

# Public Outreach at LIGO Hanford Observatory



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# Presentation Focus

- LIGO Hanford Observatory (LHO) outreach methods and strategies
- Effectiveness of the methods
- Future directions for the outreach program



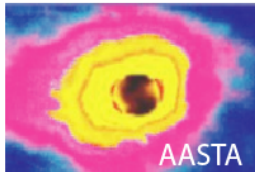
# LHO Outreach Mission

**LIGO Hanford Observatory seeks to impact the development of the Tri-Cities and the surrounding region by providing opportunities for lifelong learning, by promoting and developing science literacy and by building relationships with educational and community development organizations that will advance mutual interests**



LHO's Local Educator Network (LEN) helped author the mission statement. Yearly meetings of the LEN produce advice, contacts and ideas related to outreach

# Collaborations with Local and Regional Organizations Fuel Outreach

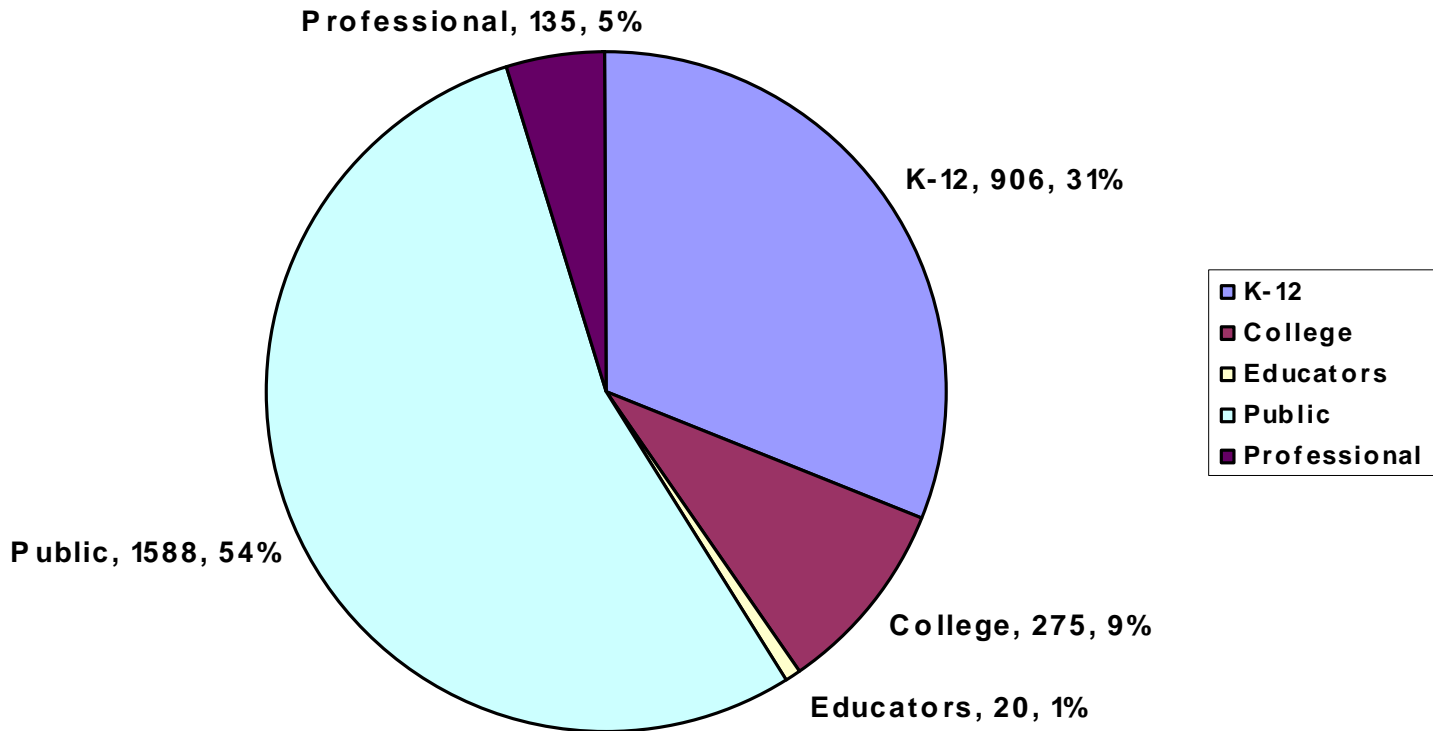


Outreach partners have helped improve LHO's visibility to target groups. For instance, LHO's outreach to Hispanic and Native American groups has grown through our collaborations with Columbia Basin College, WSU GEAR UP and Yakima Valley/Tri-Cities MESA

