

Reporter

OAK RIDGE NATIONAL LABORATORY

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Using image retrieval technology

Combating blindness is vision of ORNL, UT project

Millions of people at risk of becoming blind could one day be helped by an ORNL technology originally intended to understand semiconductor defects.

The project takes advantage of the laboratory's proprietary content-based image retrieval technology, which is a method for sorting and finding visually similar images in large databases. Manufacturers of semiconductors have found this technology highly effective for rapidly scanning hundreds of thousands of tiny semiconductors to learn quickly about problems with manufacturing processes.

"We're adapting a proven technology and combining it with new image gathering and analysis tools to help create a database to assist in the diagnosis and treatment of blinding eye diseases such as diabetic retinopathy, glaucoma and age-related macular degeneration," said project co-leader Ken Tobin of the Engineering Science & Technology Division.

Diabetic retinopathy alone will affect 239 million people worldwide by 2010, according to Tobin, who noted that this number will have doubled since 1994.

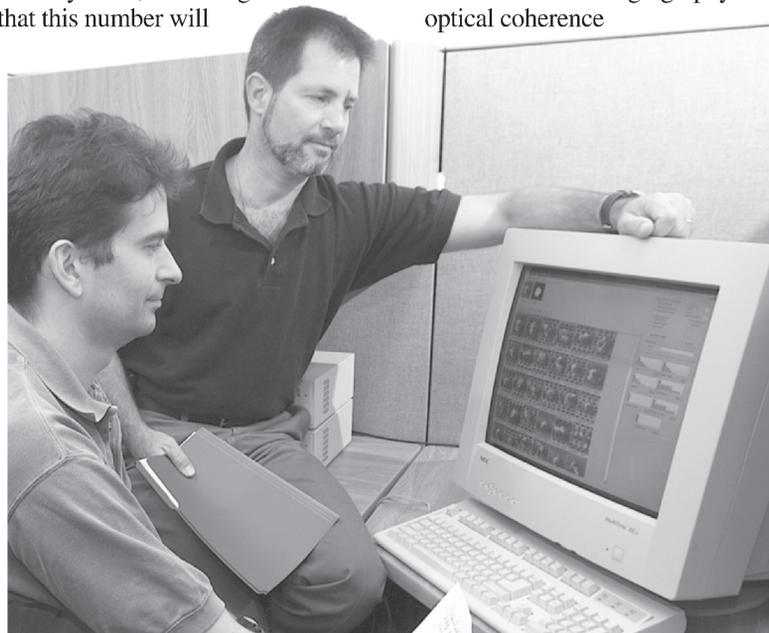
Partnering with ORNL is Edward Chaum, an ophthalmologist and Plough Foundation professor of retinal diseases at the University of Tennessee Health Science Center in Memphis.

Researchers plan to use digital retinal photography and optical coherence tomography — a technique for examining living tissue non-invasively — to image and quantify specific disease-based

changes in the retina. They will develop an extensive image database of known retinal disease states for clinical validation studies.

Institutional Review Board approval was secured to enable Tobin and ORNL colleagues Tom Karnowski and Priya

Govindasamy to assemble a database of thousands of fluorescein angiography and optical coherence



Ken Tobin (standing) and Tom Karnowski are assembling thousands of images representing hundreds of diagnosed human patients and retinal diseases.

tomography images representing hundreds of diagnosed human patients and retinal diseases.

"The dataset provided by Dr. Chaum documents the visual attributes of fluorescein
(See BLINDNESS, page 7)

Lab must 'continue the transformation,' Wadsworth urges

Citing the "remarkable transformation" ORNL has undergone during the past five years, Laboratory Director Jeff Wadsworth challenged listeners at the recent Senior Staff Meeting to continue the process by creating new opportunities and addressing issues that remain.

"We have seen amazing changes," Wadsworth said, "including an increase in our operating budget by some 50 percent, wins in major scientific competitions, excellent progress on the Spallation Neutron Source and revitalized biology and ecology programs.

"Our DOE customers have recognized and rewarded this transformation with high performance ratings and plans to extend the management contract, but we must build on this progress and take advantage of our improved position to prepare for and create new opportunities," he said.

