New Telescope to be Installed in Upgraded Observatory

A hail storm in May of 2001 left the observatory dome looking more like a golf ball than a proper dome, and made it even more difficult to open and close. This summer, the old dome was replaced and at the same time the old telescope was replaced as well.

The new telescope, a sixteen inch diameter Meade reflector, has special ultrahigh transmission coatings that make its light collecting power equivalent to a 20 inch telescope. The old telescope, a Celestron 8 inch, could no longer be pointed accurately and the cost of repairing it was comparable to the cost of the new telescope.

The new telescope will allow students and the public to view celestial objects with greater ease, and will facilitate the observatory's use for student research. In addition, the observatory will be able to offer more advanced research opportunities with accurate pointing.

The department plans to use additional funds to purchase a second telescope. The new 16 inch telescope and a second telescope will increase the observatory's capabilities to higher levels and make it more valuable to both students and the public.

Ron Wilson Retires

After 26 years working at UW-River Falls, Ron Wilson has decided to retire from teaching and pursue other interests.

Ron obtained his Bachelor’s and Master’s degrees from Western Michigan University in Kalamazoo, MI, and his Ph.D. in Nuclear Physics from the University of Wyoming. Before coming to UW-RF, he also taught at several other schools, including Delta College and the University of Wyoming.

At UW-RF, Ron ran the extensive Electronics curriculum, part of which is required for every physics major. Recently, he has been teaching all of the introductory labs—making sure that all the equipment needed is set up and working properly.

Over the years, Ron has supervised numerous student projects, such as “Digital Display of Temperature Using the PIC 16C55 Microcontroller,” “Designing, Building and Instrumenting a Gas Turbine Engine,” “Senior Seminar on Speech Recognition by Computer,” and “A Three State Digital Logic Algebra.”

Ron has also consulted for companies such as Trippensee Planetary, StarLiner Telescope Company, Nyco Industrial Insulation, and Speedtech Inc. His contributions included designing an automatic cleaning system for an astronomical telescope, measuring heat flow rates for innovative industrial pipe insulation and insulation systems.

Retirement from UW-RF does not mean a life of leisure on his boat, however, as Ron plans to start a new company to design and market innovative electronic measuring devices directed toward niche markets.
The annual spring banquet was held on May 2 to honor this year’s inductees into the ΣΠΣ Honor Society. To become a member of the society, students must have completed 3 semesters of physics, with a grade point average of at least 3.0 overall and in their physics courses. This year’s inductees are:

2003 ΣΠΣ inductees, from left: Paula Stanley, Jackie Meyer, Alan Kruizenga, Nick Kirchner, Justin Howard, Kyle Hoegh, Patrick Fillmore, Joseph Exner, and Jesse Ahlert.

The following students have been awarded scholarships for the 2003-04 year:

- Alan Kruizenga: Earl G. Albert Scholarship
- Mike Majer: Earl G. Albert Scholarship
- Jesse Ahlert: Kaitz Family Scholarship
- Tracy Mayer: Curt and Dee Larson Scholarship
- Jeremiah Bodenner: Dr. Henry Tranmal Scholarship
- Jeremy Tilsen: Physics Dept. Scholarship

The Alumni Scholarships for incoming students were awarded to:

- Matt Dodar: Somerset High School
- Michael Tate: Muskego High School

These scholarships provide $1000 per year for up to four years and are funded by contributions from physics alumni and friends of the department.

The speaker at the banquet was Erik Hobbie from the National Institute of Standards and Technology (NIST) in Maryland. Some alumni will remember Erik from when he taught at UW-RF in the mid-1990’s. He spoke about his experiences in the field of physics, particularly in the realm of metrology, which is the science of measurement. Erik also discussed the mission of NIST, which is to promote innovation and industrial competitiveness by serving as a measure of national excellence and security. Much of the talk was dominated by questions from the audience.

Erik Hobbie responds to a question during his talk at the banquet.

Scholarship Winners Announced

Cosmic Ray Detector Installed at UW-RF

Glenn Spiczak tips up the water tank before it was moved into the laboratory. Getting it through the doorway required some effort.

The Physics Dept. now houses a cosmic ray detector similar to detectors based at the South Pole. The detector, constructed by student researchers Jonathan Eisch and Luke Sheard, is a test bed for the 160 similar tanks that will be deployed at the South Pole as part of the IceCube neutrino telescope.

When high energy particles impact the Earth's atmosphere, they generate a large number of energetic particles that rain down onto the surface of the planet. This shower of particles is visible as a flash of light, which is detected by the cosmic ray detector. The detector, which is located underground, is designed to capture this light emission. The detector uses photomultiplier tubes placed in or above the surface of the water to detect the light. The detector can be used to monitor the direction that the muon was traveling.