# LHO Visitor Categories, 2005-06

2005-06 LHO Visitor Count

Total = 2924



**Roughly 2500  
off-site contacts in 2005**

# For the Public: Family-based Activities



**Star parties, family science events, monthly drop-in public tours, privately scheduled tours**

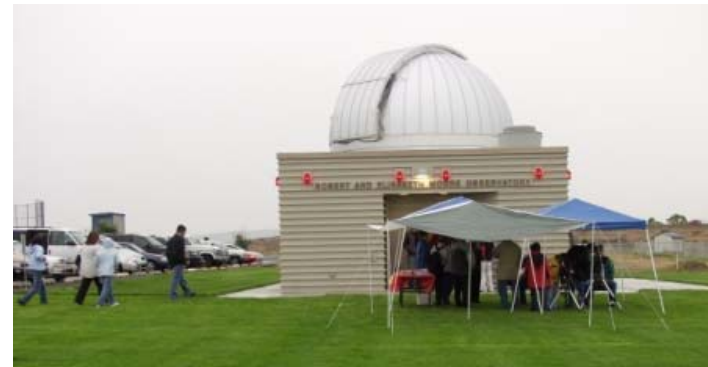


**Interest group visits (scouts), participation in off-site science venues**



# Bilingual Family Activities

- Una tarde de Astronomía, 2006
- 2005 joint astronomy events at the Moore Observatory at Columbia Basin College



# Off-site Native American Activities

- *“AISES Math-Science Carnival Enlightens and Entertains,” 2005*



- *AISES Cay-Uma-WA stargazing, 2006*

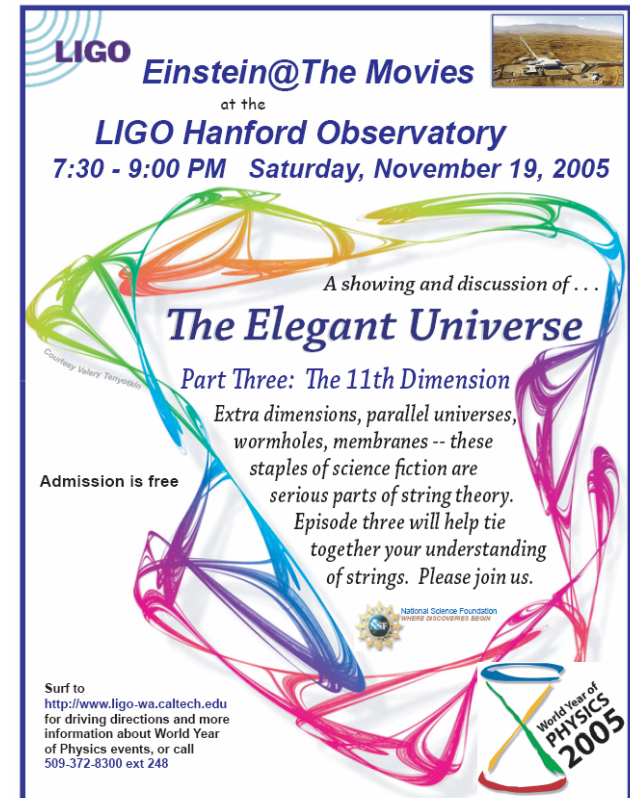
**STARGAZING IN MISSION**





# Special Science-themed Events

- Public lectures, film showings

**LIGO** Einstein@The Movies  
at the  
**LIGO Hanford Observatory**  
7:30 - 9:00 PM Saturday, November 19, 2005

A showing and discussion of . . .  
**The Elegant Universe**  
Part Three: The 11th Dimension  
Extra dimensions, parallel universes,  
wormholes, membranes -- these  
staples of science fiction are  
serious parts of string theory.  
Episode three will help tie  
together your understanding  
of strings. Please join us.

