



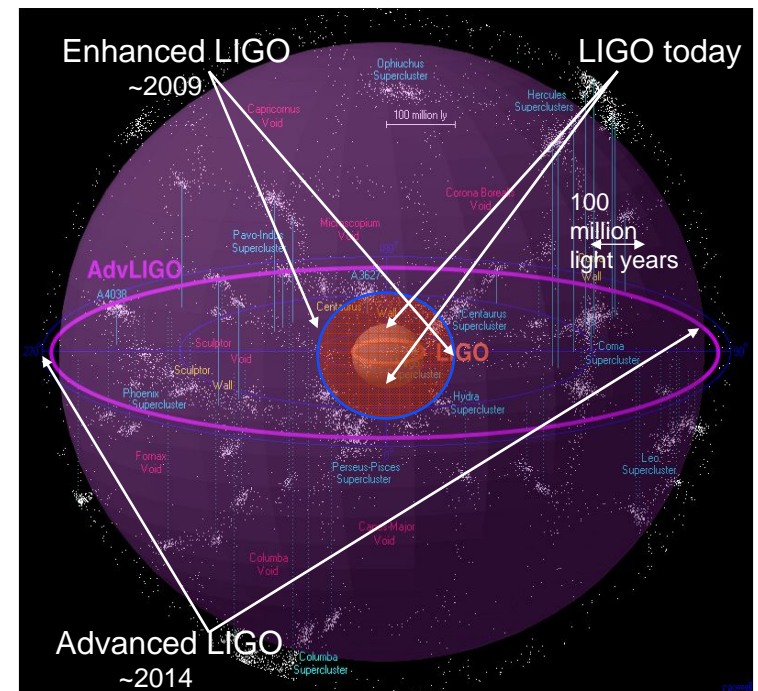
Advanced LIGO Team Monthly Update

24 April 08
David Shoemaker



Status of Advanced LIGO

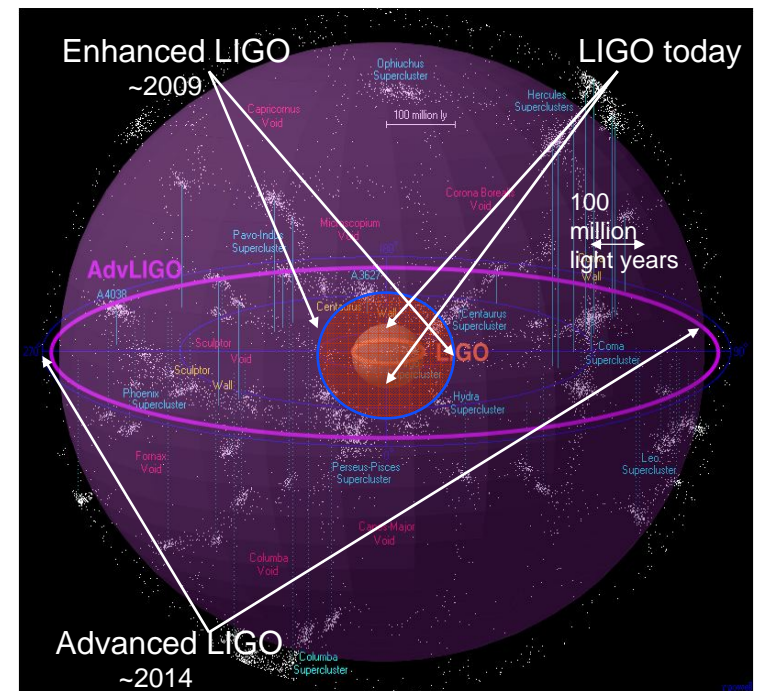
- Baseline Review in November 2007
 - » Review committee gave us (you all) high grades
 - » “The panel is unanimous that AdLIGO is ready for a new construction start. We were extremely impressed with the thoroughness of their preparation and the soundness of the design.”
- Construction start awaits the end-March meeting of the National Science Board
 - » They received the package a few weeks ago...
- Anticipate Project Start in April 2008
 - » Expect robust funding
- Planning and hoping for continued broad LSC participation – adding value during Project digging into post-Project tuning and testing





Status of Advanced LIGO

- The Project has started!





