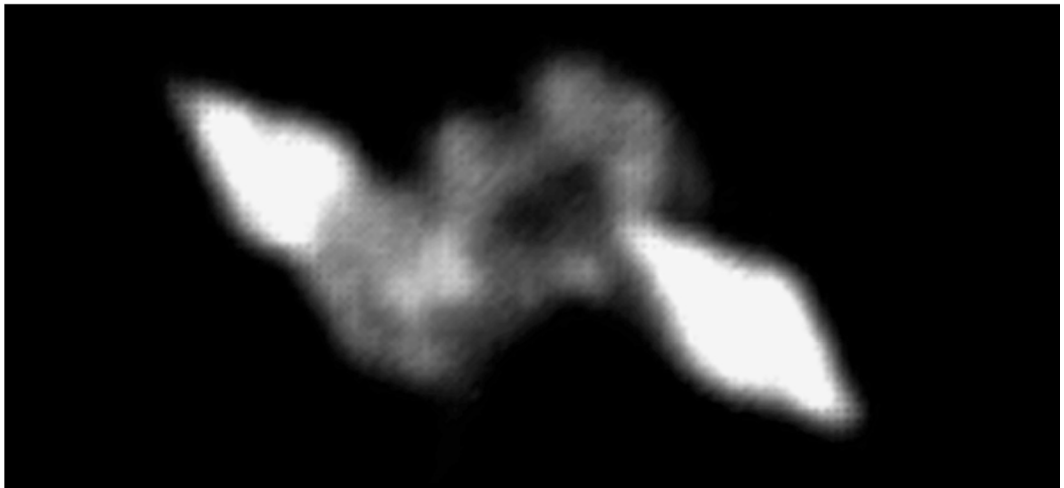
NASA



There's an uncanny resemblance between the Annihilation Fountain and GRO itself. Coincidence? You decide!



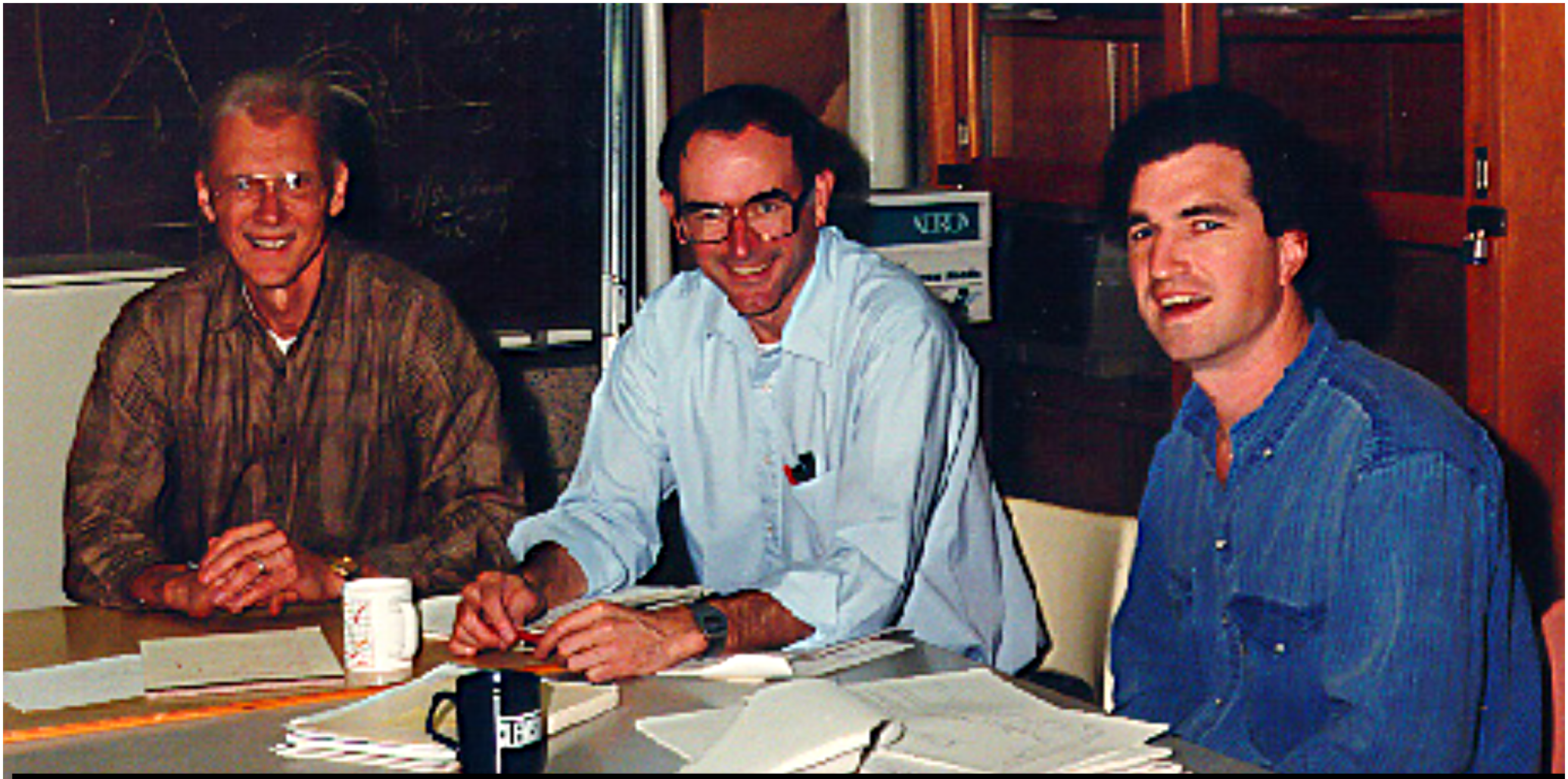
John Obenauer, Bob Kinzer, Ket Dang, Patty Sandora



GRO as seen from Hawaii, just before re-entry

OSSE team meeting at NRL, 1993

Mike Harris, Greg Jung, Chris Star, Steve Matz, Dave Grabelsky, Rob Cameron, Mark Leising, Craig Jensen
Lih-Sin The, Mark Strickman, BIll Purcell, Bob Kinzer, Dick Kroeger, Eric Grove
John Obenauer, Neil, Jim Kurfess, Don Clayton, Mel Ulmer, Ron Murphy



Don Clayton, Jim Kurfess, and Mark Leising smile about the discovery of 57Co in SN1987A

OSSE Collaboration Meetings

Because meetings are what they pay us for

Kellie McNaron-Brown and Neil at Clemson University

Bob Kinzer, Dieter Hartmann, and Mel Ulmer enjoy some good science

Mark Leising is pitching it, but Neil and Dave Grabelsky aren't buying

Mark Strickman, Neil, and the back of Dave Grabelsky's head

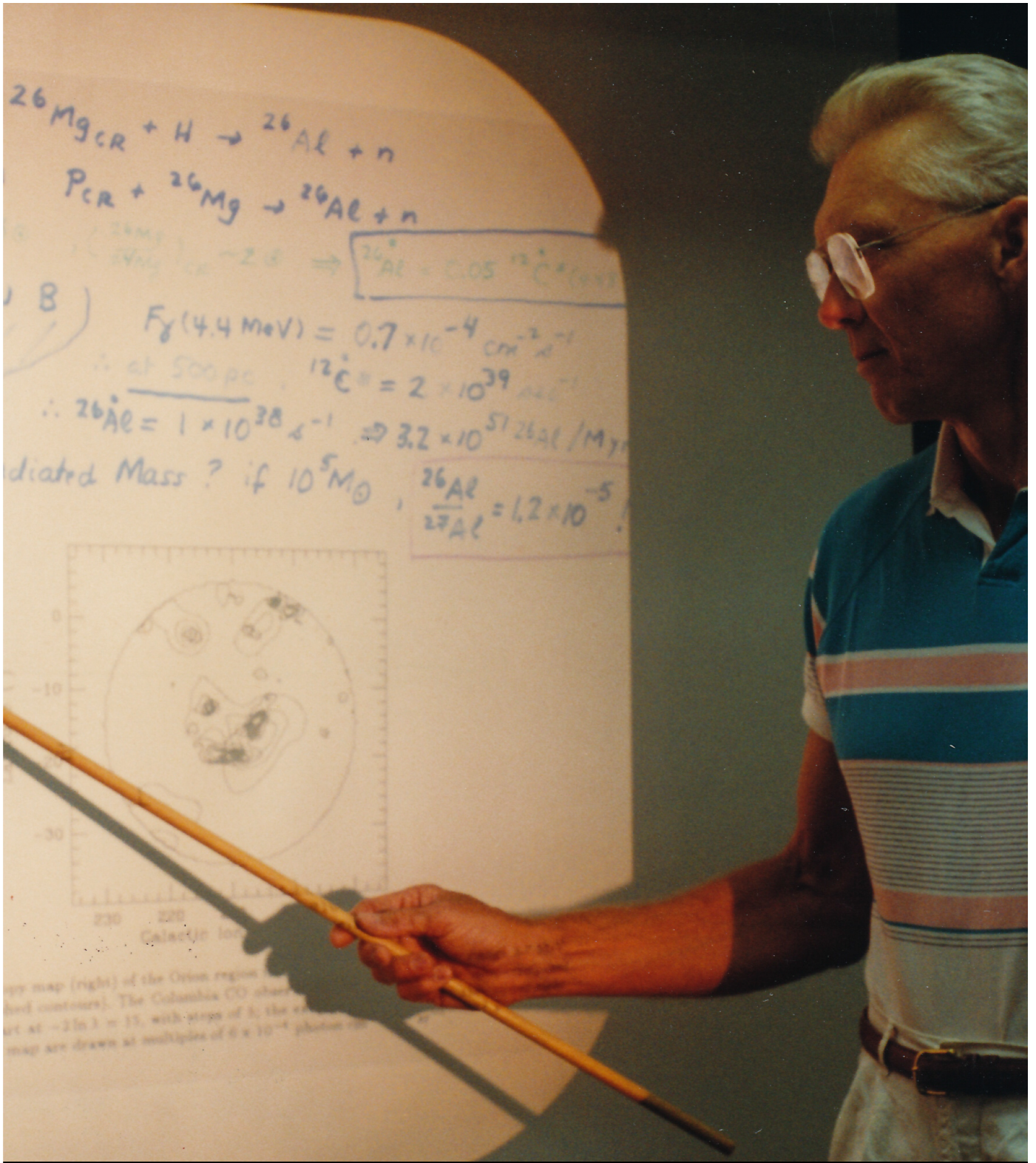
Jim, Mark, and Mark wait for another entry in TLA bingo

Mark Strickman charts the flow of scientific progress. Or at least OSSE science data.

