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# LIGO Lab / LSC Integration and Management

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# Outline



- Original structure of LSC and relation with Lab
- Critique of original structure
- Why we chose to stay with Caltech/MIT
- New structure
  - » Expansion of Directorate
  - » Extension of authority and responsibility, looking toward Advanced LIGO
  - » LIGO Management Council
  - » Expansion of Oversight Committee
  - » LSC role in search for LIGO Director
  - » Review of Memoranda of Understanding
  - » Revision of Charter
- How things are working

# LIGO LIGO Scientific Collaboration



QuickTime™ and a TIFF (LZW) decompressor are needed to see this picture.



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LIGO-G050567-00-Z





**LIGO**

# LIGO Scientific Collaboration



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The LIGO Scientific Collaboration was formed in 1997, to carry out the scientific program of LIGO.

It now includes about 500 members from around 40 institutions, from seven foreign countries and from across the United States.

The entire membership of the GEO Collaboration are members of the LSC.

The LSC's membership includes the scientists, engineers, and other key staff of the LIGO Laboratory.

When we say “LIGO” (without a qualifier), we refer to both the LIGO Lab and the LSC.



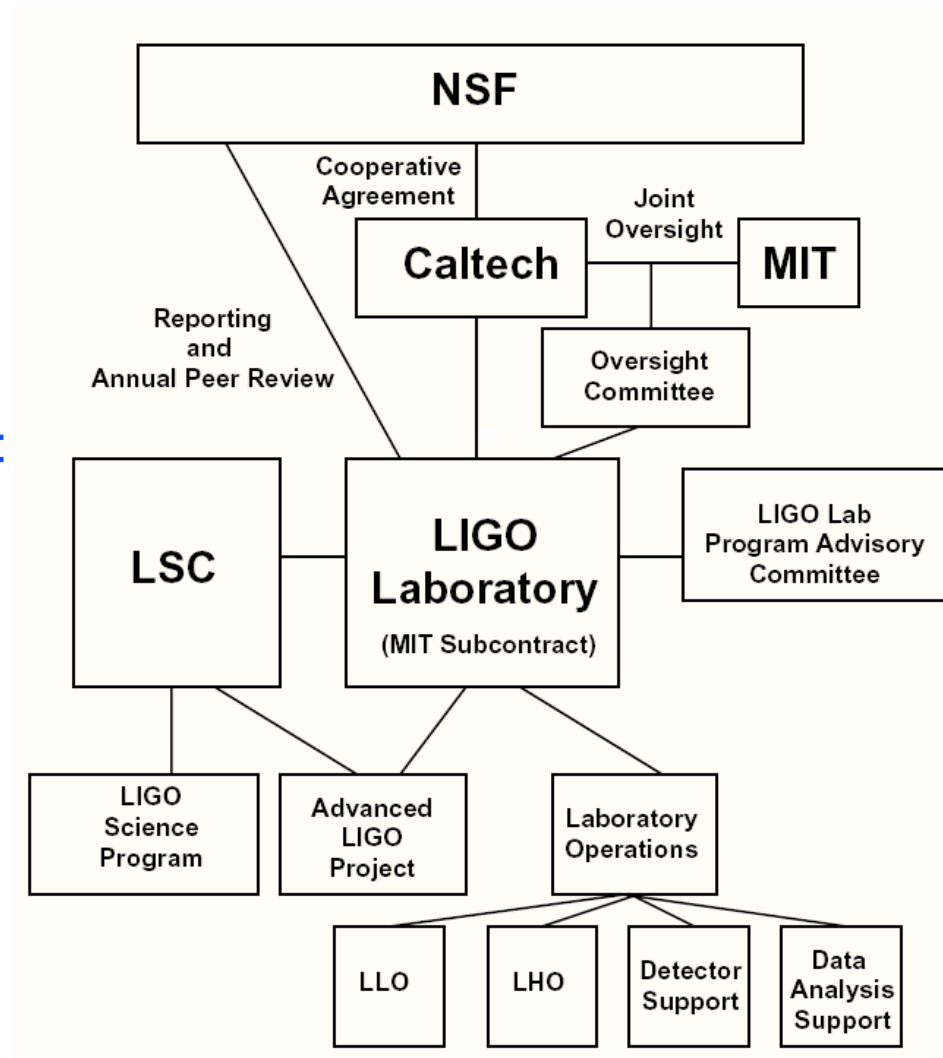
# Previous LIGO Organization



At June 2004 Program Advisory Committee (PAC) meeting, Barry presented a critique of the present organizational structure of LIGO.