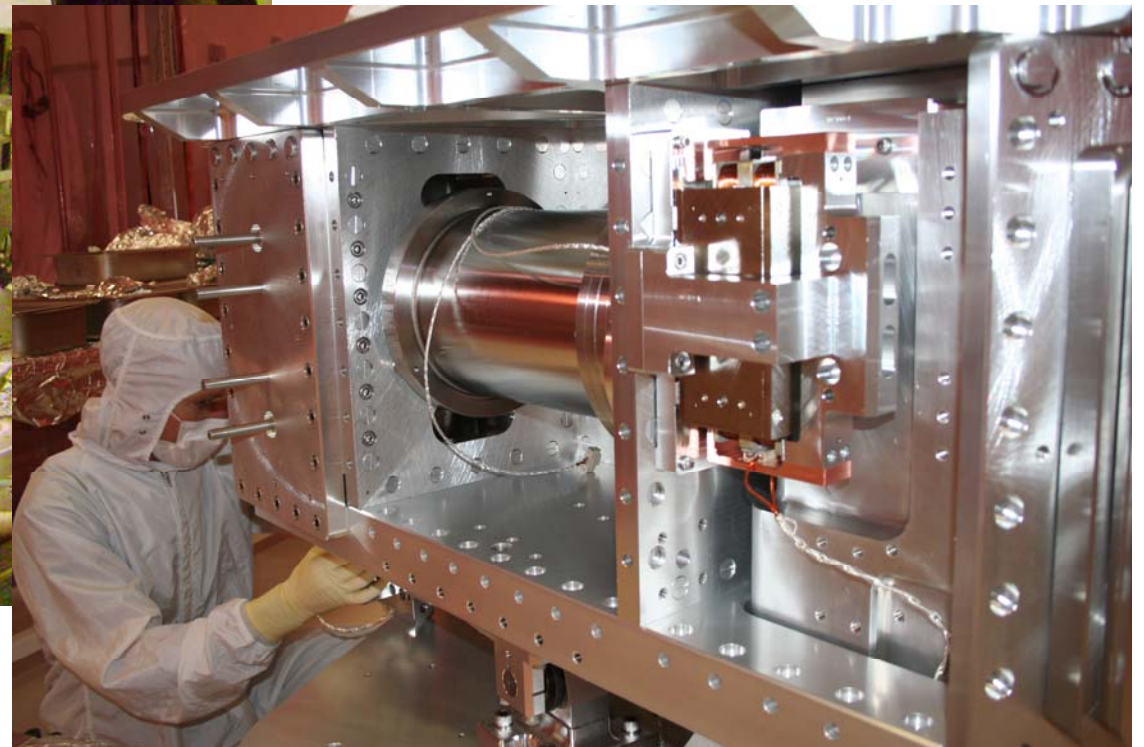
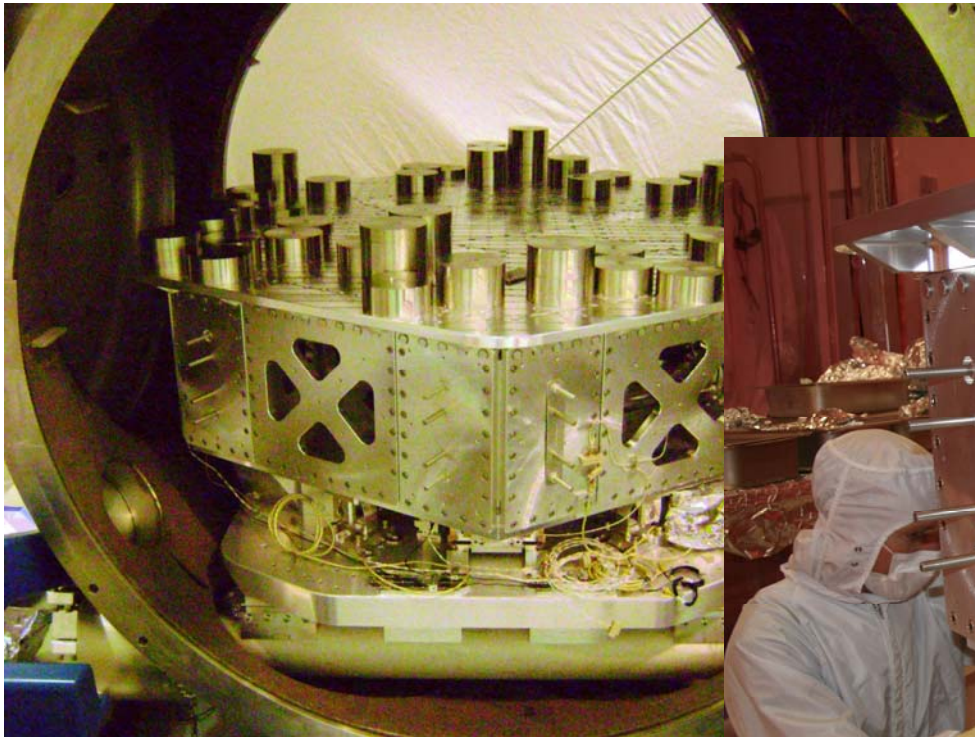
Status

