



The Australian International Gravitational Observatory: Project Plan and Science Benefits

An International Conference under the auspices of
The Gravitational Waves International Committee
and

The DIISR India-Australia Science and Technology Exchange Agreement

The Conference will be held at the University of Western Australia and the Gingin Gravity
Centre

22-24 February 2010

Draft Program

22 February: Public Launch of the AIGO Project, University Club Theatre Auditorium

- 9:00 – 9:10 Prof Robyn Owens, Deputy Vice-Chancellor Research and Innovation
Welcome address
- 9:10 – 9:20 Prof Stan Whitcomb, Gravitational Waves International Committee
The GWIC Roadmap and the need for AIGO
- 9:20 – 9:30 Prof Jesper Munch, Chair of the AIGO Committees
AIGO and World Science
- 9:30 – 9:40 Tony Martin, CEO, STM-Duraduct introduces the video
AIGO: Discovering the Dark Side of the Universe
- 9:40 – 9:45 Dr Kenneth Chern, US Consul General: Science Cooperation across the world
- 9:45 – 10:00 Dr Jay Marx, California Institute of Technology
LIGO Laboratory and International Partnership in AIGO
Dr Marx will introduce members of the AIGO partnership (listed below)
Prof Sanjeev Dhurandhar, Prof Bala Iyer and Prof Unnikrishnan leaders of the INDIGO Consortium
Prof Karsten Danzmann, Director MPI for Gravitational Physics
Prof Zonghong Zhu, Beijing Normal University (China GW collaboration)
Prof Pierre-Francois Cohadon, French Consortium for AIGO
- 10:00 – 10:05 The Hon. Helen Morton MLC, Parliamentary Secretary to the Treasurer;
Commerce; Science and Innovation; Housing and Works; Water; Mental Health;
Member for East Metropolitan Region, to represent the Premier's Office,
welcomes participants on behalf of the Government of Western Australia.
- 10:05 – 10:10 Prof Lyn Beazley, Chief Scientist of Western Australia
Official Opening of AIGO Conference
- 10:10 – 10:15 Prof David Blair, University of WA
Vote of thanks and invitation to morning tea and public lectures

10:15: Morning Tea, University Club Ground Floor Foyer

10:30 – 11:30: Private Meeting, University Club, Seminar Room #2

Private meeting with Prof Robyn Owens, Prof Lyn Beazley and International Project participants Dr Jay Marx, Prof Stan Whitcomb, Prof Karsten Danzmann, Prof Sanjeev Dhurandhar, Prof Bala Iyer, Prof Unnikrishnan, Prof Jesper Munch, Prof Pierre-Francois Cohadon, Prof Zonghong Zhu, Prof Edna Cheung, Prof David McClelland and Prof David Blair

10:45 – 12:30: Public Lectures for High School Students, University Club Theatre Auditorium

10:45 Prof Andrew Melatos: The Dark Side of the Universe

11:30 Prof Karsten Danzmann: Listening to the Universe in Einstein's Gravitational Waves

13:00 – 14:00: Lunch at University Club, Ground Floor/Outside Terrace

14:00 – 17:00: International Participants Workshop, University Club, Seminar Room #1

Chair: Jesper Munch

1. Reports from AIGO Participants

Stan Whitcomb: Report from LIGO, USA

Sanjeev Dhurandhar: Report from India

Karsten Danzmann: Report from Albert Einstein Institute, Germany

Pierre-Francois Cohadon: Report from France

Zonghong Zhu: Report from China

David Blair: AIGO Infrastructure Project Planning

Alexey Veryaskin: Industry Benefits from GW research

2. International Partners meeting. Agenda determined by recommendations from the AIGO International Advisory Committee Meeting October 27, 2009.

18:00: Welcome Reception: US Consul General, 8 Bellevue Terrace, West Perth

19:30: "Exploring the Dark Side of the Universe" Evening Public Lectures, UWA Social Science Theatre

23 February: 8.30 Transport to Gravity Centre: arrive 10:00 am

10:00 - 10:30: **Morning Tea**

10:30 - 12:30: **AIGO Site Inspection** (UWA Suspension review begins in parallel in Cosmos Centre Building)

14:00 -18:00: Plenary session (Southern Cross Cosmos Centre) and Parallel Meeting (AIGO Meeting Room)

Contact Technical Program Coordinator Ju Li (juli@physics.uwa.edu.au) for program changes and additions.