Key problems highlighted:

- Separation between Lab and LSC:
  - No review of overall LSC program
  - No natural way for full LSC participation in Adv LIGO
- No representation of LSC stakeholders on LIGO Oversight Committee.





# History of deliberations



The LSC formed an *ad hoc* committee to consider possible responses to Barry's critique. It brought forward various possibilities to a general discussion at the August 2004 LSC Council meeting. A free exchange of ideas took place. One key result – no serious dissatisfaction, and an interest in restructuring to make LSC and Lab closer partners.

After the August 2004 LSC meeting, the *ad hoc* committee added Barry, Stan, and Kip as members. It then worked on distilling a proposed consensus view. Its key features were:

- » Adopting the “tighter integration” model.
- » Staying with Caltech/MIT as the hosts of LIGO
- » Working with the Caltech administration on
  - Expanding the membership of the LIGO Oversight Committee
  - Finding a mechanism to allow distribution of responsibility and authority to LSC members outside of the Lab

Discussions with Caltech administration (Tombrello) and with the existing Oversight Committee confirmed Caltech's willingness to meet the new requirements.



# Why we chose to stay with Caltech/MIT



Why fix something that isn't broken?

The LSC requested that Caltech make two reforms:

- » Expansion of the Oversight Committee to include major stakeholder institutions, and
- » Creation of a mechanism to allow LSC members from outside the Lab to take on positions of authority within the Caltech system, especially for Advanced LIGO.

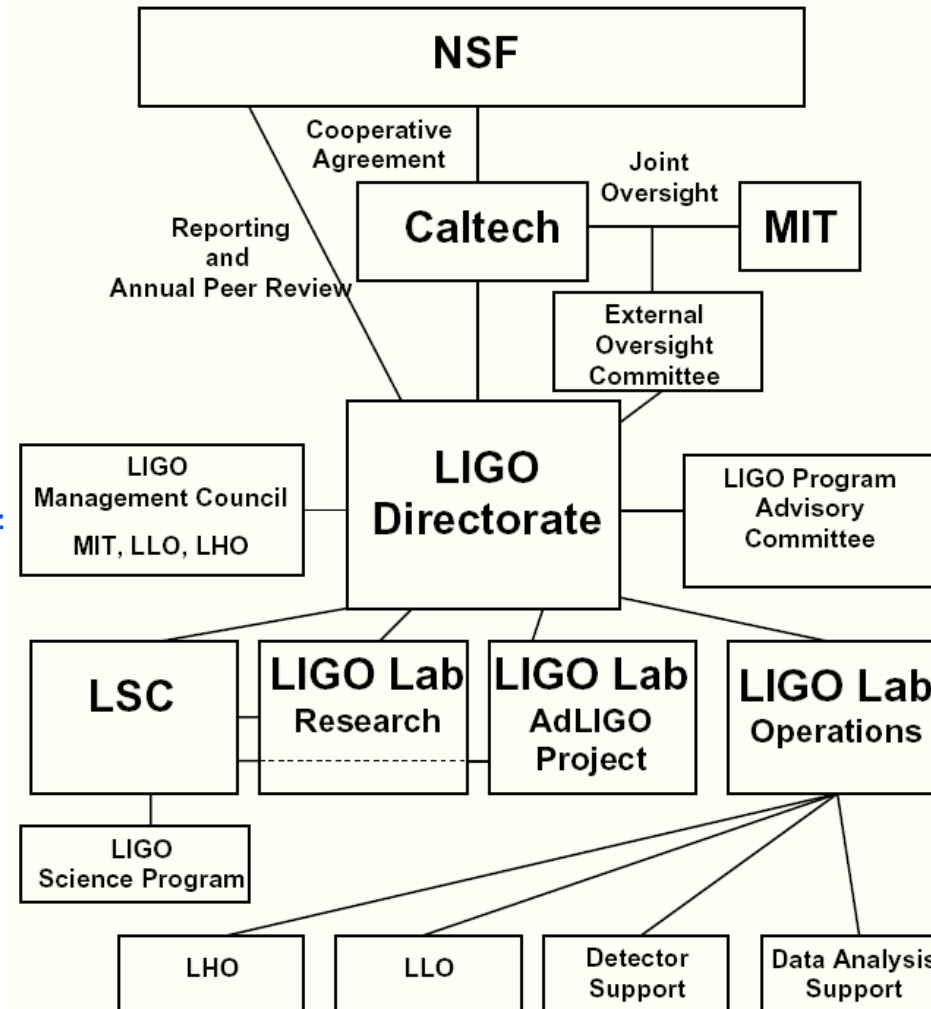
As long as these changes could be made, then LSC members saw no reason to look elsewhere for different management.

