

# *Conference Experience for Undergraduates in the Division of Nuclear Physics – 10 years Running*

Supported by:

- National Science Foundation
  - Department of Energy
  - Division of Nuclear Physics
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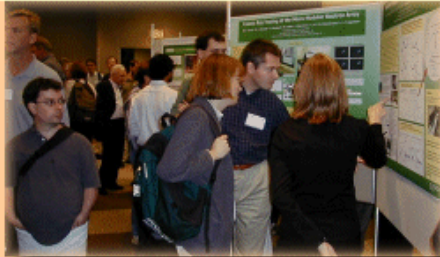
# Conference Experience for Undergraduates (CEU)

[Fall 2007 Meeting - Division of Nuclear Physics](#)  
[American Physical Society](#)  
Newport News, Virginia  
10-13 October, 2007



The goal of the CEU is to provide a "capstone" conference experience for undergraduate students who have conducted research in nuclear physics, by providing them the opportunity to present their research to the larger professional community and to one another. Additionally, it enables the students to converse with faculty and senior scientists from graduate institutions about graduate school opportunities.

This year's tenth annual CEU is being held in conjunction with the Fall 2007 DNP meeting of the American Physical Society. CEU07 events will include a poster session for the presentation of student research, in addition to several activities scheduled throughout the DNP meeting for the benefit of the participating undergraduates. **Travel and lodging awards will be granted to the top applicants.**



**Conference Experience for Undergraduates 2007 Resources:**

# CEU Mission Statement

*The goal of the CEU is to provide a "capstone" conference experience for undergraduate students who have conducted research in nuclear science, by providing them the opportunity to present their research to the larger professional community and to one another.*

*Additionally, it enables the students to converse with faculty and senior scientists from graduate institutions about graduate school opportunities.*



CEU2007 – Newport News, VA

# *National Academy of Sciences*

*“Rising Above the Gathering Storm”*

*Energizing and Employing America for a Brighter Economic Future*

- Chaired by Norman Augustine, retired chairman of Lockheed Martin Corporation
  - Findings presented to Congress on 20 October 2005
  - American Competitiveness Initiative – Feb 2006 State of the Union Address – Double NSF and DOE budgets
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# *“Worrisome” Indicators*

- Undergraduates receiving their degrees in natural science or engineering
    - South Korea – 38%
    - France -
    - China – 59%
    - Singapore – 67%
    - United States – 15%
  - During 2004, China overtook the United States to become the leading exporter of information-technology products, according to the Organization for Economic Co-operation and Development (OECD)
  - In 2004, China graduated over 600,000 engineers, India 350,000, and America about 70,000
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- The United States is today a net importer of high technology products. Its trade balance in high-technology manufactured goods shifted from plus \$54 billion in 1990 to negative \$50 billion in 2001
  - A company can hire nine factory workers in Mexico for the cost of one in America. A company can hire eight young professional engineers in India for the cost of one in America
  - In 2000, 93% of students in grades 5–9 were taught physical science by a teacher lacking a major or certification in the physical sciences (chemistry, geology, general science, or physics)
  - About one-third of US students intending to major in engineering switch majors before graduating
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# *NAS study*

- Key recommendations:
    - Increase the quality of *K-12 math and science education* (10,000 teachers, 10 Million minds)
    - *Research* (sowing the seeds)
    - *Higher education* (best and brightest)
    - *Economic policy* (incentives for innovation).
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# *NSAC Education Subcommittee – November 2004*

- ... in a time when the general public has become more and more critical of the need for basic scientific research, nuclear science faces especially acute public misperceptions.
  - We recommend that the nuclear science community work to increase the number of new Ph.D.'s in nuclear science by approximately 20% over the next five to ten years.
  - We recommend that there be a concerted commitment by the nuclear science community to be more proactive in its recruitment of undergraduates into nuclear science, especially among underrepresented groups. We also recommend that the NSF and the DOE continue to be supportive of requests for recruitment and outreach support.
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# *Conference Experience for Undergraduates through the years*



