

King of covers

Lynn Boatner and his colleagues produce images that scientific journal art directors love

Lynn Boatner could be called the “king of covers,” but he’s not a supermodel. “Covers” in this instance refers to the front covers of scholarly journals.

Images generated by Lynn and his colleagues in the Solid State and Metals and Ceramics divisions have graced many nationally and internationally distributed scientific publications, and in some instances, they have been featured in books and on calendars.

“Scientifically interesting and aesthetically pleasing” is how Lynn, a Corporate Fellow researcher, describes the beautifully multi-hued microscopic images. Professional society journals that have featured these images include the *Journal of the American Ceramic Society*, *Advanced Materials & Processes* and *Science*. They’ve also been included in a book about scientific images, in the traveling Nikon “Small World” exhibit that was on display this past summer at the American Museum of Science and Energy, and in the 1999 calendar from Buehler, Ltd., the world’s leading manufacturer of metallographic equipment.

The color micrographs demonstrate the inherent beauty in nature, even at microscopic resolution. But the eye appeal is a bonus.

Their real value is in the science they reveal. The pictures of striking geometrical shapes—from orbs to polygons to fractals—are valuable investigative tools that help Lynn and fellow researchers analyze experiments and understand the processes responsible for their outcomes. They can show why an experiment didn’t work, and they can reveal the mechanisms behind a new material’s properties.

Lynn notes one instance where “microscopy was everything.” In a 1994 experiment that anticipated the current drive toward nanophase materials, a series of images from an experiment on the sintering of magnesium oxide nanoparticles showed why certain structures would not bond with particular contact geometries: Tenuous links at corners of the cubic crystal structures were unstable and disappeared during sintering. That series of electron microscope images showed the entire process and made the cover of the *Journal of the American Ceramic Society*, one of a long string in that publication.

Lynn’s earliest cover hit was a color photograph illustrating an article he co-authored with Solid State’s Brian Sales, which made the front of *Science*, one of the leading

scientific journals. “We discovered that by adding iron oxide to ordinary lead phosphate glass, which is not very durable, it increased its durability by 10^4 . We proposed at the time that

(See **COVERS**, back page)



Lynn Boatner

Physical Sciences Directorate orients its capabilities to ORNL’s future

Continuing a series of articles by members of the Lab’s Leadership Team, Associate Laboratory Director Jim Roberto discusses the outlook of the Physical Sciences Directorate.

BY JIM ROBERTO

For more than 50 years, Oak Ridge National Laboratory has had a strong tradition in the physical sciences. This tradition has been documented by broad impacts in many fields, including neutron scattering, materials science and engineering, condensed matter physics, chemical and analytical science, and low-energy nuclear physics—and by significant national and international recognition including the Nobel Prize, Fermi Prize, E.O. Lawrence Award and more than 30 R&D 100 Awards.

The physical sciences are central to DOE’s missions in science, energy, environment and national security. DOE is the nation’s largest supporter of research in the physical sciences, and

ORNL is among DOE’s largest performers of this research. The physical sciences directorate manages ORNL’s core research programs in the physical sciences, develops and operates unique research facilities that support these programs and partners with other directorates to provide an integration of capabilities across disciplines—an important competitive advantage of the national laboratories.



Jim Roberto

Over the next five years, ORNL will see more investment in physical sciences infrastructure than at any other time in our history. The major change will be in neutron science, but initiatives are also under way in nanoscale science and engineering, materials and chemical sciences and nuclear physics.

The Spallation Neutron Source and the upgraded High Flux Isotope Reactor will transform ORNL.

These are both billion-dollar facilities, and they are unique in the world. ORNL will become the world’s foremost center for neutron scattering research, a field with broad impacts in materials research, chemistry, fundamental physics, biology and engineering. Growing neutron scattering across the Laboratory is a high priority, and a Neutron Science Day addressing the new capabilities is being planned for the spring.

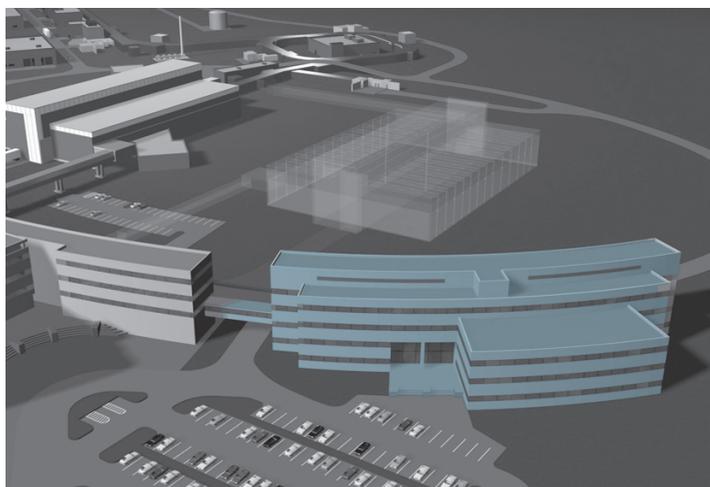
HFIR successfully completed its Operational Readiness Review in October and is preparing to resume operations. The scheduled replacement of the reflector and cooling tower has been completed, and installation of new and upgraded neutron scattering instrumentation is under way. Construction of the new cold guide hall will begin in the next few months, with installation of a high-performance cold neutron source and guide system to follow. The intense steady-state neutron beams at HFIR will complement the pulsed neutron capabilities of SNS.

(See **PHYSICAL**, page 2)

Physical

Continued from page 1

In 1998, then Presidential Science Advisor Neal Lane described nanoscale science and engineering as the “area of science and engineering that will most likely produce the breakthroughs of tomorrow.” This emerging field is a high priority at ORNL and is expected to have broad impacts across the Laboratory. The focus of this activity will be a \$65 million Center for Nanophase Materials



ORNL's proposed Center for Nanophase Materials Sciences (foreground) will join the complex of buildings at the Spallation Neutron Source, putting the Lab at the forefront of an emerging field of science.

