

Scientific Citizenship: Connecting Physics & Society

2008 Quadrennial Congress of Sigma Pi Sigma

Hosted at
 **Fermilab**
November 6-8, 2008



Attention SPS Members:

You are invited to participate in the 2008 Sigma Pi Sigma Quadrennial Congress! The Congress brings together undergraduate physics students, practicing physicists, and physics alumni to address common concerns for the discipline and for society. Make plans now to attend:

Scientific Citizenship: Connecting Physics and Society
2008 Quadrennial Congress of Sigma Pi Sigma

Held at Fermi National Accelerator Laboratory, Nov. 6-8, 2008

This meeting is hosted by Sigma Pi Sigma, the physics honor society, but is open to all members of the science community. So check out the program and start planning your SPS chapter's trip to Congress.

Scientific Citizenship

With this theme, the Congress attendees will explore the greater role of the physicist in society through round-table discussions, distinguished speakers, and historical perspectives.

The construction of the first atomic bomb prompted many scientists to engage in government and public organizations like never before, sharing their knowledge of the world to help shape public opinion of science, assist with policy decisions, or to otherwise connect their work with the broader community. This legacy continues today, as physicists work to address current political and social issues such as energy concerns and science curriculum integrity.

Though many different venues, the Congress will provide opportunities for members of the physics community to share their stories about working at the intersection of physics and society, and for attendees to discuss how to use their physics training to positively impact society.

We very much hope you will join us at Fermilab!

Fermilab

The Fermi National Accelerator Laboratory has seen many significant moments in physics



Fermilab's Wilson Hall
Photo courtesy of Fermilab



The Fermilab particle accelerator
Photo courtesy of Fermilab

history and is home to many leading high energy research projects. Founding Director Robert R. Wilson committed the laboratory to firm principles of scientific excellence, esthetic beauty, stewardship of the land, fiscal responsibility and equality of opportunity; and the lab has operated under those principles since its founding. For all these reasons, Fermilab is an ideal setting to explore scientific citizenship.

2008 Congress Highlights

Speakers

The Congress will feature a number of distinguished speakers, including:

- **Richard Garwin**, IBM Fellow Emeritus at the Thomas J. Watson Research Center and consultant to the U.S. Government on military technology and arms control.
- **Young-Kee Kim**, Deputy Director of Fermilab and Professor of Physics at the University of Chicago.
- **Neal Lane**, Senior Fellow of the James A. Baker III Institute for Public Policy and Professor of Physics & Astronomy at Rice University.
- **Leon Lederman**, Physics Nobel Laureate and Director Emeritus (1979-1989) of Fermilab.
- **Pier Oddone**, Director of Fermilab.
- **Jill Tarter**, Director, Center for SETI Research at the SETI Institute.



Leon Lederman
Photo courtesy of Fermilab

Workshops

Congress attendees will debate scientific citizenship issues during a series of workshops. The workshops will consist of invited talks by citizen scientists and round-table discussions on the role of the scientist in addressing these issues within the community, society, and government.

Workshops include:

- **Energy Efficiency**, Led by David Goldston, Scholar in Residence at the Woodrow Wilson School and Julia Philips, Director of the Physical, Chemical, & Nano Science Center at Sandia National Laboratories.
- **Scientific Citizenship in the Public Eye**, Led by Mike Fortner, State Representative in the Illinois

General Assembly and Louis Lanzerotti, incoming chair of the American Institute of Physics (AIP) governing board, former mayor and member of his local school board. *(continued on next page)*



An ethics workshop at the 2004 Congress
Photo by Tracy Schwab



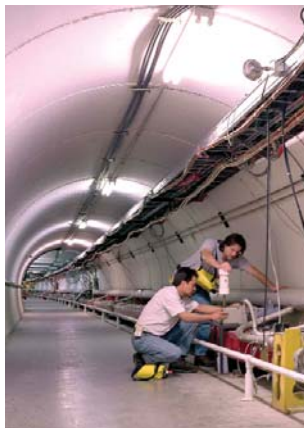
(Workshops, continued from previous page)

- **Science Curriculum Integrity**, Led by Adrian Melott, founding director of Kansas Citizens for Science.
- **Communicating Science to the Public**, Led by Aziza Baccouche, president of AZIZA Productions, Inc.

