

2008 Congress Sets Priorities for SPS

**November 6–8, 2008
Fermi National Accelerator
Laboratory, Batavia, IL**

More than 600 physics students, faculty, and alumni from over 170 campuses and institutions gathered at Fermilab for the 2008 Sigma Pi Sigma Congress last November. More than double the size of the 2004 Sigma Pi Sigma Congress, the 2008 Congress was a fast-paced, high-energy event focused on what it means to be a scientist and a citizen in today's world.

Meeting highlights included Fermilab tours, over 100 student poster presentations, and distinguished speakers such as Nobel Laureate Leon Lederman, who discussed what presidents and physicists need to know about science and policy; and authors Fred Jerome and Rodger Taylor, who described Einstein's oft-ignored role in the fight against racism. In this and future issues of *Radiations*, we will feature plenary talks and other facets of the 2008 Congress that enliven the concept of scientific citizenship.

One outcome of the 2008 Congress is a series of recommendations for the Society that bubbled up from dozens of round-table discussions. The recommendations that attendees deemed highest priority include:

SPS should expand its outreach efforts on the nature of science, critical thinking, and the scientific method.

SPS should educate its members about existing resources within the American Institute of Physics (AIP), its Member Societies, and other organizations.



2008 Sigma Pi Sigma congress a resounding success.

SPS should investigate and promote policy opportunities for undergraduates and recent bachelor's degree recipients.

SPS should encourage scientific citizenship among chapters at the local level.

A committee within the SPS National Council is mapping out plans for addressing these recommendations, much as was done with the ethics recommendations that emerged from the 2004 Sigma Pi Sigma Congress (see www.sigmapisigma.org/congress/2004/ethics.htm).

We invite you to share your thoughts about these recommendations. You can do so by email to sps@aip.org (subject line, "Radiations") or by writing to:

Radiations Magazine
Sigma Pi Sigma
One Physics Ellipse
College Park, MD 21042

Society News

Dr. Karen Williams honored with Worth Seagondollar Award

Dr. Karen Williams, professor of physics at East Central University (ECU), Ida, OK, has been awarded the Worth Seagondollar Service Award in recognition of her extraordinary level of service and commitment to Sigma Pi Sigma and the Society of Physics Students. Williams served two terms as president of the SPS and Sigma Pi Sigma National Council from 2001-2005, and is the current zone councilor for Oklahoma-Kansas-Missouri, zone 12.

Williams received the award at the 2008 Sigma Pi Sigma Quadrennial Congress held at Fermilab in Batavia, IL. It recognizes her "service as a chapter adviser, zone councilor, and president of the Society of Physics Students, overseeing a great expansion of the role of president and the precedent-setting 2004 Sigma Pi Sigma Congress."

The Worth Seagondollar award was instituted at the Society of Physics Students National Council Meeting in 1996 and Seagondollar was the first recipient. Seagondollar is a former Sigma Pi Sigma



Dr. Karen Williams receives the Worth Seagondollar Service Award from Dr. George Miner, former president of Sigma Pi Sigma, at the 2008 Quadrennial Congress of Sigma Pi Sigma.

president who was well known as one of the scientists involved in the Manhattan Project that produced the first man-made nuclear explosion. Williams is only the fourth recipient of the prestigious award.

Honorary Members – Congress 2008

Membership in Sigma Pi Sigma recognizes a life committed to excellence in the study, propagation, and fellowship of physics. Most members are received as undergraduates on the basis of their chapters' standards for academic success and character. Graduate students are received by a chapter on the basis of making satisfactory progress toward an advanced degree. Professional physicists are received by a chapter on the basis of their professional record. Physicists who have attained noteworthy distinction on the national or international level in physics or a closely allied field may be designated for the special distinction of Honorary Membership. This may only be awarded upon election by the National Council of Sigma Pi Sigma. These include the discoverer of pulsars, Jocelyn Bell-Burnell, Nobel Laureates Carl Wieman and Bill Phillips, and the extraordinary educator Melba Phillips.