Sciences, one of three nanoscale science research centers recommended by DOE for FY 2003 construction funding.

The CNMS will provide 80,000 square feet of laboratory and office space and state-of-the-art equipment for nanoscale science and engineering. The center will be located adjacent to SNS to take advantage of the unique nanocharacterization capabilities of neutron scattering and will include a

Nanofabrication Research Laboratory and a Nanomaterials Theory Institute. More than 270 scientists from 60 institutions attended a planning workshop for the center October 24–26. Hundreds of researchers from ORNL, universities and other institutions are expected to collaborate annually at the center.

In materials sciences, ORNL's Advanced Materials Characterization Laboratory will be constructed over the next 18 months. This facility, adjacent to the High Temperature Materials Laboratory, will house the next generation of highly sensitive microanalytical equipment, including two of the world's highest-resolution electron microscopes. The next generation of analytical equipment is a priority in the chemical sciences. Both materials and chemical sciences are involved in the development of state-of-the-art beam lines at the upgraded HFIR and the SNS.

In nuclear physics, plans are under way for a fundamental neutron physics beam line at SNS, and a neutrino physics laboratory has been proposed to take advantage of the intense pulsed neutrino beams available at the facility. Plans are also being developed to upgrade the Holifield Radioactive Ion Beam Facility as a bridge to the next-generation radioactive ion beam facility.

The physical sciences agenda for the next five years is aggressive but achievable, provided we focus our resources and fully involve our partners. Laboratory-Directed R&D and program development investments have already paid off in positioning the Laboratory for the nanoscience center and in winning more than \$10 million in new nanoscale science research programs over the next several years. Similar focused investments are strengthening neutron science, materials science, chemistry and nuclear physics. Collaborative outreach to other DOE

programs and to university partners is providing leverage and broadening impacts. The outcome will be a Laboratory with unsurpassed capabilities in key areas of physical science for DOE and the nation. [ornl](#)

Team UT-Battelle volunteers arrive in force at local events

Team UT-Battelle volunteers are making their mark on several major charitable events and activities this fall.

At the October 20 Susan G. Komen Breast Cancer Foundation Race for the Cure, 169 Team UT-Battelle members participated, winning the first-place award in the “largest corporate team” category. Team co-chairs were Wendell Ely and Nina Roberts. Close to 10,000 people took part in that event, held on the University of Tennessee campus in Knoxville.

Team UT-Battelle was also a strong presence in the American Diabetes Association's 2.5-mile Walk for Diabetes, held the following day. The 500-plus participants raised \$70,000—Team UT-B had 100 participants and turned in about \$10,000. In addition, UT-Battelle made a corporate contribution of \$3,000. ORNL Director Bill Madia served as general chairman of the walk.

Team UT-Battelle is also delving into the fine arts. A call went out for volunteer stagecraft workers for the Oak Ridge Playhouse's upcoming production of *Peter Pan*, which runs November 22 through December 2. ORNL's Bob Wham has enlisted Team UT-Battelle support for the current season of productions for both the playhouse and junior playhouse, and volunteers are still needed.

Finally, Team UT-B's Habitat for Humanity project is now a home for a Heiskell family, a scant five months after the project began. See the Lab Notes item on page 3.

If you'd like to participate in Team UT-Battelle projects or have a project or cause that you think the team might be able to help, contact Bill Pardue, 576-0235, or Brenda Hackworth, 574-4160.—B.C. [ornl](#)

Bethel Valley Rd. closed to trucks

Bethel Valley Road, the main access route into ORNL, was closed to all trucks except those that have direct business with the Lab on October 30 following consultation with DOE.

Trucks affected are defined as all vehicles larger than a pickup truck or those towing a trailer. The road will remain closed to trucks indefinitely. Personal vehicles will still be permitted on Bethel Valley Road.

The decision is one of a number of security actions taken following the September 11 terrorist attacks.



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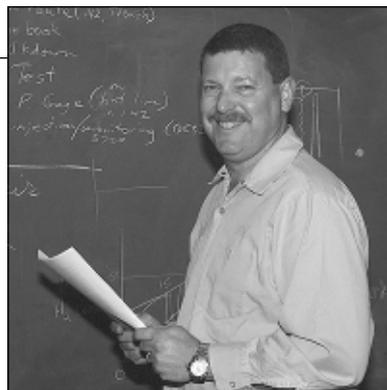
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Lab Notes

Write it down

Mark Dobbs more or less sits in the captain's chair of ORNL's central computing facility. As the facility's manager, he holds a key position in the Lab's shift to "paperless" business and communications over the past decade. The Building 4500-North facility runs the Lab's scientific computing and business administration computing, databases, e-mail... you name it. If things get unplugged in central computing, the on-line Lab pretty much comes to a standstill.

For that reason, the facility staff keeps a scrupulous record of daily routine operations and maintenance—or just about anything worth noting, including visits by dignitaries. Ironically, in the facility that has moved ORNL toward electronic operations, those notes are handwritten in a log-book—just like notes were written when they built this place. Just like Columbus used, for that matter.

"The shift log book was started back in the 1960s as a good way to do business," Mark, an SAIC employee, says. "It's since been incorporated into our conduct of operations. It's valuable for the 12-hour shift workers who come back from long breaks—they can catch up with what's happened."

The logbook, now into its 35th volume, is a historical record of just about everything significant that's ever happened—computerwise—at ORNL. It notes when the workhorse PDP10—the machine that was system number one on the old "system select network"—was shut down, on Dec. 10, 1994. It notes when ORNL's e-mail system went down for a day or two and when the Lab's first trendsetting supercomputer, the Intel Paragon, was delivered.

It's all right there. Written down on paper. Kind of makes you think.

ORNL's own modern marvels

Those who make *Modern Marvels* part of their nightly TV fare may soon see some familiar faces on it. The show is getting

Oak Ridge National Laboratory

together an episode on the Manhattan Project—and getting that story obviously involves a trip to Oak Ridge.

