

**International Steering Committee Report
American Physical Society
January 2006**

The World Year of Physics celebration in the United States was led by the American Physical Society, in conjunction with the American Association of Physics Teachers and the American Institute of Physics. The APS contributed financially to the effort, and we were also able to secure three government grants totaling US\$570,000, which gave us an aggregate budget of about \$750,000.

Our celebration focused on four core activities, and a long list of collaborations with other organizations. In addition to activities associated with the APS, more than 600 local events were submitted to our Online Event Finder (www.physics2005.org).

Core Projects

Our four main projects were: PhysicsQuest, a learning adventure for middle school (grades 6-9); recreating the Eratosthenes experiment, an activity for high school students (grades 9-12); Einstein@Home, a distributed computing project for the public; and Physics on the Road, a physics demonstration program for schoolchildren of all ages and the public.

PhysicsQuest (Grades 6-9; ages 11-14)

PhysicsQuest is our learning adventure for middle school students. This outreach project was based on a fictional search for Einstein's missing treasure. The hunt, located around the grounds of the Institute for Advanced Study in Princeton, New Jersey, takes students through a series of four simple experiments. Each experiment leads the students closer to a "missing treasure."

It was so successful with teachers and students that we were able to run the project twice, once in the Spring of 2005 and again in the Fall.

PhysicsQuest	PhysicsQuest 2
Teachers: 1,362	Teachers: 1,266
Classrooms: 5,100*	Classrooms: 4,000

(*estimate based on 102,000 students)

Recreating Eratosthenes Experiment (Grades 9-12; ages 14-17)

More than 2000 years ago, the Greek scientist Eratosthenes first measured the circumference of the Earth with an ingenious technique requiring only sticks, shadows and a little mathematics. This past Spring, over 700 schools from all over North America

(United States, Canada and Mexico) participated in re-creating this momentous experiment.

Grand Average of the Earth's Radius:

6562.56 km (4078.66 Miles)

This value only differs by 3% from the true value of 6371.3 km (3959 Miles)!

Einstein@Home (Everyone)

Einstein@Home is a distributed computing program that uses idle computer time to search for gravitational waves from asymmetrical spinning neutron stars, using data from the LIGO and GEO detectors.

Currently, there are more than 121,000 registered users, who represent 162 different countries. There are more than 205,000 registered computers analyzing data. The average computational speed is 55 TeraFlops. If all the computers were computing all the time, the maximum computer speed would be 242 TeraFlops.

Einstein@Home is the second most popular distributed computing project in the world, and the third most powerful computational engine of all time after SETI@Home and IBM's Blue Gene/L.

Physics on the Road (Everyone)

Twenty colleges and universities were chosen from 39 schools and science museums that applied. Of the 20 teams, 16 received grants of approximately \$10,000 from NSF, DOE and NIST. Through fundraising, four additional teams were funded by APS.

The funds received by these teams were used toward purchasing new and better demonstration equipment and much needed audio visual equipment, and for student travel to and from shows. In some cases, the funds were even used to secure new vehicles for the program.

Together, these teams have performed physics demonstrations for thousands of people at schools, shopping malls and other venues. (This is only an approximate number of audience members. Final numbers had not been submitted at the time this report was filed.)

Collaborations

In addition to our four core projects, we collaborated with a number of different organizations to celebrate the World Year of Physics 2005.

International Gala, with the American Association for the Advancement of Science (AAAS)

Together with the AAAS, we held a Gala Reception on February 20, 2005. The Gala was the official kick-off event for the U.S. celebration of the World Year of Physics. The event was preceded by a day-long series of physics talks. (These talks are archived on our website at: www.physics2005.org/conferences/index.html)

More than 2,000 people attended the gala, which was held in conjunction with the AAAS annual meeting in Washington, DC. Both APS President Marvin Cohen and AAAS President Shirley Jackson welcomed the crowd and spoke briefly on the importance of science education and outreach. Actors, portraying some of the most influential scientists of the 20th century, were hired to mingle with the crowd. The actors were provided with a “script” to help them answer questions that they may have been asked.

“Einstein’s Big Idea” Premiere, with the National Academies of Science (NAS)

Together with the NAS, the APS hosted a premiere party for “Einstein’s Big Idea,” a two-hour-long TV show based on David Bodanis’s book, *E=mc², Biography of the World’s Most Famous Equation*. The event was also sponsored by the U.S. Department of Energy, Universities Research Association, and the Washington PBS station WETA. More than 600 attendees were invited to view a 30-minute preview of the movie which aired on public television in October 2005.