- National Science Board on March 26-27:
 - » “The Board authorized the Director, at his discretion, to **approve the award** to the Laser Interferometer Gravitational-Wave Observatory (LIGO) Laboratory Operations and Maintenance to California Institute of Technology and the award **for advanced LIGO construction** to California Institute of Technology.”
- **\$205M approved** for 2008-2015 total Project
- **April 1** official start date
- **\$32M for the first year**, as we had requested
- Still getting paperwork straight to have money transferred to Caltech/MIT – maybe this week?

- So – some technical progress you have made this month

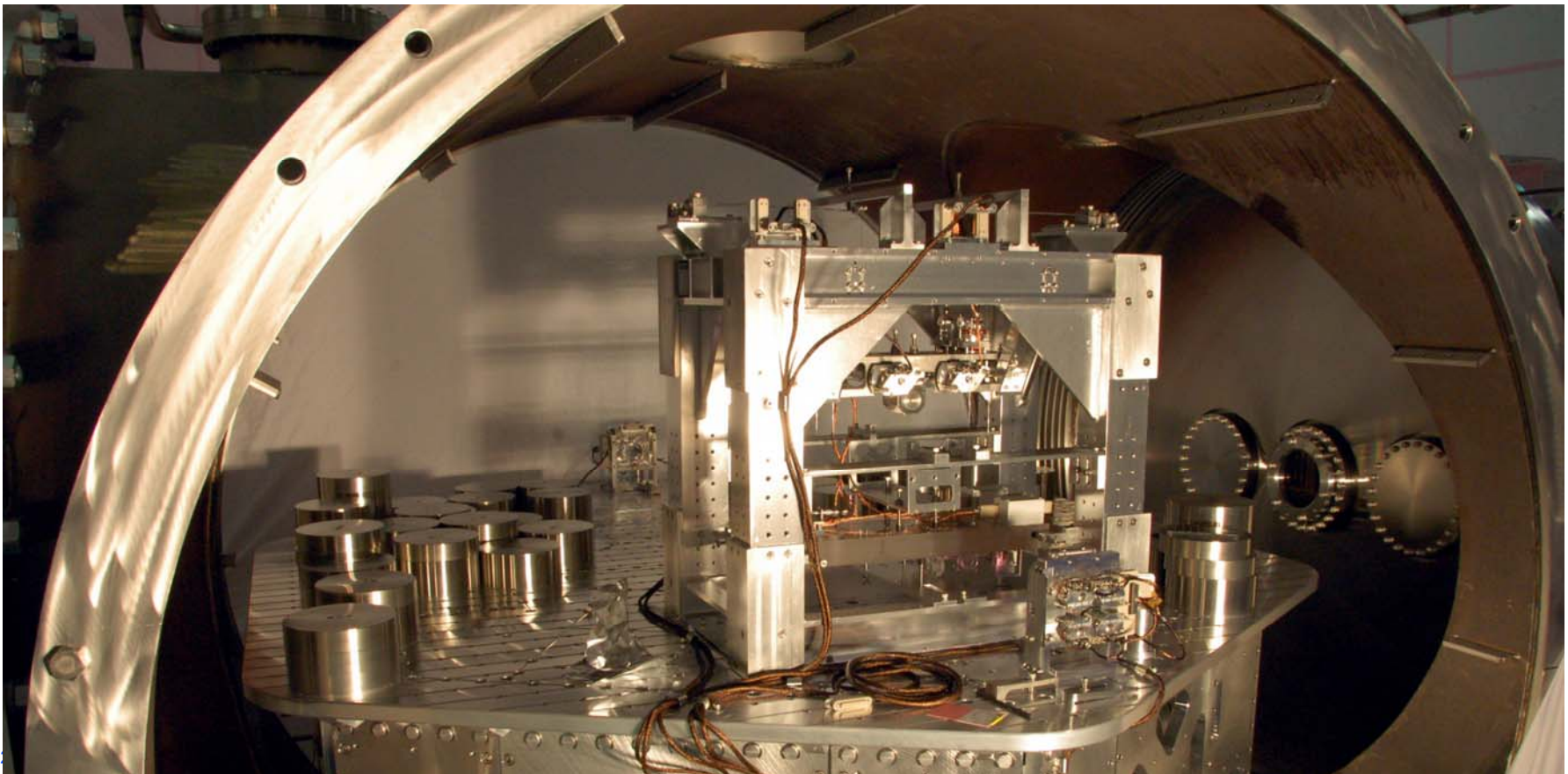
HAM Seismic Isolation

- HAM isolators – installation completed at LLO and well underway at LHO for eLIGO output detection bench



ISC Output Mode Cleaner on OMC Suspension

- The complete output mode cleaner mini-optical-table, suspended by its double suspension, tip-tilt steering mirrors as well, installed on the HAM Seismic Isolator!