More speakers & workshop leaders to come—watch the Congress website!

Fermilab Tours

All Congress attendees will be treated to tours of Fermilab's cutting-edge experimental facilities. Anticipated tour stops include the Linear Collider, the Collider Detector at Fermilab (CDF), the D-Zero detector, the Main Injector Neutrino Oscillation Search (MINOS) facility, and the Lederman Science Center.



*The Tevatron Accelerator
Photo courtesy of Fermilab*

Future Faces of Physics Events

SPS is engaging in a year of dialogue on student diversity in physics, with the intent of increasing the visibility and focus on this issue for the physics community. The Future Faces of Physics zone meeting kits and Jeopardy game are part of this effort. The Congress will include a special poster session, plenary session, and Jeopardy game focused on the issue of diversity in science. Details on these sessions will be posted on the Congress website as they become available.

Poster Sessions

Present a research, outreach, or Future Faces of Physics poster at the Congress! Poster sessions will be held on Friday and Saturday afternoon. Abstracts can be submitted beginning in May, when registration opens.



*Poster session at the 2004 Congress.
Photo by Tracy Schwab*

Art Contest & Display

The Fermilab grounds boast unique architecture and art. Founding director Robert R. Wilson, a renowned physicist and an accomplished artist and sculptor, believed that a research laboratory should be a cultural center for the community and the nation.

In celebration of Wilson's vision, Congress participants are encouraged to submit their 2- and 3-D creations for display and/or judging at the Congress. See the Congress website for details.

For fundraising ideas, information on trip planning and travel awards, and more program details, visit the Congress website:



*The Tractricious sculpture at Fermilab's Industrial Center
Photo courtesy of Fermilab*

www.sigmapisigma.org/Congress/2008/

ANNOUNCING THE CONGRESS REPORTER AWARDS FOR SPS CHAPTERS

Would your Chapter like \$500 to help offset your registration and travel expenses to the Sigma Pi Sigma Quadrennial Congress and the chance to share your experience with others?

Apply for a \$500 Congress Reporter Award!

HOW IT WORKS:

- Your Chapter applies for the award by sending an e-mail to Kendra Rand (krand@aip.org) stating your Chapter's intent to be a Congress Reporter.
- At least four members of your Chapter (may include faculty) register for and participate in the Congress.
- On returning from the Congress, the attendees compile a report that includes tales from the road, photos, an interview with a speaker (or other assigned task), and highlights from the meeting.
- Your Chapter sends the report to SPS and to the donor(s) that sponsored your award.
- Upon receipt of your Chapter report, SPS sends your Chapter a check for \$500 to reimburse travel expenses.

Should your situation require that some or all of the award be provided prior to the Congress, please contact the National Office.

For more information, please visit www.sigmapisigma.org/congress/2008/ or use the contact information below.

Sigma Pi Sigma/Society of Physics Students

American Institute of Physics
One Physics Ellipse ♦ College Park, MD 20740
Tel: 301.209.3007 ♦ Fax: 301.209.0839
E-mail: sps@aip.org

Congress Highlights: Fermilab Tours

All registrants will be treated to tours of Fermilab's cutting-edge experiments and facilities. Anticipated tour stops include:

The Accelerators

The **Linac**, approximately 500 feet long, accelerates charged hydrogen ions to about 70% of the speed of light. The ions then pass through a carbon foil, which removes electrons from the hydrogen ions, creating positively charged protons.

The protons continue to accelerate as they travel through the Booster, a circular accelerator, and the Main Injector, which accelerates protons, delivers protons for antiproton production, and accelerates antiprotons coming from the antiproton source. Then the particles enter the Tevatron.

Fermilab's **Tevatron** is currently the most powerful particle accelerator in the world. Protons and antiprotons circle around the four-mile accelerator at almost the speed of light in opposite directions, before colliding in one of the detectors.

