

# AIGO and World Science

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on behalf of

The Australian Consortium for Interferometric  
Gravitational Astronomy (ACIGA)



AIGO Conference 2010



# AIGO Participants Welcome

- LIGO : USA
- GEO : Germany, UK
- INDIGO : India
- CGWG : China
- FCA : France
- ACIGA : Australia
- Distinguished Guests



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# Australian Consortium for Interferometric Gravitational Wave Astronomy (ACIGA)

- Established 1995 to coordinate Australian based research in field
- Promotes and coordinates interferometric gravitational wave research in Australia and for Australia internationally
- Operates the High Optical Power Test Facility (HOPTF) at Gingin, WA
- Active participant in international research, including the LSC and the Australian Partnership in LIGO
- Promoting efforts to build AIGO, including establishing MOUs with International Partners.





# ACIGA

About 50 students and staff, engaged in GW research, from:

- ANU
- Adelaide University
- UWA
- Melbourne University
- Monash University



# Recent ACIGA Accomplishments

- Established Australian partnership in LIGO
  - ANU to provide arm stabilization and output optics for LIGO
  - AU develops ultra sensitive Hartmann sensors for LIGO
- UWA develops theory of Parametric Instability in GWI
- ANU pioneered low frequency squeezing
- ANU establish major data analysis centre
- Melbourne and Monash establish strong theory groups
- Successful experiments at HOPTF to demonstrate:
  - 2kW circulating power at Gingin
  - verification of thermal lens evolution
  - thermal lens compensation
  - verification of parametric instability
  - successful suppression of PI
  - AU building new 50-80W laser for HOPTF



# ACIGA Objective: Establish AIGO

- Gravitational Wave Astronomy is a whole new approach for investigating the birth and the dynamics of our Universe
- Fundamental new knowledge will be obtained.
- Will happen only as a global collaboration
- **GWIC has determined a critical need for a detector in the Southern Asian Hemisphere.**
- **ACIGA in collaboration with its international partners will attempt to respond by creating AIGO**



# AIGO Advisory Committees

- **International (IAC):** Expert advice on international issues, GWIC, global arrays, collaborations  
E. Weigold (Chair), J. Hough, A. Giazotto,  
K.Kuroda, J.Marx
- **National (NAC):** Expert advice on Australian issues, funding, collaborations, centre of excellence, GW in Australia  
E. Weigold (Chair), H. Bachor, D. Manchester,  
D. Melrose, J. Piper