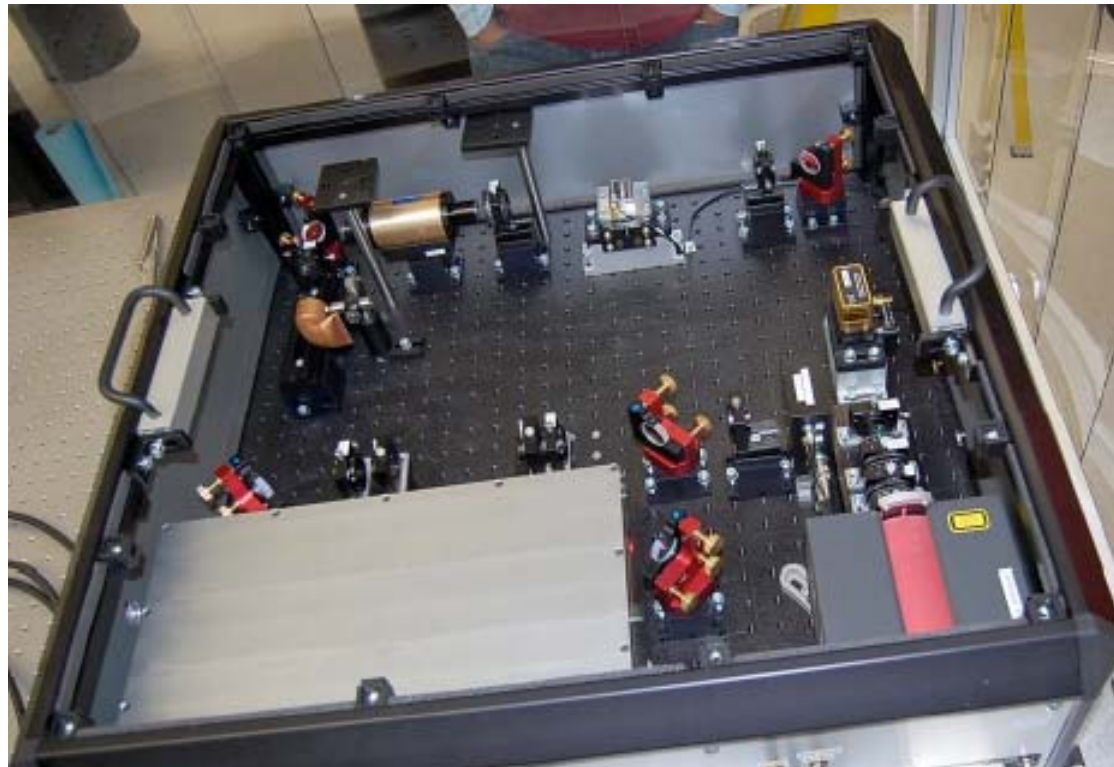
Seismic and Quad Suspension

- The combined BSC seismic isolation system with the quad suspension attached flown into the LASTI vacuum chamber
- Next will wed the bottom half of suspension, via the side door
- Have made baseline change from ribbon to round fused silica suspension fibers