At the 2008 Sigma Pi Sigma Congress at Fermilab, our society welcomed an exciting new class of Honorary Members.

- *Richard Garwin* has worked on the fundamental problem of non-conservation of parity and the eminently practical issues of nuclear proliferation.
- *Young-Kee Kim* contributed to the discovery of the top quark and is an ardent advocate of undergraduate research opportunities.
- *Neal Lane* has advanced atomic and molecular theory, directed the National Science Foundation, and served as Provost of Rice University as well as Presidential Science Advisor.
- *Lou Lanzerotti* advanced space and atmospheric science as a member of Bell Laboratories, served on National commissions to set space exploration policy, is both the current chair of the governing board of the American Institute of Physics and the mayor of Harding Township, New Jersey.
- *Margaret Murnane* has blazed a trail in the pure and applied study of femtosecond pulses of coherent X-ray beams and another trail in expanding diversity among scientists and engineers.
- *James Stith* has been an advocate and mentor for diversity in the sciences, from the faculties of the U.S. Military Academy and The Ohio State University to the presidencies of the American Association of Physics Teachers and National Society of Black Physicists, and has recently retired as Vice President, Physics Resources, of the American Institute of Physics.



SPS council member Christine Ploen welcomes Lou Lanzerotti into honorary membership in Sigma Pi Sigma.

Photo by Phillip Payette.



SPS associate zone councilor representative Jenna Smith presents plaque to recognize Dr. James Stith as an Honorary Member of SPS.

- *Jill Tarter* is an untiring ambassador for science to the public and passionate pursuer of the question, "Are We Alone?", engaged in the scientific pursuit of extraterrestrial intelligence.

All of these new honorees embody the Congress's commitment to encourage all to be "Citizen Scientists." It was a thrill to recognize these distinguished scientists as Honorary Members of Sigma Pi Sigma.

Nobel Laureate Leon Lederman, who experimentally demonstrated the separate identities of the electron and muon neutrinos, has advanced science education nationally, and served as valedictory speaker of the Congress was not so recognized; he was received as an Honorary Member when he served in the same role at the 1992 Congress, in Dayton, OH.

By T. Olsen

The $\Sigma\Pi\Sigma$ Congress: Student Perspectives

The following excerpts are taken from reports on the Sigma Pi Sigma Congress written by students. Sigma Pi Sigma members contributed over \$6,000 to a Congress fund which was used to provide partial travel support for 14 SPS chapters attending the meeting. Chapters received the funding in exchange for their reflections on the Congress. For full reports and extensive photo collections, visit www.sigmapisigma.org/congress/2008/reports/.

Being Inspired

By the Angelo State University SPS chapter

Speaking with Dr. Jill Tarter after the lecture, we asked if she could offer any advice to undergraduate students. She stressed the importance of finding something you love, and then making a career out of it. She also noted that time and discipline will always be required when working towards a specific goal. Lastly, Dr. Tarter counseled us to always be humble about what we know.

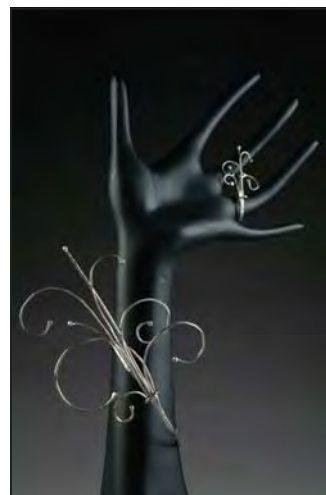


"Are we alone?" asked Jill Tarter (left), Director of the Center for SETI (Search for Extraterrestrial Intelligence) Research, in a plenary lecture at the Congress.

Celebrating Art

By the Drexel University SPS chapter

The art was vibrant and in many cases demonstrated the beauty and intricacy of physics. One photo that stood out showed an image of feet in a funhouse mirror; others showed the sky at sunset, for instance. Some of the work, however, was just a reminder that scientists are people, too...