IGORE, SDB, IDL, RMF, PHA

Good science demands good acronyms

Bob Kinzer, being told he needs to purge files



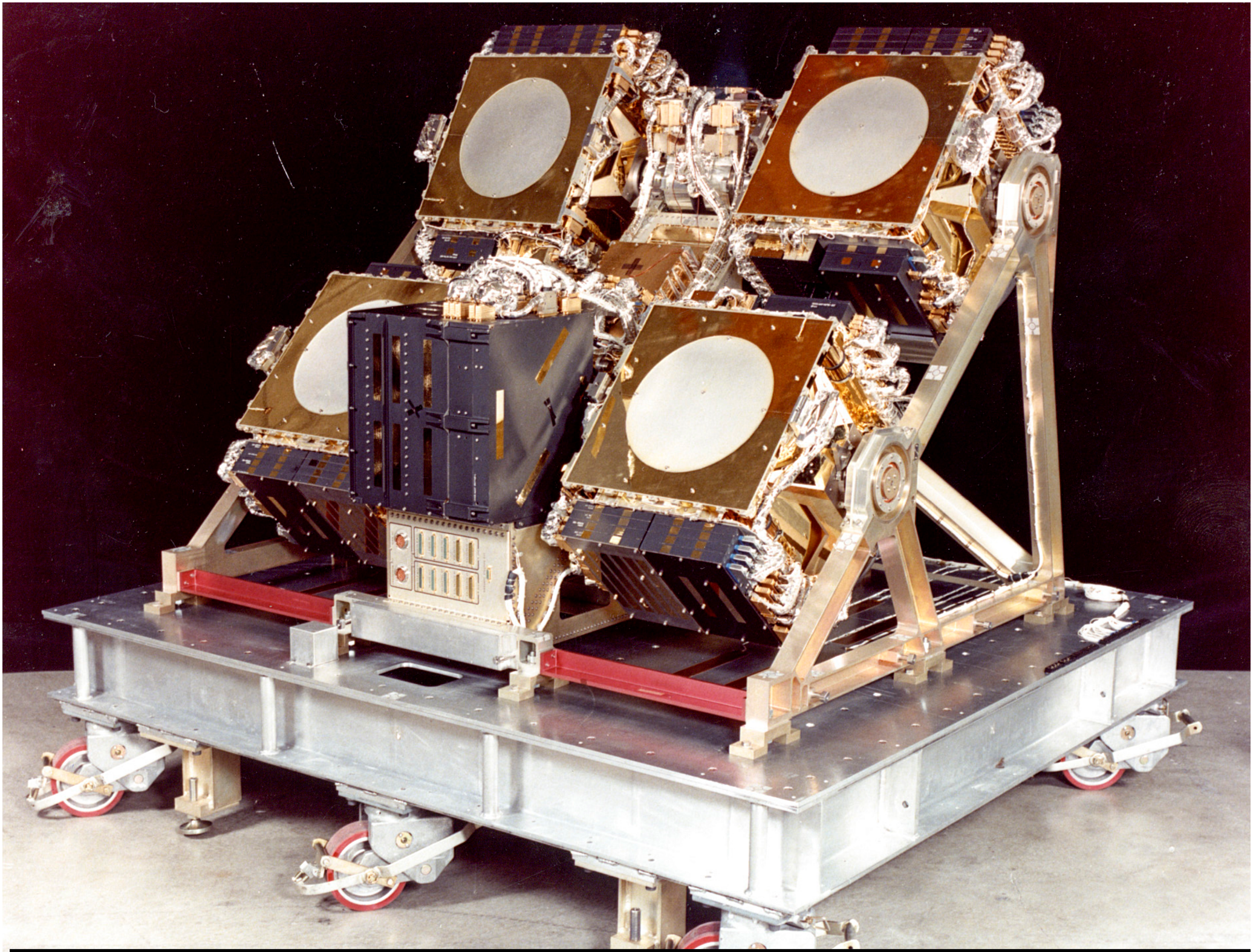
Don Clayton explains nucleosynthesis in three easy steps

OSSE TEAM MEETING
at
NORTHWESTERN UNIVERSITY
APRIL, 1993

FRONT ROW: Mark Strickman, Bernard Phlips, Carlos K. Guérard, Ronald Murphy, J. Eric Grove, Mel Ulmer, Gerry Share

SECOND ROW: Steven Matz, Neil Johnson, Charles Dermer, Lih-Sin The, Kellie McNaron-Brown, David Grabelsky, Bob Kinzer

BACK ROW: Richard A. Kroeger, Donald D. Clayton, James D. Kurfess, Mark Leising, Tom Bridgman, William R. Purcell

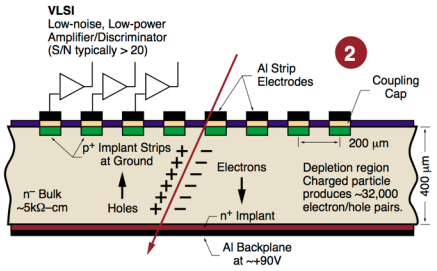


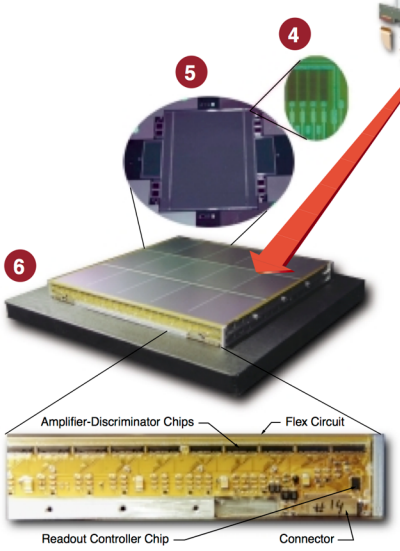
Your friend, the OSSE

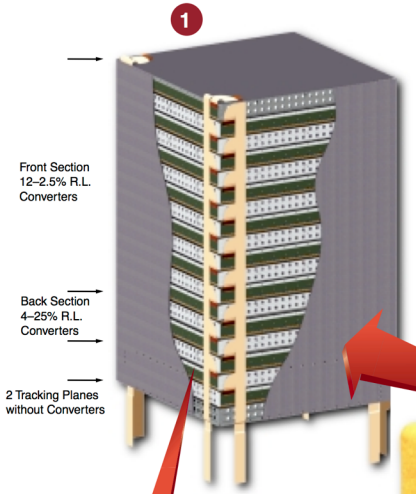
GLAST Large Area Telescope

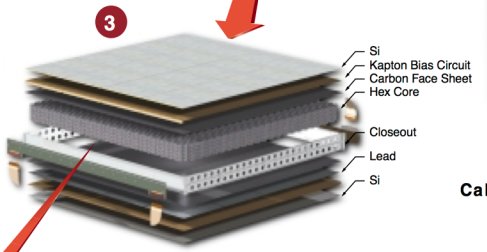
Tracker

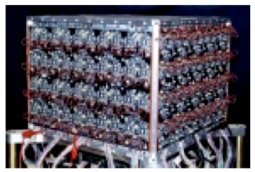
1. Tracker tower: stack of 19 trays with 18 x,y detection planes, enclosed in C walls.
2. Si strip detector cross section.
3. Exploded view of a tracker tray.
4. Si strips, bias resistors, and bonding pads.
5. 6" Si wafer, with a BTEM detector surrounded by test structures.
6. Complete tracker tray of the BTEM, with Si detectors on the top and bottom faces and readout electronics on two sides.





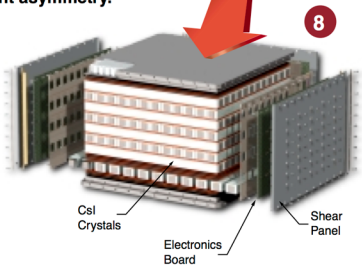


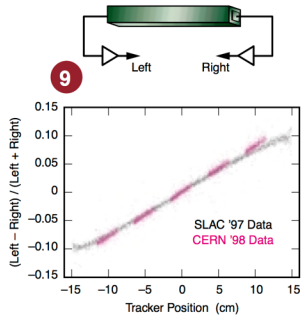




Calorimeter

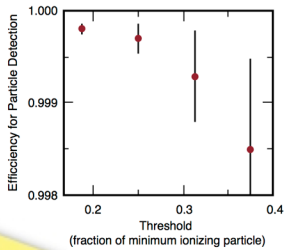
7. Assembled BTEM CAL module.
8. CAL compression cell design
9. CAL beam-test results: Position measurement from left-right light asymmetry.