 - » Almost identical loss for optimized ribbons and optimized fibres – 6% difference; 5 times better than (non-optimized ribbon) baseline
 - » ...easier to make, too.



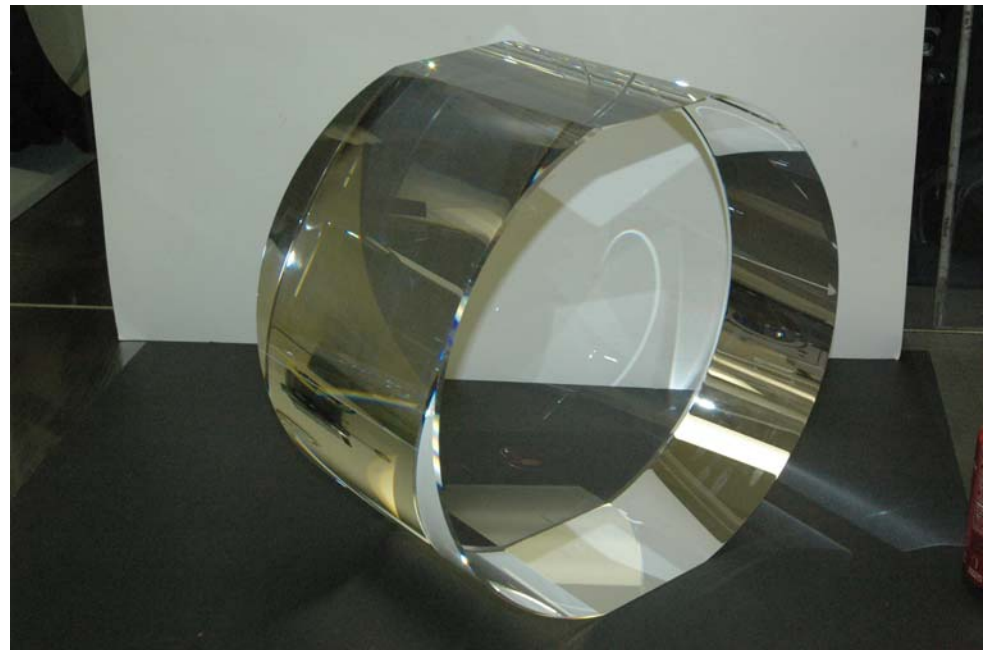
Pre-Stabilized Laser

- 35 W laser installed and being characterized at LHO – this means also the diode pump room, fibers, and safety concerns all taken care of
- 35 W laser shipped to (and received at?) LLO