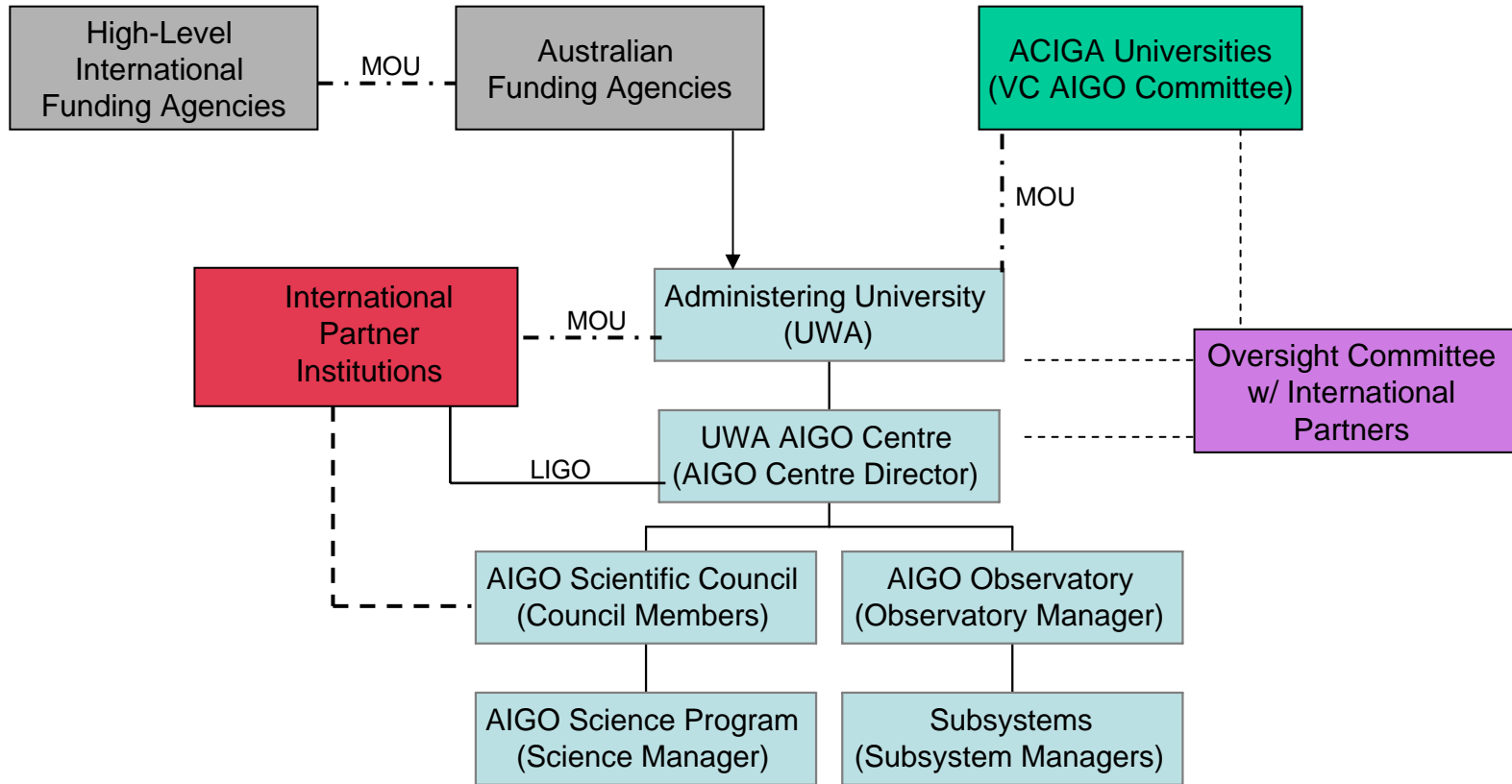


# AIGO Progress

- Formed strong international and national advisory committees
- Preliminary design and cost complete
- Established that Australian funding likely only with major international collaboration and contribution
- Senior management from ACIGA Universities taking the lead in establishing AIGO Centre and identify funding sources
- Currently considering two approaches



# AIGO Org Chart



\* AIGO Partners are represented on all advisory committees



# AIGO concepts

AIGO has preliminary MOUs and expressions of interest from international partners:

Suggested international contributions include:

- U.S.: Detailed Advanced LIGO design
- Germany: 200W PSL, students
- France: PI control hardware, fiber optics, staff, students
- India: vacuum technology, control systems, electronics, staff and students
- China: Science experiment designs, lasers and optics, staff and students



# AIGO concepts

Baseline design is Advanced LIGO

Plan A: Clone of Adv LIGO by ~ 2015

Plan B: Modified concept by ~2017-18 using later developments or possible modifications

Requires major funding from Australian sources:  
Federal, Host State, ACIGA Universities

Requires significant contributions from international partners



# Plans for this meeting

- Detailed discussions of AIGO options
- Determine funding requirements
- Determine timeline of possible international contributions
- Agree on approach