Admission is free

Surf to  
<http://www.ligo-wa.caltech.edu>  
for driving directions and more  
information about World Year  
of Physics events, or call  
509-372-8300 ext 248

National Science Foundation  
WHERE DISCOVERIES BEGIN

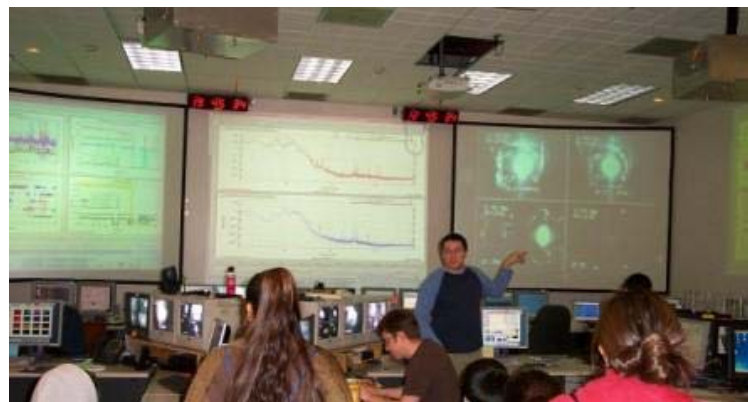
World Year of  
PHYSICS  
2005

# Outreach to K-12 Schools

- **Field trips: Watch *Einstein's Messengers*, hear from a LIGO scientist, walk the site and visit the control room. Experiment with 12 hands-on exhibits and activities that relate to LIGO science and to state science education standards**
- **On-site visits to schools: Emphasize hands-on experiences with waves**



10/17/2006



*LIGO-G060525-02-G*

# Undergraduate Outreach



## Outreach to Teachers

- WSU Tri-Cities Teaching & Learning 523 (graduate level), “The Nature of Scientific Inquiry,” taught by Professor Judy Morrison with contributions from Raab, Ingram and LHO staff; hosted by LHO
- Science materials development: Support materials for *Einstein’s Messengers*, development of the LIGO branch of the I2U2 program
- Summer internships for teachers