*In celebration of Fermilab founding director Robert Wilson's belief that a research laboratory should be a cultural center for the community and the nation, Congress participants created more than 30 works of art for display and/or judging at the Congress. Shown is the winning collection, *The Particle Decay Series*, by Kristal Feldt. Look for a more extensive display of the Congress art in the next issue of *Radiations*.*

Photo by Aaron Paden, University of Kansas News.

Gathering Together

By the Northern Arizona University SPS chapter

At 6:00 AM on November 3rd, six physics/astronomy majors from Northern Arizona University stepped onto the train in Flagstaff, AZ, and wouldn't get off until arriving in Naperville, IL, 36 hours later. The long train ride was one of excitement and joy, partially due to the upcoming Sigma Pi Sigma Quadrennial Congress at Fermilab, and partly because November 4th promised an election outcome for the history books.



Students from Northern Arizona University took a 36 hour train ride from Flagstaff, AZ to Chicago, IL to get to the Congress.

Photo by Eric Betz.

Reflecting on Race and Racism

By the Chicago State University SPS chapter

The presence of [Fred] Jerome and [Rodger] Taylor at the conference was very beneficial because their message was that, as the future faces of physics, we will be trying to solve our energy crisis, discover the Higgs boson, and find a planet with the same properties as ours, in addition to many other scientific advances – but we need to remember that physics is also a social endeavor.



Authors Fred Jerome (second from left) and Rodger Taylor (second from right) pose with students from Chicago State University. Jerome and Taylor gave a plenary talk, "Einstein as Citizen—Addressing Race and Racism."

Photo by Sean Gallardo.

Seeing Femilab at Work

By the Grove City College chapter

It was exciting to see the scientists at their work. It gave this feeling of awe, sort of like watching astronauts in space or exploring the moon. This gave a feeling that made you wish that you did what they are doing.



For many, a highlight of the Congress was touring Fermilab's cutting-edge facilities.

Engaging with the Physics Community

By the Juniata College SPS chapter

What we found most compelling about the conference was the chance to see and interact with the scientific community. For many of our group from Juniata College, it was our first conference. The chance to listen to some of the giants of physics and scientific citizenship and to meet fellow physics students was spectacular.



Nobel Laureate Leon Lederman sharing his thoughts about what presidents and physicists need to know about science.

Discussing Scientific Citizenship

By the Northeastern Illinois University SPS chapter

Four workshops were scheduled throughout the Congress, and after all suggestions were submitted and tallied, we allotted two representatives from our chapter's dispatch to vote on the suggestions...Some sessions got a little heated as we covered some very touchy political issues, but the overall format was open, inclusive, and constructive to the goals of the Congress.



Toni Sauncy, a member of the SPS National Council, facilitates a roundtable discussion on scientific citizenship.

Photo by Phillip Payette.

Sharing Research & Outreach

By the North Carolina State University SPS chapter

Between answering questions from onlookers, the presenters traded jokes, tips for better presenting, and even questions about their neighbor's research projects. This all contributed to an exciting and convivial atmosphere during the sessions on both days: small groups would form around posters and instead of a boring ask-and-tell routine, freewheeling conversation about research with a lot of give and take spontaneously formed.



Students presented posters on their research and outreach experiences during two poster sessions at the Congress.

Belonging

By the Saint Peter's College SPS chapter

Physics majors are hard to come by in our school. We were represented by half of the school's physics majors, five. Take that number, multiply it by one hundred, and then add another hundred. That was the attendance at the miraculous Sigma Pi Sigma Congress. Needless to say, the sight of that many devoted to our particular field was astonishing.



Around 600 physics students, faculty, and alumni filled the banquet hall each night.

Photo by Phillip Payette.

