

2008 Sigma Pi Sigma Quadrennial Congress Report

The Society of Physics Students Chapter at the University of Southern Mississippi

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Who We Are

The University of Southern Mississippi chapter of the Society of Physics Students is an active and thriving organization that greatly benefitted from the Congress. As an organization we already promote undergraduate research by holding “*Jam Sessions*,” where the physics and astronomy faculty are invited to speak directly to underclassmen about their research and the opportunities to work with them. Our chapter received the 2007 *Sigma Pi Sigma Undergraduate Research Award* for a “*Systematic Characterization of a Rubidium Magneto-Optical Trap*”. One of our SPS members, Gregory Carson, has been recognized with the 2007 SPS *Outstanding Student Award for Undergraduate Research*. Our chapter has been extensively involved in performing high school outreach and recruitment, in conjunction with a nation-wide outreach campaign, the “*Absolute Zero and the Conquest of Cold*”. We visited twenty high schools across the states of Mississippi and Alabama and performed liquid nitrogen demonstrations to approximately 1000 high school students. The USM SPS chapter has been recognized as a 2007 *Outstanding SPS Chapter* by SPS National and as the 2007 *Outstanding Student Organization of the Year* by the USM Student Activities Office. In addition, Kileigh Peturis, the 2007-08 SPS president has been recognized by the USM Student Activities Office with the *Outstanding Student Organization Officer of the Year Award*. Dr. Alina Gearba, our SPS faculty advisor, has been recognized by the USM Faculty Senate and Presidential Awards Committee with the 2008 *Mentoring Award*.

How We Got There

The Sigma Pi Sigma Congress became a priority on our chapter’s agenda at the end of the spring 2008 semester. A few of the officers were sitting around the office late one night trying to find something to do other than our mechanics homework, when one of us stumbled upon it. All that was said was, “Hey, anyone wants to go to Fermi Lab for the Congress?” Being freshly inducted into the Sigma Pi Sigma, hands went up immediately. So, we worked out with our faculty advisor who should attend the congress and began planning for it. Fund-raising was a big part of the planning process and we are grateful to have received support both from the Physics Department and the Student Government Association, in addition to the Congress Reporter Award. Of course, us being the procrastinators that we are, we forgot about our commitment over the summer and ended up scrambling to submit our abstracts and register online the day before the deadline. But, in the end we got everything in and we were all set to go! Of course, afterwards two more students decided they wanted to go, so there were late fees to be paid on the registration and last minute plane tickets to be bought, so there was some more scrambling. Not to mention that our research and outreach posters got printed the day before the congress started. But again, we took care of everything and we were set to go! Three of us were to fly out of Gulfport, MS together, but two of us are from the Mobile, AL area. So, we made the trip home the night before so that parents could drop us off at the airport to avoid parking fees. More

procrastinating by the Vice President, led to a late night drive from Hattiesburg to Mobile, followed by a 3:00 am trip to Wal-Mart for something warm to wear at the conference. We live in South Mississippi after all! So, staying up late led to leaving late for the airport, which made for one nervous chapter President. We arrived just in time though, and we were off to Chicago (after the VP's bags got searched, of course). Now, there was quite a fiasco at O'Hare. We got off the plane and claimed our luggage without any problems, but exiting the building turned out to be nearly impossible. The entire lobby is glass, so we could see the street. We saw people walking around outside, saw taxi cabs picking people up, but we could not seem to figure out how they got out there! The exit door was nowhere to be found. We went up and down escalators, up and down stairs, back and forth down hallways, round and round in circles but could not find the door. Defeated, we all sat in the floor around our luggage, debating what to do next, when one of us looked up and noticed a sign glaring at us from above, "EXIT." Finally, we were free. All that was left was to find a taxi. Another fiasco followed, but after about 20 minutes of running back and forth down the sidewalk searching for taxi number 260, we were finally on our way to the hotel, where our faculty advisor was waiting on us impatiently.

Benefits of the Congress

We annually attend the region SPS Zone 10 meeting where we take advantage of the excellent opportunities to hear and present undergraduate research and to participate in discussions with other chapters. The Sigma Pi Sigma Quadrennial Congress 2008 turned out to be one in a lifetime opportunity! The workshops tailored to the theme of the congress, "*Scientific Citizenship: Connecting Physics and Society*", led to some excellent discussions that our chapter is planning on how to act on. The location of the Congress at Fermi National Accelerator allowed for an excellent opportunity to talk to professional physicists and tour its impressive research facilities. Several key-note speakers were invited for this event: Young-Kee Kim, Deputy Director of Fermi Lab, Leon Lederman, Noble Laureate and Director Emeritus of Fermilab, Jill Tarter, Director of the Center for SETI research at the SETI Institute, Julia Phillips, Director, Physical, Chemical and Nano Science Center, Sandia National Lab and many others. Besides delivering outstanding presentations at an undergraduate student level, the speakers were extremely thought provoking and encouraging, which has spurred on an ambition in our chapter to reach out in to the local community and promote physics. We are overwhelmingly grateful for the opportunity to attend such an informative and challenging conference. It is our sincere desire to make the most of our time and efforts in promoting physics in the light of the ideas presented at the Congress.