A panel discussion moderated by APS President Marvin Cohen followed the movie preview. Panel members included: David Bodanis; Paula S. Apsell, the Senior Executive Producer of NOVA and the Director of the Science Unit of WGBH in Boston; Walter Isaacson, President and CEO of the Aspen Institute and former Managing Editor of TIME, who is at work on an Einstein biography; David Kaiser, associate professor of the history of science in MIT’s Program in Science, Technology, and Society; Gary Johnstone, Producer/Director/Writer of “Einstein’s Big Idea”;

Young Scientists Challenge, with the Discovery Channel

Every year, the Discovery Channel hosts the Young Scientist Challenge. Forty middle school children were chosen based on their submitted science research projects. Because of the World Year of Physics, the Young Scientists Challenge that was filmed in November 2004 featured four physics experiments. These experiments were designed and executed with help from the APS.

Intel International Science and Engineering Fair

In honor of the World Year of Physics, APS and AAPT presented special awards to seven students who participated in the fair. (\$3000 for first prize, \$2000 for second prize, \$1000 for third prize and certificates for the four honorable mentions.) Using judges from the APS and AAPT membership, students were chosen on the merits and originality of their research.

As part of the annual science fair, local school-children are brought in to view the projects and participate in a science expo. This year, APS and AAPT participated in the expo, providing short and easy physics experiments for the students.

NASA project

Six teacher teams from across the country were chosen from 13 proposals to conduct experiments on NASA's reduced gravity aircraft. Working together with their students, teachers submitted ideas for experiments they would like to conduct in microgravity. The teams were chosen on the merit and originality of their experiment ideas. The actual flight unfortunately had to be postponed twice due to mechanical problems, and has been tentatively rescheduled for May 2006.

Other Projects

Adopt-a-Scientist

In this WYP pilot program, high school physics students around the country found out what it's like to be a scientist. Students conducted email interviews with real scientists in different fields. As they reported their findings to the class, the class was exposed to the wide variety of opportunities available within science.

Participant Breakdown:

Teachers: 150

Classrooms: 400

Scientists: 600

Einstein in the 21st Century Art Project

As a capstone to the WYP, the Washington Glass Studio was chosen from a pool of four proposals, to commemorate the WYP through art. The artwork consists of 32 glass panels, each of which represents some aspect of Einstein's contribution to science, or of his life. Over 300 pictures of children have been used, together with the artwork, in creating a poster. The poster will be distributed to classrooms nationwide.

To explain the artwork, a supplemental website (www.physicsmatters.org) is being launched during the week of January 16. It highlights each aspect of the art, and explains the science behind it.

Einstein's Miraculous Year Video

We commissioned a video that highlights the importance of physics in everyday life, while reflecting on Einstein's contributions from 1905. The video was distributed to all the classrooms that participated in PhysicsQuest, and videos were also distributed to more than 1000 additional middle-school classrooms nationwide.

Historic Sites Initiative

Although it is quite common in Europe for historic physics sites to be commemorated by plaques, these are much rarer in the US, and during the World Year of Physics, the APS has launched a program to recognize important historic physics sites in America. The first five sites were chosen in 2005 (commemorating Franklin, Michelson and Morley, Gibbs, Rowland and Compton) and three of the five plaques have been presented. APS views this initiative as a means to bring physics to the general public in an unanticipated, effective, and very delightful way: a person unexpectedly encounters a plaque that describes an important event in the history of physics and walks away a little thoughtful and a little more knowledgeable about physics.

Outreach for 2006 and Beyond

As a result of the World Year of Physics, we plan to continue several of our projects into the future.

PhysicsQuest

This project proved extremely popular among both teachers and students. APS plans to continue PhysicsQuest as an annual project with a different theme each year. Because 2006 is the 300th anniversary of Benjamin Franklin's birth, this year we intend to design the experiments around some of the science that Franklin developed, for example electricity and lenses.

Adopt-a-Scientist

Because this program was well received by both scientists and teachers, we plan to repeat it in 2006 and beyond.

Einstein@Home

This distributed computing project has had broad participation internationally, and with new data coming in, will continue probably for the next several years. In addition to the web site that people visit to sign up, there is a special web site prepared by APS, www.einsteinathome.org, that focuses on the science of gravitational waves.

Einstein in the 21st Century Art Project

The creation of the artwork led to the creation of the web site www.physicsmatter.org. We will continue to develop this website for the public and for schoolchildren, as we find a permanent home for artwork. In addition, we are distributing a poster, related to the artwork and containing the above URL, to more than 18,000 middle school and 10,000 high school teachers, and to approximately 900 colleges and universities.

Historic Sites Initiative

This program, described above, is ongoing, and further sites will be chosen in 2006 and beyond.

PhysicsCentral.com

With Physics Central, an award-winning website created in 2000, we endeavor to communicate the excitement and importance of physics to everyone. On this site, we describe the latest physics research, we profile interesting physicists, and we explain physics using eye-catching photographs. We also have a section that explain how physics helps understand the world around us, and another that features excerpts from books written by physicists for the public.