



LIGO MIT  
LABORATORY  
175 ALBANY STREET  
MIT NW17-161  
CAMBRIDGE MA 02139

TEL: 617.235.4824  
FAX: 617.253.7014

Date: 15 June 2007

Refer to: LIGO M070106-02-M

LIGO Contacts: David Shoemaker  
Jay Marx

## Re: Advanced LIGO Development MoU with The Australian National University

The LIGO Laboratory and the Australian National University agree to the scope of work under subcontract as described below to support the development phase of Advanced LIGO.

The purpose of this sub contract is to expedite the transfer of funds to aid our current and future collaboration. It is in anticipation of a true subaward with programmatic responsibility to be awarded to ANU after the work is successfully completed and once funding is received from the NSF for Advanced LIGO. The funds have to be spent on the specified project, a financial report must be submitted at the end of the project and any unspent funds returned.

The ANU Centre for Gravitational Physics will:

1. Design a tip tilt stage which:
  - provides a dither signal in the kHz range
  - provides a dither angle ~6 mrad
  - has resonance modes above 2 Hz
  - provides access to the transmitted beam
  - is vacuum compatible
2. Complete PDR for tip tilt stage
3. Build tip tilt prototype
4. Finalize design and complete FDR
5. Supply 4 tip tilt stages (without OSEMs) for testing at LIGO by August 2007.
6. Supply complete drawings to LIGO for tip tilt stage
7. Develop requirements for seismic platform (or suspension point) interferometer (SPI)
8. Determine feasibility for implementation on Advanced LIGO
9. Depending on 5, work on the design for a Seismic Platform Interferometer (SPI)
10. Complete Conceptual Design Review for SPI by October 2007.

The work will be undertaken by Bram Slagmolen and Glenn de Vine, with input from Daniel Shaddock, under the supervision of David McClelland.

The fee for the effort is US\$50,000.

The LIGO Laboratory will:

Supply electronics and software, on long-term loan or for integration in Australia with mechanical elements and subsequent return to LIGO, to help in development and delivery of the tip-tilt stages and the SPI development.

Items include

- ALIGO satellite boxes
- ALIGO SUS receivers

- ALIGO Anti-aliasing boards
- ALIGO SUS coil drivers
- ALIGO anti-imaging boards

LIGO will support the development work through systems/requirements guidance, regular discussion and review.

Prof. David McClelland, in a letter of May 3 2007 (attached), has agreed to this scope of work and subcontract.

Jay Marx  
Executive Director, LIGO Laboratory

David Shoemaker  
Leader, Advanced LIGO