

LIGO Education and Outreach


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On behalf of the LIGO Scientific Collaboration's Education
and Public Outreach Working Group

*Joint Spring Meeting of the New
England Sections of the APS and AAPT
May 5, 2009*

World Science Festival

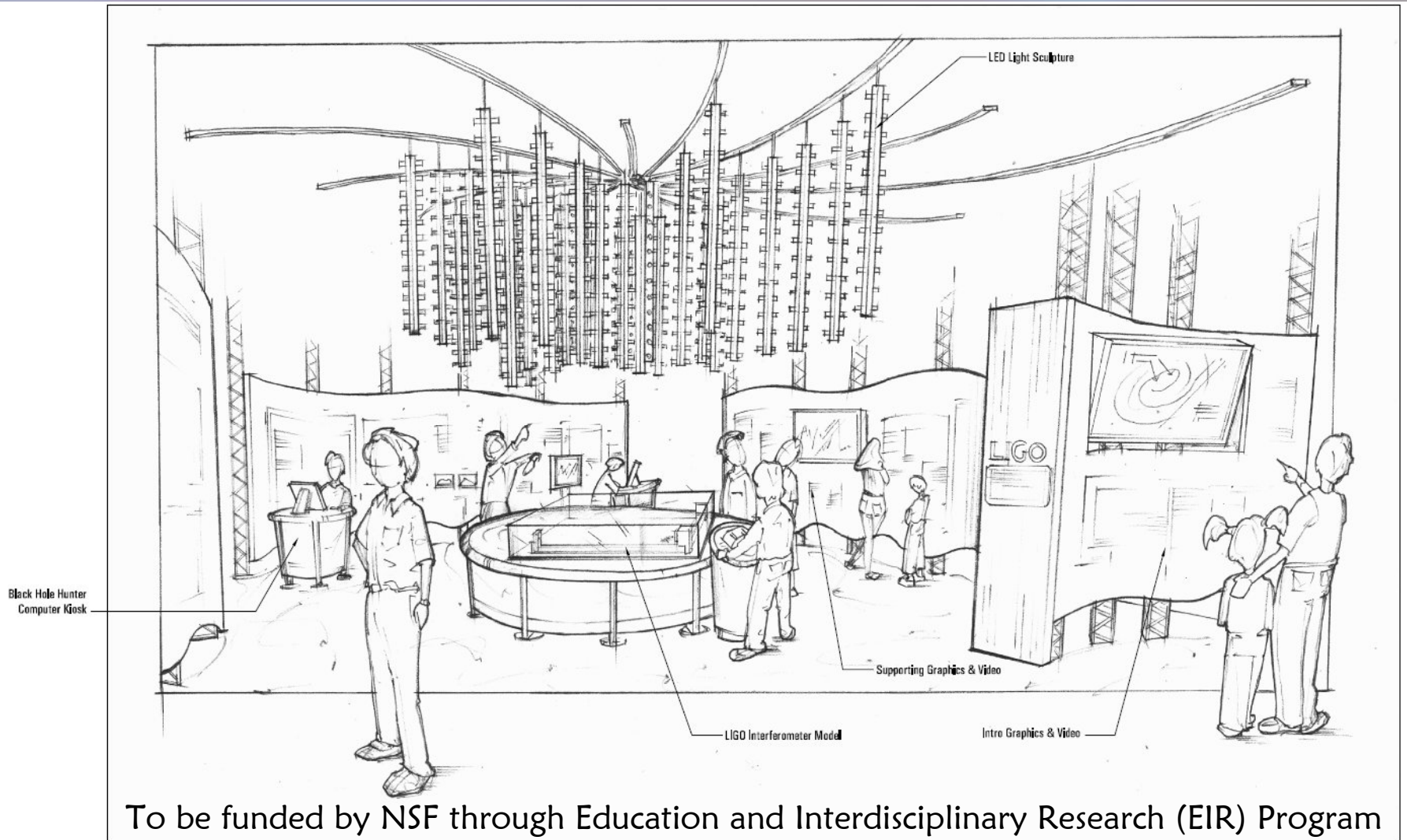
- Annual festival in New York: June 10-14, 2009
 - LIGO exhibit to travel afterwards
 - Both LIGO, Historically Black Colleges and Universities, Adler Planetarium in Chicago
- 2010 – larger permanent exhibit in New York
- Inspire students to enter science

A photograph of a spiral galaxy, likely the Milky Way, showing a bright central core and several distinct spiral arms. The galaxy is set against a dark, starry background.

Immerse yourself in a world of scientific discovery as the **WORLD SCIENCE FESTIVAL** takes you on a thought-provoking journey - making the esoteric understandable and the familiar fascinating.

- Exhibit includes
 - tabletop interferometer
 - Black Hole Hunter Game
 - rubber sheet to simulate space-time

Concept for 2010 Exhibit



- www.ligo.caltech.edu

- Articles, media guide



- www.einsteinsmessengers.org

- 20 min documentary on LIGO

- Classroom activities

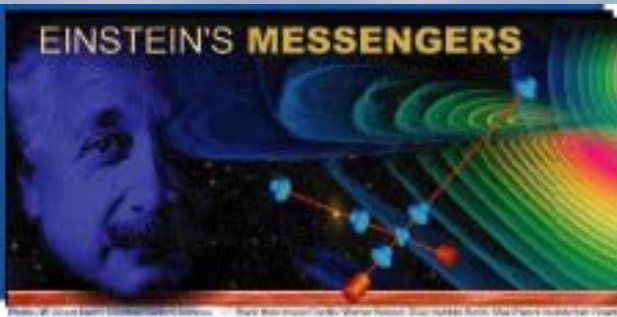
- Interferometry, data analysis, astrophysics

- www.blackholehunter.org

- Facebook – LIGO Scientific Collaboration

- Blog - ligonews.blogspot.com

- Twitter – www.twitter.com/LIGO



- <http://www.einsteinathome.org/>
 - Runs as a screensaver
- BOINC program
 - Distributed computing
 - Continuous sources
 - Unknown frequencies/locations
 - Markers on sky map
 - LIGO sites, analysis point, etc.
- More on webpage
 - Press releases, message boards
 - Ask a Physicist
 - Join teams, high scores.

