

**Attachment Number B to the  
Memorandum of Understanding (LIGO-M950043-00-M)**

**between the**

**Syracuse University Experimental Relativity Group (SUERG)**

**and the**

**Laser Interferometer Gravitational Wave Observatory (LIGO) Laboratory**

**February 15, 2000**

This Attachment to the Memorandum of Understanding LIGO-M950043-00-M covers the role of SUERG as a Charter Member of the LIGO Scientific Collaboration (LSC) and a member of the Isolation/Suspension/Thermal Noise Development Group (ISTNDG). 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 Syracuse University Experimental Relativity Group (SUERG) and the LIGO Laboratory concerning the activities of SUERG as a Collaborating Institution in the LIGO Scientific Collaboration (LSC) and in the Isolation/Suspension/Thermal Noise Development Group (ISTNDG), and as indicated in item No. 8 below.
4. Isolation/Suspension/Thermal Noise Development Group - The Isolation/Suspension/Thermal Noise Development Group (ISTNDG) is the scientific collaboration for defining and developing future isolation and suspension improvements for use in advanced subsystems for the initial LIGO interferometers or in entirely new advanced interferometers. A specific Attachment

will define the roles and responsibilities of groups in this development group. Members of this group will normally be authors on publications reporting the work of the group and will normally be eligible to participate in data runs and science beyond the LIGO I data run.

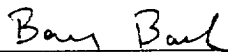
5. Report of Progress - SUERG will provide a status report on its activities in support of LIGO every six months. The report will consist of: a) a summary status on research by topic as indicated item No.8 below including progress against the milestones if any, significant accomplishments such as new 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.

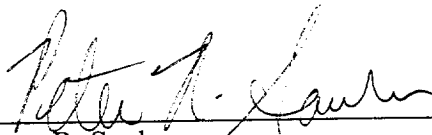
The coordinates of SUERG members are included in the Attachment Z to the Memorandum of Understanding LIGO-M950043-00-M.

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 August 15, 2000 to February 15, 2000, SUERG will include Peter Saulson and collaborators Steven Penn (postdoctoral research associate), Gregory Harry (postdoctoral research associate), Andri Gretarsson (graduate student), and Scott Kittelberger (graduate student). They will:
  - a) Carry out research into the loss mechanisms in fused silica.
  - b) Carry out research into the loss mechanisms in sapphire.
  - c) Carry out research into levels of mechanical losses in mirror coatings. (Harry; 4Q00 for results of REO coatings on superpolished substrate).
  - d) Continue improvement of the anelastic aftereffect measurement system, in support of the research objectives listed above. (Penn and Kittelberger; 4Q01 for systematic-free measurements on fused silica and sapphire).
  - e) Develop a violin mode monitor suitable for use with suspended pendulums, and with sufficient sensitivity to measure Brownian motion with 1 sec integration times. (Gretarsson; 2Q01).
  - f) Participate in Development Group design activities, aimed at producing a new suspension design for LIGO II.

9. During the period February 15, 2000 to August 15, 2000, the LIGO Laboratory will make available upon request and as necessary its research data on loss mechanisms in LIGO optics materials and coatings and on advance optics suspension designs.
  10. The research effort pursuant to this Attachment B will be coordinated by P. Saulson and Mark Coles on behalf of SUERG and LIGO Laboratory respectively.
  11. Resource Sharing: P. Saulson's participation as the LLO Interferometer Installation Leader during CY 2000 is at the explicit request of the LIGO Laboratory. Accordingly, all associated and reasonable costs will be borne by the LIGO Laboratory. Appropriate contractual and funding arrangements will be made pursuant to the LIGO Visitor's Program. Copies of the Academic Appointment and authorizing Caltech subcontract are attached.
- a) The above resources will be in addition to the coordination effort and data to be made available per item No. 9 above.

Approved:

  
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Barry Barish  
LIGO Laboratory Director

  
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Peter R. Saulson  
SUERG Principal Investigator

4-19-00  
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Date

17 Mar 2000  
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Date