Wadsworth quoted Intel exec Andy Grove,
(See TRANSFORMATION, page 5)

UT-B performance rated 'outstanding'

The Department of Energy has awarded UT-Battelle an overall performance rating of "outstanding" for the company's management of ORNL.

The rating is the highest awarded by DOE and comes after an evaluation of the laboratory's performance from October 2003 through September 2004.

In a letter to Laboratory Director Jeff Wadsworth, DOE's Oak Ridge Manager Gerald Boyd said UT-Battelle received the maximum fee for the laboratory's overall performance in science and technology, including continued progress of the Spallation Neutron Source on time and on budget.

DOE also awarded the maximum fee in community service, noting the company's

leadership role in efforts to rebuild Oak Ridge High School.

UT-Battelle received 90 percent of the maximum fee in the category of operations.

UT-Battelle's total fee for operating ORNL in 2004 is \$6,619,000, or 96.4 percent of the maximum fee.

Wadsworth said the outstanding rating is "a tremendous statement about the quality of the ORNL staff who performed so well over the last year. They could not have brought us a higher grade on our report card."

DOE will be conducting negotiations with UT-Battelle in March for a five-year contract extension to continue the management and operation of ORNL.

Wadsworth elected to National Academy of Engineering

ORNL Director Jeff Wadsworth has been elected to the National Academy of Engineering, one of the highest professional distinctions awarded to an engineer.

Election to the academy honors those who have made important contributions to engineering theory



Wadsworth

and practice, including engineering pioneers and those who have helped bring about major advancements in engineering and engineering education.

Wadsworth, an internationally recognized metallurgist, becomes the third ORNL director named to the academy, joining Alvin Weinberg, who was elected in 1975, and Alvin Trivelpiece, elected in 1993.

Wadsworth is one of 17 academy members with a current or previous association with Oak Ridge.

In 2003, Wadsworth was elected Fellow of

the American Association for the Advancement of Science for his distinguished contributions in developing advanced materials and superplasticity, and in determining the history and origins of Damascus and other steels, and for broad scientific leadership supporting national security.

Wadsworth will be inducted during October ceremonies in Washington D.C. He is among 74 new members, bringing the association's total U.S. membership to 2,195 and the number of foreign associates to 178.

Super-heavy nuclei take shape in 'extreme' new theories

Advanced computational methods and supporting experiments, including work performed at ORNL, are giving scientists a better understanding of the nature and stability of superheavy nuclei and the heaviest elements that lie beyond the borders of the periodic table.

A recent review article in Nature describes collaborative work by ORNL and UT researchers and by scientists in Poland and Belgium. The authors describe the behavior of super-heavy nuclei — those chock full of protons and neutrons to the point that they tax the physical forces that hold them together.

"Predicting the stabilities of extremely heavy nuclei has been a long-term goal of nuclear scientists. This research represents the very best we can do at predicting the structure of these species," said Witold Nazarewicz, a researcher in the Physics Division and UT's Department of Physics and Astronomy.

The paper describes how protons and neutrons of extremely heavy nuclei arrange into shapes that can be oblong or flat. That shape can help determine the stability or life of the nucleus, which is a factor in determining if the atomic species can even exist or be synthetically created.

Because of strong electrostatic repulsion, some of these superheavy nuclei may have extremely short lifetimes -- in the range of a millisecond.

But in some cases, isotopes may be much more stable, or long-lived, and this stability may depend on the nuclear shape. Experiments performed at GSI in Germany, RIKEN in Japan, in Dubna, Russia, and elsewhere have bolstered theories that the lives of nuclei become longer as certain proton and neutron configurations are achieved. Computationally intense theoretical modeling indicates that a large difference in the shapes of a "parent" nucleus, which decays by emitting an alpha particle, and that of its "daughter" isotope will hinder the rate of decay to that daughter.

"It takes time for a nucleus to decay from a flat, oblate shape to a well-deformed elongated shape. The protons and neutrons are rearranging themselves, and this shape change causes difficulty," said Nazarewicz.

Some experiments indicate that the addition of neutrons to a nucleus can extend the life of an isotope of a superheavy element — for instance the unnamed element 112 — from a fraction of a second to more than 30 seconds. In terms of existence for extremely heavy

nuclei, a half-minute is an eternity.

