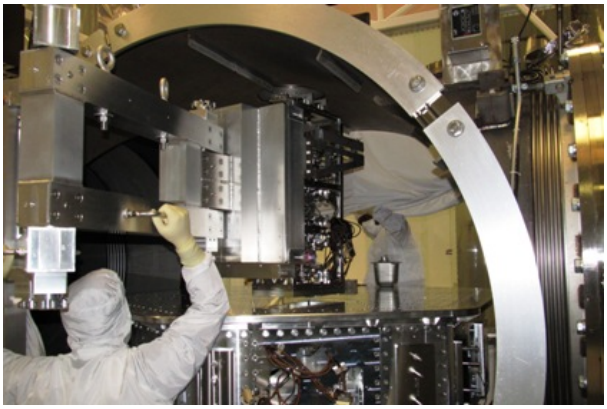
LIGO e-Lab Workshop

BHSU QuarkNet Summer Institute
June 3/4, 2013



Welcome to the LIGO e-Lab workshop! LIGO, the Laser Interferometer Gravitational-wave Observatory, operates detector facilities in southeast Washington and Livingston Parish, Louisiana. The first-generation interferometers at these sites collected data between 2002 and 2010. No gravitational wave detections were reported during this era. LIGO's current comprehensive set of upgrades, the Advanced LIGO project, should move the detectors to sensitivities sufficient to capture the whispers of gravitational waves. E-Lab-based seismic studies performed by students and teachers can assist LIGO with hardware characterization in the early stages of Advanced LIGO operations. We hope that this workshop helps you develop a vision for using the LIGO e-Lab with your students.

Facilitator

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Workshop Goals

Through attendance at the workshop, participants will . . .

- Understand the basics of LIGO detector operation and explain the need for LIGO's seismic monitoring program.
- Learn to use the LIGO e-Lab by completing a full seismic investigation, including the mounting of a poster in the e-Lab poster archive.
- Learn to manage student use of the e-Lab by developing expertise with the teacher tools that the e-Lab provides.
- Plan to implement the LIGO e-Lab with students by integrating the e-Lab into the local instructional framework, by anticipating logistics of the e-Lab's use, and by deploying the e-Lab's instructional unit if appropriate.

Workshop Agenda

Day One

- LIGO 101, 201: *Eintein's Messengers*, Michelson Interferometer, seismicity in LIGO
- Break
- The LIGO e-Lab (I): Project Map, getting started (www.i2u2.org)

- The LIGO e-Lab (II): Research questions, research plans
- Lunch
- Time for research
- Break
- Generating posters
- Sharing posters

Day Two

- Reflections on day one
- LIGO 301: Advanced LIGO subsystems
- e-Lab Teacher Home: Instructional frameworks, standards
- Break
- Nuts and bolts of e-Lab student management: Enrolling and grouping students, monitoring student progress, assessment
- Lunch
- Planning for implementation: Instructional unit, additional resources
- Break
- Sharing of plans
- Wrap-up, evaluation

Interferometer recipes

- Wooden base, epoxy attachment
- Steel base, magnetic attachment