Report from India

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Perth 22nd February 2010

Formation of the consortium for IndIGO

- People from several important institutes have come together to form a consortium – TIFR, RRI, IUCAA, IISERs, …

- The aim of the consortium is to promote and foster

  Indian Initiative in Gravitational Wave Astronomy

- Set up the roadmap and a phased strategy towards the

  Indian Interferometric Gravitational wave Observatory (IndIGO)

The Road Map for IndIGO

- Step 1: 3 metre scale prototype : Current

  C. S. Unnikrishnan & group at T.I.F.R.

- Step 2: Collaboration with AIGO: Current

  Ranjan Gupta (IUCAA), Ajai Kumar (IPR),

  Unnikrishnan (TIFR), RRCAT

- Step 3: 30 metre class prototype: 2013-2014

- Step 4: Advanced detector IndIGO: 2020

Document submitted to directors + other VIP

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Members of IndIGO consortium

1. S. V. Dhurandhar (IUCAA)
2. B. R. Iyer (RRI)
3. C. S. Unnikrishnan (TIFR)
4. T. Souradeep (IUCAA)
5. R. Adhikari (Caltech)
6. B. S. Sathyaprakash (Cardiff)
7. K. G. Arun (→ CMI)
8. B. Bhawal (USA)
9. S. Bose (WSU)
10. P. Dasgupta (DU)
11. S. Doravari (UK)
12. A. Gopakumar (TIFR)
13. R. Gupta (IUCAA)
14. S. Jhingan (Jamia Millia)
15. B. Krishnan (AEI)
16. A. Kumar (IPR)
17. S. Mitra (Caltech)
18. S. Mohanty (UTB)
19. R. Nayak (IISER)
20. A. Pai (IISER)
21. A. Parmeswaran (Caltech)
22. G. Rajalakshmi (TIFR)
23. T. Seshadri (DU)
24. A. Sengupta (LIGO → DU)

International Advisory Committee

1. Rana Adhikari (LIGO, Caltech)
2. David Blair (UWA)
3. A. Giazotto (Virgo, Italy)
4. P. D. Gupta (RRCAT)
5. Jim Hough (GEO, Glasgow)
6. K. Kuroda (LCGT, Japan)
7. H. Lueck (GEO, Hannover)
8. Nary Man (Virgo, France)
9. Jay Marx (LIGO, director)
10. David McClelland (ANU)
11. Jesper Munch (ACIGA, Chair)
12. B. S. Sathyaprakash (Cardiff)
13. B. F. Schutz (AEI director, GEO)
14. J-Y. Vinet (Virgo, France)
15. Stan Whitcomb (LIGO, Caltech)

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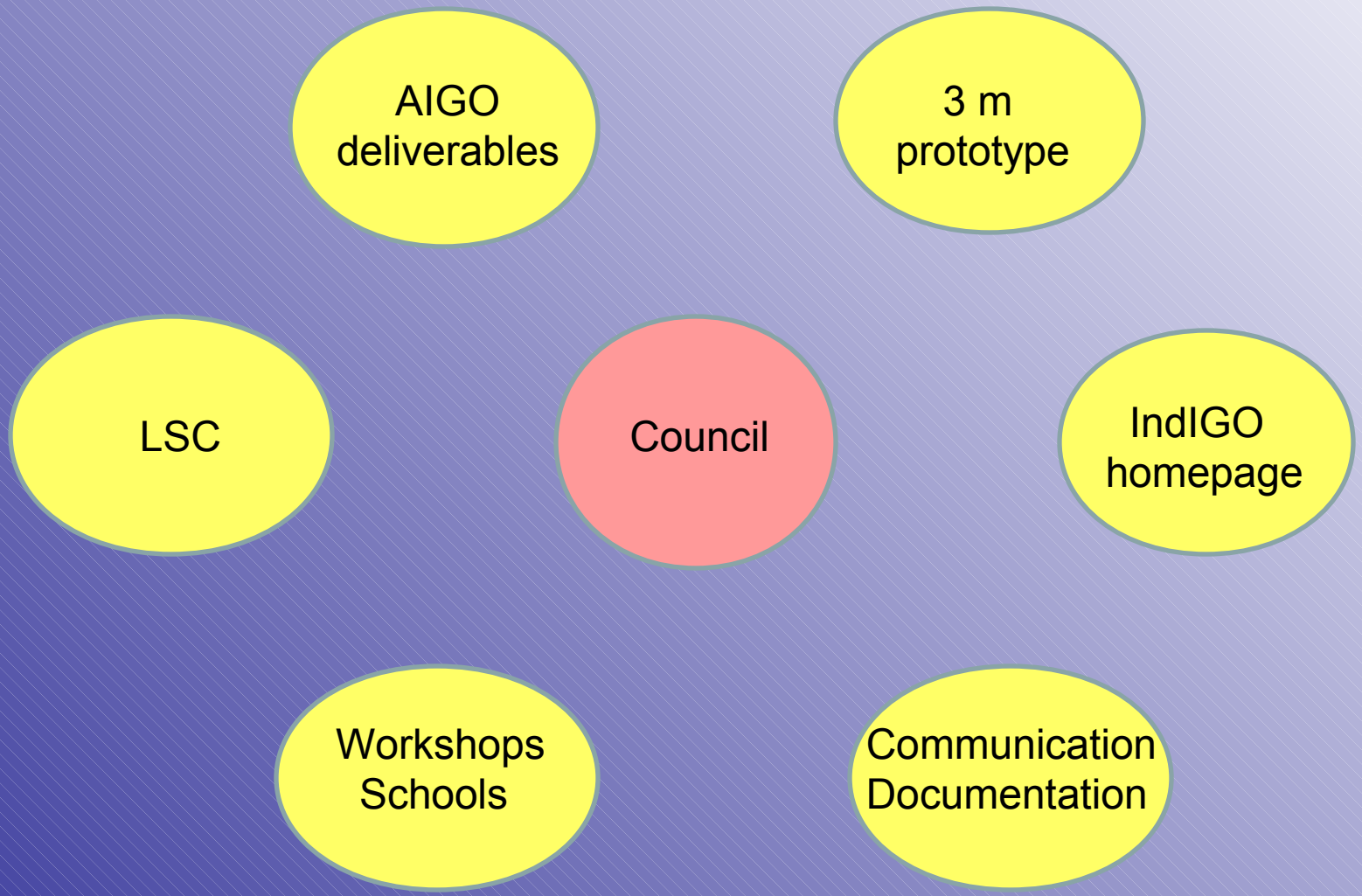
Organisation & Sub-committees



