How do you serve?

We asked Sigma Pi Sigma members via email, Facebook, and LinkedIn, "How do you serve?" What follows is sample of real-world stories from our membership.

ABOVE

Edward Leonard, Jr. runs a demonstration titled "liquid nitrogen explosion." It entails filling a 2-liter soda bottle halfway with LN_2, capping the bottle tightly, and sinking it with bricks to the bottom of a water-filled trash can. The ensuing explosion is always crowd captivating.

Photo by Michigan Technological University, University Marketing and Communications. Courtesy of Michigan Tech Mind Trekkers.

Edward M. Leonard, Jr.
Physics Major, Michigan Technological University, Houghton, MI

Michigan Technological University's Mind Trekkers is a group of undergraduate students from all disciplines that take STEM (science, technology, engineering, and mathematics) demonstrations to events ranging from single schools to festivals with 100,000+ participants and puts science in the hands of the next generation of engineers and critical thinkers. The organization, with the Michigan Tech Center for Pre-College Outreach as its umbrella, has been able to reach upwards of 500,000+ students since its debut in July 2010. Flying under the flag of "informal STEM instruction," it has significant impact in rural areas in particular, where middle and high schools do not always have the time to do the kinds of experiments that the Mind Trekkers bring to the table. From making ice cream with liquid nitrogen to demonstrating Lenz's law, the Mind Trekkers have been making an explosive impact, literally, wherever they go.

I've been a member of this fantastic entity since I assisted in its creation in January 2010, followed by the first event in July of the same year. I've been the resident physicist on duty since, and I've loved every moment of it. Most recently, we took the Mind Trekkers to the USA Science and Engineering Festival in Washington, DC, an event for which I skipped my undergraduate commencement. Two weeks before that, we held an event forty miles from my hometown of Dotyville in Sheboygan, WI, where we were the main event, bringing one hundred Mind Trekkers from Michigan Tech to put on the first ever Sheboygan Science and Engineering Festival.

The best part about this group? It's 100% volunteer on the student side. After finishing homework for the night, it's Mind Trekker time. There are always more logistics to work, more lessons to plan, and more demonstrations to write, and it's with the will power and dedication of the volunteers that we are the dynamic sensation that we are today. I couldn't be more proud than to have been there from the start.

Bill Yeager, PhD (Retired)
Fearrington Village, NC

I'm a "hidden physicist" with degrees in physics and chemistry. Since 1993 I have been volunteering online to answer questions at the "NEWTON Ask A Scientist" online service hosted by Argonne National Laboratory: www.newton.dep.anl.gov.

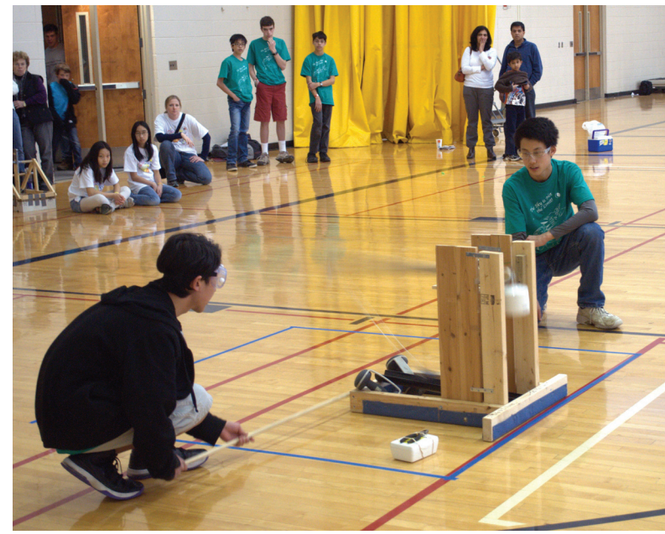
This site connects K-12 students and educators from around the world with scientists who try to help answer their questions in a technically correct but understandable fashion directed at their grade level.

The system was developed and operated by Nathan Unterman and Steven Sample. They have been running it ever since its early days as an online Bulletin Board System (BBS) accessed via direct dialup. Nate and Steve exemplify the important responsibility of scientists to make continuing contributions to public service.

BELOW

Two middle school students compete in the North Carolina Science Olympiad *Storm the Castle* event.

Photo by Robert Q. Topper.



Robert Q. Topper
Professor of Chemistry, The Cooper Union for the Advancement of Science and Art, New York, NY

For the past three years, I have worked with middle school students competing in the North Carolina Science Olympiad (NCSO) *Storm the Castle* event. I meet once a week with the students from mid-October to late February (for the regional tournament) and possibly late April (if they qualified for the state tournament). The students design and construct a trebuchet launching device that conforms to specifications in the rules for the event (see www.scienceNC.org). It takes about three months to construct, test, and modify the device. During this time I also review the principles of projectile motion with the students.

After the design is frozen, the students test the device with various projectiles, ranging from 20 to 60 grams, and counterweights ranging from 1 to 3 kg. They make five shots at each setting so that they can determine the accuracy and range of the device. Then they graph the results for all projectiles with each counterweight. At the tournament the students are given a projectile and counterweight and told their masses. Using the graphs they have prepared, they must estimate the distance their device will throw the given projectile with the given counterweight. They specify the target distance and take two shots. Their score