# LIGO Lasers and Optics Working Group

# History

First Meeting Aspen January 1997 - 3

Second Meeting LSU 24-25 August 1997 - 23

Third Meeting Hanford 12-14 March 1998 - 36 ?

# Roster of the LIGO Lasers and Optics Working Group

| | |
|---|---|
| ACIGA Adelaide, Australia | |
| Professor Jesper Munch | jmunch@physics.adelaide.edu.au |
| | |
| GEO | |
| Prof. Jim Hough | hough@physics.gla.ac.uk |
| Prof. Karsten Danzmann | kvd@mpq.mpg.de |
| Harry Ward | h.ward@physics.gla.ac.uk |
| Sheila Rowan | srowan@physics.gla.ac.uk |
| Benno Wilke | willke@loki.stanford.edu |
| Ken Strain | kstrain@physics.gla.ac.uk |
| | |
| JILA Boulder Colorado | |
| Professor John Hall | jhall@jila.colorado.edu |
| | |
| LIGO | |
| Stan Whitcomb | stan@ligo.caltech.edu |
| Rick Savage | rick@ligo.caltech.edu |
| Peter Fritschel | pf@tristan.mit.edu |
| Mike Zucker | mike@tristan.mit.edu |
| Peter King | pking@ligo.caltech.edu |
| Stefan Seel | sseel@ligo.caltech.edu |
| Jordan Camp | jordan@ligo.caltech.edu |
| | |
| Stanford | |
| Prof. Robert Byer | byer@ee.stanford.edu |
| Prof. Martin Fejer | fejer@ee.stanford.edu |
| Prof. Jonathan How | howjo@sun-valley.stanford.edu |
| Eric Gustafson | gustaf@ee.stanford.edu |
| Bill Tulloch | tulloch@loki.stanford.edu |
| Todd Rutheford | rutherf@leland.stanford.edu |
| | |
| University of Florida | |
| Professor David Reitze | reitze@phys.ufl.edu |
| | |
| VIRGO | |
| Professor Alain Brillet | brillet@lal.in2p3.fr |
| Professor Nary Man | man@lal.in2p3.fr |

| Milestones and Dates from the Lasers and Optics Working Group (LSU Fall 1997) | | | | | |
|---|---|---|---|---|---|
| | | Comments, Concerns and Connections | | | |
| | Decision | Install | Decision | Install | Decision |
| **Technology (person)** | **2002** | **2004** | **2006** | **2008** | **> 2010** |
| **Options** | | | | | |
| | | | | | |
| **A. Laser Power and Type (Munch)** | | | | | |
| 1. 30 watt system | Select between | | Select between | | |
| 2. 100 Watt system | 1 and 2 | | 1 and 2 | | Select between |
| 3. 1000 Watt system | | | | | 2 and 3 |
| 4. Unstable oscillator | | | | | Select between |
| 5. MOPA | Select between | | Select between | | 3,4, 5 and 6 |
| 6. Injection locked laser | 4,5 and 6 | | 4,5 and 6 | | |
| 7. Broadband source | | | | | |
| | | | | | |
| **B. Wavelength (Gustafson)** | | | | | |
| 1. 1064 nm | Selected | | Select between | | Select between |
| 2. SHG 532 nm | | | 1,2,3 and 4 | | 1,2,3 and 4 |
| 3. SHG 266 nm | | | | | |
| 4. OPO VIS-NIR | | | | | |
| | | | | | |
| **C. Core Optics (Whitcomb)** | | | | | |
| 1. Fused Silica | Selected | | Select between | | |
| 2. Sapphire | | | 1 and 2 | | Select between |
| 3. Silicon | | | | | 2, 3 and 4 |
| 4. Some other material | | | | | |
| | | | | | |
| **D. Contamination and Cleaning (Camp)** | Yes or No | | Yes or No | | Yes or No |
| | | | | | |
| **E. Laser Control (Savage)** | As the laser power is increased the requirements on the laser noise | | | | |
| | will become more severe | | | | |
| **F. Photodetectors (Zucker)** | | | | | |
| 1. Multi detector systems | Select between | | Select between | | |
| 2. Higher power designs | 1 and 2 | | 1 and 2 | | |
| | | | | | |
| **G. Mode Cleaner (Tanner)** | Decisions on the mode cleaner and laser type will be determined by | | | | |
| | the selected interferometer requirements and laser noise | | | | |
| | | | | | |
| **H. Other Optics (Tanner)** | | | | | |
| 1. Phase modulators | | | | | |
| 2. Isolators | | | | | |
| 3. Pre-mode cleaner | | | | | |
| 4. Waveplates | | | | | |
| 5. Polarizers | | | | | |
| 6. Beamsplitters | | | | | |

