



Report to PAC on LSC Issues

Peter R. Saulson
Syracuse University
LSC Spokesperson



Outline



1. LSC grants that are already funded
2. LSC at the last NSF Review
 - Issues that the reviewers raised
 - Should LSC work be the subject of NSF reviews of the LIGO Lab?
3. Other issues on the LSC's horizon



Who in the LSC has NSF funding now?



Among this year's proposers:

Currently funded:

González (LSU)

Kalogera (Northwestern)

McHugh (Loyola)

Whitcomb/Braginsky (MSU)

Penn (Hobart) (small 1-yr grant for equipment)

Proposing for new grants:

Ganezer (CSU-DH)

Melissinos (Rochester)

Mueller (Florida)

Ugolini (Trinity)

Zotov (LaTech)

Yoshida (SLU)



Who in the LSC has continuing grants?



- Giaime (LSU): Transient Noise Sources I_{exp} , A_{exp} , DA, DC
- Drever (Caltech): New Detectors A_{exp}
- Whelan (Loyola): Coherent GW Searches DA
- Mavalvala (MIT): Non-Classical (Squeezed) Light I_{exp} , A_{exp}
- Owen (Penn State): Signals from Compact Objects Th
- Brau (Oregon): Search for Gravitational Radiation I_{exp} , DA, DC
- Riles (Michigan): GW Detection and Astrophysics I_{exp} , DA, DC



Who in the LSC has continuing grants?



- Mistelmakher (Florida): Interferometry, Devices, Materials, and Analysis Iexp, Aexp, DA, DC
- Christensen (Carleton): Data Analysis and DetChar DA, DC
- Bose (WSU): CAREER grant DA
- Sigurdsson (Penn State): Astrophysical Sources Th
- Allen (UWM): Data Analysis and Phenomenology DA, Th
- Saulson (Syracuse): Thermal Noise and Burst Search Aexp, DA
- Byer (Stanford): Advanced Detectors Aexp



Who in the LSC has continuing grants?



- Reitze (Florida): Optical Component Characterization (w/ IAP, Russia) Aexp
- McGuire (Southern): AdLIGO Materials Aexp
- Thorne (Caltech): Relativistic Astrophysics Aexp, Th
- Finn (Penn State): Data Analysis and GW Astronomy DA, DC, Th
- Anderson (UT Brownsville): Data Analysis DA

Key:

Iexp - major contribution to LIGO I

Aexp - experimental work on advanced ifos

DA - data analysis

DC - detector characterization

Th - theory



LSC issues in the last NSF review of Lab



AdLIGO R&D (joint Lab/LSC) gets good review:

4. The R&D program for Advanced LIGO is making good progress. The installation of the active seismic isolation system at the Livingston Observatory will provide a critical test of this key subsystem of the Advanced LIGO plan while making it possible for the Livingston site to maintain lock during times of high ambient seismic noise from human activity. This is a strong confirmation of the advantages of supporting a vigorous R&D program while commissioning and operating the interferometers.
5. The selection process for the high power laser system is likely to provide a laser system meeting the power and stability requirements for Advanced LIGO. It is, however, important to maintain a backup option for this critical system.
6. Either silica or sapphire could be successfully used as the substrate for the test masses at their current performance levels assuming thermal compensation. The Panel supports the selection of sapphire as the test mass substrate material if no intervening results suggest otherwise.
7. Coating mechanical loss remains the largest known mechanism of degradation of Advanced LIGO from design specifications. The planners are to be commended for seeking out wide expertise for solving this demanding problem. Immediate attention should be focused on the two most promising avenues, titania doped tantala and hafnia.



LSC issues in the last

LIGO

NSF review of Lab



Data analysis, etc:

8. The LIGO lab and the LSC have made remarkable progress on the organization of data analysis efforts. The S1 analyses have established a firm foundation for the analysis of future datasets and have fed back important information for further commissioning of the system. Each analysis group should come up with its own simple figure of merit for instrument performance so as not to lose priority relative to the binary neutron star inspiral group.
9. Software flexibility has already led to data management improvements that should improve analysis efficiency, and will allow responses to continued developments in distributed computing.
10. LIGO/LSC should continue streamlining their publication review process to improve timeliness of publication.
11. We urge the LIGO lab and the LSC to participate more actively in the efforts of the Penn State PFC to bridge the astrophysics and experimental relativity communities. Regular presentations at the semi-annual American Astronomical Society meetings would make the astronomical community generally aware of LIGO's remarkable experimental progress.



Recommendation 9:

LIGO

“Software flexibility”



Review committee endorses flexibility in software.

The LSC currently lacks consensus on whether unity or diversity in data analysis environments is the best approach.

We are urgently trying to establish such a consensus.

Recommendation 10: Streamlining review



LSC was urged to streamline its review process for observation papers.

S1 papers are just now coming out!

1 accepted (and 2 more are about to be) by journals, 2 others are just being posted.

Yet, we don't want to be sloppy.

We are reviving formal software reviews for S2.

We are groping to find the right balance.

Review process is labor-intensive, promises to become even more burdensome as scope of analyses broaden.



Lab reviews: LSC role?



Now that LIGO scientific operations have successfully begun, NSF wants to know how it is going.

Last Review's Charge explicitly asked for comment on the scientific program.

This is the LSC's responsibility, but Lab was (understandably) reluctant to have its review hostage to LSC performance.

Should LIGO ask NSF to do things differently from now on?



Other issues on the LSC's agenda



Major issues:

- Keep or abolish the LIGO-I Working Group?
- Are we ready for a 6-month run?
- Ensuring integrity of results

Other organizational issues:

- LSC meetings: how often?
- Role of LSC Council vs. Exec Comm
- Clarification of Publication Policy