

**Attachment Number A to the**  
**Memorandum of Understanding (LIGO-M950073-00-M)**  
**between the**  
**Michigan Gravity Wave Group (MGWG) in the Department of Physics of the**  
**University of Michigan**  
**and the**  
**Laser Interferometer Gravitational Wave Observatory (LIGO) Laboratory**  
**August 15, 1997**

This Attachment to the Memorandum of Understanding LIGO-M950073-00-M covers the role of the Michigan Gravity Wave Group (MGWG) in the Department of Physics of the University of Michigan as a Charter Member of the LIGO Scientific Collaboration (LSC) and a member of the LIGO I Development Group (LIDG). The period of performance for the activities in this Attachment is from August 15, 1997 to February 15, 1998. This period may be modified by agreement to a revision of this Attachment.

1. LIGO Scientific Collaboration - The LIGO Scientific Collaboration will be organized as a separate organization from the LIGO Laboratory. It will include scientists from the LIGO Laboratory, and those from collaborating institutions, and will have 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 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 will commence on March 1, 1997 and will end following the first full meeting of the Collaboration at which the Collaboration Council will assume its role. We expect that this transition will occur within six months. Membership in the Collaboration during this charter period will be initiated by proposal to the LIGO Laboratory Directorate.

Following the charter period proposals will be evaluated through the Collaboration Council. With Collaboration approval, 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 Michigan Gravity Wave Group (MGWG) in the Department of Physics of the University of Michigan and the LIGO Laboratory concerning the activities noted below, under provision 8, of MGWG as a Collaborating Institution in the

LIGO Scientific Collaboration (LSC) and in the LIGO I Development Group (LIDG).

4. LIGO I Development Group - The LIGO I Development Group will be 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 - MGWG will provide a summary report of progress, monthly, by e-mail to the Collaboration Council and to the LIGO Laboratory Director. MGWG will submit a complete report on its activities every six months, supply an updated List of Collaborators, and a plan of activities for the next six months. This report should be submitted one month before the updated attachment will take effect.
6. Term of Membership - Membership will be renewed every six months upon evidence of satisfactory performance of agreed upon duties.
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 August 15, 1997 - February 15, 1998, MGWG will concentrate on the task of operating and analyzing the data from the 40-m, primarily using it as a diagnostic tool to anticipate potential problems with the full LIGO detector, but also using it as a serious scientific instrument in a broad-band search for gravitational waves. In the longer term, a laboratory is being set up at Michigan for LIGO electronics development and testing, exploiting the substantial electronics lab facilities already established by Michigan high energy physics research groups. MGWG will participate in the following areas:
  - a.) Continue noise studies and develop lock acquisition diagnostics with the 40-m (Gustafson).
  - b.) Participate in testing of the Recycler (Gustafson).
  - c.) Participate in the 40-m DAQ Data Group (Gustafson).
  - d.) Develop analysis tools for both "online" and "offline" software diagnostics for rapid detec-

tion of noise sources, including correlations in servo control signals (Riles).

e.) Begin development of electronics for use in LIGO I diagnostics (Gustafson & Riles).

f.) Acquire and analyze 40-m data to search for signals (Gustafson & Riles).

Approved:

*Barry Barish*

Barry Barish  
LIGO Laboratory Director

*Aug 15, 1997*

Date

*Prasad Uher for CD*

Citrad Uher  
Chair, Department of Physics

*August 19, 1997*

Date