Both of the requested reforms have been worked out satisfactorily.

(Details follow.)



# New LIGO Organization



Note, especially, new location of the LSC within the organization of LIGO.

This, and other features, will be described in the rest of this talk.





# Integration of LIGO Lab and LSC



- LSC and LIGO Laboratory report to expanded Directorate
  - » LIGO Director, LIGO Lab Deputy Director, LSC Spokesperson
  - » Share responsibility for annual NSF reporting, organizing reviews, Program Advisory Committee meetings, agreements with other Labs, major technical decisions, ...
- LSC retains internal governance
  - » Elected Spokesperson, governing LSC Council
  - » Working groups, data analysis groups
- Integrated Advanced LIGO project management
  - LSC members to take subsystem responsibility/authority within project organization



# Functioning of the expanded Directorate



- Deputy Director and Spokesperson meet weekly by telephone.
- Spokesperson participates in weekly phone meeting with NSF.
- Spokesperson involved in selecting new members of Program Advisory Committee, setting agenda of meetings, etc.
- Spokesperson participates in writing the LIGO Annual Report to NSF, and in NSF reviews.
- Spokesperson has control of an account for LSC travel expenses,
  - e.g., for PI's of member groups to present proposals at the Fall Program Advisory Committee meeting.
- Spokesperson has his own teleconferencing code, a very valuable commodity.



# Advanced LIGO Organization



- Advanced LIGO will have traditional project-type organizational structure.
  - » WBS linked to schedule and deliverables
  - » Task leaders with defined work packages
  - » Hierarchical reporting
- Task leaders have been identified.
  - » Several key positions filled by non-Lab LSC members.  
Already working this way while still in R&D phase
  - » Integration enables LSC members to take responsibility/authority for project tasks.
  - » Key non-Lab members will have appointments at Caltech as Visiting Associates in LIGO.

(See Carol Wilkinson's talk tomorrow.)



# Visiting Associates in LIGO



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This is the mechanism created at Caltech for appointing non-Lab LSC members to positions of authority within the LIGO Lab structure.

Especially for Advanced LIGO project

It allows someone to direct the work of someone at Caltech, so a Visiting Associate could manage a portion of the Advanced LIGO work.

Strictly “personnel-related” issues of Caltech employees still to be handled by a Caltech supervisor

Spending authority defined by memo from LIGO Director, with defined spending limits



# Recommendation from Last Year's Review



“The proposed Visiting Associate classification at Caltech developed to allow non Caltech members of the LSC to assume line management roles in LIGO needs to be tested as early as possible to allow for revision if it proves difficult. Caltech should do whatever is necessary to smooth the way for non Caltech LSC members to take on line management responsibilities in LIGO .”

Response:

First appointments have been made, to Riles (Michigan), Saulson (Syracuse), and Shoemaker (MIT).



# LIGO Management Council



LIGO Oversight Committee raised the issue of ensuring a special role for MIT in LIGO management.

LHO and LLO also need representation in key issues, in a somewhat parallel manner.

## Solution:

The LIGO Directorate will consult with the LIGO Management Council, consisting of the Heads of the MIT group and the LLO and LHO Observatories, on major decisions. The Council advises and participates in e.g., the preparation of the annual workplan, the strategy for staffing across the Laboratory, and decisions on infrastructure investments. The MIT group head represents MIT's institutional role in the operation of the Laboratory.



