



When One Thing Leads to Another

July 28, 2011

Two years ago Physics Professor Witek Nazarewicz was attending a nuclear physics summer school in South Africa when, as is often the case when researchers gather, a discussion arose that took a good idea and created a new one. He and his colleagues were so encouraged by their positive interactions with African students and junior scientists that a plan began to take shape: an educational program that would give these young physicists a more basic offering on the current status of nuclear physics and develop research contacts in South Africa to create future collaborations.



Students and Lecturers at the International Workshop on Nuclear Physics. The workshop was held May 16-27 at the National Institute for Theoretical Physics (NITheP) in Stellenbosch, South Africa.

With that in mind, Dr. Bruce Barrett of the University of Arizona and Nazarewicz submitted a proposal to the National Science Foundation and won funding to help support the International Workshop on Nuclear Physics. The workshop was held May 16-27 at the National Institute for Theoretical Physics (NITheP) in Stellenbosch, South Africa. (The locale was fitting, as NITheP hosted the 2009 Chris Engelbrecht Summer School, where the workshop idea was born.) Additional support came from the Hemholtz International Center (HIC) for the Facility for Antiproton and Ion Research (FAIR) in Germany and the iThemba Laboratory for Accelerator-Based Sciences in South Africa. With the funding settled, next came the issue of encouraging young physicists to come to the workshop.

"Announcements were sent to universities in South Africa, and also posted on several portals," Nazarewicz explained. "We also had a large number of applicants from Africa (outside of South Africa), whom we were unable to support due to not having the funds to fly them in from the rest of Africa. NITheP could only support South African and African students in South Africa."

In all, the workshop drew 23 graduate students and post-docs: 20 from South Africa, two from the United States, and one from Germany. For 10 days they attended morning lectures on both introductory and current topics in nuclear physics; then spent their afternoons in intensive hands-on sessions on theoretical and experimental projects.

Workshop organizers put together a roster of talented, enthusiastic instructors from the U.S., Germany, and Poland who covered an array of topics including an overview of the basic properties of atomic nuclei, a tutorial in computational physics, and reactions with rare isotopes. Lecturers with ties to UTK or Oak Ridge National Laboratory were Nazarewicz, Associate Physics Professor Thomas Papenbrock, Meredith Howard (a post-doc from Rutgers, working in the ORNL Physics Division) and Steve Pain of the ORNL Physics Division. The organizers took care to ensure that no one presented material too advanced for the workshop participants.

"Prior to the meeting, we made it clear to the lecturers that the presentations and hands-on training would have to be basic," Nazarewicz said. "Two of us (Barrett and Nazarewicz) shared their talks with other instructors, to define the level."

Those lectures were reinforced in the afternoon sessions, where participants, with guidance from instructors, worked hands-on with experimental equipment like detectors, radioactive sources, and electronics brought from the neighboring iThemba Laboratory. Students also had access to the University of Stellenbosch computer labs, which gave them the opportunity to analyze data and write code for random number generation and Monte Carlo calculations. Student feedback underscored how important that component was to the overall success of the workshop. One participant was elated to write and execute his first computer code. Another had previously used data from gamma-ray detectors, but it wasn't until she attended the summer workshop that she actually saw firsthand how the equipment works, changing the data acquisition settings as the data was coming in. As the organizing committee noted in their workshop report, "Such personal discoveries and rewarding experiences were a daily event at the hands-on sessions."

In fact, Nazarewicz said the individual interactions with students during the hands-on sessions proved to be the most rewarding part of the workshop for him as an organizer. The mix of roll-up-your-sleeves work and lectures was a winning formula, as one student wrote in her workshop evaluation that the wide cross-section of interesting topics, as well as the structure of lectures and hands-on training, proved to be a very good system. Beyond that, Nazarewicz and the other organizers were delighted to see the bonds developing between participants, as they evolved from classmates to colleagues.

Buoyed by this success, workshop lecturers, along with the physics staff at NITheP and at the African Institute for Mathematical Sciences (AIMS), began discussing possible future collaborations, including a nuclear physics course at AIMS or the organization of a Pan-African Low-Energy Nuclear Physics School in the next two years. As was the case in 2009, in the midst of one successful program, discussion for another began to percolate, and history may very well repeat itself.



Workshop participants spent their mornings in lectures covering a broad range of topics in nuclear physics .