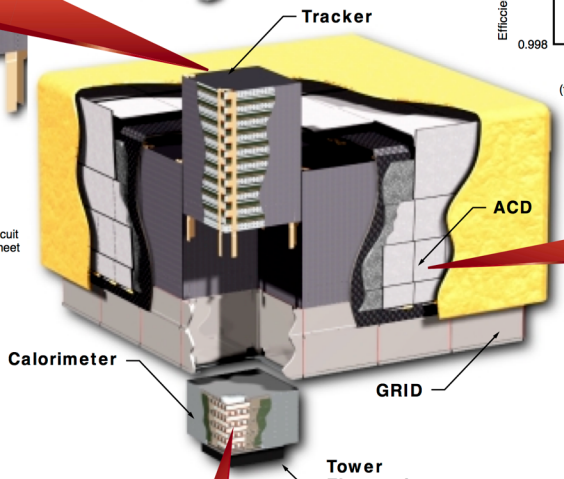


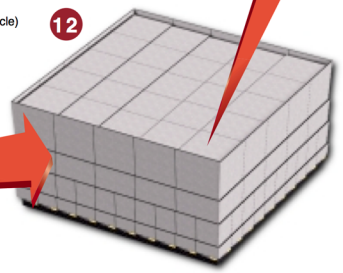


The Anticoincidence Shield

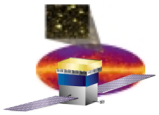
10. ACD beam-test results: efficiency to detect a minimum-ionizing particle versus the discriminator threshold. The required efficiency is 0.9997.
11. ACD scintillator tile, with waveshifting fiber readout.
12. The LAT enclosed in the ACD veto shield.







GLAST LAT/*Foldout C*
Instrument



Key Features:

- Low Aspect Ratio—Wide Field of View
- Large Energy Reach, Excellent PSF
- Proven Detector Technologies
- Large Detector Performance Margins
- Modularity, Redundancy
- No Consumables

Instrument Detector Technologies

Tracker (TKR):
Silicon Microstrip Detectors

- High efficiency
- High signal/noise
- Robust, Rad-Hard, Low Voltage
- Widespread use in space and HEP

Calorimeter (CAL):
Cesium-Iodide crystals; PIN diode readout

- Excellent energy resolution over wide range
- High signal/noise
- Hodoscopic array gives good position resolution and shower leakage correction
- Widespread use in space and HEP

Anticoincidence Detectors (ACD):
plastic scintillator tiles;
waveshifting-fiber/PMT readout.

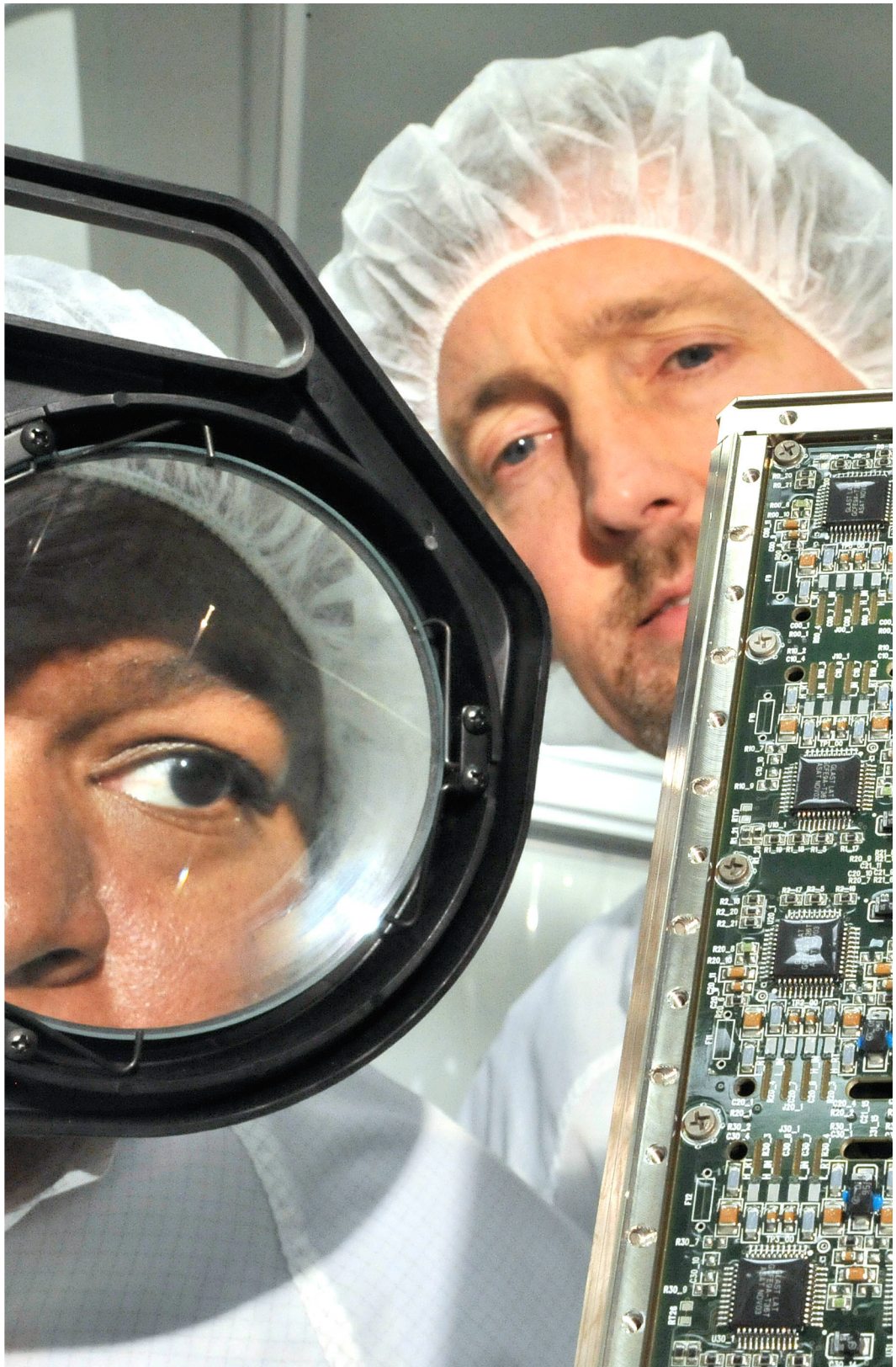
- High efficiency
- High segmentation to avoid self veto
- Widespread use in space and HEP

By 1999, proposals had to have glossy foldouts

Calorimeter Construction

November 1999 and still going

Calorimeter proposal, through Phase D, $10.8M.
Actual cost through 2014, approaching $50M.

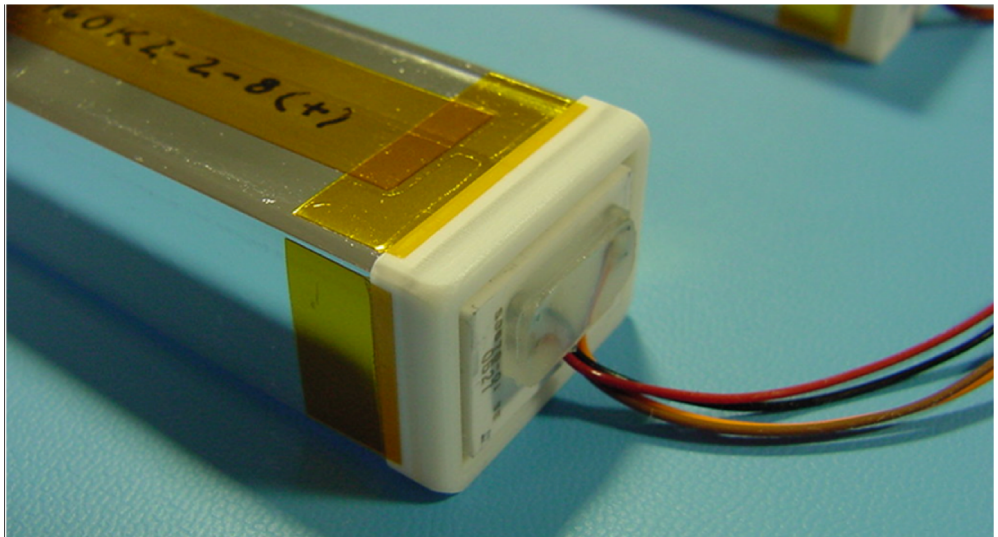


LAT Calorimeter Team, version 2003

Giles Bogeart, George Johannesson, Benoit Lott, Berrie Giebels, David Smith,
Leif Nilsson, Jim Ampe
Per Carlson, Thierry Reposeur, Neil, Didier Bederede, Paul DIzon, Staffan Carius
Sara Bergenius, Bob Kraeuter, Sasha Chekhtman, Eric Grove, Johan Bregeon

