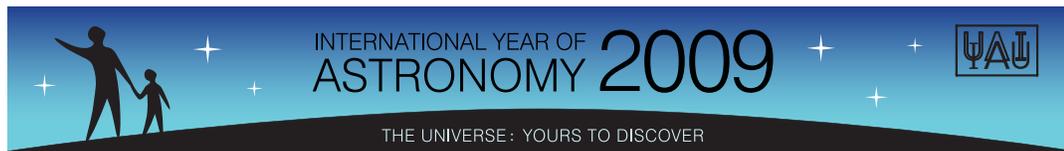


LIGO Hanford Observatory Outreach Summary 2008-2009



The worldwide celebration of the International Year of Astronomy provided the backdrop for LIGO Hanford Observatory public outreach in 2008-2009. A year-long special schedule of Web casts, LIGO open houses, film and literary festivals, star parties and other hands-on astronomy opportunities encouraged hundreds of community members of all ages to “look up” throughout the year. Each LHO IYA activity was a collaborative effort involving partner institutions whose locations ranged from the Tri-Cities to around the globe. At the forefront of LIGO’s International Year was the ongoing search for gravitational waves. The start of the S6 Science Run in July 2009 brought 18 months of Enhanced LIGO detector commissioning to a close. Observatory visitors in 2010 will experience two faces of LIGO -- S6 detector operations and vigorous preparations for the installation of Advanced LIGO.



March 21 -- Astronomy for the Very Young

April 3 -- Around the World in 80 Telescopes

May 2 -- International Astronomy Day

June 4 -- LitFest 2009, Columbia Basin College

June 20 -- Get Your Hands on Astronomy

August 22 -- Search the Deep Sky

Sept. 26 -- Einstein Film Festival

Nov. 7 -- Astronomia la manera de LIGO/ Astronomy LIGO-style



LIGO Hanford Observatory

Local Educator Network (LEN)

Warren Buck
Professor, Arts and Sciences
University of Washington
Bothell, WA

Marisela Mendoza
Training Program Lead
Energy Northwest
Richland, WA

Rebecca Chitkowski
Science Teacher
Gladstone High School
Gladstone, OR

Mary Moore
Teacher
Lewis & Clark Elementary School
Richland, WA

Rod Coler
Community Member
Kennewick, WA

Judy Morrison
Professor, Teaching & Learning
WSU Tri-Cities
Richland, WA

George Garlick
President
Garlick Enterprises
Richland, WA

Tim Olson
Professor, Sci. & Engineering
Salish-Kootenai College
Pablo, MO 59855

Roy Gephart
Scientist
PNNL
Richland, WA

Keith Plewman
Teacher
McLoughlin Middle School
Pasco, WA 99301

Stacia Gunderson
Education Coordinator
CREHST
Richland, WA

Brock Wells
Science Teacher
Connell High School
Connell, WA

Bruce Hawkins
Superintendent
ESD 123
Pasco, WA

Trisha Herron
Development Specialist
City of Richland
Richland, WA



School field trips to LIGO brought 2400 students to the Observatory during 2008-2009. *Nine schools brought 100(+) students, utilizing LHO's accommodations for large student groups to simplify field trip planning for their schools. The addition of a staff educator at LHO in 2010 will further improve the quality of large field trips. The number of LIGO student visitors decreased by 10% in 2009 from the previous year as schools trimmed their budgets in Washington's challenging economic climate. LIGO summer teacher interns continue to develop the Observatory's field trip and general public visitor resources. Interns have correlated LHO field trip materials to the revised WA Science Standards, updated the Spanish-language version of the student field trip guide, and developed additional materials for pre-field trip and post-field trip activities for the classroom.*



College Interns Continue to Assist with LHO Outreach

Interns from Columbia Basin College provided key support for LIGO outreach activities while advancing their participation in technical work at the Observatory. Intern staffing for outreach enabled LIGO to participate in simultaneous events at different locations several times throughout the year.



Extended summer program partnerships provided students with in-depth LIGO experiences. Four WSU GEAR UP sites partnered with LHO on multi-day summer programs in 2009. Ephrata and Walla Walla (Pioneer Middle School) employed a mixed-location model that combined LIGO visits to the school sites with student field trips to the Observatory. The Pioneer activity included the school's 21st Century after-school program as a partner. Vista Hermosa/Broetje Orchards near Prescott brought 20 students per week to LIGO for two four-day science day camps. Stevens and Ochoa Middle Schools in Pasco brought another 20 students for a similar three-day program that culminated with an evening family event. LIGO provided and facilitated hands-on programs in electronics, computing, seismic data analysis and basic optical astronomy; GEAR UP/21st Century sites provided additional staffing, transportation and meals in addition to recruitment and registration of students.