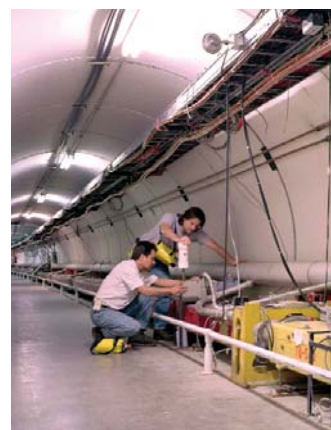
The Detectors

Protons and antiprotons accelerated in the Tevatron collide head-on inside the huge **Collider Detector at Fermilab** and the **DZero** detector, where their collisions are studied. International collaborations of scientists use the information to search for evidence of new physics, such as the Higgs Particle; measure and study the decay of known particles such as electrons, muons, and taus; and measure the production properties of known particles and jets.

Protons from the Tevatron are also used to create a beam of elusive neutrino particles. The **Main Injector Neutrino Oscillation Search experiment** shoots this beam underground through the "near" detector located underground at Fermilab to a "far" detector located in a historic mine 450 miles away, and is designed to observe the phenomena of neutrino oscillations, an effect related to neutrino mass.



*The Linac (Linear Accelerator)
Photo courtesy of Fermilab*



*The Tevatron Accelerator
Photo courtesy of Fermilab*

The Lederman Science Education Center

The Lederman Science Center, named for Nobel Laureate, former Fermilab Director, and Congress plenary speaker Leon M. Lederman, is host to several interactive exhibits including ones on accelerators and detectors. This facility is used for education and

outreach to children of all ages, giving them hands-on experience exploring how Fermilab physicists understand nature's secrets.

And More!

While at Fermilab you'll also get to see a number of unique sculptures that represent the intersection of art and science, floor-to-ceiling blackboards covered in equations and diagrams, award-winning wetlands, distinctive architecture, and maybe even Fermilab's herd of American bison.



*The American Bison herd at Fermilab.
Photo courtesy of Fermilab*



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Get to Congress: Planning Your Trip

Fermilab is located 35 miles west of Chicago, in Batavia, IL.

How do we get there?

The closest airports to Fermilab are Midway and O'Hare.

Chicago Midway Airport

www.chicago-mdw.com

Distance to Hotel: 31.2 miles

O'Hare International Airport

www.ohare.com

Distance to Hotel: 26 miles



We strongly encourage schools within driving distance to look into renting a van or bus and carpooling with other Congress attendees – remember to include space for luggage!

Where should we stay?

The official Congress hotel is the Holiday Inn Select® in Naperville, IL. Some Congress events will be held here, although the majority will be at Fermilab. The hotel is about 13 miles from Fermilab, but transportation will be provided between the hotel and Fermilab daily. The Congress kicks off Thursday evening and concludes Saturday night, so expect to stay three nights.

Holiday Inn Select®

1801 N. Naper Blvd.

Naperville, IL 60563

Phone: 1-630-5054900

Fax: 1-630-5058239

www.naperselect.com

Room rates for Congress attendees are \$109/night for up to quadruple occupancy.

For other lodging options check out: <http://bss.fnal.gov/travel/hotels.html>

What else is there in town?

- Information about the area (compiled by the Graduate Student Association of Fermilab): www.fnal.gov/orgs/gsa/guide/v2000/WestSuburbs.html
- Restaurants near the hotel: <http://theory.fnal.gov/people/ellis/restaurants.html>
- Naperville Riverwalk Settlement - 2 miles from Fermilab: www.nicerweb.com/sketches/NPD/Riverwalk/riverwalk.html
- Cantigny Park (Gardens and Museum) - 9 miles from Fermilab: www.cantigny.org
- Morton Arboretum - 14 miles from Fermilab: www.mortonarb.org
- Hollywood Casino – 15 miles from Fermilab: www.hollywoodcasinoaurora.com
- Argonne National Laboratory - 25 miles from Fermilab: www.anl.gov
- Downtown Chicago – 35 miles from Fermilab: www.choosechicago.com

Check the Congress website for more travel details and tips!



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Get to Congress: Fundraising Ideas

Start raising funds now for your trip to congress.

