

Attachment Number A to the
Memorandum of Understanding (LIGO-M980120-00-M)
between the
Center for Applied Physics (CAPS) of Louisiana Tech University
and the
Laser Interferometer Gravitational Wave Observatory (LIGO) Laboratory
February 15, 2000

This Attachment to the Memorandum of Understanding LIGO-M980120-00-M covers the role of the Center for Applied Physics (CAPS) of Louisiana Tech University as a Charter 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 February 15, 2000 to August 15, 2000. This period may be modified by agreement to a revision of this Attachment.

1. LIGO Scientific Collaboration - The LIGO Scientific 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, physics publications, and talks announcing new physics results. This will be done through regular 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 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 Center for Applied Physics (CAPS) of Louisiana Tech University and the LIGO Laboratory concerning the activities of CAPS 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, during the first two years following its collection, through formal collaboration within the LIGO I Development Group.

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 - CAPS will provide a status report every six months on its activities in support of LIGO. 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 (Attachment Z), and c) a plan of activities for the succeeding six-month 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 commitments in Item No. 8 below.

The coordinates of CAPS members are included in Attachment Z to the Memorandum of Understanding LIGO-M980120-00-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 February 15, 2000 to August 15, 2000, the CAPS group will consist of Asst. Prof. Zeno Greenwood, Assoc. Prof. Kathleen Johnston, Asst. Prof. Neven Simicevic and Assist. Prof. Lee Sawyer. Undergraduate student Clay Westbrook will also participate. In addition, Assoc. Prof. Gary Zumwalt, head of the Louisiana Tech Geosciences program, has agreed to advise CAPS on geological matters.

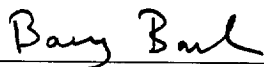
The CAPS group proposes to collaborate in the installation and commissioning of the first LIGO Detector at Livingston (LLO), and to undertake research on the seismic background and its seasonal variation at the LLO site. The CAPS group will be part of the LIGO Scientific Collaboration, participating in the LIGO I Development Group. The work for LIGO I will consist of:

- a) Collaboration with the LLO staff in the installation and operation of seismic measuring devices at the LLO site in order to accurately determine and monitor the long-term ambient seismic background.
- b) Measurement and characterization of the gravity-gradient noise at the LLO site which is

anticipated as a limiting background for the Advanced Interferometer design. Vertical and horizontal variations in the local density with high spatial and temporal resolution will be measured for the purpose of computing seismic gravity-gradient noise. The equipment used and data collected can be employed in the subtraction of gravity-gradient noise from data recorded by next-generation Advanced Design LIGO interferometers.

- c) Assisting in the LLO Beam Tube (BT) bakeout.
9. During the period February 15, 2000 to August 15, 2000, the LIGO Laboratory will share, as requested and appropriate, the LIGO data of relevance to the research focus in Item No. 8 above.
10. The research effort pursuant to this Attachment A will be coordinated by Z. Greenwood and Syd Meshkov on behalf of CAPS and the LIGO Laboratory, respectively.
11. Resource Sharing: The LIGO Laboratory will contribute resources including allocation of appropriate scientific and engineering personnel, research facilities and funding in support of the effort in Item No. 8, as indicated below. These resources will be in addition to the coordination effort and data to be made available per Item No. 9 above.
- a) Provide accommodations for CAPS investigators while on LIGO research assignment at Caltech, and/or LIGO sites.
- b) Contribute funding for CAPS's effort in support of LIGO. Funding is provided under a subcontract between Caltech and the Louisiana Tech University. The funding authority is National Science Foundation (NSF) Grant No. 9800097.

Approved:



Barry Barish
LIGO Laboratory Director



Zeno Greenwood
CAPS Principal Investigator

4/3/00

Date

3/16/00

Date