ORNL veterans Don Trauger and John Gillette recently filmed a session for the show at the Graphite Reactor Museum. John, who once directed the Isotopes Division, described his role loading uranium into the fabled reactor when it first went critical on the morning of Nov. 4, 1943. Don shared memories from his five-decade career in nuclear energy technology, including his first research efforts at ORNL involving K-25's gaseous diffusion process.

It's not the first time a cable-TV production has used Oak Ridge and the Graphite Reactor for a backdrop. British historian James Burke filmed an episode here for his Discovery Channel *Connections2* series back in 1993.

ORNL Director Emeritus Alvin Weinberg and Lab Director Bill Madia were interviewed for the History Channel show at Weinberg's home on the ridge. Six other interviewees gave accounts of life and work in Oak Ridge during the Manhattan years. Whatever makes the final cut, it should be an interesting show. Check local listings.

Moving day arrives for HFH couple

Team UT-Battelle's Habitat for Humanity house, a project that began in May, was dedicated on October 20. The structure, located in the Heiskell community with a priceless view of the Cumberlands, represents the toil of up to 250 volunteers from around a dozen ORNL divisions, who helped a regular crew of Habitat volunteers with the construction.



Jerry, Ellen and Ellie Goodman (with Habitat for Humanity official Heide Croce) now live in their home in Heiskell.

Jerry and Ellen Goodman, formerly of Oliver Springs, contributed their own "sweat equity" and will own and occupy the home with their daughter Ellie, who is tickled with her new Winnie-the-Pooh blue bedroom. The Goodmans received the keys, a tool kit and a Bible from the Team UT-Battelle organizers led by Jim and Brenda Hackworth.

Team UT-Battelle's participation in the Habitat build came as the result of a challenge by Lab

Modernization Project Director Tim Myrick, who proposed that UT-Battelle match a \$15,000 contribution from Tim and his wife, Teresa. Half of UT-B's \$15,000 went to the Habitat build, and the rest was applied to the Aid to Distressed Families of Appalachian Counties project that refurbishes existing houses.

"The Habitat organization commented on how smoothly this build went," says Tim. "We had good-sized, dedicated crews whenever needed, and they didn't have to bring in professionals to fix much of what we had done!"

The Team UT-Battelle project was the 23rd home built by the Anderson County Habitat organization, and it was a project that went safely.

"Probably the most amazing aspect of this build was that none of the Team UT-Battelle volunteers got hurt or hurt each other during the construction," Tim says. "We should also feel good that Lee (Riedinger) only ruined one power tool."

United Way goal topped again

ORNL staff members have again pushed the annual ORNL United Way campaign over its goal. The goal for the August 1–September 14 drive for 2001 was \$565,000. By the close of the campaign, the total raised was \$601,181.98, marking 106 percent of the goal. UT-Battelle Corporation contributed an additional \$55,000, including designations of \$19,100 for Anderson County and \$20,300 for Knox County, making the grand total \$656,181.98.

Calling this year's campaign "a great team effort," ORNL campaign chairman Harvey Gray expresses his sincere thanks to "all—the campaign committee, division coordinators, solicitors, and, especially, you, the contributors—for making the campaign a success."

Reported by Bill Cabage



ORNL veterans John Gillette (left) and Don Trauger (seated) ham it up for the *Modern Marvels* camera crew on location at the Graphite Reactor Museum.

Curtis Boles

Art of the possible

National Security Directorate's trio explores a cornucopia of Oak Ridge technologies

All three are retired colonels, so they are well versed in the role science and technology play in warfare and national security. For the past three months the former Army officers have been learning how well ORNL can plug into the national security mission's ever-increasing S&T needs and requirements.

The task of effectively applying new ideas and capabilities to national defense has attained a new-found urgency.

"ORNL is an untapped resource for the Department of Defense and other U.S. government agencies," says Rich Stouder, who recently completed, along with his compatriots Bob Leicht and Gary Steimer, an intensive orientation they refer to as "boot camp."

The boots actually "hit the road running" about three months ago in support of a U.S. Army program called Objective Force Warrior, a Defense Department initiative to explore "technologies the soldier of the near future will need to be dominant on the battlefields of the future."

The events of September 11 have added timeliness to their task. Since that day, the three have been working on a plan to demonstrate how Oak Ridge technologies can assist in counterterrorism, cyber warfare and homeland security.

In fact, shortly after the terrorist attacks, the National Security Directorate asked Lab researchers to "apply your creativity" toward technologies for the fight against terrorism. The respondents filled an auditorium and their deliberations resulted in a thick book of ideas and proposals.

Last month Associate Lab Director for National

careers to the life and community surrounding Oak Ridge," says Rich.

NSD's Tim Vane set up the boot camp, an intensive introduction to ORNL's technological capabilities. They spent a week in October going through the Lab, talking to different directors and principal investigators, or PIs—the researchers who lead the projects.

"We consider ourselves in direct support of the PIs, to assess their technologies, see if there is a customer and then match them up to bring those applications home," Bob says.

The Army's Objective Force Warrior program represents a new approach by the military in going outside for new technologies that can be applied on the battlefields of the new century. It has become readily apparent that many traditional concepts of warfare no longer apply.

Says Bob, with just enough military speak: "Our ultimate objective is to see if there are 'leap ahead' technologies that can create a force overmatch that makes the U.S. soldier far superior. He already is, but we want to see how we can stretch that overmatch with potential and future adversaries. An open aim is to expose a group of outside experts to the 'art of the possible'—in technological terms in the next 5 to 10 years—of what can be adopted for use by the Army."

Rich characterizes Oak Ridge's participation in Objective Force Warrior as a seminal event. "The chief scientist for the Army went to a science and technology center—Oak Ridge—and asked for an outside-the-Army look at Objective Force Warrior—help the Army learn the art of the possible with a fresh set of eyes."