1. Approach the student government/senate for funds.

Emphasize that it is a national meeting of physics students and professionals with top-notch speakers (list them). It is also helpful to build in a contribution by the student and the department with the proposal--say \$100 each or so.



2. Take advantage of department specific items:

- Buy textbooks for a discount and sell them to students.
- Sell lab manuals.
- Have a used book sale.
- Have a “garage sale” or silent auction of department junk. Old scientific apparatus makes fine curiosities. (You might even try selling them on e-bay!)

3. Tie fundraising in with your SPS activities:

- Sell physics themed t-shirts/toys for a profit. (Not just to your SPS members!)
- Provide tutoring for a fee—especially right before exams in the freshman physics classes. (Check out an SPS chapter that does this: www.phy.ilstu.edu/~phyclub/tutoring.html)
- Host a liquid nitrogen ice cream social.

4. Don't forget about food:

- Sell donuts or other baked goods regularly in your Physics/Science building in high traffic areas. (Be sure to check with your school on the rules pertaining to this!)
- Try hosting bake sales in front of local businesses. (Don't forget to get approval from store management.)
- Sell pizza and snacks during a “study party” before big tests. (Or while you help tutor freshman students.)

5. Be Creative!:

- Try a “Rent-a-Student” Campaign with your campus community.
 - Campus Professors and Staff often need help with things during the fall months (raking leaves, washing cars, tutoring,etc.). Set aside a couple Saturday mornings and offer your services each morning for a fee.
- Have a car wash in winter, especially where they salt the roads. (Many Wal-Marts and other stores will match what you make.)



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Choose Your Representatives! The "One & One" Campaign

By participating in the Congress, your chapter will help set the course for the future of Sigma Pi Sigma. Congress attendees will debate scientific citizenship issues during roundtable discussions and will formulate recommendations for action by the Society and its members. These recommendations* will be taken to a vote of endorsement Saturday evening. Sigma Pi Sigma chapters** in attendance will be allotted up to two votes in the deliberative process, ideally one vote to a student delegate and one vote to an alumnus delegate. **Therefore, all chapters are encouraged to send a minimum of "One & One" to the 2008 Congress—one student and one alumnus.**

Chapters are encouraged to send as many people as possible to the Congress, and all in attendance will be included in the deliberation process. The "One & One Campaign" seeks to identify those who will carry out the voting on behalf of their chapter.

As you plan for the 2008 Congress, please take the time to choose your representatives and let us know who they are using the form below, or online at www.sigmapisigma.org/congress/2008/one_and_one_form.htm.

*Recommendations voted on at the 2004 Congress: www.sigmapisigma.org/congress/2004/ethics.htm.

**Although voting delegates serve as the official representatives of $\Sigma\Pi\Sigma$ chapters at the Congress, ALL Congress attendees will be actively engaged in the discussions leading up to the vote. If your college or university does not have a Sigma Pi Sigma chapter but would like to vote, please contact the SPS national office (sps@aip.org).

Chapter & Advisor Information

Institution _____

Advisor's Name _____

Advisor's Email _____

Part I: Chapter's Voting Delegates (Ideally one student and one alumnus)

Name of First Rep. _____

Email address _____ Phone Number _____

Address _____

City _____ State _____ ZIP Code _____

Name of Second Rep. _____

Email address _____ Phone Number _____

Address _____

City _____ State _____ ZIP Code _____

Part II: Chapter/Group Attendance

Additional members of our chapter are coming to the 2008 Congress! (Indicate approx. number below)

- 3-5 people 6-10 people 11-20 people more than 20 people

Mail or Fax your Completed Form to:

Sigma Pi Sigma / Society of Physics Students

American Institute of Physics • One Physics Ellipse • College Park, MD 20740

Tel: 301.209.3007 • Fax 301.209.0839

www.sigmapisigma.org/congress/2008/



Present a Research Poster!

All members of Sigma Pi Sigma and the Society of Physics Students are invited to submit a poster for the Friday or Saturday Poster Sessions. Start thinking now about what you'd like to present!

