

**Attachment Number A to the
Memorandum of Understanding (LIGO-M950060-A-M)
between the
Stanford Advanced Gravitational Wave Interferometry Group
and the
Laser Interferometer Gravitational Wave Observatory (LIGO) Laboratory
August 15, 2002**

This Attachment A to the Memorandum of Understanding LIGO-M950060-00-M covers the role of the Stanford Advanced Gravitational Wave Interferometry Group as a Member of the LIGO Scientific Collaboration (LSC) and a member of the LIGO I Development Group (L1DG). The period of performance for the activities in this Attachment is from **August 15, 2002 to February 15, 2003**. This period may be modified by agreement to a revision of this Attachment.

1. LIGO Scientific Collaboration - The LIGO Scientific Collaboration (Collaboration) is organized as a separate organization from the LIGO Laboratory. It includes scientists from the LIGO Laboratory, and those from collaborating institutions, and has its own leadership and governance. The Collaboration will ensure equal scientific opportunity for individual participants and institutions. It will organize the research, publications, and all other scientific activities. The Collaboration will report to the Laboratory Directorate for final approval of its research program, technical work, observational physics publications, and talks announcing new observations and physics results. This will be done through regular semi-annual reports to the Directorate and its PAC.
2. Charter Membership - An initial period for formation of the Charter group of institutions in the LIGO Scientific Collaboration commenced on March 1, 1997 and ended following the first full meeting of the Collaboration at which the Collaboration Council assumed its role.

Following the charter period, proposals will be evaluated and approved, as appropriate, through the Collaboration Council. An MOU with the LIGO Laboratory, including Attachments defining specific work, will be required for any participating institutions.

3. This document is an agreement between the Stanford Advanced Gravitational Wave Interferometry Group and the LIGO Laboratory concerning the activities of the Stanford Advanced Gravitational Wave Interferometry Group as a Collaborating Institution in the LIGO Scientific Collaboration (LSC) and in the LIGO I Development Group (L1DG), and as indicated in Item No. 8 below.

4. LIGO I Development Group - The LIGO I Development Group is the scientific collaboration for implementing and exploiting the initial LIGO detector and physics through the initial science data run. Only groups who establish a specific Attachment approved by the LIGO Laboratory, which defines a sufficient contribution and participation in LIGO I development, implementation or data analysis will be part of this initial LIGO data run and science. Participation in future data runs and science that follow LIGO I will be possible for other groups, with guidelines to be determined by the LIGO Scientific Collaboration. It is anticipated that LIGO I data will only be made available through formal collaboration within the LIGO I Development Group during the first two years following its collection.

The general guideline for institutional membership in the LIGO I Development Group is that the contribution per collaborator of any new group to the design, construction, and implementation of the initial LIGO detector and to the first data run be comparable to that of the LIGO Laboratory scientists.

5. Report of Progress – The Stanford Advanced Gravitational Wave Interferometry Group will provide a status report on its activities in support of LIGO every six months. The report will consist of: a) a summary status on research by topic as indicated Item No. 8 below including progress against the milestones if any, significant accomplishments such as new insights/discoveries or publications, issues of concern if any, and an indication of invested time, b) updated List of Collaborators, and c) a plan of activities for the succeeding six-monthly period. The report will be due one month before the close of the period of performance under the Attachment in question.
6. Term of Membership - The Membership will be renewed every six months upon evidence of satisfactory performance of agreed upon duties.

The coordinates of the Stanford Advanced Gravitational Wave Interferometry Group members are included in the Attachment Z to the Memorandum of Understanding LIGO-M0950060-00-M.

7. Intellectual Property Rights - The rights to intellectual property developed under this Attachment will be subject to the National Science Foundation Grant Policy as indicated in Section 730, Intellectual Property.
8. During the period of **August 15, 2002 to February 15, 2003**, Brian Lantz and various Attachment A LSC members will work with LIGO to ameliorate the ground motion at the LIGO Livingston Observatory (LLO) and to accelerate the development of the Advanced LIGO external hydraulic system so that it can be installed in initial LIGO if deemed appropriate. Pursuant to this agreement, we will:
 - a) Brian Lantz will serve as the lead scientist for the hydraulic isolation system development at the LASTI facility at MIT and for deployment at the LLO.
 - b) We will continue the prototyping and testing of the hydraulic actuators at Stanford.

- c) We will calibrate the control valves for LASTI
 - d) We will design of a new hydraulic valve calibration stand. Instrumentation is being assembled.
 - e) We will continue to develop a model of the hydraulic pre-isolator at LASTI.
 - f) We will install and run the hydraulic isolation system at LASTI.
9. During the period **August 15, 2002 to February 15, 2003**, the LIGO Laboratory will provide, as requested and necessary, LIGO data of relevance to the research topics in Item No. 8 above.
10. The research effort, pursuant to this Attachment A will be coordinated by Roger Route and Gary Sanders on behalf of the Stanford Advanced Gravitational Wave Interferometry Group, and the LIGO Laboratory, respectively.
11. Resource Sharing: The LIGO Livingston Observatory will make research facilities available in support of the effort in Item No. 8 as indicated below.

The LIGO Laboratory will provide:

- a) Research facilities and funding in support of the effort in Item No. 8.
- b) Accommodations for Stanford Group investigators while on LIGO research assignment at Caltech, MIT, and/or LIGO sites.

The Stanford Group will provide:

- a) Accommodations for LIGO Laboratory and LSC scientists while on research assignment at Stanford.

Approved:

Barry Barish
LIGO Laboratory Director

Date

Robert L. Byer
Principal Investigator

Date