1998: Santa Fe, NM



2000: Asilomar, CA



1999: Williamsburg, VA



2001: Maui, HI



2002: East Lansing, MI



2003: Tucson, AZ



2004: Chicago, IL



2005: Maui, HI



2006: Nashville, TN



2007: Newport News, VA

... 2008: Oakland, CA

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# *Basic components of a typical CEU*

- Research poster session
  - 2 nuclear science seminars
  - Ice cream social
  - Graduate school information session
  - Full participation in the DNP meeting
  - DNP banquet
  - Group photo opportunity
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# *CEU nuclear physics seminar speakers*

- 1998: Harry Lipkin
  - 1999: Barbara Jacak, Alejandro Garcia
  - 2000: Eric Norman, Michael Thoennesen
  - 2001: Michael Thoennesen, Baha Balantekin
  - 2002: Betsy Beise, David Hertzog
  - 2003: Con Beausang, Filomena Nunes
  - 2004: Hendrik Schatz, Naomi Makins
  - 2005: Hirokazu Tamura, Rebecca Surman
  - 2006: Brant Johnson, Jolie Cizewski
  - 2007: Noemie Koller, Jerry Gilfoyle, CEU mini-symposium
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# *Budget targeting*

- Awards are competitive
    - All deserving participants receive lodging
    - Travel awards judged by review committee made of 5 DNP members
    - Initial awards list and waiting list
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# APS News, February 2006

APS NEWS

## Undergrad Awards Promote Student Participation at DNP Meeting

Last September about 75 undergraduates were able to mix the pleasure of attending a nuclear physics conference with the business of hanging out on the beach in Hawaii.

The students were in Maui attending the 2005 Division of Nuclear Physics meeting as part of the Conference Experience for Undergraduates (CEU). Each year the CEU program brings between 70 and 90 undergraduates to the DNP meeting. The students, who have done research in nuclear physics, present their work at a special undergraduate poster session.

CEU draws applications from students around the country. These applications are reviewed by a committee, and about half receive travel and lodging awards. Funding for the CEU awards is provided by the NSF

“I had a lot of positive comments about my research. One group thought it was very impressive that I could get the project done in one summer, and another thought the ideas behind it were very interesting,” said Daniel Passmore, a student at the University of Tennessee, Knoxville.

Scientists at the meeting have been very impressed with the students’ research, said Rogers. “They are amazed at the quality of the undergraduate work. The students find out that their research is truly valued. I think that is very motivational for them.”

“Numerous DNP colleagues have also expressed sincere appreciation for the energy and enthusiasm the students bring to the meeting, and several have reported that meeting the students and attending the



*Photo credit: Warren Rogers*  
*NSF Assistant Director Michael Turner (in red shirt) chats with CEU participants at an ice cream social during the DNP meeting in Maui.*

nuclear physics.

Some of the 2005 CEU students say they plan to continue to study nuclear physics, while others have interests in different fields. They were certainly glad to have had the chance to attend the meeting.

“I can’t believe what wonderful opportunities physics has opened up for me,” said Mahmood.

Beverly Lau, a CEU participant

## NSF Highlights

### Conference Experience for Undergraduates Celebrates 10th Annual Event

Highlight ID: 16597

The Conference Experience for Undergraduates (CEU) activity celebrated its 10th anniversary at the Fall 2007 meeting of the Division of Nuclear Physics of the American Physical Society in Newport News, VA. The goal of the CEU is to provide a "capstone" conference experience for undergraduate students who have conducted research in nuclear physics, by providing them the opportunity to present their research to the larger professional community and to one another. Additionally, it enables the students to converse with faculty and senior scientists from graduate institutions about graduate school opportunities. The program, funded by NSF with additional contributions from major national laboratories, provides travel and lodging awards to the top applicants, typically numbering up to 90. The central activity for CEU is a poster session, which is heavily attended (standing room only) by senior researchers. There is also a special guest lecture session for CEU students, who hear overviews of topics to be covered the plenary invited talks.