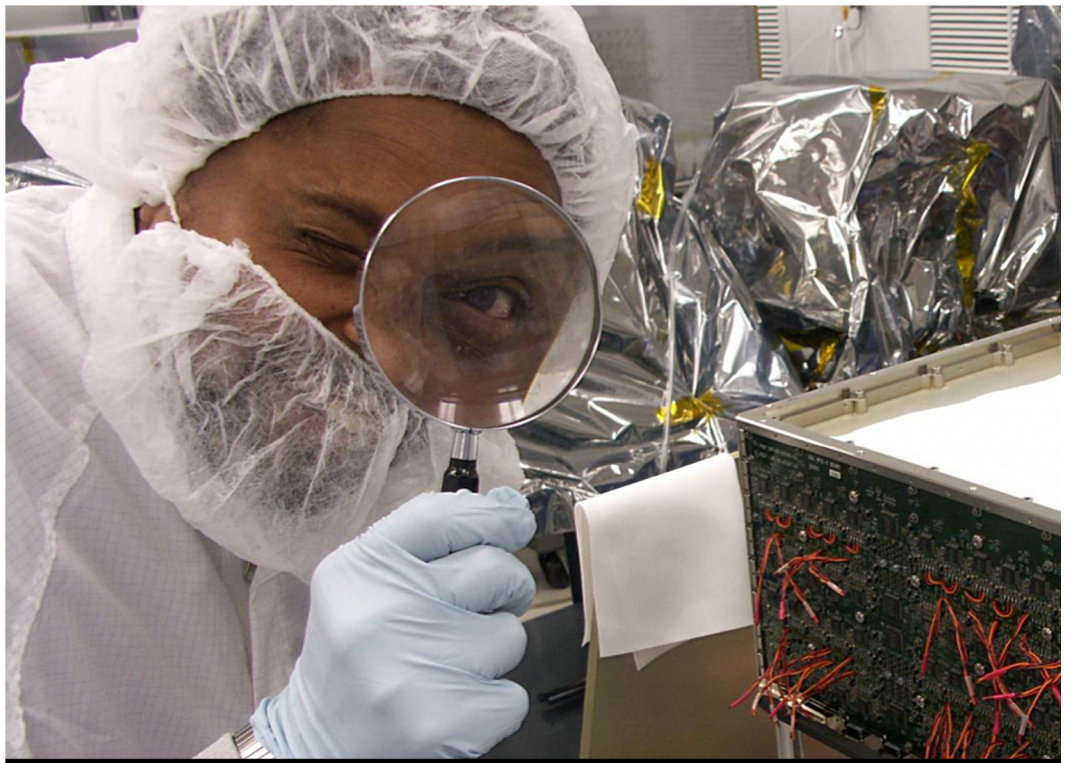
Paul Dizon, Nick Virmani

Kalmar castle helps guard the Swedish investment in CsI



Neil's signature orbits the Earth

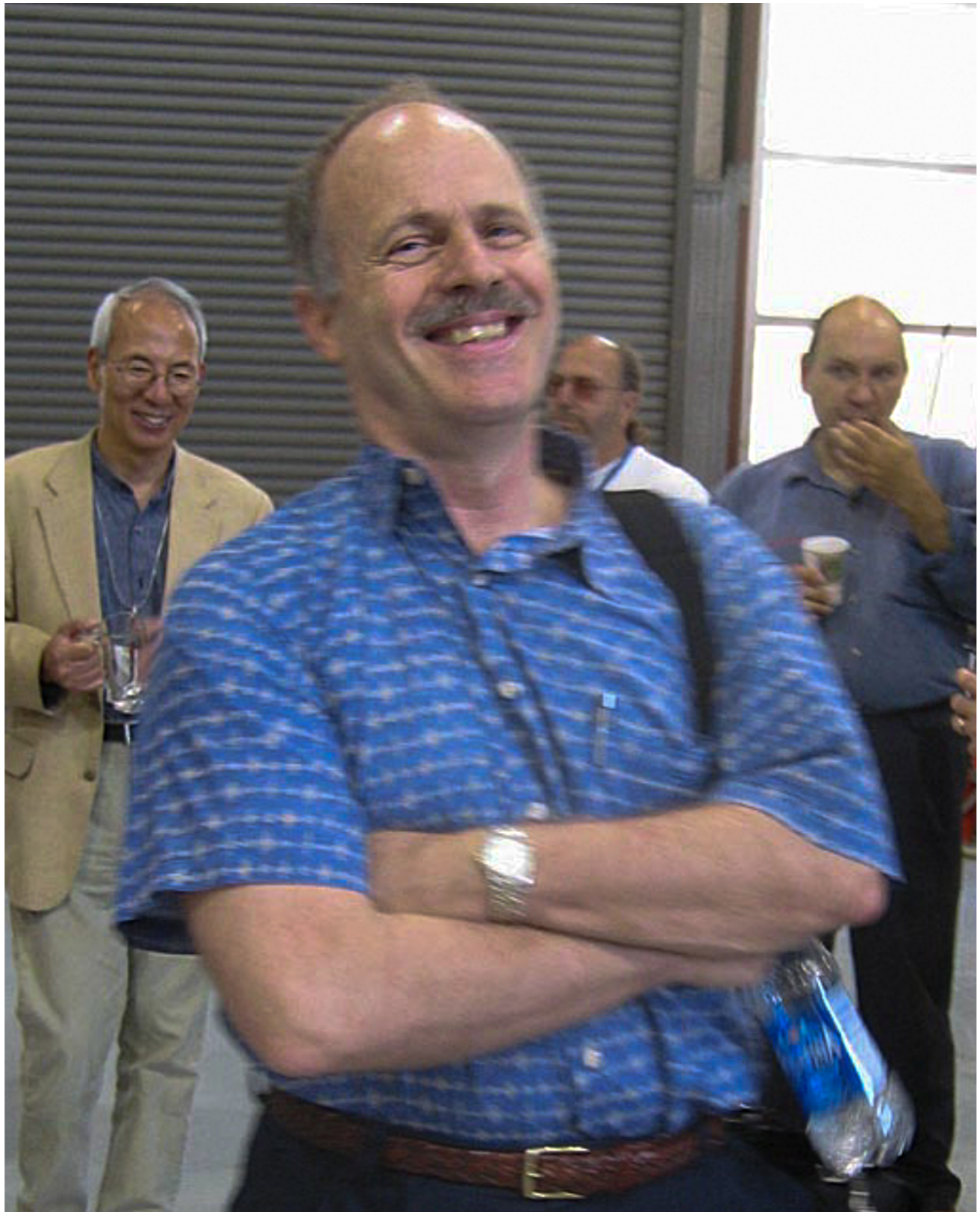
Oscar Ferreira, Alain Bonnemaison



Jimmy Lee provides the ever-watchful eye of QA

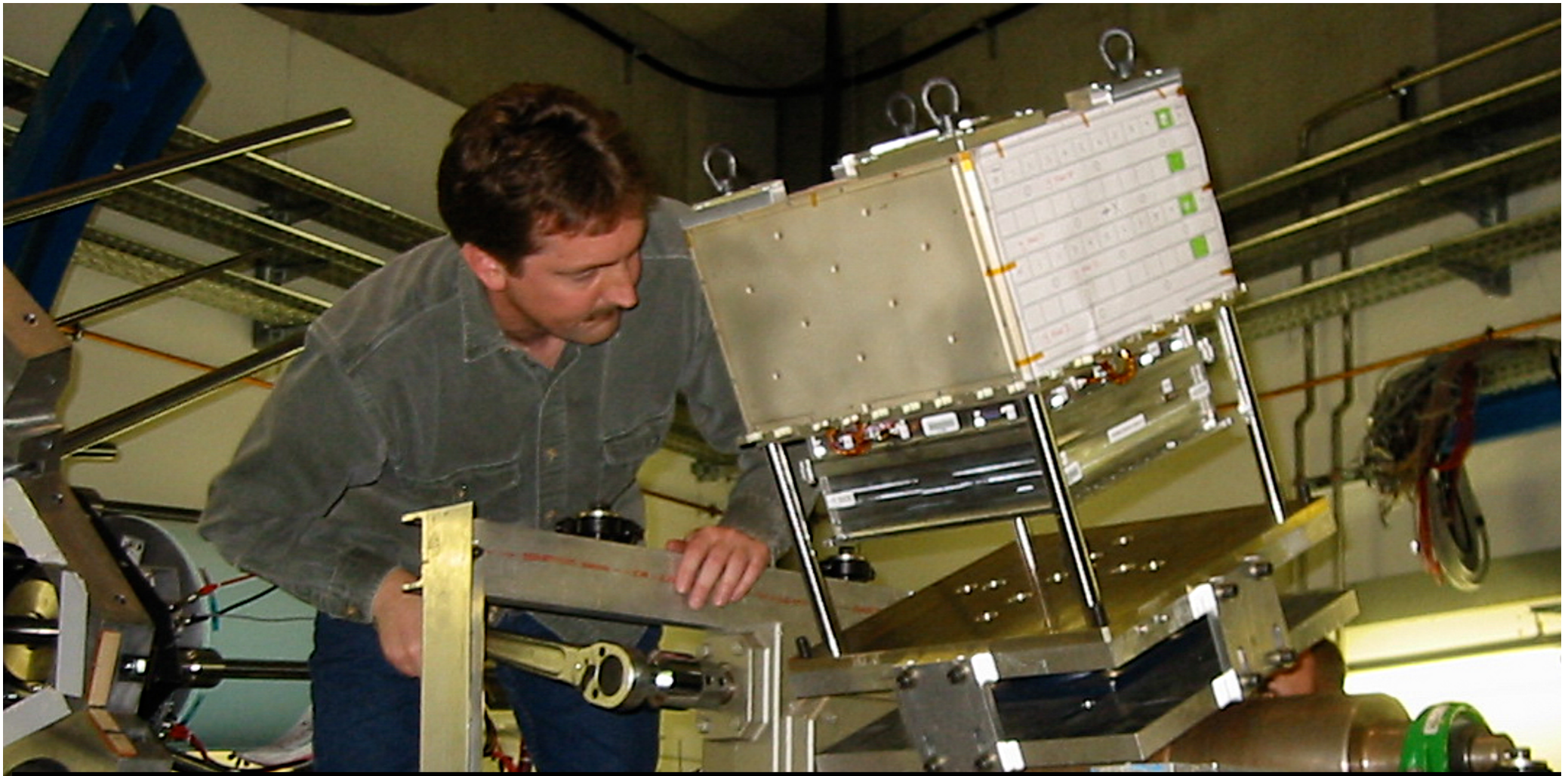
Mary Rambert and Eric Grove in a candid shot. Paul Dizon prepares for TVAC

Neil with Staffan Carius



Calorimeter Beam Tests

Neil and his calorimeter gang spent many hours waiting for beam at SLAC, CERN and here at GSI in Darmstadt, Germany, in 2000 and 2003.