Nuclei in the particularly well-bound isotopes find arrangements that physicists regard as "magic." Such nuclei are reminiscent of noble gases — for instance, helium, argon and neon — which because of their closed electron shells are so stable and unreactive that they are known as inert gases.

Nuclei also can have closed shells of protons and neutrons. Lead-208 is the heaviest "doubly magic" nucleus with closed shells of 82 protons and 126 neutrons. "We do not really know what is the next doubly magic nucleus beyond lead-208," Nazarewicz said.--Bill Cabage



Nazarewicz

New Staff Members

ORNL continues to grow. Welcome to the following new laboratory employees.

- Kara J. Kembel, Business & Information Services Directorate
- Hugh M. O'Neill, Chemical Sciences
- Douglas R. Lepro, Computational Sciences & Engineering
- Jeffery A. Kuehn, Computer Science & Mathematics
- Deniz Aykac, Jae-Soon Choi, Christina D. Ward and Teresa K. Williams, Engineering Science & Technology
- Nancy L. Engle, Environmental Sciences
- Mary M. Conger, Integrated Operations Support
- Thak Sang Byun and Vlastimil Kunc, Metals & Ceramics
- Jason P. Cook, Nonreactor Nuclear Facilities
- Matthew A. Buchholz, Douglas R. Freels and Johnafred M. Thomas, Operational Safety Services
- Michael E. Futrell, SNS Experimental Facilities
- Brett R. Bosley and Carolyn S. Walls, Technology Transfer & Economic Development Directorate

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Curtis Boles

Karen Wilson and Virginia Dale enjoyed open house festivities for the recently remodeled Central Research Library.

Lab Notes

ORNL named 'best in class'

DOE's Office of Science has selected ORNL as one of two national laboratories (along with Pacific Northwest) to receive the "Best in Class" award for pollution prevention. The award recognizes ORNL's leadership in implementing source reduction and recycling initiatives and incorporating sustainable building design and operating principles throughout the laboratory. The following ORNL projects were cited:

- *The laboratory continued to evaluate cost-effective source reduction technologies and implemented two new initiatives, replacement of a plasma arc torch with water jet cutter technology and imaging plate system implementation eliminating photographic chemicals.
- *ORNL recycled a total of 2,477.56 metric tons with two new initiatives—the Biology Complex Legacy Materials Disposition Initiative and the High Flux Isotope Reactor Nickel-Cadmium Battery Reuse project.
- *Design, construction and operational changes at the Spallation Neutron Source significantly reduced the amount of process waste requiring treatment.

BHM events a big success



Black History Committee member Regina Parks stands behind the "Make A Wish" representatives (from left) Mamosa Foster, Marilyn Davidson and Brenda Reliford.

ORNL's Black History Month observance ended with a flourish as a Main Street grand event attracted hundreds and the charitable

"Make A Wish Come True: Empowering Children" raised nearly \$5,000.

Lab employees and UT-Battelle contributed \$4,986.45 to support Fair Garden and Sam E. Hill family and community service centers and Maynard Elementary School. Each school or center will receive \$1,662.15 for their programs for minority and needy families.

Dave Hamrin of Networking & Computing Technologies won the Black History Month trivia contest. Members of the BHM Committee, who provided a month of great programming, expressed thanks to everyone who helped make the celebration a success.

Former veep drops in

Former Vice President Al Gore helicoptered to ORNL earlier this spring to see some of the new facilities and talk with research staff members. Gore, former U.S. senator from Tennessee, served as a keynote speaker (along with Howard Baker, former ambassador and senate majority leader) at the "Cleaning America's Air: Progress and Challenges" conference at the University of Tennessee.

Gore received a briefing in the EVEREST visualization lab from the Computer Science and Mathematics Division's John Drake and David Erickson, who demonstrated current and future climate models being developed here. He also talked with the Environmental Sciences Division's Gary Jacobs and Robin Graham about biofuels and signed the Cray computer.

ATM moves west

ORNL Federal Credit Union Lab Branch Manager Leigha Stewart advises that one of the two onsite ATMs has been relocated to Bldg. 1505 to better serve employees in the West Campus area. The ATM is located near the new coffee cart in 1505.