# Expanded Oversight Committee



- Expanded membership
  - » Core membership appointed by Caltech and MIT administrations
  - » Representatives from “major stakeholders” from LSC
    - Example: foreign contributors to Advanced LIGO
  - » Technical advisors selected from non-Lab members of the LSC.
- Reports to Caltech, MIT administrations,
  - » Plus LSC major stakeholder institutions, where appropriate
- Main responsibilities
  - » Insure that management compatible with Caltech/MIT standards
  - » Monitor progress of the scientific, financial and scheduling aspects of all large-scale LIGO activities
  - » Recommendations to insure that the project has adequate institutional support
- Internal Caltech/MIT issues dealt with by subcommittee of Caltech/MIT appointees



# New members of the LIGO Oversight Committee

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## Major Stakeholders:

- » Kurt Mehlhorn, Max-Planck-Institut für Informatik  
Vice-President of the MPG
- » Abbas Ourmazd, Vice Chancellor for Research and Dean of the  
Graduate School, University of Wisconsin-Milwaukee
- » Alan Coates, Head of Particle Astrophysics, PPARC
- » Harold Silverman, Vice Chancellor for Research, LSU

## Technical Advisors (non-voting):

- » Prof. David Reitze, University of Florida
- » Prof. Keith Riles, University of Michigan





# LSC participation in search for next LIGO Director

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LIGO Oversight Committee asked in April that the LSC to provide it with input on the best candidates for the next LIGO Director.

O.C. to make the recommendation of next Director to Caltech/MIT.

Asked for a short list of candidates before the end of August.

The LSC Executive Committee approved a Search Committee headed by Jim Hough (Glasgow).

Search Committee met almost weekly throughout the summer. In early September, it submitted a report listing three candidates.



# Director Search Committee members

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- Jim Hough, Glasgow (chair)
- Patrick Brady, Milwaukee (secretary)
- Bill Frazer, Berkeley
- Gabriela Gonzalez, LSU
- Albert Lazzarini, LIGO/Caltech
- David McClelland, Australian National University
- Fred Raab, LIGO Hanford Observatory
- Gary Sanders, Caltech
- Peter Saulson, Syracuse
- Kip Thorne, Caltech
- Joel Tohline, LSU
- Rai Weiss, LIGO/MIT
- Benno Willke, Hannover



## Since the Search Committee's report

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The LIGO Oversight Committee received the report, and has been carrying the process forward.

Soon after the receipt of the report, the Major Stakeholder representatives joined the Oversight Committee, and have participated in deliberations.

The issue of a Caltech professorship for the next Director will be handled by the core members from Caltech and MIT.

This represents a genuine carrying out of the integrated structure, in which the Lab, the LSC, and Caltech/MIT carried out their new roles in the cooperative fashion that we envisioned.



# LIGO Review by the LSC of its groups' Memoranda of Understanding

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Starting last February, we inaugurated a new method for reviewing LSC members' Memoranda of Understanding with LIGO.

All MOUs are read together at an annual meeting of a committee of chairs of LSC working groups and data analysis groups, plus representatives of the Lab.

This enables the LSC to look at the program as a whole, looking for duplication or gaps. It also institutionalizes the idea that the working leadership of the LSC should judge (and give feedback on) the work each group is doing, in comparison with its commitments. This is a key part of enforcing planning and deadlines.

This process will lead to the production of an annual report and (the following year's) work plan.



# How the reviews have worked



The Review Panel met for the first time in early March, then again in August.

Now, will move to reviews only once/year.

- » All MOUs were supplied by PIs before the meeting.
- » The Review Panel was able to review all of the MOUs.
- » The right expertise was available for making insightful critiques of the groups' work.
- » Difficult cases were discussed by the LIGO Directorate after the meeting.
- » Panelists reported results to PIs.



# Revision of the LSC Charter



Charter Revision Committee: David Shoemaker (MIT),  
Norna Robertson (Stanford and Glasgow), Peter  
Saulson (Syracuse).

with early help from Sam Finn (PSU)

Scheme: The Charter proper has principles, followed by  
Bylaws with details of procedures.

The new Charter was discussed at March 2005 LSC  
Council meeting; members provided guidance.

At August 2005 LSC Council meeting, the new Charter  
was approved.

Key features of revised Bylaws were also discussed.  
The new Bylaws are almost completed; adoption is  
expected at March 2006 LSC Council meeting.



# How things are working



Process has been long, but in retrospect has gone extremely smoothly.

Long history of respectful nurturing of the LSC by the Lab (and by Caltech/MIT) has paid off in good will and mutual respect, and in steady maturation of the LSC itself.

Everyone is excited by the challenges ahead: doing science with initial LIGO, and moving on to Advanced LIGO.

We are proud to be working together as a unified team.