

**Attachment Number A to the
Memorandum of Understanding (LIGO-M970077-00-M)
between the
German/British Collaboration (GEO 600) for the Detection of Gravitational
Waves
and the
Laser Interferometer Gravitational Wave Observatory (LIGO) Laboratory
February 15, 2000**

This Attachment to the Memorandum of Understanding LIGO-M970077-00-M covers the role of GEO 600 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, 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 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. 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 German/British Collaboration for the Detection of Gravitational Waves (GEO 600) and the LIGO Laboratory concerning the activities of GEO 600 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 - GEO 600 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.

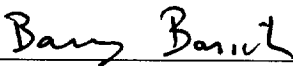
The coordinates of GEO 600 members are included in the Attachment Z to the Memorandum of Understanding LIGO-M970077-00-M.

7. For GEO 600 personnel who will participate in the LIDG activities in Item No. 8 below, see the attached GEO LSC Contribution for LSC Period 02-15-2000 through 08-15-2000.
8. During the period February 15, 2000 to August 15, 2000, the GEO 600 group will:
 - a) Supply data taken with the GEO 600 Interferometer for analysis by the LIGO Laboratory and its designated representatives. (Bernard Schutz)
 - b) David Churches will continue with development of software to search for in-spiral waves from coalescing black holes/neutron stars. (Cardiff)
 - c) R. Balasubramanian will continue with development of software for unstructured bursts using time-frequency analysis. This effort should be helpful in recognizing instrumental and environmental transients. (Cardiff)
 - d) Implement theoretical models for in-spiral searches in Cardiff's search software. These models, when used in data analysis searches, should greatly enhance LIGO's chance of detecting in-spiral events. In the search software is under development. (Cardiff)

Milestones for items b) and c) above are as follows:

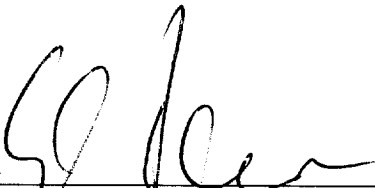
1. Frequency domain templates (SPA, irSPA) / end of March
2. Time-domain T-approximant templates with eccentricity / end of June
3. Time-domain T-approximant templates for spinning binaries / end of June
4. Template placement algorithms for point-mass, spinless binaries / end of September
5. Recording of Steger's code for curve detection / end of April
6. Testing of time-frequency code on a beowulf system with simulated coloured Gaussian noise with the initial LIGO power spectrum / end of April
9. The LIGO Laboratory will share, as requested and appropriate, LIGO data of relevance to the planned research in Item No. 8 above. This will include data taken with the LIGO Interferometers at Hanford and at Livingston for analysis by the GEO 600 and its designated representatives.
10. The research effort pursuant to this Attachment A will be coordinated by Bernard Schutz and Albert Lazzarini on behalf of GEO 600 and the LIGO Laboratory, respectively.

Approved:




Barry Barish
LIGO Laboratory Director
6-12-00

Date



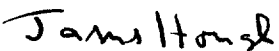
Karsten Danzmann
GEO 600 Principal Investigator
20/5/00

Date



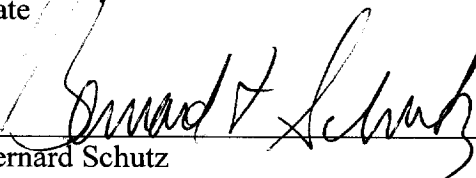
Albert Lazzarini
LIGO Laboratory Data and
Computing Leader
13 June 2000

Date



James Hough
GEO 600 Principal Investigator
18/03/00

Date



Bernard Schutz
GEO 600 Principal Investigator
24/03/00

Date