For the 10th annual event, several CEU alumni were invited back, including one assistant professor, four postdoctoral fellows, and three graduate students, to discuss their current activities, and the impact of CEU on their career preparation.

#### *Primary Strategic Outcome Goal:*

- Disciplinary/Interdisciplinary Research (Anything not covered by one of the 12 categories below.)

#### *Secondary Strategic Outcome Goals:*

*How does this highlight address the strategic outcome goal(s) as described in the [NSF Strategic Plan 2006-2011](#)?:*

This activity provides a critical link for undergraduate research experience, allowing them to present their results and interact with professionals in the scientific community.

***Does this highlight represent transformative research? If so, please explain why.***

*The National Science Board has defined transformative research as "Research that has the capacity to revolutionize existing fields, create new subfields, cause paradigm shifts, support discovery, and lead to radically new technologies." National Science Board: [Enhancing Support of Transformative Research at the National Science Foundation](#)*



CEU 2007 attendees.

Permission Granted  
Credit: Warren Rogers



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## Conference Experience for Undergraduates

Global

Information [edit](#)

## Group Info

Name: Conference Experience for Undergraduates  
 Type: [Common Interest - Science](#)  
 Description: This group is for all students who have participated in the Conference Experience for Undergraduates, Division of Nuclear Physics, American Physical Society.

## Contact Info

Email: [rogers@westmont.edu](mailto:rogers@westmont.edu)  
 Website: <http://physics.westmont.edu/ceu/>

Recent News [edit](#)

DNP07 at Newport News, VA, October 10-13, 2007. See the pictures at <http://physics.westmont.edu/ceu/>.

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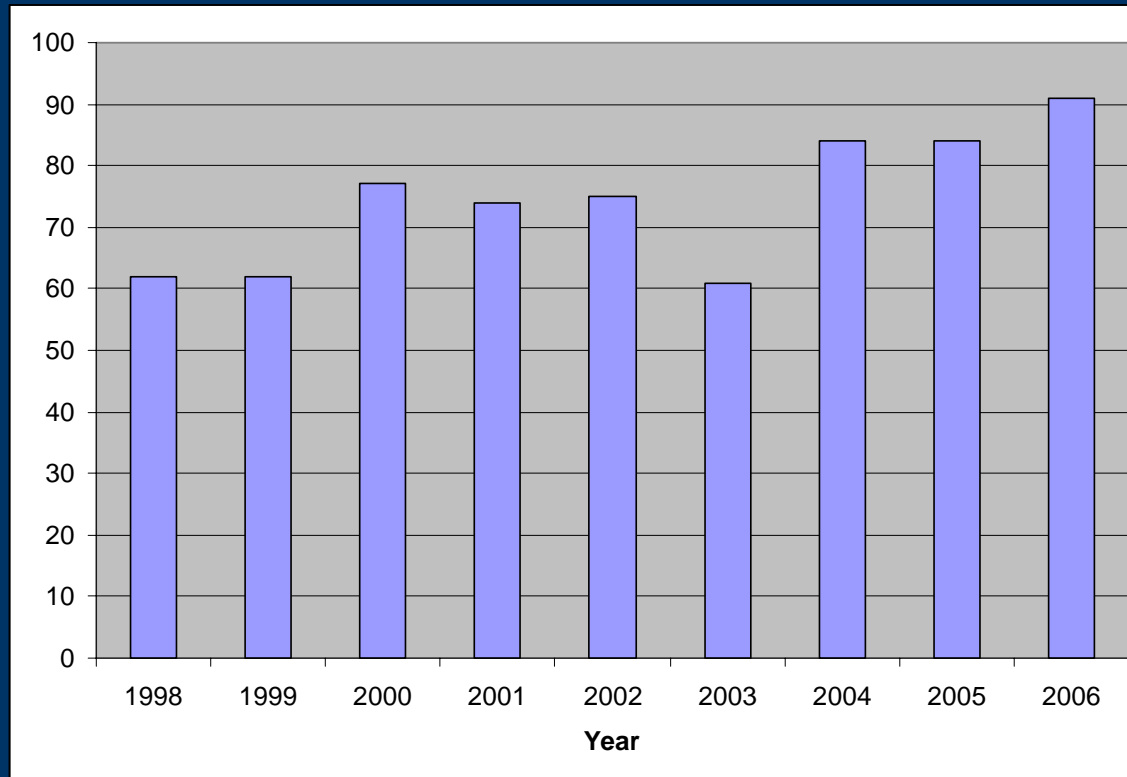
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So I Could Lie Tangent To Your Curves!