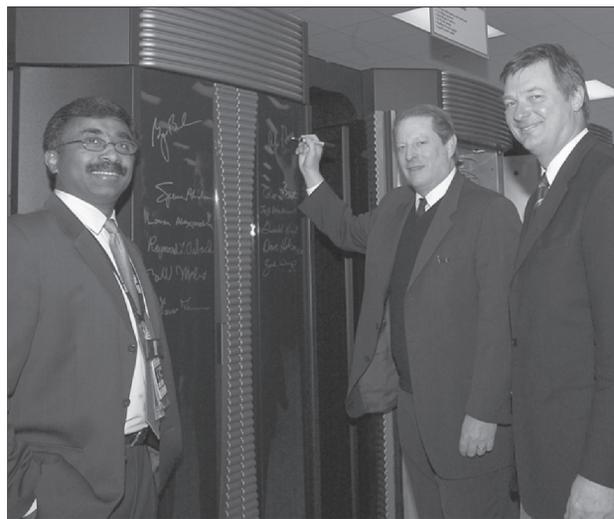
The credit union branch on Main Street continues to offer full-service banking needs, including an ATM and a 24-hour kiosk. Plans also are under way to install an ATM in the new cafeteria.

Education support cited

Twenty-nine ORNL staff members have been honored for their contributions to ORNL's education programs. Twenty-two of the employees served as mentors

in DOE- and ORNL-sponsored internship programs and were nominated as outstanding mentors by the students they hosted. ORISE, which administers most of the laboratory's education programs, nominated seven others for their unique contributions to ORNL's education mission.

Awards were presented to ORNL mentors Jun Xu and Laetitia Delmau, Chemical Sciences; Glenn Allgood, Computational Sciences & Engineering; J. Lee Robertson, Condensed Matter Sciences; Jeff Christian, John Simpson, Kirby Wilcher, Melissa Lapsa, Shawn Goedeke and Terry Heatherly, Engineering Science & Technology; Melanie Mayes, Molly Pace and Xiangping Yin,



Gore signs in at the Cray computer as Thomas Zacharia and Jeff Wadsworth watch.

Environmental Sciences; Mark Carter, Fusion Energy; Thomas Klasson, Life Sciences; Andrew Payzant, Metals & Ceramics; Bradley Rearden and Costas Tsouris, Nuclear Science & Technology; Mark Wendel, Craig Deibebe, Saeed Assadi and Ted Williams, Spallation Neutron Source Directorate.

Special awards were presented to Kara Kruse, Computational Sciences & Engineering; Craig Blue, Metals & Ceramics; and Bernadette Kirk, Nuclear Science & Technology, for their consistently strong mentoring and broad support of education programs at the laboratory. Also receiving awards were Wendy Williams and Kowetha Davidson, Life Sciences; Lee Riedinger, University Partnerships Directorate; and Will Minter, Business and Information Services Directorate, for their unique contributions to education.

Wipe those sneaks

The ORNL Fitness Center in Bldg 4500-South certainly stays busy, with more than 2,000 registered users. Karon Foster of Facilities Management has reminded users — especially during wet and muddy spring weather — to be sure to wear clean footwear in the center. Mud and gravel mess up the floors and can also trash up the exercise equipment. Remember to wipe your feet!

Laboratory's canine visitor leaves for advanced training

Naomi, a beautiful yellow Labrador-golden retriever mix, has spent the last year at ORNL as part of her socialization training for Canine Companions for Independence. She and her handler, David McLaughlin (Operational Safety Services Division), often could be seen walking to and from the mailroom or at the cafeteria.

Now Naomi is headed for six months of advanced training at CCI's Southeast training facility at Sea World in Orlando. As part of

this program, she will be taught skills such as turning on light switches, opening refrigerators and doors, picking up dropped items, and other tasks to aid wheelchair-bound or hearing-impaired individuals. Naomi is following in the footsteps of Epstein and Penn, two other CCI puppies that were "socialized" at ORNL.

McLaughlin expressed his appreciation to co-workers, supervisors and others at ORNL for "their tolerance, acceptance and support" of the program. "You may not realize it, but you have been an important part of Naomi's training and development by the simple act of sharing an office space or a cafeteria lunch spot with a young dog who may one day be a big help to a needy individual," he added.