The Congress was also entertaining. Even though most of the participants had physics in mind, there was still time for fun. In between and after sessions, our SPS group socialized with other SPS chapters. On Thursday night we ordered pizza and played card games with students from Juniata College. On Friday and Saturday nights, we spent some time with students from both Iowa State and Juniata. Today we are still keeping in touch with these friends, and hopefully we will see them again in the future. We really enjoyed meeting people we had something in common with, but even though we all study physics, the group of people at the Congress was still very diverse. Another entertaining aspect of the Congress was provided by the speakers. Almost all of them had a good sense of humor, especially the Nobel Laureate, Dr. Leon Lederman. It was great to receive a great deal of information during the lectures, but having comic relief kept the mood of the audience happy.

Highlight on the Scientific Citizenship Workshop I: The Evolution of Science Curricula and What Our Chapter Is Doing For Science Education

The purpose of the 2008 Sigma Pi Sigma Quadrennial Congress hosted at Fermilab was summed up by former SPS and Sigma Pi Sigma director Phillip Hammer. He posed the question, “*What is scientific citizenship and how can science make a difference?*” The structure of the workshops was to invite a speaker to highlight a specific area for scientific citizenship to provoke some thought towards the direction of Sigma Pi Sigma and SPS. The floor was then open for a brief question and answer session between the speaker and the audience. Then the entire assembly broke into groups of about 20 to have roundtable discussions to propose actionable ideas.

The first speaker, Adrian Melott, founder of the Kansas Citizens for Science, gave some insight from an episode of science activism between 1998 and 2003. Melott fought for the Kansas School System to teach the Theory of Evolution in its science curricula. His first objective was to gain public attention. He and some colleagues formed the organization Families for Learning Accurate Theories (FLAT), which advertized with hoax campaigns on the local media for a couple of months. With the public’s attention, he moved on to a more serious approach. After reviewing the science standards in the curriculum, he moved to political organizing through the internet, news, and letters to the editor. The Kansas Citizen’s for Science attended state school board meetings, but were fairly unsuccessful until their efforts were noticed by the corporate sector. When media began highlighting the events and industries began pulling out of Kansas, then the Kansas Citizens for Science could point out the pragmatic economic and personal issues that impacted the general population. Melott said that there was political turnover at this point, but there was not much action taken past this incident. The Kansas Citizens for Science soon lost membership and the issue was unsettled.

Melott’s talk provoked some passionate discussions in the roundtable discussions at Fermilab, which set the tone for the ideas that were generated at the Congress. Many of the discussions determined that a large portion of the public’s disinterest and possibly distrust in the sciences is due to the adult population’s lack of education and misinformation in the science fields, specifically physics, which is the basis for every other science. In this day in time, it is imperative that the general public begins listening and trusting scientists’ advice on crucial issues facing the world, such as the current energy situation. In a step towards public confidence in science, it was discussed that adult education is a top priority as well as school system reform to avoid the current situation in future generations.