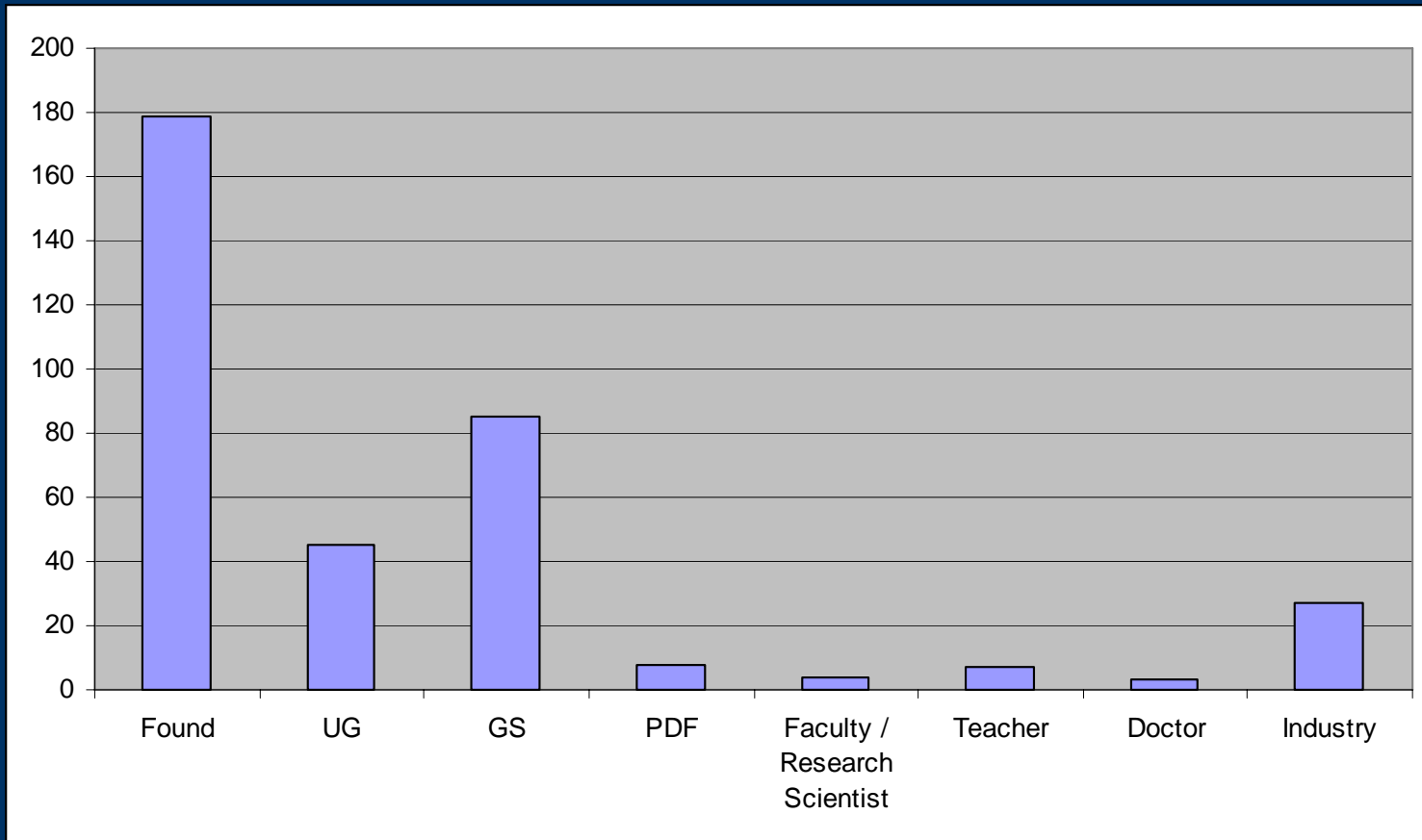
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