



Proposal for Trinity University Participation in the LSC

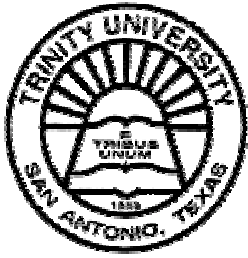


Dennis Ugolini, Trinity University

Wednesday Plenary Session

LIGO-G030066-00-Z

LSC Meeting, Livingston Observatory, 3/18/03

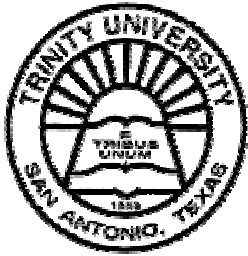


Trinity University

<http://www.trinity.edu>

- Founded in 1869 in Tehuacana, Texas
- Settled permanently in San Antonio in 1952 (~550 miles from LLO)
- 205 faculty in 26 academic departments
- 2622 undergraduates, 250 graduate students (mostly accounting and education)
- #1 comprehensive college in the Western US for eleven straight years (US News & World Reports)





Physics at Trinity

- 6 faculty members
 - » Gordon MacAlpine (Wisconsin, astronomy)
 - » David Hough (Caltech, astronomy)
 - » Eugene Clark (Florida, atmospheric physics)
 - » Fred Loxsom (Dartmouth, environmental physics)
 - » Daniel Spiegel (UC Santa Barbara, liquid crystal studies)
 - » Dennis Ugolini (Stanford, LIGO)
- Also visiting faculty, lab instructor, two postdocs
- Large engineering department
 - » Includes three electrical engineering faculty



Student Research at Trinity



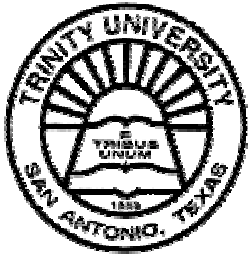
- 4-6 physics students per year complete a thesis project
 - » Start in 2nd semester of junior year
 - » Almost half of students publish
- Also 10+ electrical engineering students per year
 - » All complete design projects
 - » Overlap between departments encouraged



Support for LIGO Program

- \$90,000 in startup funds
- 400 sq. ft. of laboratory space
- New physics building under construction (completed 2004)
- Shared infrastructure, resources with Dan Spiegel's laser laboratory





Plans for Trinity LIGO Laboratory

- Short-term goals:
 - » Procure and install pre-stabilized Innolight 500 mW laser
 - » Characterize Innolight frequency and intensity noise
 - » Investigate issues that have arisen during ISS prototyping at 40m
 - Sensing and actuating on current flow from power supply
 - » Provide open testbed for other PSL-related R&D
 - VCO phase noise improvement for Adv LIGO

- Long-term goal: study potential control schemes for “speed meter” systems
 - » Takes advantage of relationship with electrical engineering department
 - » More infrastructure, study required



Other Contributions to LSC

- **Detector Characterization**
 - » Have participated with correlations group since E7, using CorrMon (A. Ottewill) and the XBic bicoherence monitor (S. Penn)
 - » Working with N. Christensen through S2

- **Support of 40-Meter Prototype**
 - » LSC/ASC servo modeling
 - » Develop projects for students, supervise on-site during summer

- **Site Support (shifts during science runs, etc)**



Summary

- A LIGO program at Trinity University will participate in the LSC in several ways:
 - » PSL/ISS prototyping and study
 - » Detector characterization
 - » Support of sites and 40-meter
- Startup funds and lab space have been secured
- Trinity University's engineering support provides an excellent opportunity to do experimental physics in a small-school environment.