The three note that forging links with national security is not new to ORNL. Their presence does represent a stronger thrust toward establishing those vital relationships and discovering where the technologies and needs fit together. "There are people here who have done this job before and are still doing it," Bob says. "We're here to help focus the effort back to the Department of Defense and other agencies. We've doubled the National Security Directorate's capacity here in terms of

Work-For-Others business development."

Those efforts are targeted toward continuing and building on ORNL's prestige and reputation with its customer base—raising consciousness of the capabilities the Oak Ridge complex represents, both for its intellectual capital and in bringing together diverse competencies.

"We'd only been here a couple of weeks when we were tasked to go out and find ORNL matches for 20 technologies," Gary recounts. "These PIs were amazing. They not only described their own but went out and found others in the research communities. The capabilities that are available here are truly amazing."

Gary, Rich and Bob represent nearly 100 years of military experience. Says Gary: "We've all experienced instances in our careers where we've said, 'Boy, if we just had this, we could solve this problem.' In the short time we've been here we've seen those opportunities

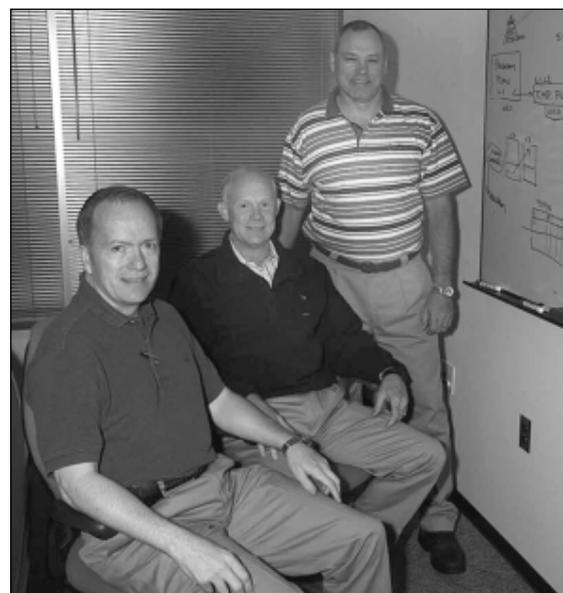
jumping up all over the place. We see things that could solve problems, in time, that we faced when we were on active duty."

Some of the ORNL technologies the trio notes are in the areas of logistical systems and in software such as CFAST. This system for the first time allows a commander to build and rapidly deploy a military force with the necessary coordination of troops, equipment and supplies—an extremely complicated task—in an integrated fashion, and on the fly. "In the old days," says Bob, "you loaded an airplane with a diagram and little cutouts of trucks and supplies that you fit together."

They also cite ORNL's chem-bio detection research, thermal management technologies such as graphite foam, wireless sensor technology, ultra-wideband communications systems and scalable weapons such as frangible ammunition and variable-speed bullets.

"The PIs are at the nucleus of everything we do. They are the heart of the Lab. We've come to learn that very quickly," Gary says, speaking for the group."

"Especially since September 11, there is a tremendous amount of patriotism that runs through the Lab," says Rich. "Those scientists truly want to contribute their science to the nation."—B.C. omi



Curtis Boles

The National Security Directorate's new triumvirate are (from left) Bob Leicht, Gary Steimer and Rich Stouder.

"We see things that could solve problems, in time, that we faced when we were on active duty."

Security Frank Akers and ORNL Corporate Fellows Council Chairman Tom Wilbanks invited Lab researchers to a series of brainstorming sessions, organized into subject areas, to gather innovative ideas. That's where the work will really start for the three ex-colonels and their colleagues, who include Dick Davis, Harvey Gray, Vivian Baylor and Art Clemons.

"We have to figure out when and where these technologies might apply to this long-term fight, develop a marketing plan for them and tailor that plan for each customer—the Immigration and Naturalization Service, FBI or Defense Department, for instance," says Bob.

The three were invited by Akers to come as advocates and business developers for ORNL to the Defense Department and other government agencies. "We've all enjoyed this transition from our previous

2000 Benefit Plans Summary Annual Report

Plan Participants and Beneficiaries:

(The 2000 benefit plans report has been prepared in accordance with instruction from the U.S. Department of Labor and is required by the Employee Retirement Income Security Act of 1974.)

This report summarizes the annual reports of the benefit plans provided by the sponsoring employers, BWXT Y-12, L.L.C. (Employer Identification Number: 54-1987297) and UT-Battelle, L.L.C. (Employer Identification Number: 62-1788235). The report is written in language specified under regulations prepared by the U.S. Department of Labor.

The sponsoring employers offered benefit plans under three structures during calendar year 2000. The qualified retirement and savings plans are multiple employer plans, with both employers participating and under an administrative services agreement, BWXT Y-12, L.L.C. serving as the plan sponsor and plan administrator. Five health and welfare plans (The Group Health Plan, The Dental Assistance Plan, The Group Life Plan, The Special Accident Plan, and the Travel Accident Plan) were provided under a Multiple Employer Welfare Agreement, with an administrative services agreement that has BWXT Y-12, L.L.C. serving as the plan administrator. The individual companies sponsored separate health and welfare plans for Long Term Disability, Employee Assistance, Education Assistance, Cafeteria Plan and a Severance Plan for Salaried Employees.

Complete annual reports for all the offered plans have been filed with the Internal Revenue Service as required by the Employee Retirement Income Security Act of 1974.

Summary Annual Report

Multiple Employer Plans

Retirement Program Plan for Employees of Certain Employers of the U.S. Department of Energy Facilities at Oak Ridge, Tennessee (The Retirement Plan).

The following is a summary of the annual report for the Retirement Plan for 2000.

Basic financial statement

Benefits under the plan are provided by group annuity contracts and separate trust investment accounts. Plan expenses were \$149,682,394. These expenses include \$128,962,777 paid to participants and beneficiaries and \$20,719,617 in administrative expenses. A total of 22,502 persons were participants in or beneficiaries of the plan at the end of the plan year, although not all of these persons had yet earned the right to receive benefits.