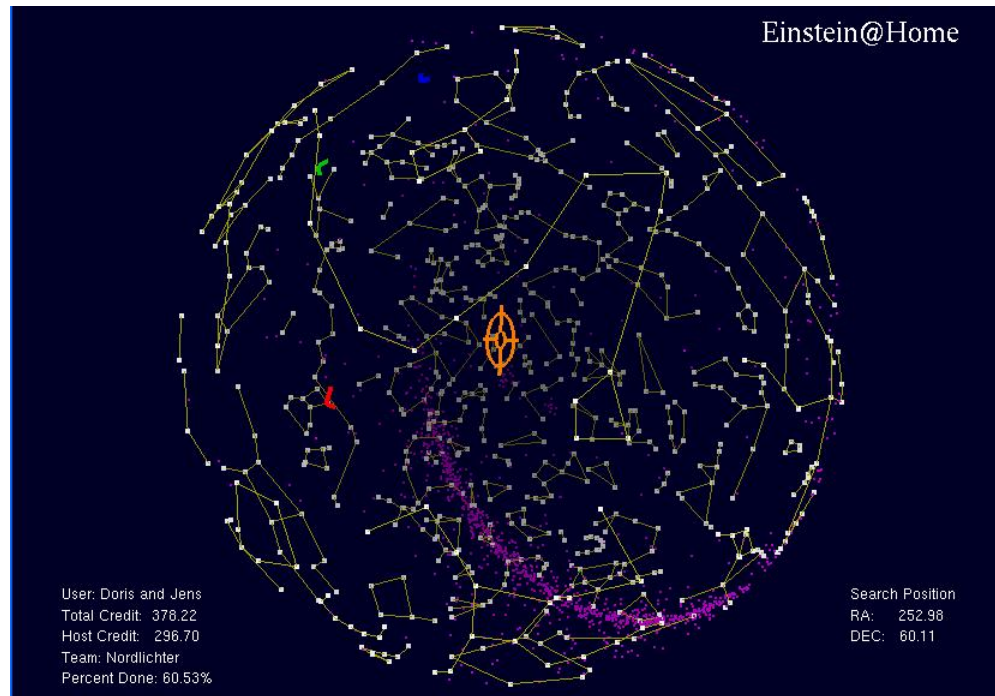
# Community Development

- **TRIDEC membership helps LHO mesh with the business, economic development and government sectors**
- **TRIDEC has helped LHO acquire a voice in the transition of the WSU Tri-Cities campus to four-year status**
- **Tri-Cities Visitor and Convention Bureau membership promotes LIGO in the tourism sector**