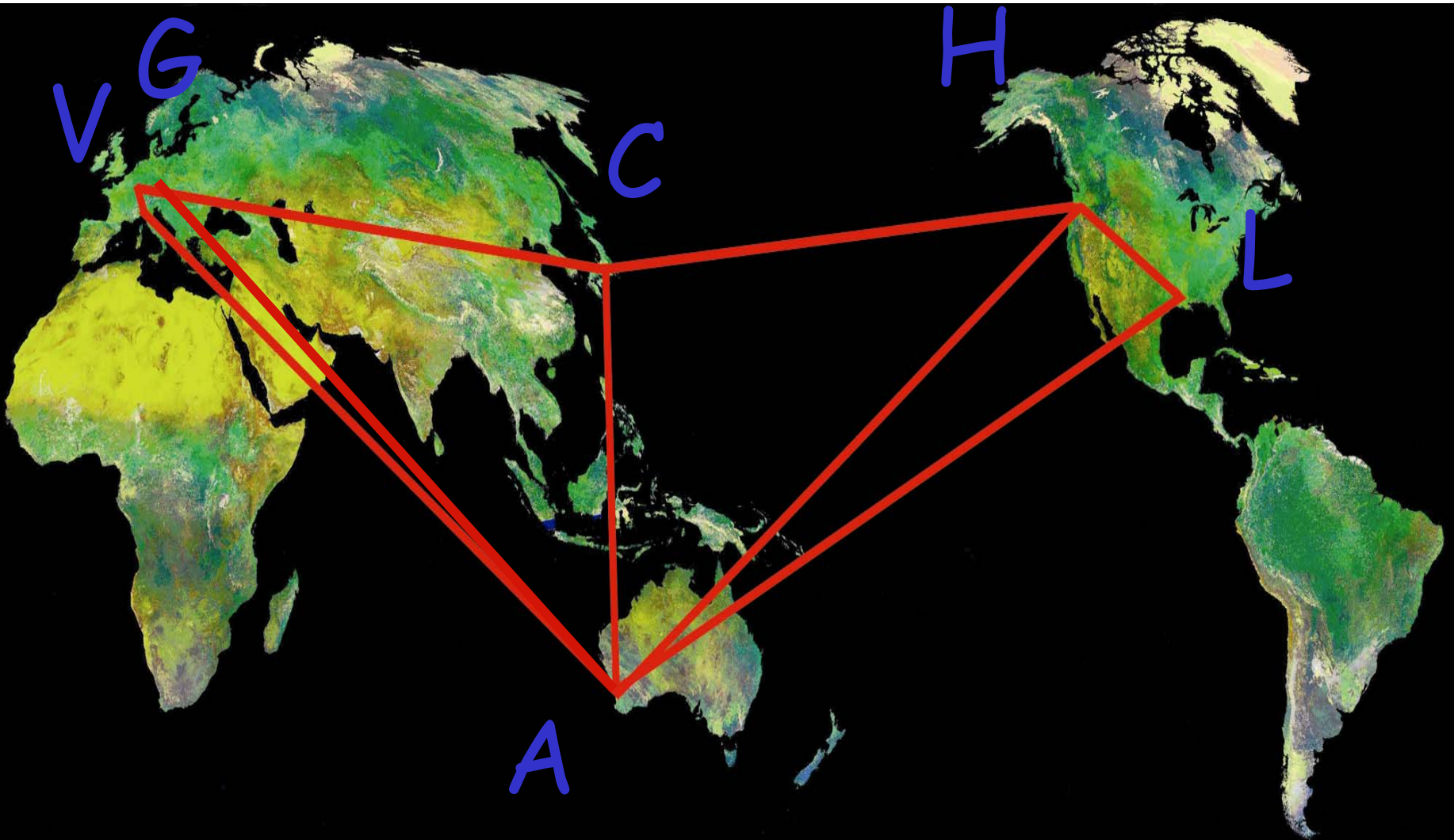


# Conclusion

- The International Community is strongly supportive of AIGO
- We have a unique opportunity to build AIGO now
- We have excellent letters of interest and intent from international partners
- Together, we have the know-how and key people
- We have an excellent site

