

MIT Role in LIGO

Key Issues

- MIT role in oversight of LIGO project
 - Structure of Oversight Committee under discussion
- Revised Caltech/MIT MOU
 - Draft under discussion
- Revised Caltech/NSF Cooperative Agreement
 - Agreement in principle
- Near-term Statement Of Work
 - Final FY95⁴ SOW negotiated
- Statement of MIT Roles in R&D and LIGO subsystems
 - Draft under discussion
- Statement of MIT Roles in "community outreach"
 - Draft under discussion
- Institutional issues: staff, space, technical support
 - Under discussion

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
CALIFORNIA INSTITUTE OF TECHNOLOGY (CALTECH)
AND THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)
ON THE
LIGO PROJECT

- 1) The LIGO project is a collaborative effort by Caltech and MIT scientists to design, build and operate an observatory to measure gravitational waves from astrophysical sources by laser interferometry. LIGO will become a national facility for gravitational wave research.
- 2) Under the terms of a Cooperative Agreement with the National Science Foundation (NSF), Caltech has prime responsibility to carry out the LIGO project and MIT shares responsibility with Caltech for oversight and execution of the project.
- 3) The presidents of both Caltech and MIT are responsible for the successful management of the LIGO Project. The presidents will be assisted by a LIGO Oversight Committee composed of members from each institution appointed by their respective presidents after mutual consultation, and chaired by the Special Assistant to the Caltech President for LIGO.
- 4) The LIGO Principal Investigator is appointed by the Caltech president in consultation with the MIT president and with the concurrence of the NSF.
- 5) MIT activities on LIGO are classified in two categories listed in the attached Statement of MIT Roles: Core LIGO Science and Technology, and LIGO Interferometer Subsystems. Core activities consist of research, development and project support in specific areas as negotiated with Caltech. Core activities are funded directly by NSF as specified in the Cooperative Agreement. Subsystem activities are funded by multiyear subcontracts from Caltech, with budgets and statements of work as negotiated with Caltech; these will be renegotiated and updated as required.
- 6) Selected members of the MIT LIGO science team will participate in the scientific and technical management of the project. One MIT member will serve in a senior, leadership role in the LIGO project and at least one will be designated as key personnel in the Cooperative Agreement.
- 7) The MIT science effort is fully integrated into the LIGO Project. Members of the MIT science team will take responsibility for selected LIGO interferometer subsystems and tasks, as listed in the attached Statement of MIT Roles. The specific tasks and their scope will be

renegotiated as appropriate during the life of the project. The MIT group will also share responsibility for establishing and maintaining interaction with the broader scientific community and for the operations phase of LIGO.

8) MIT will provide institutional, management and technical support to the MIT LIGO project through the Center for Space Research. Further institutional and academic support will be provided through the Department of Physics. The Director of the Center for Space Research and the Head of the Physics Department are the primary points of contact for institutional matters concerning LIGO.

DRAFT

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LIGO PROGRAM AT MIT

BROAD ROLES

Scientific and Technical support

- Basic research *
- Design of the interferometers (*)
- Scientific liason to facility design and construction #
- Construction and installation of the initial detector #
- Operation of the initial detector (*)
- Observation planning and data analysis (*)
- R & D of enhanced and advanced detectors *

Management and Project Responsibilities

- Establish project scientific strategy in collaboration with Caltech *
- Scientific liason to facilities/detector systems engineering and integration (#)
- Liason to the external scientific and LIGO users community *

SPECIFIC ROLES

- Development of techniques and instrumentation leading to interferometer subsystems:

Fringe sensing system #

Interferometer alignment system #

Environmental monitoring system ? #

Seismic isolation system ? #

- Delivery of tested subsystems to the LIGO sites #
- Scientific liason to vacuum system design, construction and operation (#)
- Coordination of LIGO modeling effort *
- Installation and test of the initial interferometer at LIGO sites (#)
- Development of observing strategies and data analysis (*)

* = supported by NSF directly

(*) = supported primarily by NSF directly and in part by LIGO contract

(#) = supported primarily by LIGO contract and in part by NSF directly

= supported by LIGO contract

LIGO GROUP AT MIT

Faculty:

Prof Rainer Weiss

Principal Research Scientists:

Dr David Shoemaker

Research Staff

Dr Peter Fritschel

Dr Yaron Hefetz

Graduate Students:

Bret Bochner

Joe Giaime

Joe Kovalik

Brian Lantz

Nergis Mavalvala

Partha Saha

Support Staff:

Tom Evans (Technical)

Susan Merullo (Secretarial and Administrative 1/2)

Undergraduates:

Iosif Bena

Jay Muchnij

Interested Faculty:

Prof Edward Bertschinger (Physics)

Prof Alan Oppenheim (Electrical Engineering)

Prof James Roberge (Electrical Engineering)

Prof Leslie Rosenberg (Physics)

Prof Gerald Sussman (Electrical Engineering)