14:00: **Isolation, Suspension, Vacuum and Other Technologies:** *Chair Li Ju*
Mike Zucker: Advanced LIGO Isolation and Suspension Status (20 min)
Stefano Braccini: The Virgo GW detector and its seismic isolation system (20 min)
Stefan Gossler: The AEI 10m prototype interferometer (20 min)
Pablo Barriga: UWA isolator control and integration (20 min)
Jean-Charles Dumas: Proposed AIGO suspensions (20 min)
Suresh Doravari: Low frequency vibration attenuation in the GGG apparatus (20 min)

Afternoon tea (15 min)

16:20: **Isolation, Suspension, Vacuum and Other Technologies:** *Chair Stefano Braccini*
Haixing Miao: Macroscopic quantum mechanics with future GW detectors (15 min)
G. Rajalakshmi: Short range force measurement using interferometric GW detectors (15 min)
S. Sunil: Proposed AIGO vacuum system design (15 min)
Tony Martin: AIGO vacuum pipe manufacture (15 min)
Ajai Kumar: Vacuum components from India (15 min)
Mike Zucker: Lessons from LIGO vacuum & cleanroom (discussion)

14:00: **Small Group: Planning and Funding Meeting:** *Chair Jesper Munch*
Participants: National representatives and project leaders.
This session will focus on the AIGO/LIGO South proposal, and how to manage and plan international funding in this context.
Agenda: Project timeline, Proposed Funding applications, Collaboration Management, Site assessment, Contingency Plans Decision process and timescale.
(If time: Future options should LIGO South proposal fail: Technology choices: e.g. Suspensions, mode cleaners, test masses.)

18:00: Conference *dinner at Gravity Discovery Centre:*
After dinner: bus to local accommodation (Brookside, Club Capricorn)

24 February: Gingin Gravity Discovery Centre

9:00am: *Plenary Session: Advanced Gravitational Wave Detector Workshop*
(Small group in parallel, Suspension review team inspection of isolators)

9:00: **Advanced GW Detectors and Advanced LIGO Technology:** *Chair Jay Marx*

Cole Miller: Astrophysical Sources for Ground-Based Gravitational Wave Detectors (25 min)
David Ottaway: Advanced LIGO Technology Overview (25 min)
Gregg Harry: Advanced LIGO Test Masses and Core Optics (25 min)
Karsten Danzmann: The Hannover High Power Laser (25 min)
Conor Mow-Lowry: Advanced LIGO Configuration and Squeezing (25 min)

Morning tea (15 min)

Aidan Brooks: Thermal lens Control: Lessons from Enhanced LIGO (20 min)
S. Sunil: CO₂ laser cavity tuning (short talk 10 min)
C. S. Unnikrishnan: Plans for developing GW astronomy in India (20 min)
Chunnong Zhao: Gingin 80m research facility for advanced detectors (20 min)
Bram Slagmolen: Arm length stabilisation for Advanced LIGO (20 min)
Adam Mullavey: Stable transfer of an optical frequency standard via a 4.6 km optical fibre (15 min)

13:00: Lunch at the GDC

*14:00: Plenary Data Analysis Workshop (Technical Planning Meeting in parallel).
Contact Data Analysis Program Coordinator Linqing Wen (lwen@cyllene.uwa.edu.au) for
program changes and additions.*

14:00: Data Analysis and Multi-Messenger Astronomy Workshop: *co-Chairs Susan Scott
and David Coward*

Sources and Detection

Bala Iyer: A comparison of PN templates for inspiralling compact binaries (20 min)
Duncan Galloway: Tuning up for GW detection in accreting neutron stars (20 min)
Ra Inta: Direct continuous GW searches within isolated supernova remnants (20 min)
Andrew Melatos: Narrow band search (20min)

Multi-Messenger Campaign and New Analysis Methods

Patrick Sutton: Status of externally triggered searches with LIGO – Virgo (20 min)
Ik Siong Heng: Triggering electromagnetic observations from LIGO - Virgo candidates
(20 min)

(10 minutes break)

Shaun Hooper: Fast low-latency IIR chirp finder for gravitational waves (15 min)
Shin Kee Chung: Accelerating inspiral searches using GPUs (15 min)
Archana Pai: Sparse sky-grid for the coherent network analysis (20 min)
Eric Howell: Using temporal distributions of transient events to characterise
cosmological sources populations (20 min)
Sanjeev Dhurandhar: Second generation TDI for LISA (20 min)
Kostas Savvidis: Some strategies for real-time data analysis for GW detectors (20 min)

18:00: Meeting ends with BBQ at Proposed AIGO site.

25-27 February: Conference Excursion

Wild Beaches of the Southwest (for itinerary click [here](#))

28 February-2 March: Post Conference Workshop for Students

How to Build a Gravitational Wave Detector

Three days of lectures, informal workshop sessions and hands-on experience on the basic technologies for building a gravitational wave detector. Lectures from specialists in vacuum, vibration isolation, high power lasers, optical cavities, digital control systems, data acquisition and data analysis.

[Workshop programme](#)

updated: 18_Feb_2010

Organising Committee:

Chair: Jesper Munch, Secretary: Pablo Barriga.

Members: Ju Li, Linqing Wen, Chunrong Zhao, David Coward, Jackie Davidson, Jean-Charles Dumas, Karsten Danzmann, Bala Iyer, Sanjeev Dhurandhar, C. S. Unnikrishnan, Jay Marx, David G. Blair, David E. McClelland, Susan M. Scott, Andrew Melatos, Catherine Nary Man, Zong-Hong Zhu