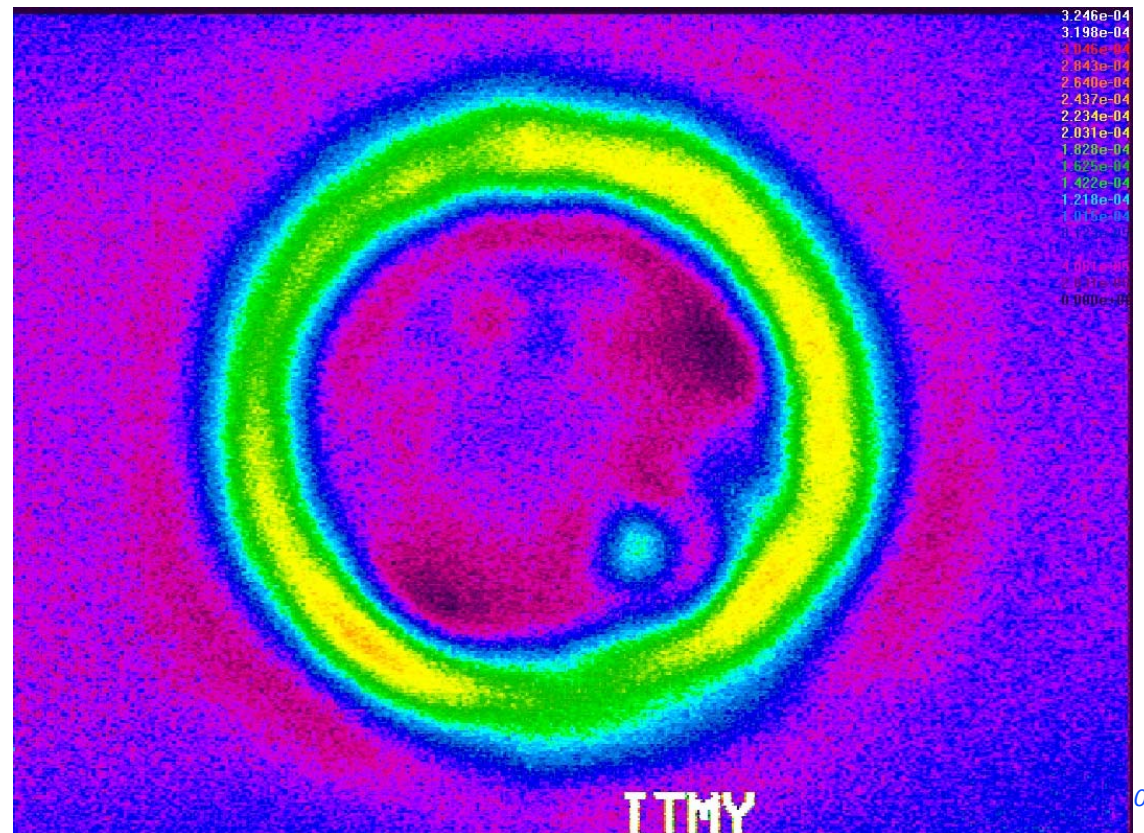
Core Optics – Test Masses

- Completed the Preliminary Design Review successfully
 - Drawings and specifications all in place
 - Request for Quotes officially on the street for procurement of the blanks
-
- Ready the LASTI Test Mass for integration with the Quad suspension



Auxiliary Optics

- Thermal Compensation for eLIGO in integration, test
- New approach using an 'Axicon' to produce desired annular heating pattern
- Image on paper of deposited heat
- Lots of design work—
Telescopes and their suspensions, SLC,
Baffle material, Layout...