Outreach to Native American Groups in 2008-2009

In 2009 LIGO interacted with Native American students at Yakama Nation Tribal School, White Swan High School and Omak Middle/High School. Students from Yakama Nation Tribal School visited the Observatory in March. LIGO participated in Astronomy Day of the Confederated Tribes of Umatilla Indian Reservation in June. John Cox of CTUIR, Jessica Sutterlicht of Washington MESA (Math, Engineering and Science Achievement) and Jessica Smith of Okanogan Valley GEAR UP coordinated LIGO's participation in these activities. LHO Operations Specialists Corey Gray and Gerardo Moreno represented LIGO as exhibitors at the SACNAS Conference in Salt Lake City in the fall of 2008. SACNAS is the Society for the Advancement of Hispanics/Chicanos and Native Americans in Science.



Advanced Astronomy Camp at Kitt Peak National Observatory



LHO Operations Specialist Ewan Douglas served as an instructor at the 20th annual Advanced Astronomy Camp for high school students at Kitt Peak National Observatory in Arizona, sponsored by the U. of A. Alumni Association and the Steward Observatory. Ewan, a former AAC participant, introduced campers to the basics of gravitational-wave astronomy through the use of bench-scale interferometers and computer-based signal processing exercises. Twenty-four students from 13 U.S. states and Spain enjoyed spectral analyses of Pink Floyd along with interferometry. *LIGO said goodbye to Ewan in August as he departed to pursue his Ph.D in physics at Boston University.*

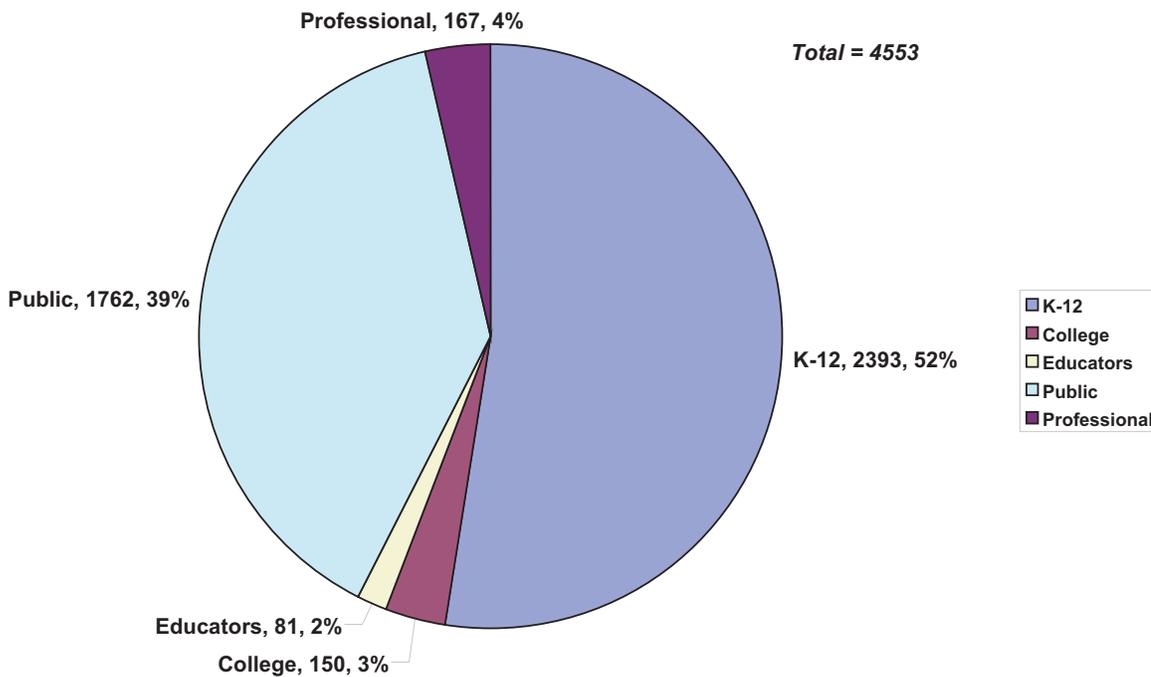


GEAR UP grants significantly increased LIGO's involvement in middle school college and career fairs in 2009. *UW GEAR UP offered a series of four fairs at Heritage University that served over 1000 students from the Yakima Valley. WSU GEAR UP hosted a similar set of events on the WSU Tri-Cities campus for schools in Pasco, Finley and communities to the north and east. An additional WSU GEAR UP career fair occurred on the campus of Walla Walla Community College. LIGO typically interacted with 70 - 100 students in 30-minute sessions at these events, providing information about careers in physics and astronomy research. At the college level, Corey Gray and Operations Specialist Annamaria Effler participated in the annual Columbia Basin College Career Fair in February 2009 (below).*