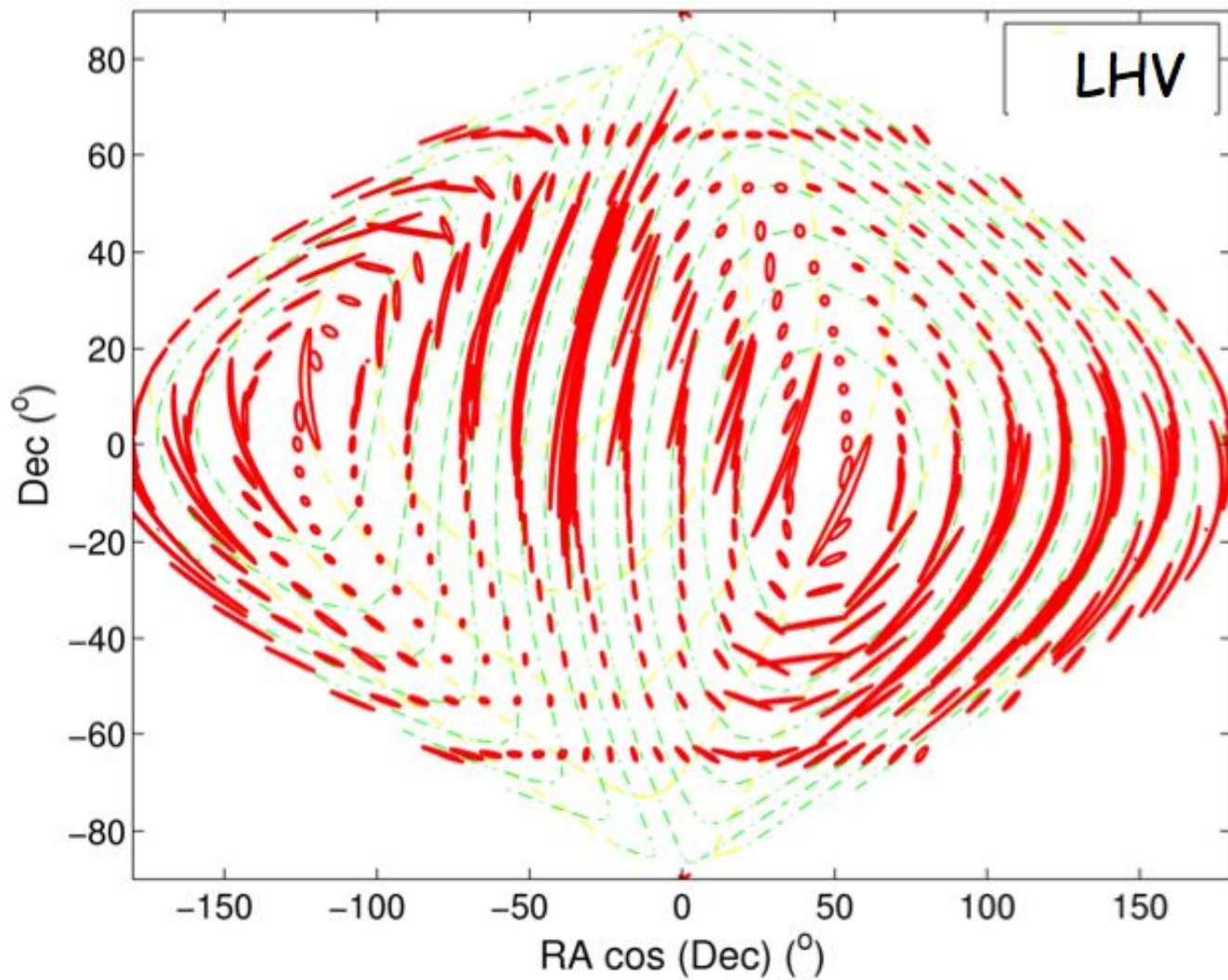
Now is the right time to proceed !