Eric Grove finds just the right angle

Bill Raynor hope to align the beam

Byron Leas gets the data flowing

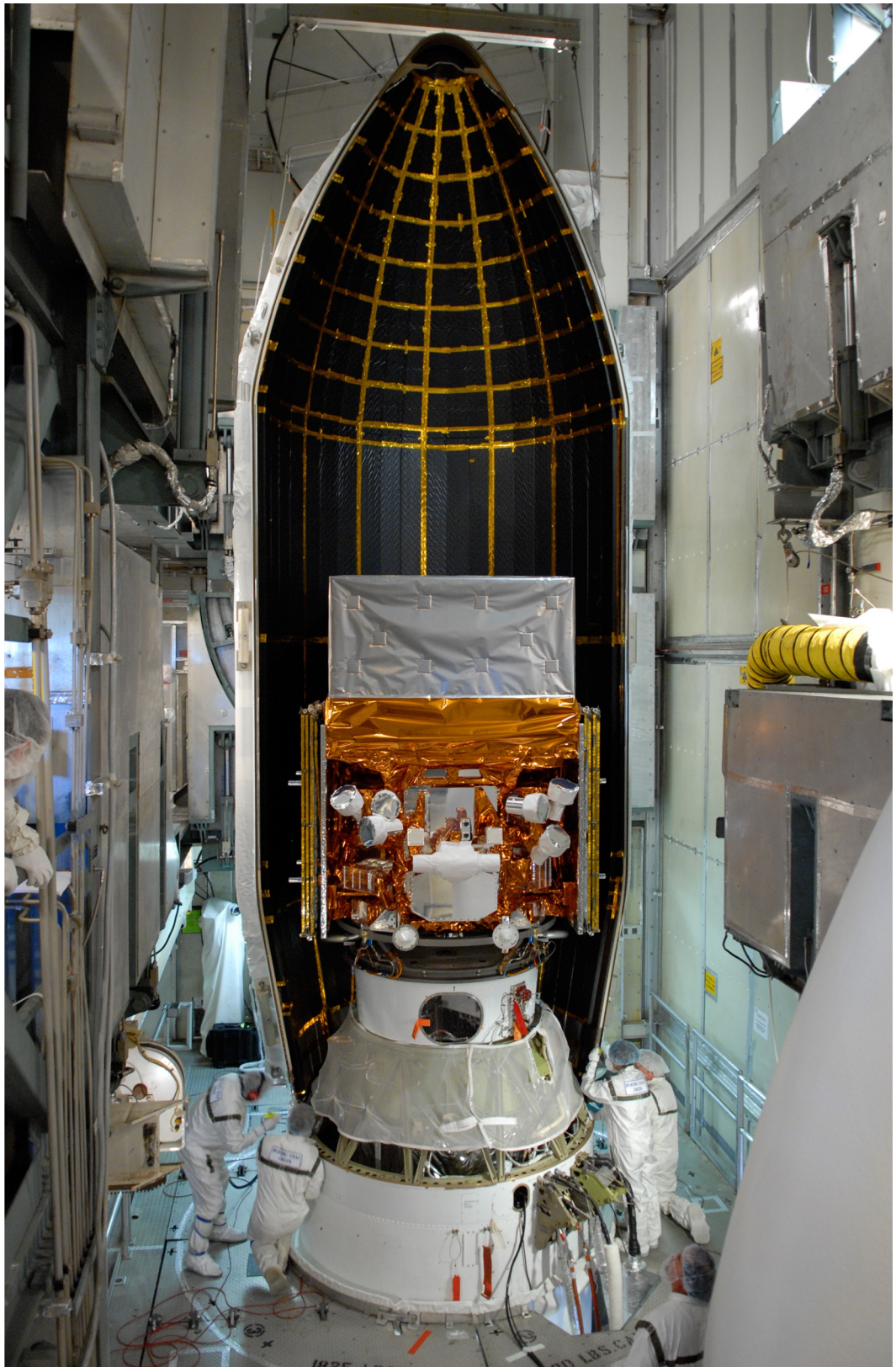
Neil working, Eric in a crate, and Johan Bregeon, Thierry Reposeur, Giles Bogeart in the break room

While everyone waits for beam time, Neil and Patty Sandora sample the fine fashions of Darmstadt

GLAST Launch

June 11, 2008

After 14 years, countless meetings, repeatedly being told how it's done in particle physics, plenty of genuinely fun, hard work – and more meetings – the day had finally come to launch GLAST into orbit

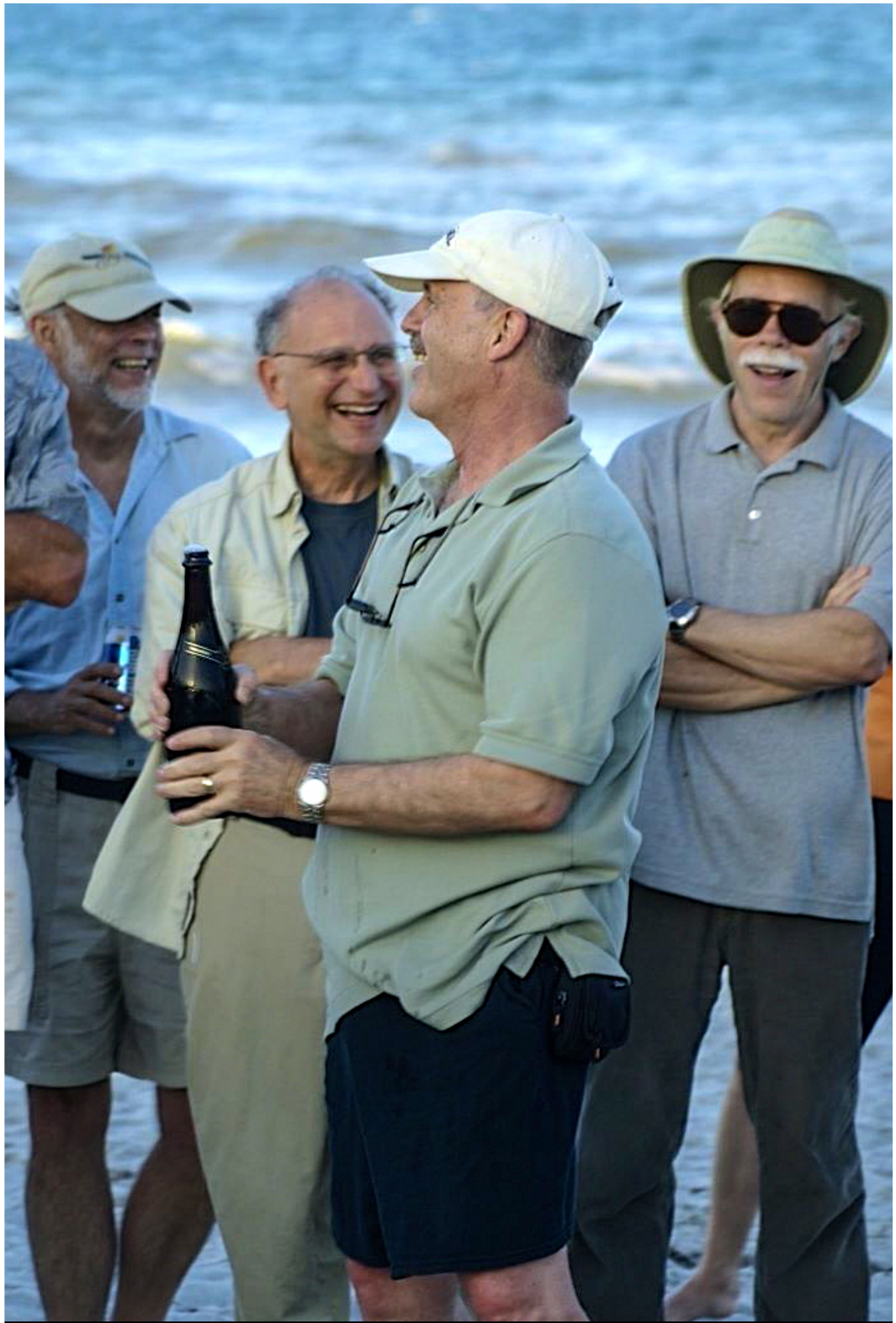


Jim Panetta, Mike DeKlotz, Ric Claus, Neil, Gregg Thayer, Jana Thayer, Eric Grove

Nothing for the LAT team to do but play tourist at Kennedy

Dibby says, “Neil, someone’s taking our picture.”