Wynveen Departs for London, Delphenich and Cummings Arrive

Aaron Wynveen, who taught in the department this past year, has left to continue his research career at Imperial College in London. Aaron completed his Ph.D. in physics in 1998, and spent the year teaching both introductory and advanced courses at UW-RF. We wish him well as he adjusts to England.

This year's new faces belong to David Delphenich and Lowell Cummings. David joins the department from the University of the Ozarks where he has been an assistant professor of physics. He earned his Ph.D. in physics from Syracuse University, and has Master's degrees in both Engineering Mechanics and Mathematics.

Lowell Cummings arrives in River Falls after being a Visiting Professor at North Dakota State University. Lowell obtained his Ph.D. from New Mexico State University and has a Master's degree from Bowling Green State University.
Spring Student Research Projects

Summer/Fall 2003

Visiting Scientists Speak at UW-RF

Physics Students Speak at National Conferences

Six UW-RF physics students gave presentations at national conferences this spring and summer. Brandon Rice and Arriety Lowell each presented results from their research projects at the American Physical Society's March Meeting in Austin, Texas. Brandon's project involved characterizing particles in optical traps while Arriety presented results on the behavior of a magnetic pendulum.

Jackie Meyer gave a presentation at the National Conference for Undergraduate Research, a conference for student researchers from many disciplines. Jackie's work involved simulating the output of the planned IceCube neutrino telescope to be built at the South Pole.

Jeremiah Bodenner presented the results of his previous summer's research on the gravitational deflection of light by massive objects at the McNair Research Conference held at the Univ. of North Texas in February. His work has been published in the American Journal of Physics.

Jon Eisch and B.J. Poore gave presentations at the summer American Association of Physics Teachers meeting. B.J. spoke on the 'Teddy Bear Centrifuge' (page 6), and Jon spoke about his cosmic ray work (see page 2).

Brandon Rice and Arriety Lowell pose with a poster for the APS March Meeting where they presented this past Spring.

Students in physics classes and the general public had opportunities to hear about new advances in astronomical research and a first-person account of one of the biggest events of the previous century.

Kurt Woschnagg was the UW-RF Visiting Professor for 2003 and while on campus spoke to several science classes and gave an evening public lecture. Dr. Woschnagg is a Research Fellow at the University of Maryland. With the project and its predecessor, the AMANDA telescope, Dr. Woschnagg has spent five Antarctic summers at the pole.

In his evening lecture, Dr. Woschnagg described the research planned for the IceCube telescope, and what information it will produce that cannot be obtained from other, more conventional instruments. The evening was presented in English, with the audience following along through a translation of the evening with a description of the trip to reach the pole and the life led by the scientists working at the pole.

Aaron Wynveen invited Dr. Hans Courant to speak to his introductory physics classes about the development of the atomic bomb by the Manhattan Project during World War II. Dr. Courant built electronic devices used in the development of the atomic bomb at Los Alamos and was near the Trinity Site when the first test was conducted. He had with him the first atomic bomb and the soldier who dropped the bomb.

Dr. Courant was a soldier during the war and was stationed at the Los Alamos, New Mexico site where the weapon was developed. He was told to mount the glass in a piece of cardboard and to hold it in front of his face during the test.

Top: Kurt Woschnagg addresses the audience during his public lecture. Behind him is a picture of the moon taken during winter at the South Pole. Bottom: Hans Courant describes the scene at the Trinity Site on July 16, 1945.

This past spring a number of students worked on projects for both senior seminar and advanced lab.

Four seniors completed their seminar projects this spring, working on a wide variety of topics. Kyle Jacobsen, a double major in physics and chemistry, used X-ray photoelectron spectroscopy to study the size of crystallites in the films and used Dynamic Mechanical Analyzer to measure the elastic properties of the films.

B.J. Poore investigated the mysterious behavior of some new moment of inertia wheels being used in the introductory physics labs. When first used by students, the wheels did not work as expected, and engineers were called in. Dr. Poore worked to determine the cause and find a solution for the problem.

Brandon Rice's project involved characterizing the behavior of particles held in optical traps. A glass sphere in water, a glass sphere in water, was moved further from the wall of the sample cell containing it.

Gina Schindel constructed and tested an inexpensive scanning Fabry-Perot interferometer cavity, based on previously published designs. Using simple materials like car window tinting film for the mirrors, a piezoelectric stack was used to vary the distance between the mirrors.

Several groups in advanced lab also worked on projects this spring. Some examples: Seth Haynes and Greg Schwebach constructed a phased array of audio speakers. When air flows across the top of the tube, the air pressure decreases, drawing fluid up the tube.

With a long term goal of watching physical changes in the trapped particles, Brandon monitored the change in the strength and shape of the trap as the particles continued to move further from the wall of the sample cell.

Observatory...