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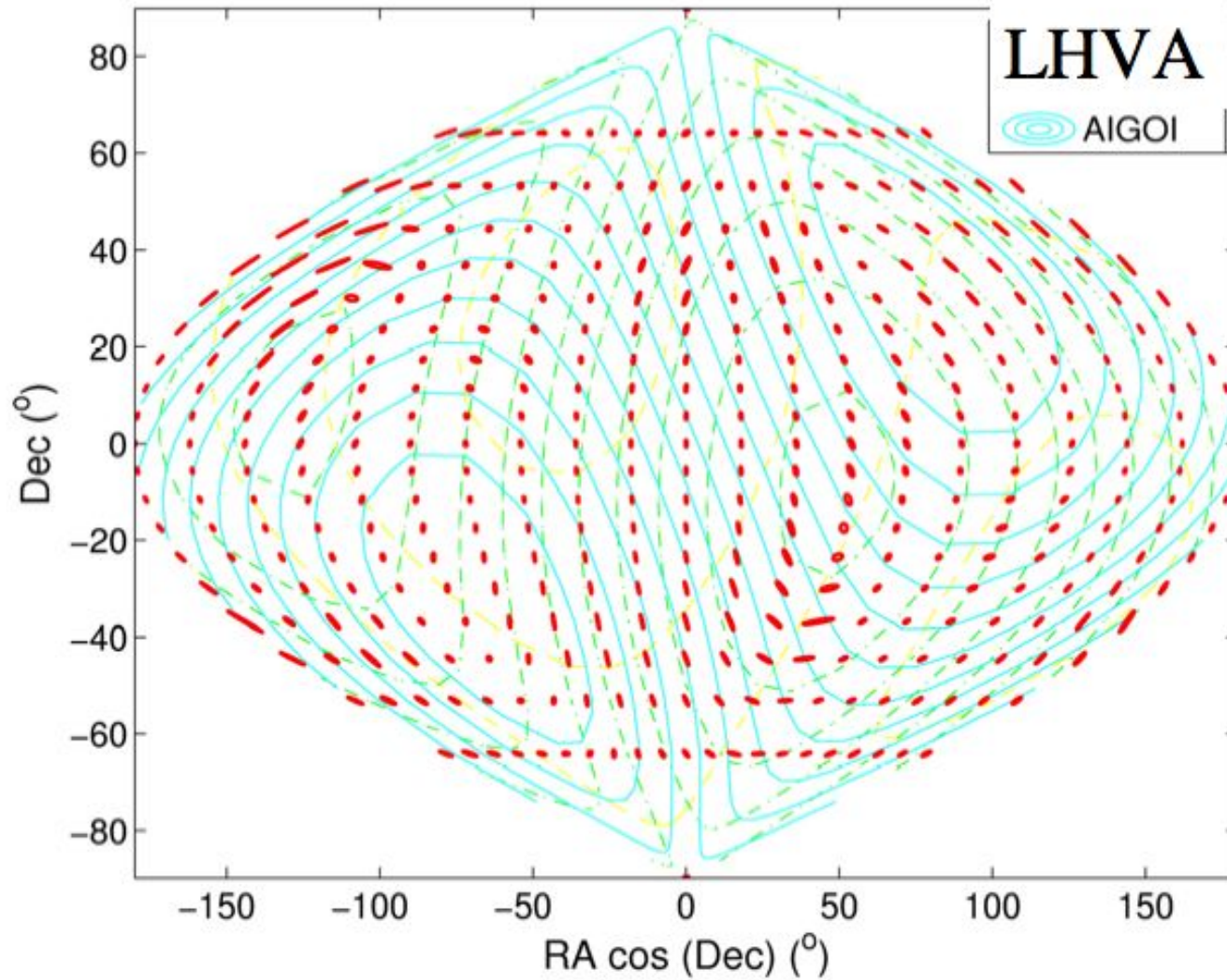




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