Neil and Ric Claus pace while the countdown proceeds



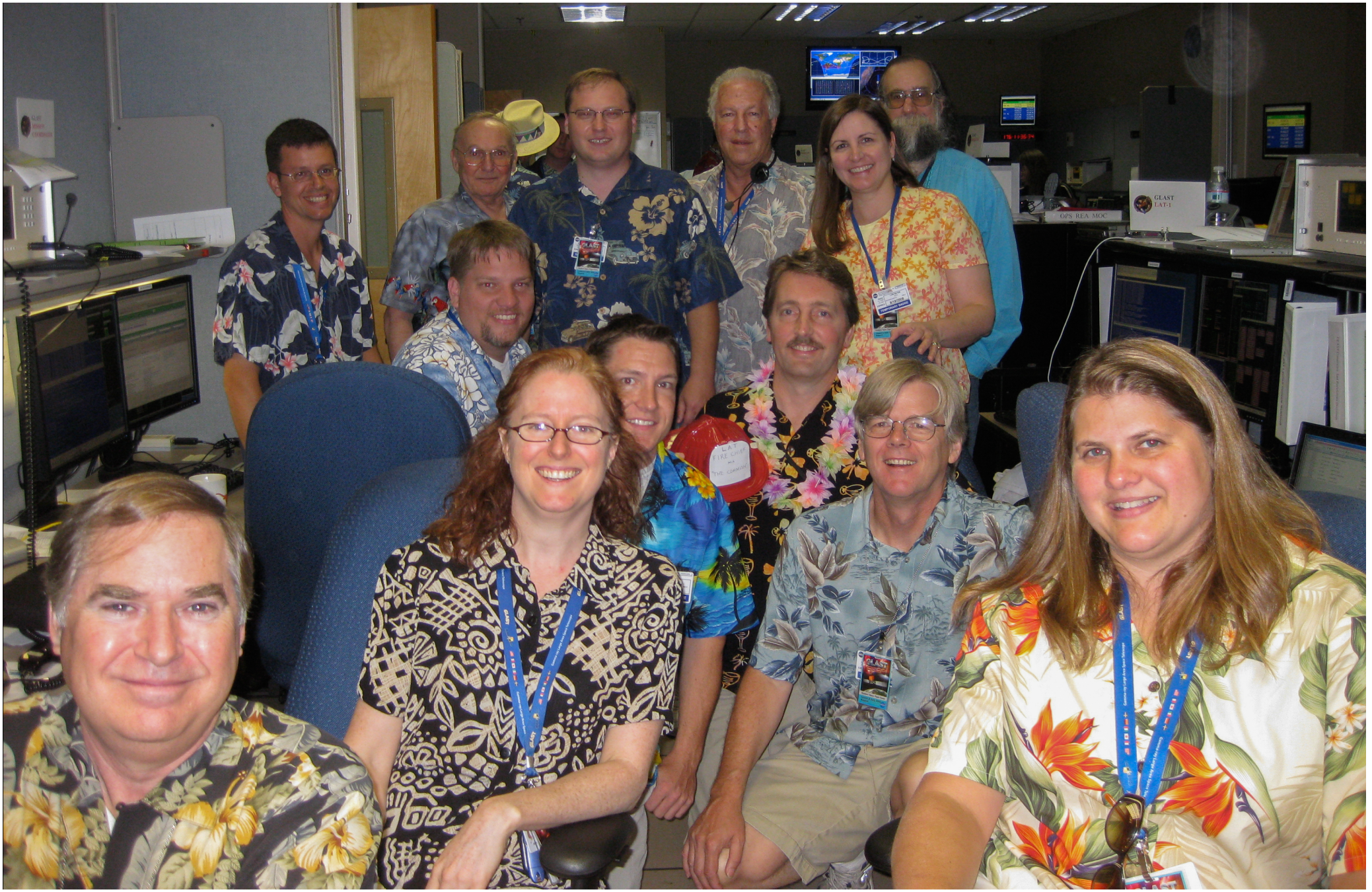
Launching champagne corks with Toby Burnett, Leon Rochester, Bill Atwood

Gregg Thayer, Jana Thayer, Ken Fouts, Neil

Llz Hays, Eric Grove looking like he's just swallowed something awful, Jana Thayer, Gregg Thayer, Fred Piron, Neil, and Ken Fouts

Post-launch Celebration!

Neil says, "Hallelujah!"



LAT Activation Day – June 24, 2008

Mike DeKlotz, Bernie Graf, Rich Bielawski, Jack Goodman, Lori Bater, Eric Siskind
Gregg Thayer, Jon Pineau, Eric Grove, Pat Hascall
Tom Gurlacz, Elizabeth Ferrara, and Jana Thayer

Hiroshima

March 2009

Tsunefume Mizuno, Peter Michelson

Kent Wood and Neil decipher the Bullet Train

LAT Collaboration Meetings

A growing international collaboration brought not only long arguments over who would be responsible for what, but also a chance to explore culture and history around the world

Kent Wood signals his approval of the excellent sushi. Eric Grove and Valerie Connaughton agree.

David Smith, Robert Johnson, Neil, Elliott Bloom

Bento boxes and the finest sushi were on the menu in Hiroshima. In Alexandria it's all about the green.

Dave Thompson frames the perfect shot

We'll always have Paris

Paris, the City of Lights …

… and carbon composite mechanical structures for GLAST calorimeters.

Melissa Pesce-Rollins doubles as guide and translator in Siena

Sharing a glass of fine Italian wine with Jim Ryan

Rome, Pisa, Trieste

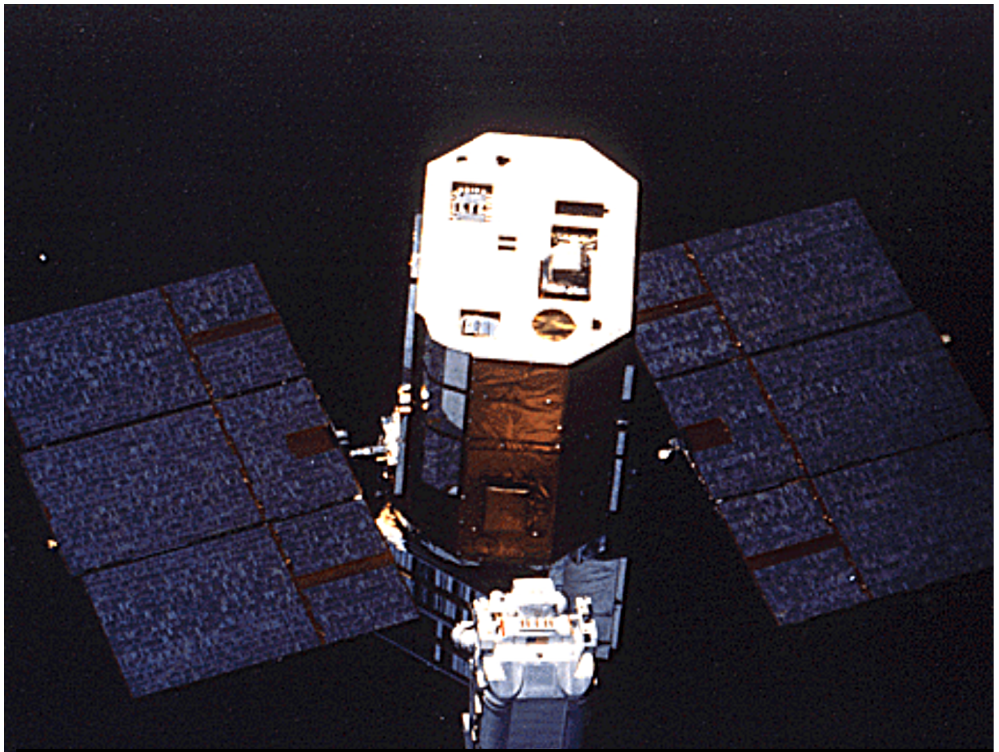
The best food in the world, and they build damn good particle trackers in Pisa, too.

Defying Gravity

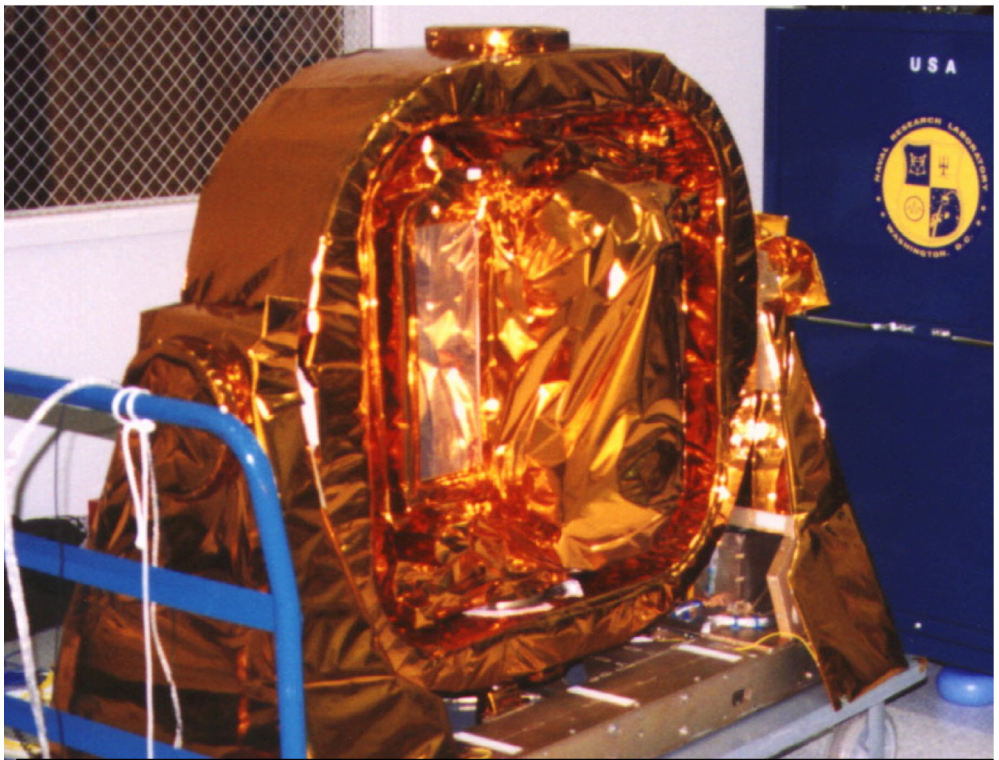
Pushing above the Atmosphere

GRO and GLAST weren't the only space missions going forward in the Branch during those 40 years