The value of plan assets after subtracting liabilities of the plan, were \$2,858,201,427 as of December 31, 2000, compared to \$2,845,771,334 as of January 1, 2000. During the year, the plan experienced an increase of \$12,430,093. The plan had total income of \$237,219,895, including earnings from investments. During the plan year, the plan transferred \$75,107,408 to other pension plans.

The plan has contracts with the Metropolitan Life Insurance Company and the Prudential Insurance Company of America that guarantee the liabilities of all participants retiring before July 1998. The assets of the plan are invested in Separate Accounts of the insurance companies or in separate trust accounts in accordance with the contract terms.

Minimum funding standards

An actuary's statement shows that enough money was contributed to the plan to keep it funded in accordance with the minimum funding standards.

Your right to additional information

Participants have the right to receive a copy of the full annual report, or any part of it, upon request. The items listed below are included in that report.

- an accountant's report
- assets held for investment
- insurance information

- actuarial information regarding the funding of the plan
- transactions in excess of five percent of plan assets

Savings Program for Employees of Certain Employers at the U.S. Department of Energy Facilities at Oak Ridge, Tennessee (The Savings Plan)

This is a summary of the annual report of the Savings Plan for 2000, including basic financial statements.

Benefits under the Savings Plan are provided by a trust fund. Plan expenses were \$100,988,149; including benefits paid to participants of \$100,228,042 and administrative expenses of \$760,107. A total of 10,877 were participants in or beneficiaries of the Plan at the end of the plan year, although not all these persons had yet earned the right to receive company matching contributions.

The value of plan assets as of December 31, 2000, after subtracting liabilities of the plan, was \$1,023,397,618 compared to \$1,024,206,373 as of January 1, 2000. During the year, the plan experienced a decrease in net assets of (\$808,755). This decrease includes the unrealized appreciation or depreciation in the value of the plan assets; that is the difference between the value of plan assets at the end of the year and the value of assets at the beginning of the year or the cost of assets acquired during the year. The plan had total income of \$118,129,628; including employer contributions of \$15,345,166; employee contributions of \$39,604,162; realized and unrealized gains of \$31,916,101; and other earnings from investments of \$31,264,199. Transfers to other plans totaled (\$17,950,234) during the year.

Your right to additional information

Participants have the right to receive a copy of the full annual report, or any part of it, upon request. The items listed below are included in that report.

- an accountant's report
- assets held for investment
- transactions in excess of five percent of plan assets

Multiple Employer Welfare Agreement (MEWA)

Under this agreement, the participating employers jointly offer health and welfare plans. Insurance policies for the plans included in the MEWA are held in trust by the Oak Ridge Insurance Benefit Trust. This is a summary of the plans included in the MEWA.

Group Health Plan

The health plan operates under contracts between the participating employers and various health care providers which include true insurance contracts (premiums paid for services provided) and other insurance arrangements that require that the participating companies will supply funds for the payment of all claims due under the terms of the contracts, up to a specified maximum determined each plan year. For the plan year 2000, the maximum was \$57,208,267. The companies share the cost of the group health plans with the participants by charging premiums to the employees.

For the plan year ended December 31, 2000, the total premiums paid were \$34,261,451, the total claims paid were \$74,510,546 and administrative expenses were \$899,565. \$22,127,180 of funds were provided by employees to pay these claims and expenses and \$88,444,382 was provided by the employers.

The financial statements of the Group Health Plan also reflect the postretirement benefit obligations of the employers. This obligation represents the present value of future benefits to be paid to covered participants. The benefit obligation is determined by the plan actuaries. As of December 31, 2000, the benefit obligation was \$721,149,440 as compared to the benefit obligation at January 1, 2000 of \$707,767,087. The increase in benefit obligation of \$13,382,353 is attributed to a change in benefit obligation of \$13,331,000 and an increase in claims incurred but not yet reported of \$51,353.

Group Life Plan

The group life plan operates under true insurance contracts between the participating employers and Metropolitan Life Insurance Company. The companies share the cost of the group life plan with the participants by charging premiums to the employees.

For the plan year ended December 31, 2000, the total premiums paid were \$3,284,149. \$2,583,894 of funds were provided by employees to pay these claims and \$700,255 was provided by the employers. Actual claims incurred and charged by the insurance company totaled \$6,358,242. The insurance company released \$4,306,106 of the Premium Stabilization Reserve during the year.

The financial statements of the Group Life Plan also reflect the postretirement benefit obligations of the employers. This obligation

represents the present value of future benefits to be paid to covered participants. The benefit obligation is determined by the plan actuaries. As of December 31, 2000, the benefit obligation was \$97,506,000 as compared to the benefit obligation at January 1, 2000 of \$97,235,000. The increase in benefit obligation of \$271,000 is attributed to a change in benefit obligation.

Additional MEWA Plans

This is a summary of the Dental Assistance Plan, The Special Accident Plan and The Travel Accident Plan. The plans have contracts with the insurance companies as indicated and the insurance companies are obligated to pay all claims incurred under the terms of the contracts.

Plan Name	Insurance provider	Total premium paid in 2000	Total claims paid in 2000
Dental assistance plan	Metropolitan Life Ins. Co. of North America	\$ 4,958,076	\$ 6,014,941
Travel accident plan	Life Insurance Co. of North America	\$ 17,250	0
Special accident insurance plan	Life Insurance Co. of North America	\$492,169	\$ 88,615

Plans maintained separately by the sponsoring companies

BWXT Y-12, L.L.C.

In addition to the multiple employer plans above, BWXT Y-12, L.L.C. sponsors the following Plans: Special Medical Plans for LMUS Retirees, Long Term Disability Plan, Cafeteria Plan, Employee Assistance Plan, Educational Assistance Plan, Prescription Drug Plan (financial data included in The Group Health Plan) and The Severance Plan for Salaried Employees.

Annual reports are filed for each of these plans.

UT-Battelle, L.L.C.