– Phys. Rev. D 79 (2009) 02201.

User: Bruce Allen
 Total Credit: 4.267274
 Host Credit: 0.00
 Team: Einstein@UWM
 Percent Done: 0.15%

User: Bruce Allen
 Total Credit: 1.49074
 Host Credit: 0.00
 Team: Einstein@UWM
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 RA: 26.83
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- LIGO Livingston LA site
- 50 hands-on exhibits
 - Most built by Exploratorium



- Focus on LIGO science
 - Waves, light, gravity, etc.
- Proposal for similar facility at Hanford WA 6

Programs for Students and Teachers

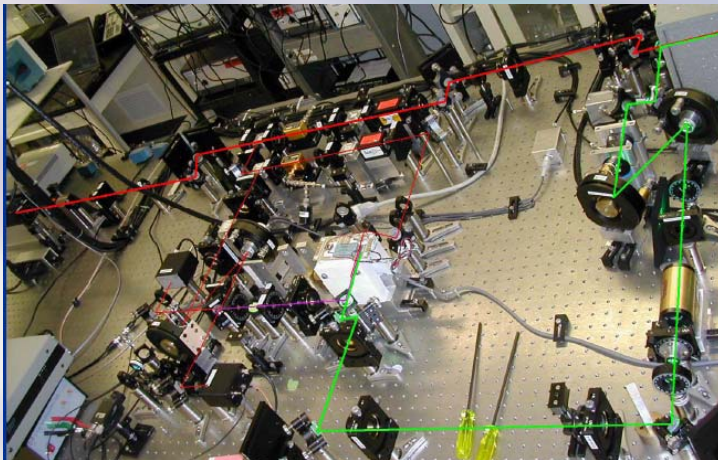
- Field trips to LIGO sites
- Professional development
 - Six week summer internships
 - Shorter programs: build demo, analyze seismometer data, etc.
- Partnerships with K-12 schools
 - Use LIGO data in science classes – www.i2u2.org
 - Participation in real research
- Undergraduate Research
 - Caltech SURF program at LIGO sites
 - International Summer Research through UFlorida
 - Both LIGO and non-LIGO US schools
 - Students to UK, Australia, Italy, Japan and France

School Group at Hanford



- Most LIGO outreach at sites
- Lab tours at MIT
 - LASTI: full scale LIGO prototype
 - Quantum optics lab
 - Many other labs
- space.mit.edu/LIGO/directions.html

LASTI Chamber and Scientist



Quantum Optics Table



Education and Outreach Outline

- World Science Festival
 - Travelling exhibit
- Programs for Students and Teachers
- LIGO on the Web
 - Einstein's Messengers
 - Webpages, Facebook, Twitter, etc.
- Einstein@Home Data Analysis Screen Saver
- LIGO Livingston Science Education Center
- Outreach at MIT
 - Lab Tours
- International Year of Astronomy
 - 100 hours of astronomy from Hanford
- Andrea Centazzo concerts

Undergraduate Docents

- Southern University Physics and Education Majors
 - Trained at on-campus “Inquiry Laboratory” with 6 exhibits



- Columbia Basin College
 - Outreach-technical internships
Hanford WA

Around the World in 80 Telescopes



- Part of International Year of Astronomy
- Live Broadcast from LIGO Hanford
 - 4:00 pm, April 3, 2009, about 20 minutes
 - Archived at www.100hoursofastronomy.org
 - Reached about 3400 viewers
 - Asked about Einstein@Home

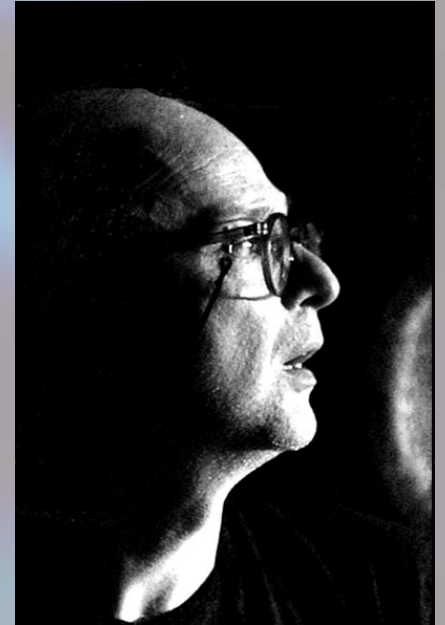


LIGO to Music

- Andrea Centazzo
 - Composer, conductor, percussionist and video artist
 - Einstein's Cosmic Messengers
 - Five part multimedia concert for percussion, digital instruments, and video
 - www.andreacentazzo.com/ecm/
 - Performances
 - Premiere at Caltech Oct 30, 2008
 - Porto San Giorgio Nov 30, 2008
 - University of Mississippi Feb 5-6, 2009
- 
- The background of the slide features three overlapping, black and white profile portraits of a man wearing glasses, looking towards the right. The portraits are slightly offset from each other, creating a sense of depth and repetition.

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- A blurred, artistic image of a galaxy or nebula, showing a bright central core surrounded by a diffuse, glowing ring of light. The colors are warm, ranging from yellow to orange and red, with some darker, cooler tones in the background.
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