

**Attachment SUS to the
Memorandum of Understanding (LIGO-M050280-00-M)
between the
Australian Consortium for Interferometric Gravitational Astronomy
(ACIGA)
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
August 15, 2005**

This Attachment SUS to the Memorandum of Understanding LIGO-M050280-00-M defines the role of the Australian Consortium for Interferometric Gravitational Astronomy (ACIGA) as a 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 August 15, 2005 to August 15, 2006.

1. 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. MOU Attachments define the roles and responsibilities of groups in this development group.
2. During the period August 15, 2005 to August 15, 2006, the members of ACIGA Group will participate in ISTNDG in the following areas:

Suspension design for AdvLIGO –

The ACIGA (UWA) group is working in close collaboration with the de Salvo group at Caltech on advanced passive vibration isolation and advanced isolation materials. De Salvo has requested a UWA Euler spring stage for evaluation at Caltech, and has supplied UWA with maraging steel technology and materials for use in Euler springs. The UWA group has tested glassy metal alloys and is following the tests of new glassy materials at Caltech with view to their use. Passive stages have been proposed for Advanced LIGO HAMS and are currently under consideration. The UWA group plans to implement LVDT technology in collaboration with the de Salvo group to implement inertial damping to future UWA passive stages.

During the next year ACIGA (UWA) will

- i) install two full isolation systems inside the 80m arm at Gingin
- ii) characterize the full high performance isolation systems
- iii) perform differential tests of the high performance isolation system in 80m arm cavity
- iv) pursue advanced digital remote control system to South (HOPTF) 80m arm.

3. 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. 2, as indicated below.
 - a) Research accommodations for ACIGA group members while on LIGO research assignment at any LIGO Laboratory site,
 - b) Access to LIGO data through established LSC channels in support of this work.

4. Coordination and Reporting – ACIGA Group will perform this research within the structures established by the LIGO Laboratory and the LSC where appropriate. In particular activities described in Item 2 will be carried out within Isolation/Suspension/Thermal Noise Development Group of the LSC. Coordination will include keeping the Group leaders informed of activities and plans, reporting to the group at meetings and telecons, and through technical documents submitted to the LIGO Document Control Center.

In addition, an annual report will be submitted with the update to this Attachment, giving a summary status on research by topic as indicated in Item No. 2, 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. This Attachment will be updated at least annually with a plan of activities for the succeeding on-year period. These documents will be due one month before the close of the period of performance under this Attachment.

Approved:

Barry Barish
LIGO Laboratory Director

David McClelland
ACIGA Principal Investigator

Peter Saulson
LSC Spokesperson

Joseph Giaime
ISTNDG Leader