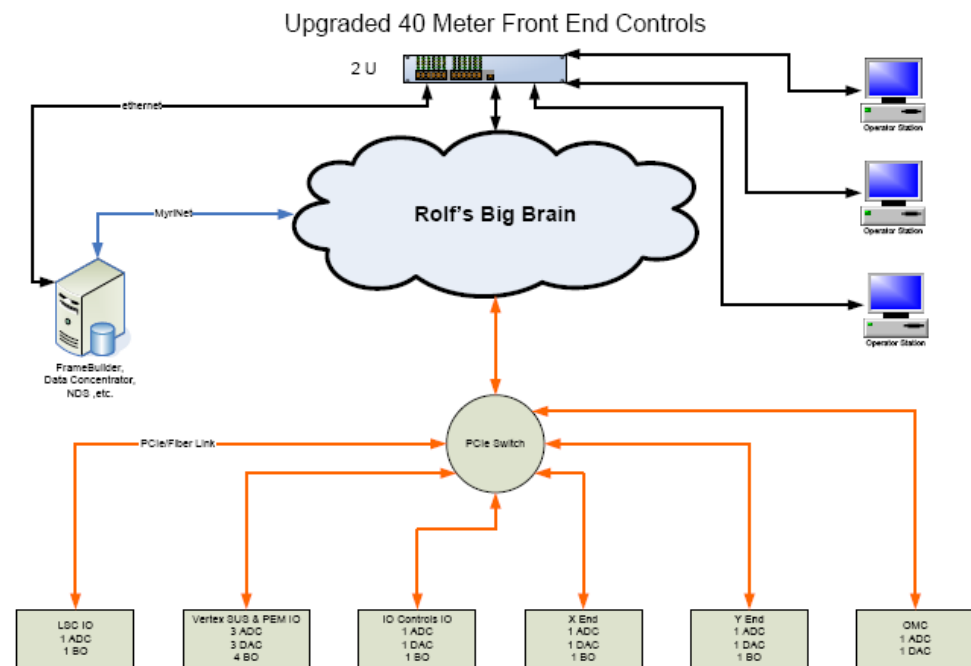
Input Optics

- Working through layouts given stable cavity...the folded interferometer is still a challenge
- Various AdL design efforts
- LLO eLIGO installation
- Working to get mode matching right into the LLO interferometer
- Adjusting MMT2...
- *"Les Petits Miroirs du HAM1."*



Control and Data systems

- Electronics (UK/US) installed at LASTI for the control of the Quad suspension
- Testing/reviewing of UK electronics design...production soon
- Progress on timing design and prototyping; review underway
- Rack layouts in planning
- HEPI electronics refreshed for review, production
- 'BorkSpace' a big hit with controls folks!