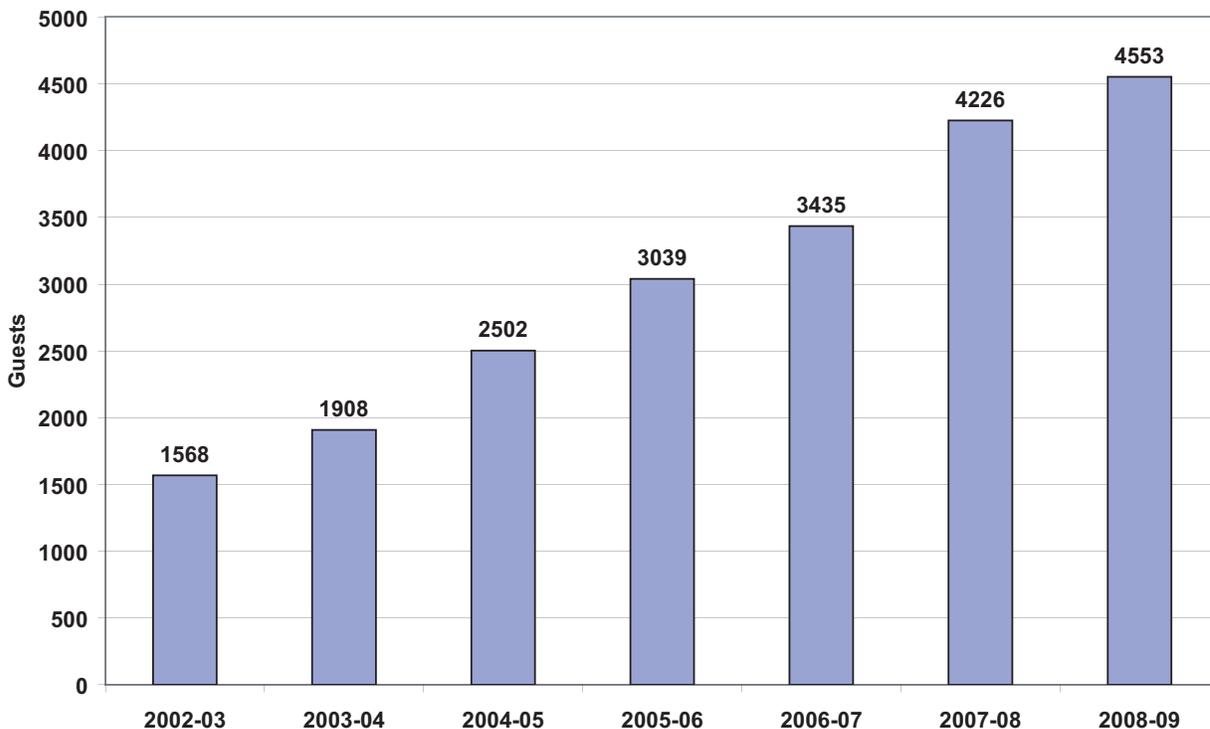


LHO visitor attendance increased by 7% in 2008-2009, fueled by an increase in general public attendance due to IYA events and monthly tours. Outreach-related usage of the Observatory was nearly continuous between May and August. A wide variety of off-site outreach events throughout the year yielded 5750 external contacts. LHO staff participated in a total of 180 on-site and off-site outreach-related activities during the year,

LHO Visitor Attendance, 2008-2009



LHO Annual On-site Outreach Attendance, 2002-09



Improvements to the LHO Web site provide a more unified and attractive interface for the public. A modified page structure now offers easy access to important visitor information along with links to additional LIGO Web resources. The new design has been propagated to all ligo-wa pages, creating a more efficient structure for maintenance and updates. LHO's "Teacher's Corner" pages now list all of the educational services and products that the Observatory makes available to schools. "Kid's Corner" offers links to a variety of games, simulations and educational activities of interest to youngsters.



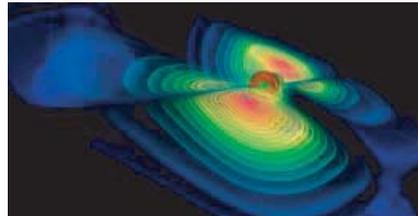
Watch us Online

100 HOURS OF ASTRONOMY

Around the World in 80 Telescopes

Live 24-hour research observatory webcast

Click to find out more



BLACK HOLE HUNTER

New Printed Materials Increase the Scope of LIGO Information for Visitors

LIGO brochures provide customized information for student intern candidates, the general public, STEM professionals and educators.