Moving Forward

By the Southern Mississippi University SPS chapter

[We have] taken the ideas discussed at the Congress and formed a plan for how a university student organization can make an impact in the local community and hopefully farther... As a portion of this endeavor, we are heavily considering pushing for a course in physics to be taught in one of the local high schools that currently does not offer physics. The hope is that if one Mississippi school can see this as a priority, others locally and nationally will follow.



Inspired by the scientific citizenship theme at the Congress, students from Southern Mississippi University created a plan for impacting their local community.

Photo by Xandria McWaters.

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[27] R. Alpher and R. Herman, "On the Relative Abundance of the Elements," *Phys. Rev.* **74**, 1737-1742 (1948).

[28] Their papers from this era on these subjects, authored separately or jointly by Alpher, Gamow, Herman, and Follin, are not listed in their entirety here. We plead lack of space.

[29] G. Gamow, "The Evolution of the Universe," *Nature* **162**, 680-682 (1948).

[30] R. Alpher and R. Herman, "Evolution of the Universe," *Nature* **162**, 774-775 (1948).

[31] R. Alpher and R. Herman, "Remarks on the Evolution of the Expanding Universe," *Phys. Rev.* **75**, 1089-1095 (1949).

[32] W.S. Adams, "Some Results with the Coudé Spectrograph of the Mount Wilson Observatory," *Ast. J.*, **93**, 11-23 (1941). A. McKellar, "Evidence for the Molecular Origin of Some Hitherto Unidentified Interstellar Lines," *Pub. Ast. Soc. Pacific*, **52**, 307, 187-192 1940; **53** 233-235 (1941).

[33] I.D. Novikov, *Black Holes and the Universe*, V. Kisin, Tr.

(Cambridge Univ. Pr., 1984).

[34] A. Penzias and R. Wilson, "A Measurement of Excess Antenna Temperature at 4080 Mc/s," *Astrophys. J.* **142**, 419-421 (1965).

[35] R.H. Dicke, P.J.E. Peebles, P.G. Roll, and D.T. Wilkinson, "Cosmic Black-Body Radiation," *Astrophys. J.* **142**, 414-419 (1965).

[36] M.S. Turner, "From $\alpha\beta\gamma$ to Precision Cosmology: The Amazing Legacy of a Wrong Paper," *Physics Today*, **61**, Dec 2008. The $\alpha\beta\gamma$ was "wrong" for all the right reasons.

[37] "April 1, 1948: The alpha beta gamma paper explains the origin of the elements," *APS News*, April 2008, p. 2.

[38] R. Alpher and R. Herman, "Reflections of Early Work on 'Big Bang' Cosmology," *Physics Today* **41**, 24-34 (Aug 1988).

[39] R. Alpher and R. Herman, *Genesis of the Big Bang* (Oxford Univ. Pr., 2001).

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Bringing it Home

By the Kansas University SPS chapter

[W]e used our next SPS meeting to have a roundtable discussion following up on topics from the conference. We shared with each other and with those unable to attend the Congress the interesting things we had heard and seen on our tours. We also discussed some of the issues that the conference addressed, and what initiatives we felt we could practically pursue as a campus chapter. Among other things, we are hoping to establish a connection with students interested in science at the Native American university in our town and open a dialogue there.



The Congress brought together students, faculty, and alumni from over 170 campuses and institutions across the country. Our hope is that they continue the discussion of scientific citizenship back home with their colleagues and friends, and in this way move the physics community forward.

Photo by Matt Noll.

Seeing the Possibilities

By the Abilene Christian University SPS chapter

Overall the conference broadened our horizons on what is truly possible in the field of physics.

The conference allowed all of us to look outside of our own personal experience as physicists, be it as students, researchers, or teachers, and view things from a more national and global perspective. It brought about reflection on what it means to live not just as a scientist, but as a citizen scientist, and imbued a sense of greater responsibility to the community that invests in us.



A view through Tractricious, a sculpture on the Fermilab grounds designed by founding director Robert R. Wilson. The free-standing hyperboloid is made from unused stainless steel beam pipe.

Photo by Reidar Hahn, courtesy of Fermilab.