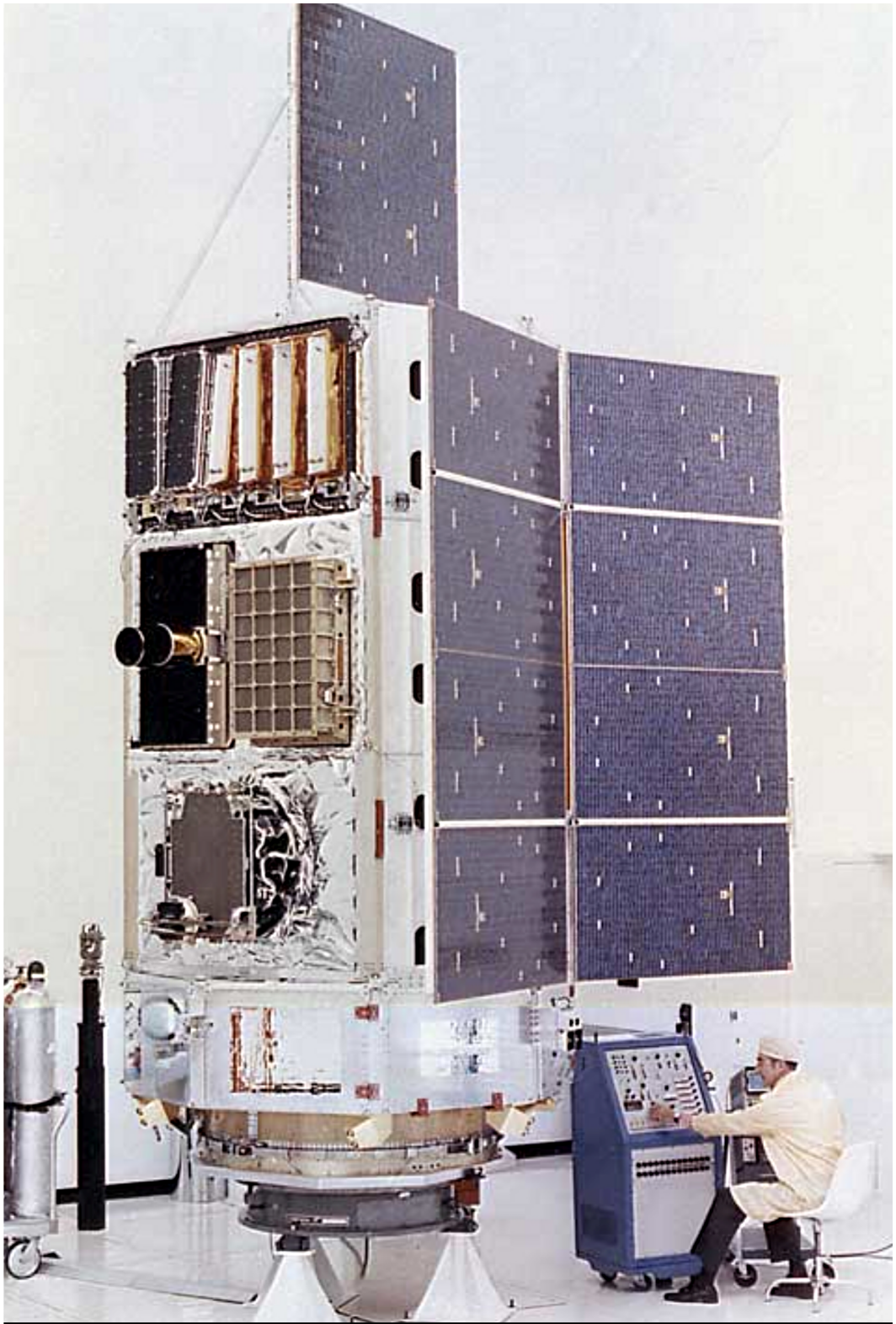
LDEF



SMM

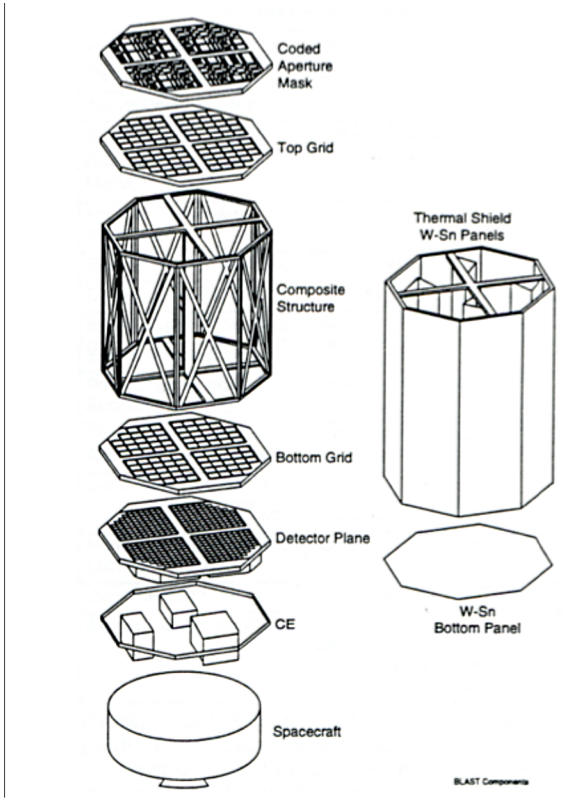


USA



HEAO-1

Neil was a busy man in the 1990s. He had GRO/OSSE on orbit, USA nearing launch, and GLAST prototypes heading to beam tests – but he still had time to lead new proposals


Coded
Aperture
Mask
Top Grid
Thermal Shield
W-Sn Panels
Composite
Structure
Bottom Grid
Detector Plane
CE
W-Sn
Bottom Panel
Spacecraft
BLAST Components

In Response to:
NASA AO-95-OSS-02
BLAST
Burst Locations with
an Arc Second Telescope
Volume I
Technical Plan
December 21, 1995
Submitted by
Naval Research Laboratory
Washington, D.C.

MISTI & SuperMISTI

The Branch finally joins the Navy

… and almost sends Byron Leas for a swim in the process

Bernard Phlips and Eric Wulf get the power going

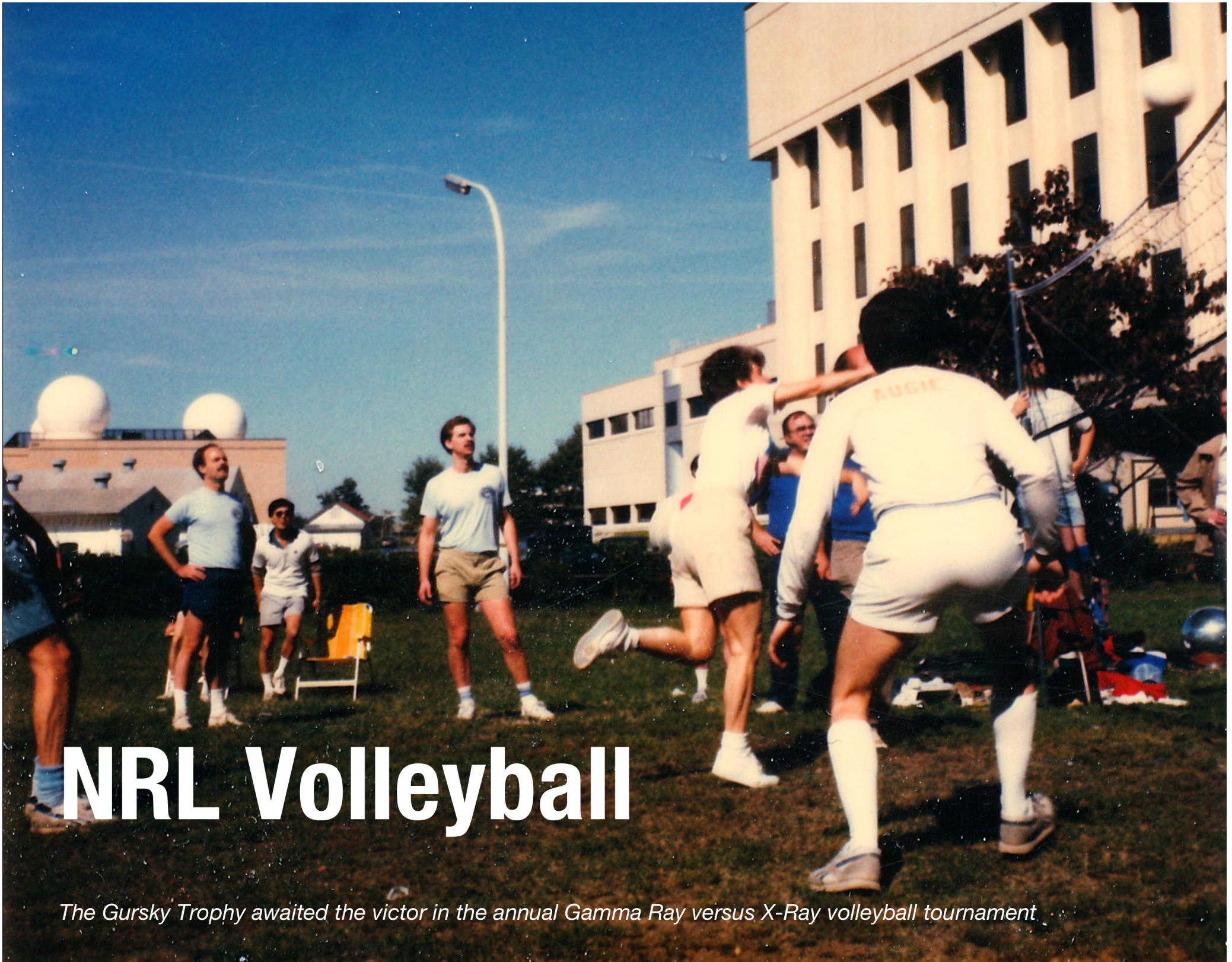
Neil is always ready to provide direction ...