Only about a third of the dogs that CCI trains eventually graduate to become active service dogs, so let's hope that our former ORNL "associate" will be one of the successes.



Awww . . . Naomi came to the laboratory as a puppy.



Naomi modeled her Canine Companions for Independence coat during one of her last days at ORNL.

Service Anniversaries

February

35 years: Jackie Ronald Mayotte, Metals & Ceramics

30 years: Vicki L. Beets, Communications & External Relations Dir.; J. Kaye Carter, Condensed Matter Sciences; Nancy M. Lay, Craft Resources; Forrest Douglas Childers, Fabrication; Larry T. Shaw, Laboratory Protection; Julia B. Cooper, Life Sciences; Brenda Darlene Hickman, Metals & Ceramics; J. L. Duncan, Networking & Computing Technologies; Charles O. Slater, Nuclear Science & Technology;

25 years: Ava Irene Rose, Computational Sciences & Engineering; Kathryn L. Allison, Craft Resources; Charles Gregory Palko, Facilities Management; Tina Tate Williford, Laboratory Protection; John Michael Vitek, Metals & Ceramics; Joyce B. Echols, Nuclear Science & Technology; Billy Curtis Large, Research Reactors

20 years: Mary L. Kelly, Nuclear Science & Technology; Franda P. Ervin, Physics; Kendell L. Sevits, Research Reactors

March

35 years: Gregory Deane Guymo, Craft Resources; Charles C. Coutant, Environ-

mental Sciences; Jess C. Copeland, Logistical Services

30 years: Jacquelyn M. Smith, Contracts; Kenny R. Davis, Jerry C. Griffith, John G. McCarter and Douglas W. Smith, Craft Resources; Elaine G. Thompson, Environmental Sciences; Russ N. Borum, Fabrication; John O. Richardson and Donald A. Spong, Fusion Energy; J. C. Brewster, Logistical Services; Rick Battiste, Metals & Ceramics; and Bennie Lee Goodman, Nonreactor Nuclear Facilities

25 years: Angela F. Beach, Business & Information Services; Cynthia C. Southmayd, Communications & External Relations; Mary Louise Bible, Rita L. Thearp, Edward Allan Vineyard and Betty Ann Walker, Engineering Science & Technology; Lana K. McDonald, Environmental Sciences; Mike Watkins, Facilities Management; Mark Alan Floyd, Networking & Computing Technologies; Bruce Allen Owen, Operational Safety Services; Greg Gruzalski, Physical Sciences; Mark E. Whitley, Physics; Janice M. Rankin, Quality Services; William E. Hill and Janie R. Ross, Research Reactors

20 years: Lori Bell Gorman and Van B. Graves, Nuclear Science & Technology

ORNL People

Will Minter, director of the Asset Management and Small Business Program Division, is featured in a recent issue of MBE, Minority Business Entrepreneur, magazine. The publication reaches some 40,000 business owners and advocates. Minter was recognized for his leadership role in helping plan DOE's annual small business conference.

Pat Parr, Facilities and Operations Directorate, was elected vice-chair/chair elect of the Executive Committee for the Southern Appalachian Man and the Biosphere Cooperative. SAMAB is a partnership of federal and state agencies that helps identify and implement broad resource management and sustainability initiatives that cross natural, political and geographical boundaries.

The Metals and Ceramics Division's **Amit Goyal** has been elected a consulting fellow of the World Innovation Foundation, an international multi-disciplinary consultative research group that advises nations and their governments behind the scenes. There are some 2,000 WIF members and fellows throughout the world, including 57 Nobel Laureates. Goyal also received an "Outstanding Young Tennessean" award from the Tennessee Junior Chamber of Commerce. OYTs are recognized for rising to the top of their chosen fields and serving as role models for youth.

Kristina Thiagarajan has joined the laboratory as manager of research programs supported by the National Institutes of Health. She received her master's and Ph.D. degrees from the University of Washington. Thiagarajan most recently has served as an assistant professor in the University of Tennessee College of Nursing and previously at the University of Washington in its nursing program.

Michael Hu of Nuclear Science & Technology is co-editor and publisher of a book titled Ceramic Nanomaterials and Nanotechnology III for the American Ceramic Society. This is the third book Hu has contributed on ceramic nanotechnology.

