



PAN (Physics of Atomic Nuclei) August 5-9, 2013

Audience

24 science-focused high school students. 12 students were female, and 3 were underrepresented in the field. Participants were selected based on interest in science as demonstrated through their applications.

Funding

Program expenses (~\$15,000) are provided by a National Science Foundation grant to the Joint Institute for Nuclear Astrophysics (JINA), making PAN free to accepted applicants. The National Superconducting Cyclotron Laboratory (NSCL) also supports PAN by donating facilities and faculty/staff volunteers in kind.

Objectives

JINA's goals for PAN are as follows:

- Teach students about the discipline and current topics of nuclear astrophysics.
- Promote the importance of nuclear research as a worthy investment.
- Introduce students to undergraduate/graduate life and research careers at MSU.
- Increase interest in nuclear physics/astrophysics.

Description

PAN (now in its 20th year) houses participants on campus. Program hours (45 intentional contact hours) are an intensive mix of faculty lectures, activities, and training sessions introducing students to experimentation methods, equipment, and results. These prepare students to conduct research using the \$1 million Modular Neutron Array. Students complete the program with a poster session to report their findings. Optional activities each evening allow students to learn more about MSU, research, and the college experience. PAN activities were directed and supported by 7 MSU faculty, 1 MSU postdoc, 7 MSU graduate students, and 3 MSU staff members. Students experienced 40 contact hours in the program.

Outcomes

Students' attitudes towards research careers were measured with pre/post surveys.

- On average, students reported that their understanding of how to prepare for and find success in such careers was increased.
- There was a strong increase in interest for physics and nuclear physics career paths.
- 100% agreed that they had learned useful things about research at NSCL, nuclear science, and astronomy.
- 100% agreed that MSU faculty, staff, and students involved with the PAN program helped them understand how to prepare for college.
- 85% agreed that PAN changed their understanding of what a research career requires.



- 85% agreed that PAN developed their skills in working with a group.
- 100% agreed that PAN increased their interest in science.
- 100% agreed they would recommend PAN to a fellow student.
- 80% agreed that PAN will influence their career plans or future academic paths.
- 100% agreed that PAN increased their knowledge of opportunities at MSU.

In response to survey questions, students offered these thoughts on their PAN experience:

- "PAN has reinforced my desire to pursue a graduate degree in physics so i can work in a facility such as the NSCL."
- "This camp has drastically improved my self confidence when it comes to my intellectual capabilities and the opportunities I can see myself achieving."
- "I am now aware of the true importance of advanced math in scientific research."

Additional Significant Information

David McCreight, a physics teacher at Lansing Eastern High School, has co-directed the program for many years. As a partner, he brings a teacher's knowledge and perspective to help connect with participants and focus the curriculum on secondary education.

Contact Information

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