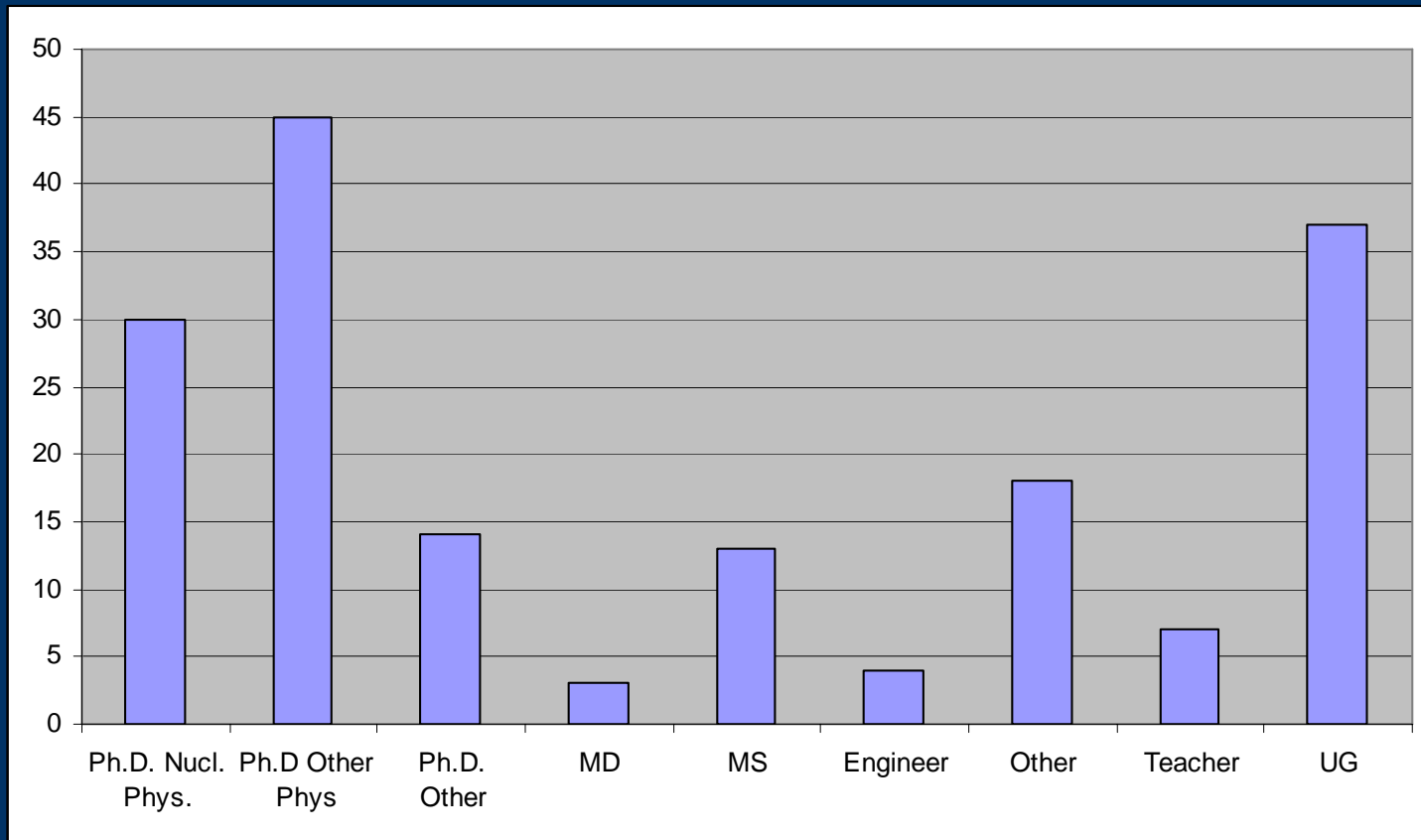
# *Preliminary Analysis – CEU tracking - Con Beausang and Peggy McMahan*