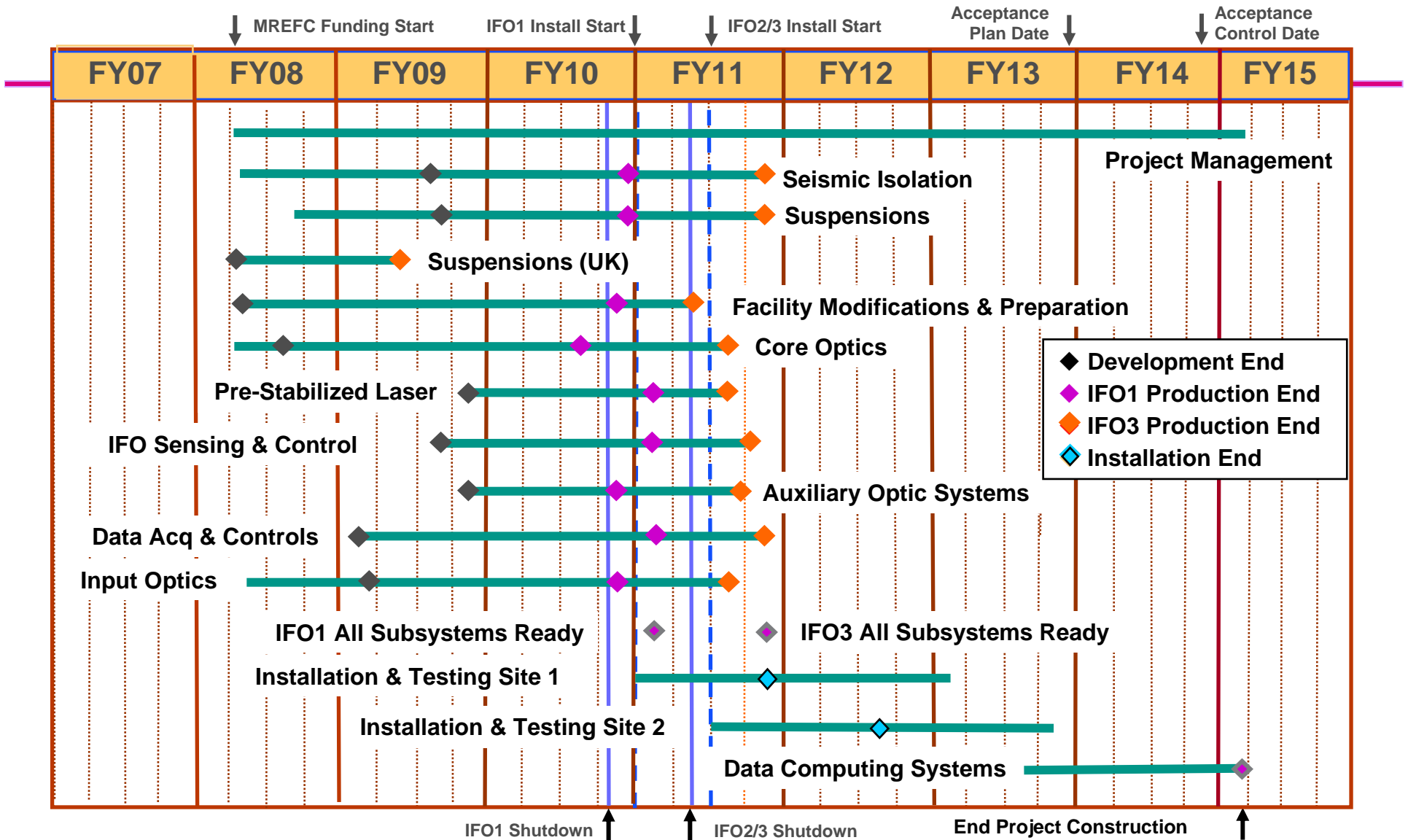
Reviews

- * COC PDR & FRR for glass completed
- * B-OSEM FDR/FRR completed
- * SUS E/ITM Structural Weldment completed
- * SUS E/ITM Mechanics underway
- * SUS glass FDR/PRR underway
- * SUS UK Electronics FRRs (a series starting late Feb through ~May)
- * HEPI FRR underway
- * FMP Facility Modifications FRR (to procure bake ovens & clean rooms to support early assemblies) underway
- * Systems PDR underway
- ...many of you helping with these; thanks.
- Need this to spend that money we got!



Advanced LIGO Subsystem Summary

(Showing Development and Project Production Early Milestones)





A little organizational stuff

- In-Lab – Need to track labor to allocate either to Advanced LIGO or Lab Operations
 - » No intention of counting people's hours! Just percentage here or there
 - » Machinery in place, used last week, some gears need oiling
- DHS about to send out note to Lab AdL folk on the subject
 - » How much time we think you are working on what – feedback, please!
 - » Reminder of matrix and line supervisors so you know who to turn to for questions
- Still ironing out kinds and quantities of meetings
 - » Hope to continue this monthly meeting of all interested
 - » Please let me know if you have ideas for it!



What's happening next?

- Many of the reviews brought to fruition, enabling...
- A bunch of long-lead procurements set up and issued
- Modifications of the observatory spaces to allow installation, storage of early arrivals (UK suspensions)
- Starting of commissioning of various eLIGO systems

-a little time passes....

- Charge into the vacuum system in early 2011
-and start tuning the interferometer in 2013.