In addition to the multiple employer plans above, UT-Battelle, L.L.C. sponsors the following Plans: Prescription Drug Plan (financial information is included in The Group Health Plan), Cafeteria Plan, Long Term Disability Plan, Employee Assistance Plan, Educational Assistance Plan and The Severance Plan for Salaried Employees.

Annual reports are filed for each of these plans.

For more detailed information

To obtain a copy of the full or partial annual reports for the insurance plans, retirement program plan or savings program, write to Plans Administrator: BWXT Y-12, L.L.C., 104 Union Valley Road, Oak Ridge, TN 37831-6497. Copying costs are 25 cents per individual page; \$4 for the complete insurance plans; \$5 for each savings plan annual report; and \$10 for the entire retirement program plan annual report.

With regard specifically to the retirement program plan and savings plans, participants have the right to receive from the plan administrator, on request and at no charge, a statement of the assets and liabilities of the plan and accompanying notes, a statement of income and expenses of the plan and accompanying notes, or both.

For each participant requesting a copy of the full annual report, these two statements and accompanying notes will be included as part of that report. The copying cost previously mentioned does not include a charge for duplicating these portions of the report because they are furnished without charge.

Participants also have the legally protected right to examine the insurance, savings or retirement program plan annual reports at the main office, located at 104 Union Valley Road, Rm. 126, Oak Ridge, Tenn., and at the U.S. Department of Labor in Washington, D.C.

Participants also may obtain copies from the U.S. Department of Labor upon payment of copying costs. Requests to the Department of Labor should be addressed to: Public Disclosure Room, N4677, Pension and Welfare Benefit Programs, Frances Perkins Department of Labor Building, 200 Constitution Avenue, N.W., Washington, DC 20216.

Colors coordinated

Display and care for the Stars and Stripes properly

The Stars and Stripes, never out of vogue, are hot fashion nowadays, adorning offices, t-shirts, mailboxes and pickup trucks. But flying the colors entails certain responsibilities and protocols. It wouldn't be a bad time to review what every Boy or Girl Scout knows about caring for and showing respect for the nation's emblem.

Our flag information was gathered from a National Flag Foundation pamphlet, *Our Flag*, the Sons of Union Veterans of the Civil War Website (suvcw.org/flag.htm) and consultation with Kaye Johnson, ORNL's nearest thing to a vexillologist.

Care and handling

Hold the flag carefully. Never let it touch the ground, floor, water or merchandise.

There is a certain way to fold the flag—a two-person operation resulting in a triangular shape with only the stars showing.

Always carry the flag aloft and free. Never fly or carry it horizontally.

Keep the flag clean. Never let it become torn, soiled or damaged.

Worn or damaged flags should be disposed of in a dignified manner, preferably by burning. Old Glory should never be relegated to the landfill.

The flag must never be used for advertising purposes. Never embroider it on household items or pieces of clothing. It should never be used as part of a costume or athletic uniform. However, it is proper to attach a flag patch to the uniform of military personnel, firefighters, police and members of patriotic organizations, provided the patch is properly affixed.

Displaying the banner

On a wall, the flag should be displayed with the blue field to the observer's top left.

Always display the flag with the blue star field up. The flag is to be flown upside down only as a distress signal.

Displayed with other countries in the United States, it should be displayed "to its own right" (observer's left). In times of peace, no nation's flag should be higher than another's.

With subordinate flags, such as state flags, the U.S. flag should be at the center and should be highest on the staff. The only state flag allowed to be flown as high as the U.S. flag is that of Texas, because it was once a sovereign nation.

When flown on a staff, the flag should be hoisted briskly and lowered ceremoniously.

Unless it's an "all-weather" flag, it should not be flown in bad weather. Unless it is properly illuminated, it should be lowered at night.

The flag should not be draped over the hood, top, sides or back of a vehicle. When the flag is displayed on a motorcar, the staff must be fixed firmly to the chassis or clamped to the right front fender.

The flag is traditionally flown at half-staff only upon the death of a prominent federal or state government figure. However, changes in the flag code in 1976 offer much leeway. Essentially, it is

flown at half staff by Presidential order. When flown at half staff, it should be raised to the peak for an instant and then lowered to the halfway point of the mast.

There are myriad intricate rules about various ways to display the flag. A good rule of thumb is that, on American soil, it should never be superceded by any other banner.

Showing respect

Flag pins, currently very popular, should be worn on the left lapel, close to the heart.

Face the flag with the right hand placed over the heart when it is raised or lowered, when the pledge of allegiance is recited, when the national anthem is played and when it passes in review.

This may be one of the most-often ignored protocols: Men's hats and other

headdress, including and especially ball caps, should be removed and held in the right hand, which is then placed above the heart, any time the pledge of allegiance is recited, when the national anthem is played and when the colors pass by during processions or parades, including the Santa Claus parade.

The flag code appears to discourage disposable renditions of the banner, such as those printed on paper napkins or boxes. However, "toy" flags, such as those reproduced on newsprint and mounted on toothpicks, are commonly accepted. While not subject to as stringent a code as an authentic U.S. Flag, they should be accorded the same due respect and treatment as the national emblem.

Fly your flag any time. Fly it properly. Fly it proudly. —B.C. 



Members of the ORNL Protective Force raise the flag during a past Veterans Day ceremony.

ORNL people

Ward Plummer, distinguished scientist in the Solid State Division and distinguished professor of physics at the University of Tennessee, has earned the 2001 Medard W. Welch Award from the American Vacuum Society. The award is the highest honor presented by the society.

Ron Klueh of the Metals and Ceramics Division recently published the book, *High-Chromium Ferritic and Martensitic Steels for Nuclear Applications* (American Society for Testing and Materials, West Conshohocken, PA, 2001), with co-author Donald R. Harries.

Marie Walsh, currently of the Environmental Sciences Division, won the Science and Technology category at this year's Knoxville YWCA Tribute to Women. Two other ORNL staff members, **Patricia Hu** (EST Division) and **Betty Mansfield** (Life Sciences Division), were finalists in that category. Marie is an internationally renowned researcher on biomass energy systems.