# Goals for the Third LIGO Lasers and Optics Working Group Meeting

Technical Discussions

Second Iteration of the R&D Roadmap

Find a Volunteers to Work on the Charter

# LIGO Lasers and Optics Working Group Meeting Agenda

Friday 10 AM

Introduction - Rai Weiss 10 Min.

Core & Conditioning Optics and Photodiodes (2-1/2 Hours)

Chairman - Stan Whitcomb

The LIGO Pre Stabilized Laser (1-1/2 Hour)

Chairman -Rick Savage

Roadmap Work (1-1/2 Hours)

Saturday 8 AM

Advanced Lasers (2-1/2 Hours)

Chairman - Peter Veitch

Roadmap Report (1-1/2 Hours)

| Agenda Lasers and Optics Working Group Meeting | | | |
|---|---|---|---|
| March 12-14, 1998 Hanford Washington | | | |
| **Friday 13 March 1998** | Speaker | Start | Stop |
| A. Introduction | Rai Weiss | 10:00 AM | 10:10 AM |
| B. Core and Conditioning Optics and Photodetectors | Stan Whitcomb | 10:10 AM | 10:15 AM |
| 1. LIGO Spec. setting and testing | Stan Whitcomb | 10:15 AM | 10:40 AM |
| 2. The LIGO Optics testbed | Jordan Camp | 10:45 AM | 11:10 AM |
| 3. Absorption Measurements | Alex Alexandrovsky | 11:15 AM | 11:40 AM |
| 4. Contamination | Daqun Li | 11:45 AM | 12:10 PM |
| **Lunch** | | 12:15 PM | 1:10 PM |
| 5. LIGO Photodetectors and Testing | Alex Marin or Peter | 12:15 PM | 12:40 PM |
| 6. LIGO Future Photodiode Needs | Mike Zucker | 12:45 PM | 1:10 PM |
| 7. Deformable Optics and Wavefront Sensing | Justin Mansell | 1:15 PM | 1:40 PM |
| **Break** | | 1:45 PM | 2:05 PM |
| C. The LIGO Pre-Stabilized Laser (PSL) | Rick Savage | 2:05 PM | 2:10 PM |
| 1. PSL Overview - Lightwave laser | Peter King | 2:10 PM | 2:35 PM |
| 2. Pre Mode Cleaner | Benno Willke | 2:40 PM | 3:05 PM |
| 3. PSL Status and Plans | Peter King | 3:10 PM | 3:35 PM |
| | | | |
| D. Work on the NSF Advanced R&D Roadmap | Whitcomb/Savage | 3:40 PM | 5:10 PM |
| | | | |
| **Dinner** | | | |
| **Saturday 14 March 1998** | | | |
| | | | |
| E. Advanced Lasers | Peter Veitch | 8:00 AM | 8:05 AM |
| 1. The future of Lasers for LIGO | Robert Byer | 8:05 AM | 8:30 AM |
| 2. GEO Laser | Benno Willke | 8:35 AM | 8:55 AM |
| 3. ACIGA Laser Progress | Peter Veitch | 9:00 AM | 9:20 AM |
| 4. ACIGA Laser Proposed | Damien Mudge | 9:25 AM | 9:45 AM |
| 5. Slab Amplifier and Amplifier Noise | Todd Rutherford | 9:50 AM | 10:10 AM |
| 6. The prospects for new wavelengths | Marty Fejer | 10:15 AM | 10:40 AM |
| | | | |
| F. Work on the NSF Advanced R&D Roadmap | Eric Gustafson | 10:45 AM | 12:15 PM |

*Note 1, Linda Turner, 04/20/98 03:30:08 PM*
LIGO-G980049-04-M