The LIGO Observatories cooperated on outreach projects in the LIGO Scientific Collaboration (LSC) that continue to reach wide audiences.

The LSC Education and Public Outreach Working Group, along with personnel in Virgo, GEO, TAMA and AIGO, coordinated a strong presence from gravitational wave astronomy in the European Southern Observatory's "Around the World in 80 Telescopes," a featured event in the International Year of Astronomy. LHO scientist Michael Landry hosted the LIGO segment in "80 Telescopes," with technical assistance from engineers Cyrus Reed and Richard McCarthy. LHO participated in a complete redesign of the LSC Web site, a portal that now provides better service to both the general public and LIGO scientists. NSF funds supported the development of "Astronomy's New Messengers: Listening to the Universe with Gravitational Waves," an exhibit that has traveled to a number of U.S. locations after debuting "on the street" at the World Science Festival in New York during June.

LIGO (AW80T webcast)



LIGO (AW80T webcast)



I2U2 Project

Interactions in Understanding the Universe (I2U2), another national outreach collaboration, continued to move forward in 2009 under NSF support. The LIGO I2U2 e-Lab has moved from a beta test version to a production version. This means that the e-Lab is now fully functional, offering an online teacher-viewable logbook, online poster capability, an interactive teacher forum and an online pre-test and post-test. Ten teachers in Indiana and Minnesota will use the e-Lab with their students during the 2009-2010 school year. Data from this year-one test will be used to improve the e-Lab. The evaluation cycle will repeat during the following school year with new test group of teachers and students.

The Southeast Washington Math Science Partnership (MSP), the centerpiece of LHO's work in K-12 teacher professional development, received an additional two years of funding from the Office of the Superintendent of Public Instruction through an extension proposal submitted by Educational Service District 123. Twenty Pasco and Othello teachers from grades 3 - 8 participated in the 2009 MSP Summer Academy at LHO. The teachers were joined by six mentor teachers, veterans of the MSP program from 2007-08 and before. Course instructors and facilitators from WSU Tri-Cities, Columbia Basin College, LIGO and ESD 123 combined with the mentor teachers to provide an inquiry-focused environment in which the participant teachers honed their science instructional skills.

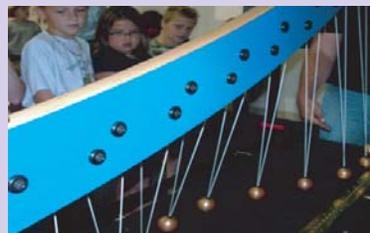


Teacher Workshops

LIGO participated in four one-day and two-day teacher workshops in 2009. Two of these workshops provided training for teachers on the use of the LIGO I2U2 seismic e-Lab. Two more were GEAR UP -sponsored workshops that brought small and geographically diverse groups of teachers to LIGO for activities focused on the nature of wave behavior in the context of LIGO science. WSU GEAR UP and Okanogan Valley GEAR UP (Central Washington University) have both asked LIGO to increase the frequency and scope of these workshop offerings.

Early Childhood Outreach

"Astronomy for the Very Young," a public event offered as part of the International Year of Astronomy in partnership with ESD 123, was an important step forward in LHO's outreach to families with young children. Observatory visits from several regional elementary schools and from community organizations brought another 400 elementary-age children to the site in 2009.



LIGO's proposal to the National Science Foundation for an outreach facility at the Hanford Observatory was favorably reviewed in April 2009 by a visiting panel of NSF-appointed science educators and facilities development professionals. LIGO anticipates learning of NSF's response to the panel's recommendations when the Foundation's funding picture for the 2010 becomes clear.



A New Outreach Staff Member

LIGO Hanford will welcome Erin Steinert to the Observatory outreach staff in mid-November 2009. Erin comes to LIGO with a degree in physics and mathematics along with professional experience in science center and planetarium operations. She will add immediate strength to LHO's field trip and public event programs and will add new dimensions to LHO outreach through her astronomy expertise.

Community Leadership Award

LIGO was pleased to accept a Community Leadership Award from the Pasco School District for ". . . outstanding community leadership and contributions to the improvement of public education." Pasco School District Superintendent Sandra Hill presented the award at the 2009 meeting of the Southeast Washington Association of School Administrators in Walla Walla on June 11.



From left: Robyn Ingram, LHO Outreach Coordinator Dale Ingram, Pasco School District Superintendent Sandra Hill, Pasco School District Executive Director of Curriculum and Professional Development Vickiy Van Beek. Photo courtesy of Courtney Stenson and the Pasco School District



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