Former ORNL researcher and National Medal of Technology winner **Bill Manly** has given the University of Notre Dame \$350,000. Two endowments establish the William D. Manly Award for Excellence in Materials Research, which will recognize one undergraduate and one graduate student annually, and the William D. Manly Endowment for Excellence in Material Research, to support the university's new engineering building.

Two journal articles published last year by ORNL authors are included among a group of six listed by the editor of the American Chemical Society journal *Energy & Fuels* that illustrate the quality and impact of papers published in the journal. Principal authors are **Jonathan Woodward**, **Phillip Britt** and **A.C. Buchanan**, all from the Chemical Sciences Division. Jonathan contributed to the article, "Enzymatic Hydrogen Production: Conversion of Renewable Resources for Energy Production"; Phillip and A.C. contributed to "Impact of Restricted Mass Transport on Pyrolysis Pathways for Aryl Ether Containing Lignin Model Compounds."

Values kicks off holiday programs

ORNL's Values Committee is entering its holiday mode. The committee organized a special Veterans' Day program at the Lab on November 8.

A Thanksgiving Food Drive runs through November 15. Food collected in boxes at various locations will be delivered to families in need.

For Christmas, the committee is again sponsoring an Angel Tree, through which employees can volunteer to purchase gifts for needy children from the surrounding counties. Last year ORNL employees purchased gifts for 181 children in the area. This year they would like to help even more kids have a good Christmas. For details on these projects, see the Values homepage at home.ornl.gov/values.

Report your concerns

UT-Battelle is committed to performing its business activities with the highest standards of integrity, honesty and professional competency. As a UT-Battelle employee, you play an important role in our commitment to maintaining the highest business standards through your individual commitment to excellence.

Further, you have the responsibility to provide notice of inappropriate activities which threaten our joint dedication to integrity in the workplace and which may prevent us from meeting the expectations of DOE and our other customers.

For work done under the DOE contract, UT-Battelle employees have a number of options for expressing their concerns about activities they may view as inappropriate on the job. Any employee with information about alleged fraud, waste, abuse, corruption or mismanagement relating to DOE programs, operations, funds or contracts may provide information directly to the following.

- Scott Branham, director of the Audit and Management Advisory Services Directorate (241-7614 or home.ornl.gov/offices/audit_management_advisory_services/).
- The Office of Inspector General (IG), 1-800-541-1625. The toll-free hotline number is operated 24 hours a day to permit immediate access by any employee.
- The DOE Oak Ridge Operations Office. The ORO point of contact for filing a complaint,

making a disclosure, or receiving additional information on how to file a complaint is the manager, Diversity Programs and Employee Concerns, Oak Ridge (576-4988).

In addition, ethics inquiries may be directed to Steve Stow, Quality of Work Life coordinator and Ombudsman, 576-7802, or to Scott Branham, as previously listed. Employees who believe their health or safety concerns have not been addressed after being reported through normal channels may provide that information to the IG or to Kelly Beierschmitt, director of Environment, Safety, Health, and Quality (241-7600).

All such disclosures may be made without fear of employer reprisal. Employees are entitled to provide information to DOE, Congress, or UT-Battelle concerning violations of law; danger to health and safety; or matters involving mismanagement, gross waste of funds or abuse of authority. Employees are also free to refuse to engage in illegal or dangerous activities which the employee believes to be unsafe; to violate laws, rules or regulations; or to involve fraud, mismanagement, waste or abuse.

Also, it is important that all employees work cooperatively with internal and external auditors and investigators.

*Scott Branham
Audit and Management Advisory Service
Directorate*

Service Anniversaries

November 2001

45 years: Rodney W. Knight, Research Reactors
43 years: Althea S. Tate, Physics

35 years: Linda A. Dockery, Nuclear Science & Technology; J. C. Mitchell, Health Services

30 years: Stephanie B. Floyd, Environmental Sciences; Debbie S. Queener, Nuclear Science & Technology; Kaye F. Russell, Metals & Ceramics

25 years: James R. Beene and Dan Shapira, Physics; Thomas B. Conley, Pat B. Fox, Sharon K. Lichtenwalter and Jennifer B. Manneschildt, Nuclear Science & Technology; Gary W. Kelly, Operational Safety Services; Helmut E. Knee, Engineering Science & Technology; Ronny D. Lomax and Michael R. Rogers, Metals & Ceramics; Kathy F. Rosenbalm, Spallation Neutron Source Project; Gerald L. Scott, Engineering; Ronnie K. Shockley, Craft Resources

20 years: Allen E. Ekkebus, SNS Experimental Facilities; Wayne H. Gregory, Craft Resources; Christy W. Griffith, Business & Information Services Dir; Brenda A. Johnson, Networking & Computing Technologies; David A. Rasmussen, Fusion Energy

Benefits' open enrollment wraps up November 16

Benefits Delivery's open enrollment for the dental and medical plans began on October 22 and continues through Nov. 16, 2001. Employees wishing to make any change in their dental or medical participation should do so during this period. Appropriate changes include adding eligible dependents, switching medical plan options (CIGNA or Healthsource) or changing tax status (before- or after-tax). For employees who take no action, current participation will be continued in calendar year 2002.

Employees who wish to participate in the Flexible Spending Accounts (dependent care or health care) must submit new forms. Participation in these plans does not automatically continue from year to year. Employees may contribute up to \$5,000 in each account annually.

Employees and retirees received letters at home with details on the open enrollment. Call OneCall, 574-1500, with any Benefits questions.

Deaths

Kenneth L. Walker, of the Nuclear Science and Technology Division, died on October 25. He lived in Oak Ridge. Kenneth worked in the Remote Systems Development group in the former Robotics and Process Systems Division.

Office established for compensation claim assistance

The Department of Labor and DOE have established an Energy Employees Compensation Resource Center in Oak Ridge to assist current or former workers who have suffered from exposure to beryllium, silica or radiation while working for DOE, its contractors or subcontractors in the nuclear weapons industry.