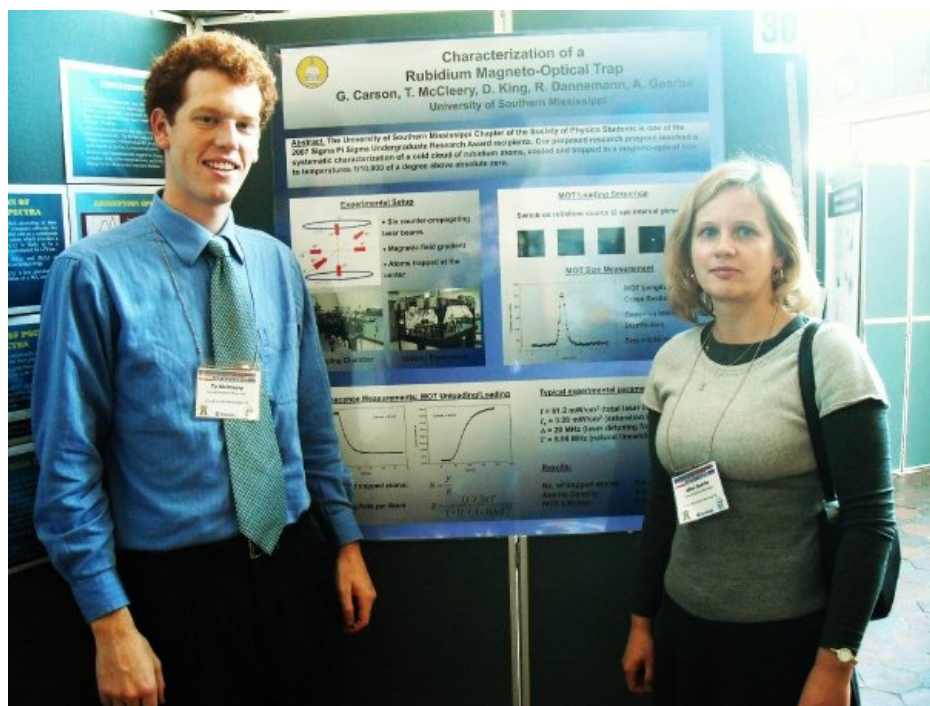
The Southern Miss Chapter of the Society of Physics Students has taken the ideas discussed at the Congress and formed a plan for how a university student organization can make an impact in the local community and hopefully farther. Among the ideas discussed, SPS at USM is strategizing on how to implement community education on the importance and applicability of physics. 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. To make this a priority in rural school systems, we must be able to relate how physics is not only applicable but fundamental in the general public’s daily life. We have tossed around ideas of public outreach demonstrations of basic physics concepts or short media segments covering how such things as a light bulb or a generator works. We have even considered attending town hall meetings to determine what issues the local population is

encountering to inform city officials and the public of how physics is applicable in these situations. If these public education efforts are successful, we should be able to present their usefulness to the school boards as justification for teaching a physics course. The course will not only be a benefit in itself, but the public education used to get there will make giant steps towards changing public opinion about the sciences and their importance.

We realize that these plans are ambitious, and these are not short term goals. It is therefore our intent to organize a plan of action to be carried out by numerous classes of SPS members over the next number of years. We also will be seeking support of local and national organizations and corporations who share common goals. We've known that physics, and really all science, education has been lacking in Mississippi. Since the 2008 Sigma Pi Sigma Congress, we've found direction towards remedying this problem. Hopefully, the next time you hear about science education in Mississippi, it's along the lines of a local Society of Physics Students chapter educating the public about the importance of Physics!



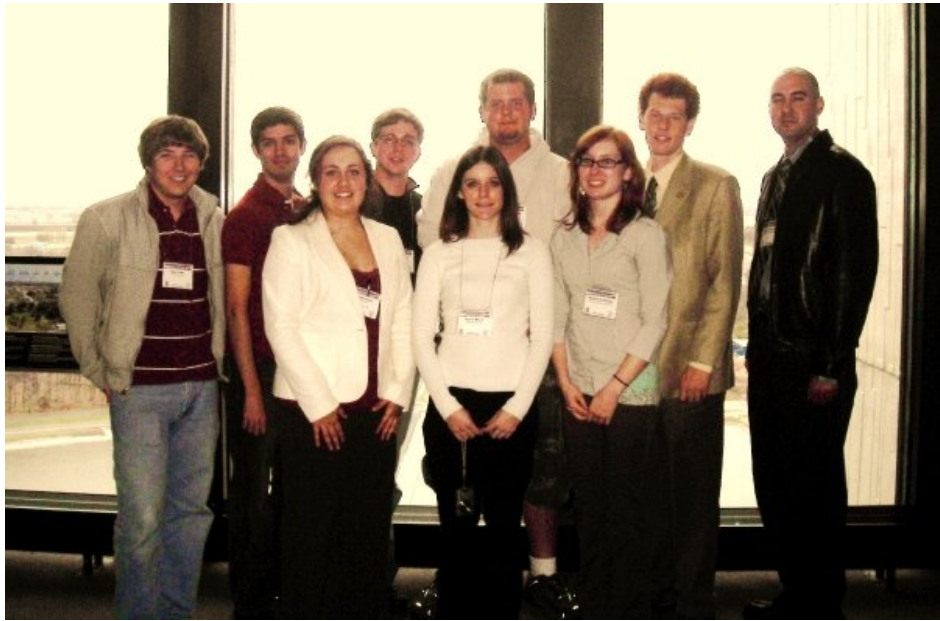
W. Tyler McCleery and Kileigh Peturis engaged in discussing scientific citizenship



W. Tyler McCleery and Dr. Alina Gearba in front of their research presentation



W. Tyler McCleery and Kileigh Peturis on top of the world
(Not exactly, but on the 15th floor of the Wilson Hall at Fermilab)



Friends Forever: Southern Miss and Iowa State SPS Chapters



Grand Finale (Nobel Laureate Leon Lederman's Plenary Lecture)