Transformation

Continued from page 1

whose book, "Only the Paranoid Survive," has become a favorite of his. "Grove has a theory that organizations are most vulnerable right after significant successes. We need to work very hard to avoid such vulnerabilities. We must take action to address our remaining serious issues by understanding our risks and strengthening our ability to manage them."

He also reviewed the laboratory's scores in achieving the coveted "outstanding" performance rating from DOE for FY 2004 while adding a cautionary note: DOE appraisals for future years will place additional emphasis on operational discipline and eventually are expected to apply a new and more rigorous numerical evaluation process. "In order to continue to succeed, we must deliver on our commitments at HFIR, REDC and other nuclear facilities; continue to improve our safety performance; and sustain or improve our performance in all other areas," he explained. "We have to focus and keep improving."

And those improvements may have to come amidst some budgetary limitations. "Although our budget has grown substantially over the past several years, the DOE FY06 funding request is down some two percent from FY05," Wadsworth said. "This may not sound like a lot, but things can get tighter as the funds flow down to individual projects. This budget plan, of course, is the initial request, so things can change as the budget moves through Congress. We are engaged in the budget process and will be following it closely through our Tennessee Congressional delegation, which strongly supports ORNL."

Wadsworth mentioned the philosophy Office of Science Director Ray Orbach has presented for the SC laboratories. "Dr. Orbach has asked us where we're going to be world-class. And, for a \$1 billion annual budget, we need to be world-class. We believe that our outstanding capabilities and facilities in neutrons and computing can serve as the underpinnings for world-class programs in materials, energy and life sciences. There are plenty of opportunities here," he added.

"We do face some tough choices, though," Wadsworth continued. "Although the laboratory is in a comparatively strong position for FY06, support for some areas, such as the computing budget, is not where we feel it needs to be. We'll be working these issues."

The area of national security, however, continues to provide good budget news for ORNL. Other long-term drivers for federally funded R&D are the Bush administration priorities of economic opportunity and ownership, fiscal responsibility, a compassionate society and effective government.

Where will ORNL efforts be focused as we continue the laboratory's transformation? "Our science and technology aspiration is to be the best lab in the world at what we do," Wadsworth said, citing neutron sciences; leadership-class computing; systems biology;

energy technologies; advanced materials; and homeland, national and global security as areas where we have made significant accomplishments but have opportunities for improvements and program expansion.

Wadsworth stressed that the laboratory also must be "world-class" in the areas of operations and environment, safety and health. He is so concerned about the safety of ORNL staff that he and Kelly Beierschmitt have drafted a paper, "Building a Solid Safety Culture: Strong Leadership, Shared Ownership," in which they outline plans to sustain the recent improvement in ORNL's safety record and reduce the likelihood of further serious accidents.

"I continue to have significant concerns about our safety record," Wadsworth said. "Although we have made improvements, staff members are still getting hurt while performing routine tasks. To help address this crucial issue, we all must take responsibility for changing our culture and behavior, providing staff with the knowledge and tools they need to work safely, and creating safer workspaces."

Traffic safety continues to be a major concern for employees.

He added that the rolling safety stand-down meetings with employees and the safety paper are only initial steps in the effort. "The Leadership Team is finalizing the next phase of the safety leaderships plans and expectations. Everyone stay tuned."

Wadsworth also told meeting attendees that the facilities modernization program has surpassed its initial goals, including constructing 1 million square ft. of space (excluding the SNS), vacating some 1.8 million square ft. of old excess space, reducing the number of staff located offsite to a minimum and reducing the average age of facilities to 34 years.

Construction on four new facilities – the Joint Institute for Biological Sciences, Joint Institute for Neutron Sciences, Multiprogram Research Facility and a substation with TVA – will start this year, he added. ORNL leaders are continuing efforts to identify funding for upgrades to the Central Materials and Chemistry Laboratories (Bldg. 4500) and for waste management systems and consolidation of nuclear facilities.

A new strategy that is now being developed focuses on exiting the central campus, Wadsworth said. Benefits to this effort would include accelerating the cleanup of Bethel Valley, enabling a new waste management system and reducing legacy burdens. "If you reside in the central area, you may be moving



Wadsworth spoke to a full house in the Research Support Building.

soon," he added.

