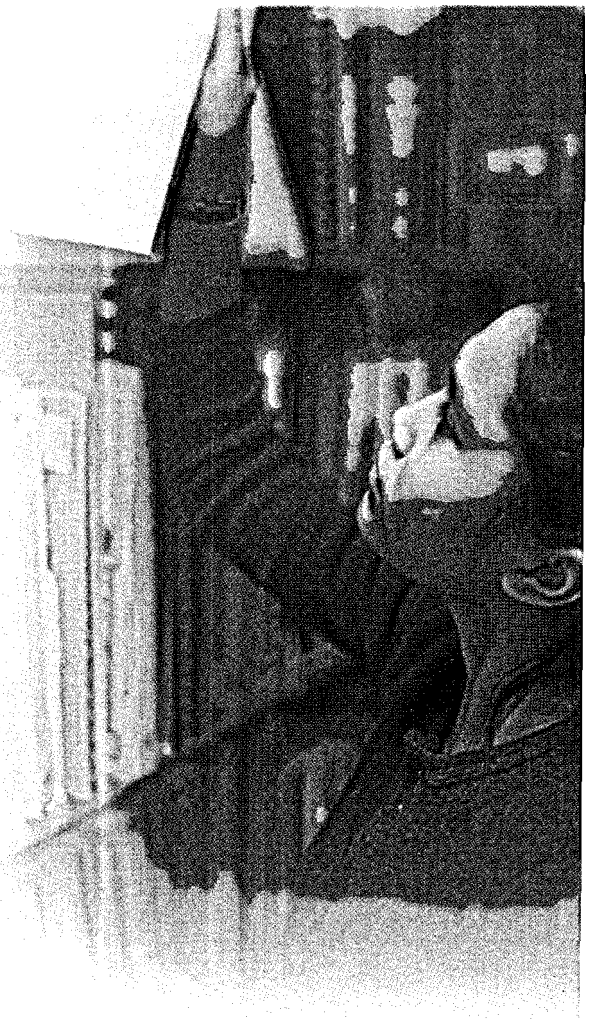
SCIENCE EDUCATION

Laying the Foundation



Since its inception, ORNL has made resources available for educational training and research opportunities. When Eugene Wigner in early 1946 became ORNL's research director, he established the Oak Ridge School of Reactor Technology. The school became the model for nuclear engineering courses at several universities and is one of ORNL's greatest contributions to nuclear energy. Among the school's graduates were leaders of the nuclear industry, including Captain Hyman G. Rickover, who came to Oak Ridge to investigate whether nuclear energy should be used by the U.S. Navy.

ORNL's educational outreach expanded in the mid-1980s with the creation of the Science Alliance, a joint program of research with the University of Tennessee. Funded by the state of Tennessee, the Science Alliance signaled a belief in the public benefit of joining the research agendas of ORNL and UT.

The relationship expanded further in 2000 when UT joined Battelle as the managing contractor for ORNL. Each year since has witnessed a growth in the number of joint faculty, graduate students and postdoctoral researchers working at both institutions. The UT-ORNL partnership includes new facilities and institutes, managed jointly, for biological sciences, computational sciences, and neutron sciences.

ORNL's close ties with UT today are complemented by partnerships with Oak Ridge Associated Universities and six core universities with which the laboratory conducts a variety of research activities. The core universities, Duke, Florida State, Georgia Tech, North Carolina State, Virginia, and Virginia Tech, provide a variety of research competencies that support the Laboratory's agenda.

ORNL's educational outreach is not confined to higher education. Each year more than 6000 area K-12 students receive science education classes sponsored by the laboratory. ORNL also is a primary sponsor of science and engineering competitions, as well as science, math and engineering scholarships to the University of Tennessee.

In 2003, as it did 60 years ago, ORNL's mission includes a commitment to share the benefits of scientific exploration.

WASTE MANAGEMENT

Closing the Circle

Sixty years after the Graphite Reactor went critical, ORNL today is helping to close the nuclear cycle by finding safe ways to isolate nuclear wastes. Perhaps the most significant work has related to repository siting for geologic disposal of spent fuel and high-level nuclear waste (HLW), part of an effort that resulted in Congressional approval of Yucca Mountain (Nevada) as the possible disposal site. The process began in 1955 with a National Academy of Sciences conference devoted to developing U.S. plans for permanent disposal of reactor waste. Among the 65 scientists attending were ORNL's Floyd Culler, Roy Morton, and Ed Struxness. The conferees recommended bedded salt as the best medium for HLW disposal, although other options existed.

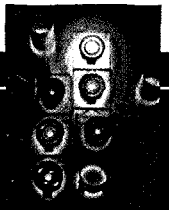
In 1958 the Atomic Energy Commission (AEC) asked ORNL to manage a repository program, largely because of its scientists' early leadership in waste management studies. In the 1960s, ORNL managed a major characterization and testing program in a Kansas salt mine. By 1970 it was announced that the nation's first demonstration repository would be sited there, but technical and political concerns reversed this position. ORNL continued to lead the AEC repository program through studies of multiple rock types and development of siting criteria. In 1976 the Office of Waste Isolation was opened in Oak Ridge before being transferred to Battelle Memorial Institute.

ORNL also has been a leader in managing low-level nuclear waste (LLW). The Laboratory served as associate leader of the Department of Energy's National Low-Level Waste Program in the late 1970s and early 1980s. Highly innovative in situ treatment technologies for reducing release of radionuclides from buried LLW have been widely accepted. Finally, disposal issues associated with mercury used at the Oak Ridge Y-12 Plant to produce enriched lithium for the hydrogen bomb program, which were largely addressed by ORNL scientists, helped motivate DOE to establish its remedial action program. From cleanup of old sites to construction of state-of-the-art new ones, responsible waste management has become a central part of the nuclear cycle.—*Steve Stow*

2001

Direct-to-digital holography for 3D defect inspection devised for semiconductor firms

HFIR resumes operation after beryllium reflector replaced, research building added



GRAIL used in *Science* and *Nature's* landmark papers on sequencing human genome

Groundbreaking for long-awaited new Mouse House

Secretary of Energy Abraham visits, transfers DOE land to ORNL for new construction

Superconducting transformer and cable developed with industrial partners