

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

This Attachment ACF 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 Advanced Detector Configurations Development Group (ADCDG). The period of performance for the activities in this Attachment is from August 15, 2005 to August 15, 2006.

1. Advanced Detector Configurations Development Group - The Advanced Detector Configurations Development Group (ADCDG) is the scientific collaboration for defining and developing entirely new advanced interferometers. It is expected that this development group will pursue research in dual recycling, resonant sideband extraction, Sagnac interferometers, systems with non-transmitting optics and other advanced configurations. 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 ABC Group will participate in ADCDG in the following areas:
 - a) *Interferometer Configurations*
 - Complete bench top Variable Reflectivity Mirror (VRM) with no arm cavities using an Output Mode Cleaner for control signal injection.
 - Inject squeezing into the above interferometer
 - Commence a bench top RSE with VRM experiment
 - b) *Squeezed Light generation*
 - Optimise and determine limits to the generation of squeezing using the new traveling wave resonator and a doubly resonant design
 - Investigate techniques to lock and control the squeeze angle with this new design with the goal to avoid the use of noise locking.
 - Determine limitations to low frequency squeezing arising from homodyne detection and other sources with the goal to achieve squeezing across the entire ALIGO band.
 - Design a 3rd generation squeezer.
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 the Advanced Detector Configurations 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

Ken Strain
ADCDG Leader