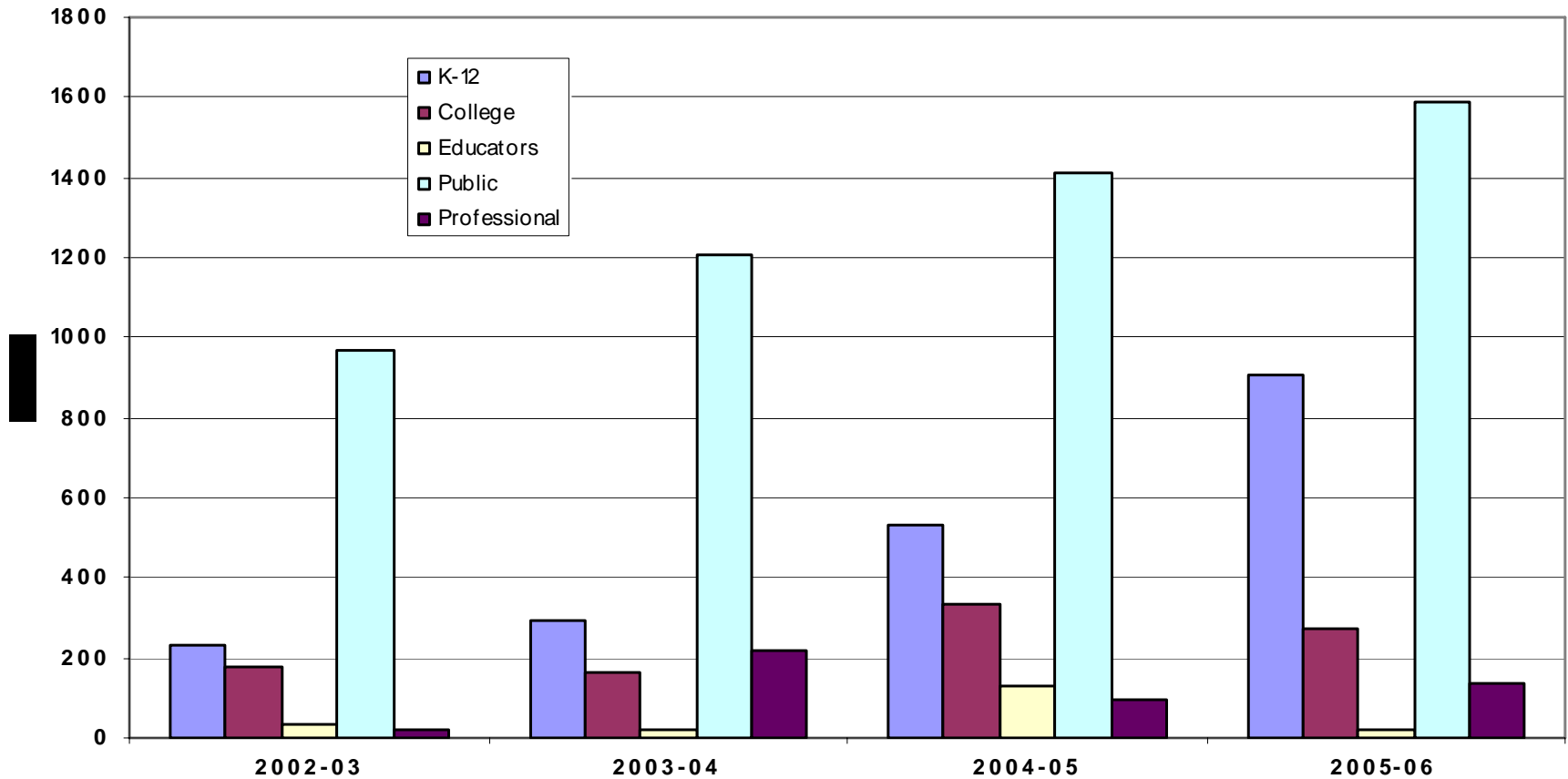
# Outreach to Everyone

Einstein@Home: 100,000(+) users



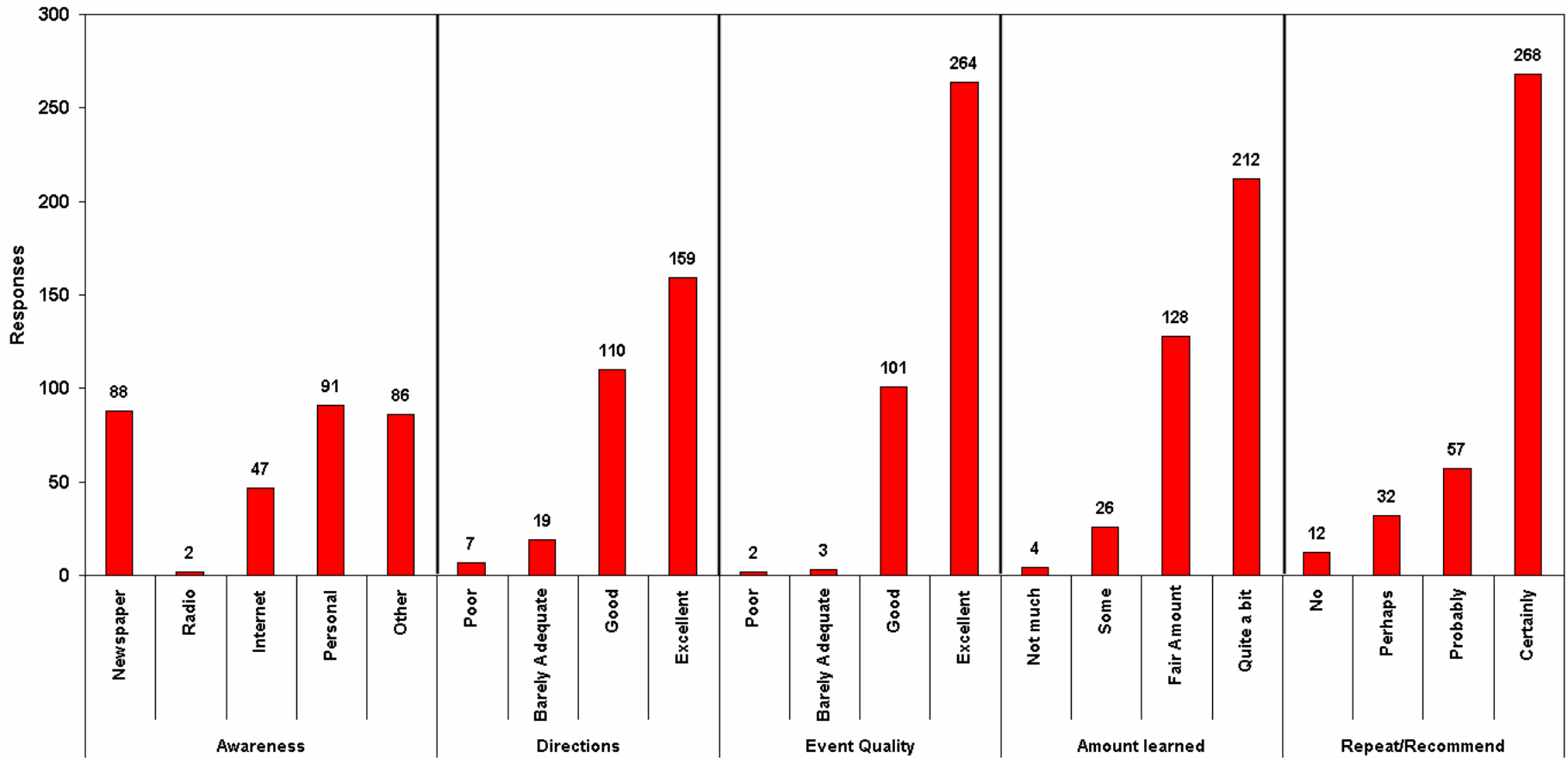
# Outreach Data

LHO On-site Outreach Attendance Categories, 2002 - 2006



# 2005 Visitor Surveys

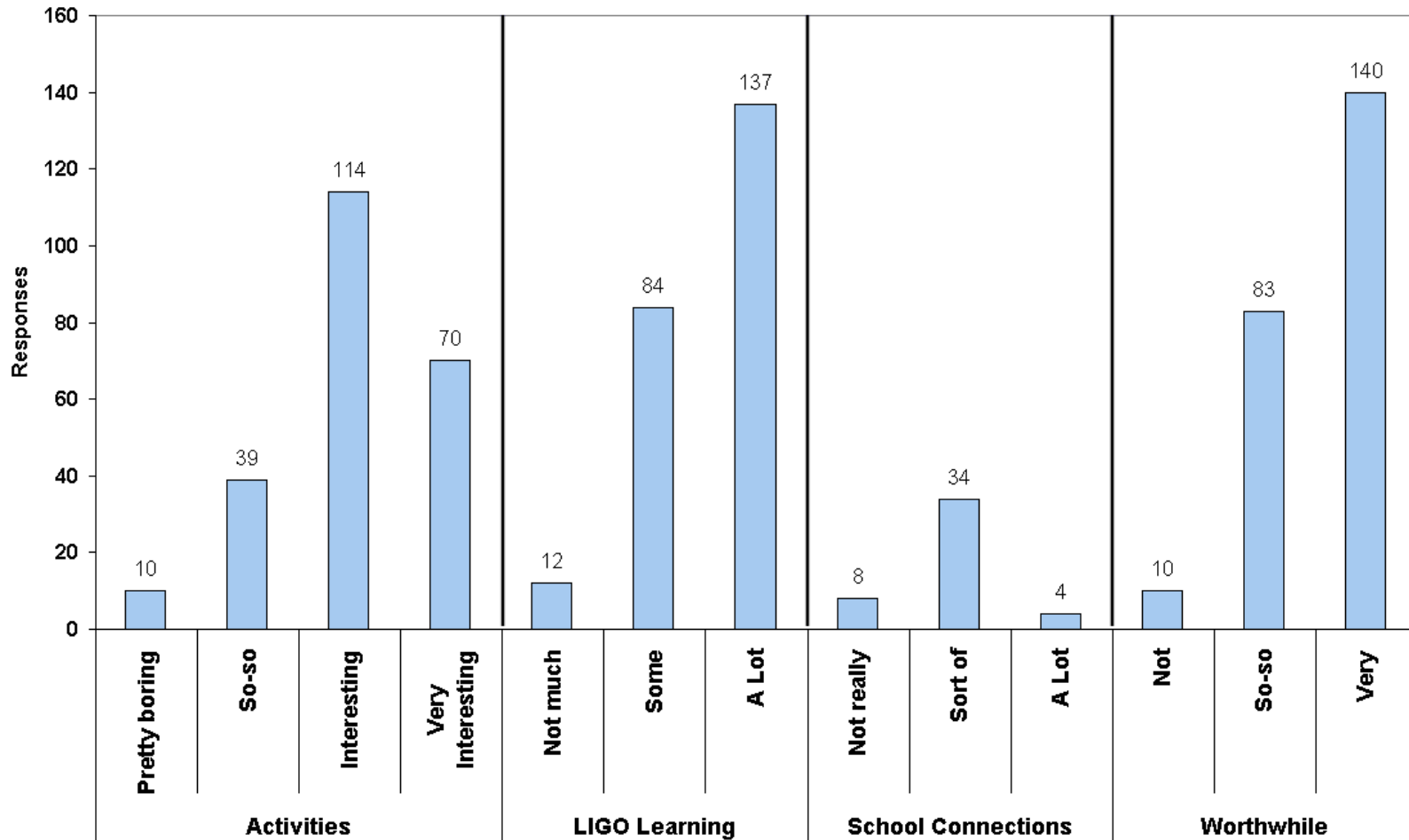
LHO Visitor Survey Results, 2005





# School Data

## LHO School Visit Survey Results, 2005-06



# Teacher Data

From Morrison\*, Raab, Ingram, *Surrounded by Scientists and Scientific Research: Influencing Teachers' Views of Science and Inquiry at LIGO Hanford*. Submitted to the Journal of Research in Science Teaching