Total attendance at the annual CEU. Since the first CEU in 1998 a total of approximately 750 students have attended.



So far we have managed to 'find' ~180 (27%) of students prior to 2007. This figure summarizes the career paths taken by these students.



This figure summarizes the sub-fields chosen by the students. For Ph.D. students, the field of study for students currently enrolled in graduate school is listed. For students who have completed their Ph.D. the field of their degree is listed. The 'Other' category basically lumps together careers in industry, one monk etc. High school teachers are all science and probably all physics teachers. Some intelligent guesses had to be made in some cases. Out of ~180 students, ~75 (42%) went on to do (or are doing) Ph.D.'s in physics, 30 (17%) into nuclear physics.

# Recent statistics

October 2006, Nashville, TN

88 undergraduate students  
62 Men (70%)  
26 Women (30%)

Ethnic breakdown:

White	55	86%*
Black	5	8%
Hispanic	2	3%
Asian	2	3%
Not reported	24	

October 2007, Newport News, VA

90 undergraduate students  
63 Men (70%)  
27 Women (30%)

Ethnic breakdown:

White	62	83%*
Black	2	3%
Hispanic	3	4%
Asian	8	10%
Not reported	15	

\* Relative to those who reported

# CEU 10<sup>th</sup> anniversary mini-symposium

- Held at Fall 2007 DNP meeting
- 8 former CEU student presenters
- 1 Assistant Professor (invited speaker), 4 postdocs, 3 graduate students



**Deseree Meyer**, assistant professor,  
Rhodes College

**Noah Oblath**, post-doc, Univ. of Washington

**Christine Aidala**, post-doc, Univ.  
Massachusetts Amherst

**Brian Moazen**, post-doc, Univ. of  
Tennessee

**Shelly Leshner**, post-doc, LLNL

**Alfredo Estrade**, grad student, NSCL MSU

**Mary Kidd**, grad student, TUNL-Duke Univ.

**Thomas Lewis**, grad student, Univ. of  
Tennessee

# *CEU follow-up, mentoring*

- Michael Thoennesen

In April, all students asking them about their GradSchool or Summer internship decisions.

Inform mentors of any student who will come to their school for the summer or for graduate school. Mentor can then introduce him or herself to the student to make sure (s)he knows about the research opportunities at the institution.

The goal is to retain good students in nuclear science and ensure that they don't get lost in the transition.

For the next summer students: At the end of the summer send a reminder email to all advisors that they should talk to their summer students about future plans. Students could then be asked if they are interested to be included in our network.

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# Online information from advisors

## CEU Mentoring

Dear Colleague, thank you very much for taking the time to answer the following short questions.

1. Last name of your CEU student:

2. Are you still in contact with the student?

- Yes
- No

3. What is the current status of the student?

- Freshman
- Sophomore
- Junior
- Senior
- Other

4. What are the plans of the student for next summer/year?

- REU
- Graduate School
- Industry
- Other
- Don't know

5. For seniors who plan to go to grad school: Which graduate school has the student applied to?