

Attachment OPT 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 OPT 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 Optics Development Group (ODG). The period of performance for the activities in this Attachment is from August 15, 2005 to August 15, 2006.

1. Optics Development Group – The Optics Development Group (ODG) is the scientific collaboration for defining and developing improvements in optics 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 ODG in the following areas:

High optical power tests

At the HOPTF in Gingin W.A., we will

1. Implement frequency stabilization of 10W laser to a rigid reference cavity
2. Provide stable lock of the 80m sapphire cavity with the 10W laser operating near full power.
3. Demonstrate Thermal Lensing Compensation (TLC).
4. Complete Hartmann beam/sensor installation and test it with TLC.
5. Complete stage 1 (single 80m cavity; 10 W laser; ITM substrate inside cavity) experiment with 10W laser.
6. Commence commissioning of stage 2 (single 80 m cavity; >50 W laser) configuration.
7. Implement LIGO digital control system: a low cost EPICS LIGO look-alike digital control system which will be used in conjunction with the both the LIGO SOS and the UWA passive isolation systems to make the Gingin high power facility more effective and more user friendly to LIGO participants.
8. Implement capacitive excitation and readout to enable parametric instability effects in the 80m arm cavity to be investigated.
9. Assemble advanced isolators in the east arm (south arm used in the above experiments) using a) preliminary optics and b) sapphire test masses with Niobium ribbon suspension and electrostatic control.
10. Provide stable locking of east arm cavity with NPRO and evaluate isolation performance.

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 Optics Development Working 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
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David Reitze
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