The sub-committees

- Council: B. Iyer, S. Dhurandhar (spokesperson), C. S. Unnikrishnan & T. Souradeep
- 3 metre: C. S. Unnikrishnan, G. Rajalakshmi & S. Doravari
- AIGO deliverables: A. Kumar, R. Gupta & C. S. Unnikrishnan
- LSC related: S. Dhurandhar, A. Pai & R. Nayak
- IndIGO homepage: A. Sengupta, S. Mitra, A. Parmeswaran , K. G. Arun & T. Souradeep
- Workshops/Schools: T. Souradeep, T. Seshadri, Gopakumar, R. Nayak & A. Pai
- Communications: same as IndIGO homepage

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The 3 metre prototype

People: Unnikrishnan (PI), Rajalakshmi, Jorge Fiscina

Time-scale: 2 ½ years

Budget: 0.4 million USD ~ Rs. 20,000,000

Laboratory: TIFR, Mumbai to be shifted later to a quieter place Hyderabad/Pune.

Objectives: Manpower training, measurements related to short-range forces and Newtonian gravity.

Instrument: 3 m arm-length Michelson interferometer with Fabry-Perot enhancement.

Sensitivity: In actual operation ~ 5×10^{-18} m/$\sqrt{\text{Hz}}$ above 200 Hz (not aiming for theoretical minimum).

Details in Unni's talk

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Vacuum and control systems for AIGO

- People: Ranjan Gupta, Ajai Kumar & C. S. Unnikrishnan

Feasibility and cost estimate on the basis of LIGO system is being worked out with Hind High Vacuum company, Bangalore.

Details will be presented by Ajai Kumar

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Indo-US centre proposal

- Subcommittee on schools and training is proposing for an Indo-US centre to formalise and facilitate training of students from India in LIGO and participation of LIGO scientists.

- Exchange program to fund mutual visits and facilitate interaction.

- Proposal is almost completed and will be submitted in June cycle.

- Nodal centres are likely to be IUCAA & Caltech

THANK YOU !

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Features:

1) 3 m arm-length Michelson interferometer with Fabry-Perot enhancement, mirror size of 15 cm.
2) Finesse of F-P cavity ~ 300
3) Laser power input: ~ 1 W, frequency and amplitude stabilized NPRO Nd:YAG laser or Fiber amplifier enhanced seed NPRO.
4) Power recycling: Yes
5) Signal recycling: to be decided
6) Squeezed light: Planned for later (part of the training feature, will be developed and implemented separately in our optics lab).
7) Vibration isolation: Passive 3-stage, to reach $<10^{-18}$ m above 200 Hz.
8) Vacuum: 10^{-8} mbar, 3 ion pumps and NEG pumps.
9) Mode cleaner: Fiber based.
10) Sensitivity in actual operation ~ 5×10^{-18} m/$\sqrt{\text{Hz}}$ above 200 Hz (not aiming for theoretical minimum).
11) Time scale for completion: 2.5 years
12) Laboratory: TIFR, Mumbai, to be shifted to a quieter place later (Hyderabad or Pune).
13) Budget (hopeful, in 2010): ~ 0.4 million US$
14) Applications: Training, and measurements related to short-range forces and Newtonian gravity.