“The opportunity as a teacher to shadow a scientist was so powerful that it greatly inspired my inquiry unit. Seeing how they went about the daily practice of their craft (which went to the heart of inquiry), I am challenged to have my students be able to focus on a question and pursue an answer wherever it leads.”

“This experience [job shadowing] broadened my understanding of the nature of a scientist's job. Science also became a lot less mysterious and unattainable. As a science teacher I think I would like my students to shadow scientists and engineers. I think this experience would make science a lot less scary and intimidating.”



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# The Road Ahead

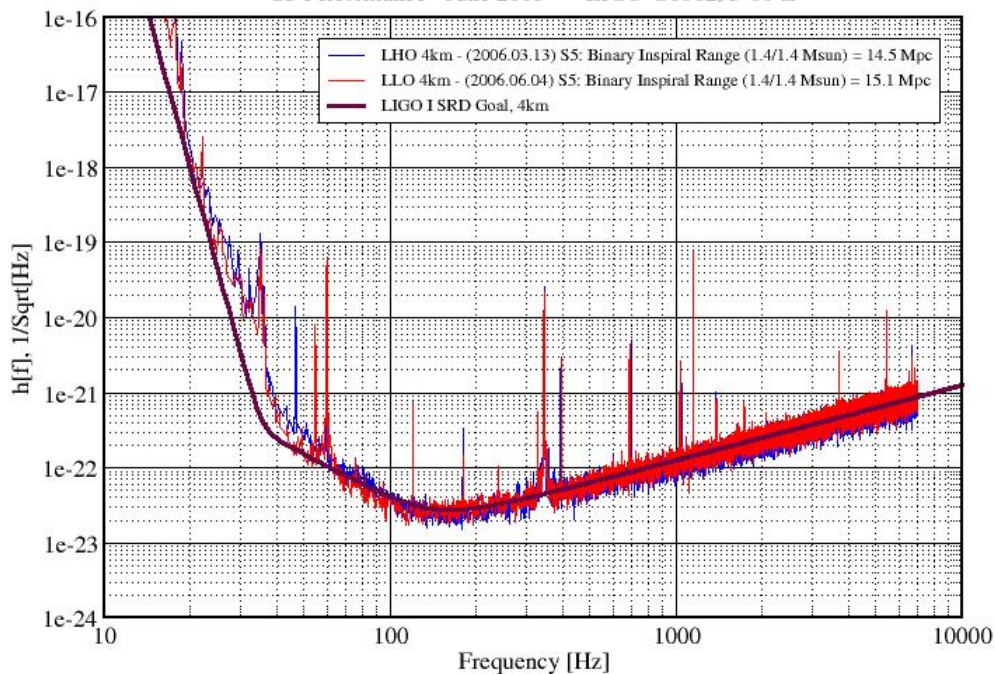
- **General Public:** Penetrate the community more fully by continuing to offer high-interest events. Leverage partnerships to strengthen LHO's reach into underrepresented communities
- **Schools:** Integrate more deeply into the way that schools do science education.
- **Teachers:** Expand our contacts and interactions
- **Community:** Increase LIGO's presence in the region's higher education sector



# On the Horizon . . .

Strain Sensitivity for the LIGO 4km Interferometers

S5 Performance - June 2006 LIGO-G060293-00-Z



**Gravitational wave detections will significantly change the volume and complexion of LIGO outreach. LIGO must prepare to serve the interest that detections will generate**