The Energy Employees Occupational Illness Compensation Program Act was passed in October 2000 and went into effect on July 31, 2001. It provides \$150,000 in lump-sum compensation, as well as related medical expenses. For the Oak Ridge area, the work locations are X-10, K-25 and Y-12.

Diseases covered include cancer caused by radiation, chronic beryllium disease and chronic silicosis. If you had cancer and are currently in remission, you can also file. In addition, medical monitoring is provided for workers with beryllium sensitivity.

If you are a surviving spouse and/or dependent child of a worker who died of one of these diseases, you may be eligible for compensation.

Current or former workers or survivors may be eligible to file a request for review by a medical panel. If approved, DOE will provide assistance in

filing a claim for compensation with the appropriate state workers' compensation system.

Assistance for this program is being provided to claimants at the Energy Employees Compensation Resource Center, located at 800 Oak Ridge Turnpike, Suite C-103, Jackson Plaza Office Complex. Phone (865) 481-0411 or toll-free at 1-866-481-0411 for information or to schedule an appointment.

Two retired researchers die

ORNL Reporter received word of the recent deaths of two ORNL retirees. James Richard Tarrant II died on August 12 in Oak Ridge. He was 75. During his career as a scientist that included 34 years of service at ORNL, he participated with a group that identified the 104th element on the periodic chart, known as unnilquadium or rutherfordium, and worked in the transuranium research laboratory.

Charles Martin Blood died on September 30. He had lived in Oak Ridge since the 1940s and worked at ORNL for 23 years as an associate research chemist. He was a contributing author on several publications.

Covers

Continued from page 1

such glasses could be used to incorporate nuclear waste, and the image accompanying the article was used on the cover of *Science*.”

The micrographs are obtained in a number of ways and with a number of instruments, including some of Solid State’s own transmission electronic microscopes as well as optical microscopes owned by other divisions, and at other institutions when specialized equipment is required. Lynn and his Solid State colleagues have enjoyed a long-term, fruitful collaboration with staff members in both the Metals and Ceramics Division and ORNL’s graphics group.

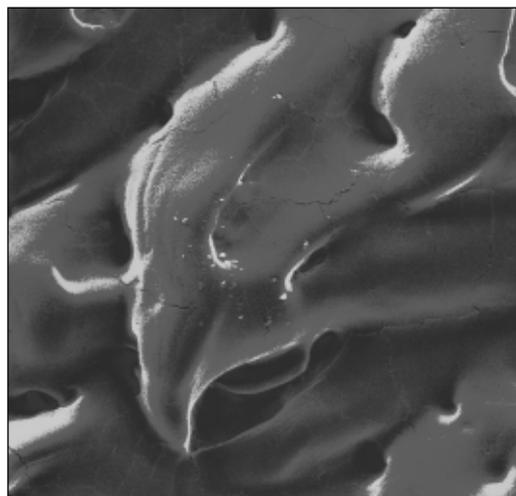
The micrographs are usually strikingly colorful, but not all of them start out that way. Micrographs taken using transmission or scanning electron microscopy are originally black and white, but digital image processing can now be used to “colorize” these images—much like colorizing some of the old black and white movies.

Although the electron microscope images only show colors after different hues are computer-assigned to the grey scale of the image, Lynn says that the optical images taken with interference-contrast microscopy show a “visual smorgasbord of beautiful colors from the moment that you look into the microscope.”

One black and white scanning-electron-microscope image produced this year by Lynn, Dorothy

Coffey and David Norton shows changes in the surface of ceramic materials after they are hit by intense pulses of excimer laser light. The patterns are interesting enough, but one unmistakably resembles the head of an eagle . . . “like the children’s game of looking for faces and animals in the clouds,” Lynn says.

Other images resemble abstract designs, paisleys and cubist fantasies. An image they are preparing to unveil, which he calls one of his favorites, has a Dr. Strange-ish, other-dimension feel to it. In fact, whatever designs artists and designers have created over the years seem to already be covered by nature under the microscope.



This eagle-head image resulted from a ceramic surface’s being subjected to intense pulses from a laser. The microscope image also revealed changes in the material’s surface.

The journal editors who select the ORNL images for their covers sometimes see them at poster-paper presentations and micrograph competitions held at scientific professional society meetings. But Lynn, who may have acquired his appreciation for beautiful pictures from his father, a master photographer, has no doubt earned a reputation as a supplier of quality scientific images that are also fun to look at.

“Sometimes our entries don’t win anything in the competitions and then wind up on the covers. It’s a matter of taste and judgment,” says Lynn.

“But they also keep the Lab in the forefront of the scientific community.” —B.C. [ornl](#)

UT-Battelle announces 2002 UTK scholarship competition

UT-Battelle is seeking applicants for its second scholarship award. The grant, which goes annually to a child of a UT-Battelle employee, is aimed at encouraging careers in science. The renewable scholarship to the University of Tennessee–Knoxville is granted on a competitive basis.

If you have a child interested in applying for the Fall 2002 class, complete an entry form by November 30.

The scholarship is worth \$4,000 per academic year and is renewable for four years if the student maintains full-time enrollment, a strong grade-point average and steady progress toward a baccalaureate degree.

Students may select a major course of study leading to a baccalaureate degree offered through UT in science, engineering or mathematics. In addition, UT-Battelle scholars will spend at least one practicum term at ORNL. Applicants must meet the following eligibility criteria, which parallel UT’s Bicentennial Scholarship Program:

- Son or daughter of a current UT-Battelle employee
- High school diploma held by the end of the current school year
- Resident of Tennessee
- Acceptance to the University of Tennessee–Knoxville for the following fall term
- Minimum high school grade point average of 3.75 in a 4.0 system
- ACT test score of 31

Applicants will be considered based on academic performance in high school; ACT scores; academic references and awards; and activities, community service and leadership.

For more information on the program for next year’s class, contact Brenda Hackworth, 574-4160, or Gail Beyersdorf, 241-9515, in the Communications and Community Outreach office by Nov. 30, 2001.

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