... and document the action

SuperMISTI hits the road

MISTI

SuperMISTI in Norfolk harbor



NRL Volleyball

The Gursky Trophy awaited the victor in the annual Gamma Ray versus X-Ray volleyball tournament

JUMPIN' JO LYON
&
COSMIC COMET BUDDY
CARTWHEELING
WITH DELIGHT

Ski instructor Neil confers with daughter Karen and friend on proper downhill technique

Skiing Massanutten
February 1987

Working hard and playing hard
… and, apparently, plowing hard

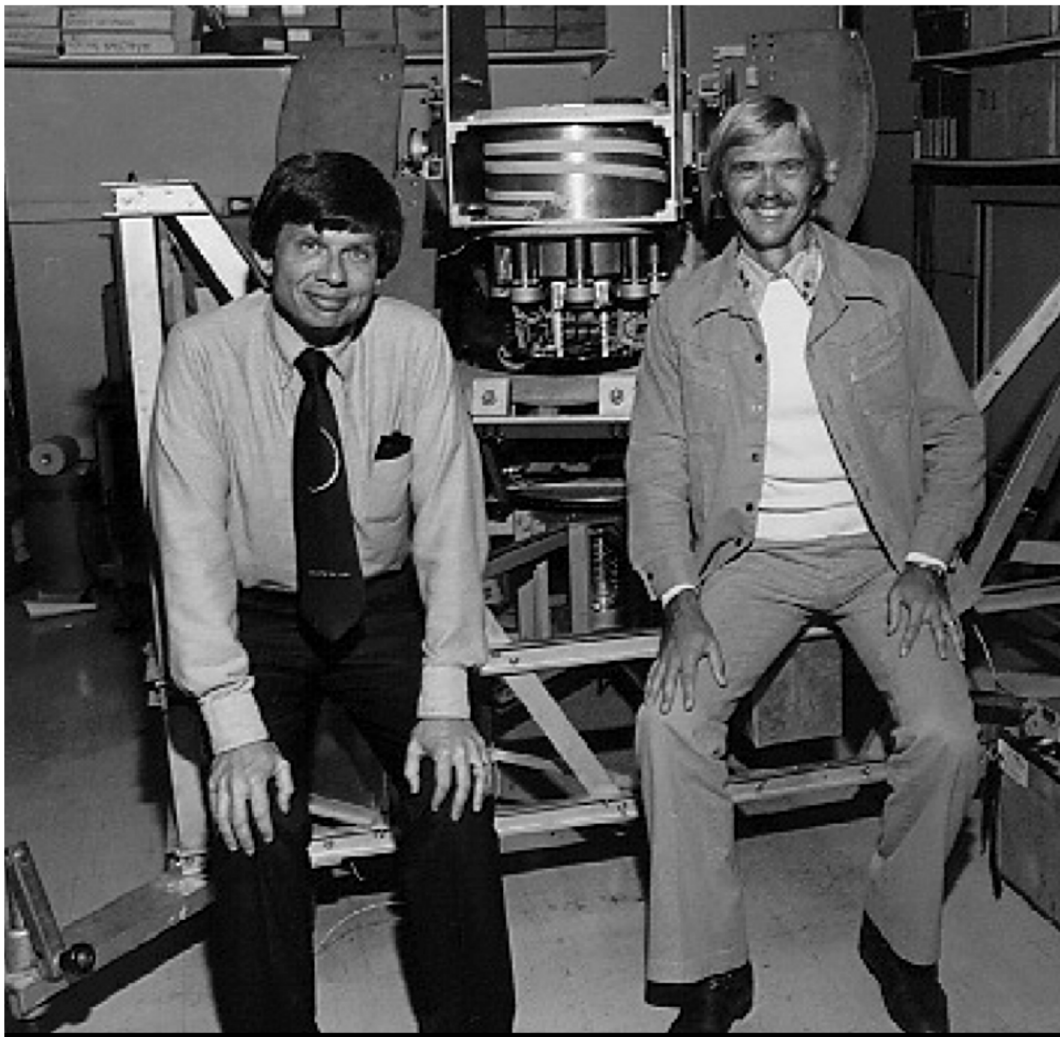
Good Times Were Had By All!

Patty Sandora puts a smile on Neil's face

Gerry Share, always ready with a friendly greeting

Bob Kinzer, C. H. Tsao

Mary and Jim Kurfess



Bob Haymes, Don Clayton

Jo Lyon

Neil, Jill Dahlburg

Brenda Bastain, Alan Tylka

Lev Titarchuk, always the charmer

Spiked punch for Daryl and Mike

Bill Hunter, Mike Kowalski, Dan Messina, Daryl Yentis

Jill Dahlburg, Neil

Ron Murphy and Gerry Share aren't sure what they've got here

Ron Murphy explains the finer details ...

Mike and Daryl seem skeptical

Beverly Shea

... and so does Jim Kurfess

Per Carlson, Benoit Lott

Leif Nilsson

Jim Ampe

Jill Dahlburg deep in thought, Kay Hire, Neil

Dr. Johnson's 2nd Grade Class
HESE Elementary, 2014

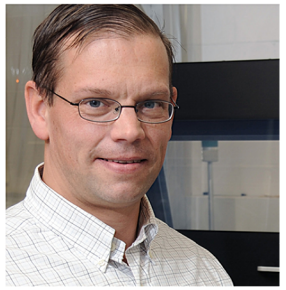
Meagan Schaal

Eric Wulf

Lee Mitchell

Rich Woolf

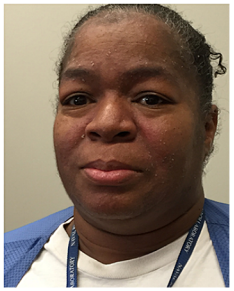
Mark Strickman


Marc Christopherson

Byron Leas

Tony Hutcheson

Mike Kowalski


Mary Johnson-Rambert

Brenda Bastain

Ken Diamond

Julia Deneva

Dr. Johnson

Bernard Phlips

Eric Grove

Not shown:
Teddy Cheung

Benz Kozlovsky

Ron Murphy

Mike Wolff

Dan Messina

Paul Ray

Ryan Cordes

Gerry Share

Kent Wood

Lori Jackson

Tyrel Johnson

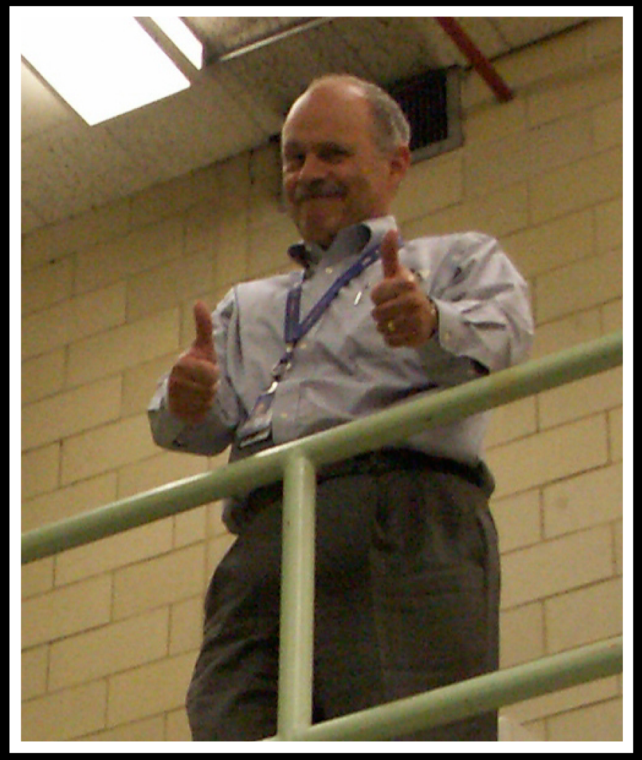
Justin Finke

Chuck Dermer

Sasha Chekhtman

Michael Lovellette

Thank you, Neil, for 41 years and 11 months of hard work, clear thinking, and straight talk. We will certainly miss you around here.

NRL High-Energy
Space Environments Branch

December 2014