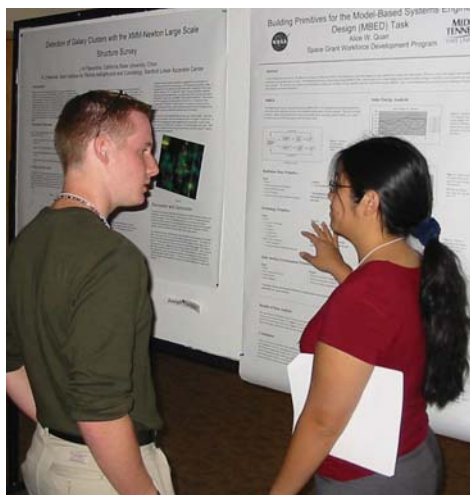
Friday Poster Session: November 7, 2008

- Research from any field of physics or applied physics
- Reports on the career trajectories of "hidden" physicists
- General science education and outreach activities

Saturday Poster Session: November 8, 2008

- Outreach with an emphasis on reaching under-represented groups
- *Future Faces of Physics* Celebration
 - Chapters that sponsor a *Future Faces of Physics* event on their campus or in their community and want to present a poster on that event will be eligible for \$200 travel stipend to the Congress. See the Congress website for details.
- Read about *Future Faces of Physics* on the Society of Physics Students website: www.spsnational.org/news/2007/future_faces.htm.

Abstracts can be submitted beginning in May, when registration opens. Watch the Congress website for more details.



Poster presenters at the 2004 Sigma Pi Sigma Quadrennial Congress in Albuquerque, NM.



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Showcase Your Artwork at Fermilab!

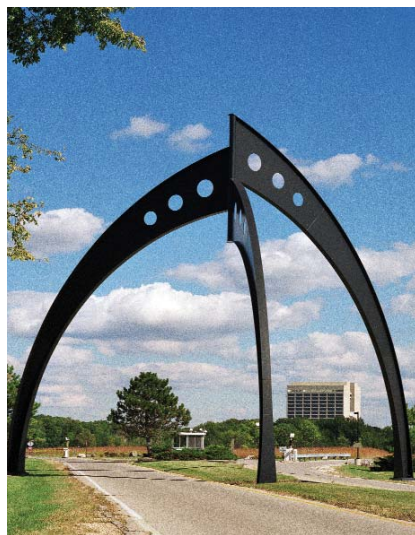
Fermilab's founding director Robert R. Wilson was a renowned physicist and an accomplished artist and sculptor. He believed that a research laboratory should be a cultural center for the community and the nation.

In celebration of Wilson's vision, Congress participants are encouraged to submit their 2- and 3-D creations for display and/or judging at the Congress.

Submissions of any type of visual art, such as paintings, photographs, holograms, and sculptures are invited from any Congress attendee. Collaborative projects, particularly those by SPS or $\Sigma\Pi\Sigma$ Chapters, are also invited. Art must be original and submitted by the artist(s).

Rules for Submissions

1. Entrants may submit multiple works of art, either individual or as part of group submissions. Work may be designated as "display only" if the artist prefers that it not be considered for prizes.
2. Artwork must meet the specifications given on the Congress website.
3. Artwork must be entered by the artist into one of following categories:
 - General Science
 - The Citizen Scientist
 - Future Faces of Physics
 - Open (non-themed)
4. Each submission must be accompanied by a summary of no more than 200 words, explaining how the piece exemplifies the theme for which it is submitted (in the case of the open category, a description of the work is sufficient). Each summary should be mounted onto a 4 x 6" index card and will be hung next to the entry.
5. Artists must fill out the on-line submission form on the Congress website by October 15, 2008.
6. Artists are responsible for transporting their artwork to the Congress. They may ship the artwork in advance (see website for details) or bring it with them to the Congress. Artists bringing their own work should bring it to the registration desk Thursday evening or by 8 AM Friday, November 7, 2008.



The Broken Symmetry gateway sculpture frames Wilson Hall.

Photo courtesy of Fermilab

Selected winners will be funded to display their work at a regional or national physics meeting. Visit the Congress website for information on artwork specifications, prizes, and to submit your entry.



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