Wadsworth said laboratory leaders also must continue efforts to "rationalize" ORNL nuclear capabilities. "As programmatic support continues on a downward trend, we must focus on preserving our capabilities in key facilities and improving operational discipline. These are important goals for Kelly Beierschmitt and his team in our new Nuclear Operations Directorate."

Another operational goal is driving overhead rates down. "We expect the rate to perhaps go down to 38.1 by the end of FY05 and to decline after 2005," Wadsworth said. "We have had some increases due to upgraded salaries and increased benefit costs. We made a decision to invest – in the new facilities and in salaries and benefits for our staff. Overhead rates should go down as the impact of these investments is felt less acutely and as we continue to grow our base."

Wadsworth also reported on the success of community involvement activities, including accomplishments in technology transfer and economic development, and community outreach and support programs such as science education, Team UT-Battelle and United Way.

During the question-and-answer session, Wadsworth was asked about a "transition phase" for veteran employees and their expertise (ORNL is addressing the issue and he hopes to see progress on it); parking problems (a new lot to be constructed across Bethel Valley Road from the Visitors Center may help ease the pinch); and the pension plan (he still hopes to separate the ORNL plan from Y-12 and feels the amount of "cushion" in the plan isn't as large as some have declared).

The issue of speeding on the campus and area roads also came up, and Wadsworth said traffic safety continues to be a major concern for employees, based on the e-mail messages he receives. He added that monitoring systems have shown that some 27 percent of drivers speed through the vehicle portals, significantly exceeding the 25 mph limit. "We all must be more careful," he concluded.

Wadsworth's slides from the Senior Staff Meeting may be downloaded from the SSM Web page at home.ornl.gov/leadership/senior_staff_meeting/. The draft paper on safety also is available on that page.

With new systems, processes

Procurement team working to save laboratory money

Purchasing and procurement operations have been called lots of things. Traditionally, “moneymaker” hasn’t been one of them, according to ORNL Chief Financial Officer Greg Turner. But following a series of rethought processes and retooled systems, the Contracts Division, which handles the laboratory’s acquisitions, is coming out in the black.

ORNL’s procurement organization, housed in the Business and Information Services Directorate’s Contracts Division and propelled by its new Acquisition Management System approach, is speeding procurement turnaround and saving the laboratory money, said Contracts Division Director Barry Miller.

“In FY 2004, the Contracts Division negotiated hard cost savings of \$6.2 million,” Miller said. “These aren’t just cost avoidances -- this is real money resulting from negotiations or unique acquisition strategies accomplished by procurement teams.”

The Contracts Division is showing a 108 percent return on investment through cost savings and avoidance, meaning that ORNL is getting back more than it pays for in terms of Contracts Division operating costs. The division, in terms of benefit and cost, is a laboratory asset.

In terms of cost avoidances, dedicated contract closeout activities accomplished in conjunction with the Audit Department have resulted in excess of another \$3 million being returned promptly to ORNL over the last 12

months. “All of this money goes right back to the programs,” Miller said.

The finance directorate’s concentration on overhauling the procurement and contracts operations didn’t come about on a whim. The AMS process is ubiquitous. “The management system concept serves the laboratory well for acquisitions as it integrates and supports the entire ‘supply chain’ process,” said Connie Arnwine, AMS quality assurance specialist.

And the systems efficiency is critical during a time of unprecedented expansion and growth at ORNL.

“The AMS touches nearly everything, including the major laboratory goals and objectives, such as supercomputing and nanoscience,” Miller said. “If we didn’t do our jobs, these programs would have a hard time meeting their schedules.”

Time is money, so the division was reorganized toward reaching procurement turnaround goals. The system is still tweaked occasionally to do it better. A suite of 20 metrics are tracked each month to see if the processes are working and where trouble areas may lie.

Working with the customer is key. The division participates in and drives a team contract approach that gets customer feedback and an advanced procurement planning process that invariably saves dollars. (“The last-minute stuff is always the challenge,” Miller said.)

This two-way relationship is good news for the laboratory. The Contracts Division touches nearly half of ORNL’s overall billion-dollar budget — some \$500 million worth of business in a single year.



Miller

The laboratory’s growth necessitated retooling procurement processes. The Spallation Neutron Source, with its unprecedented six-lab collaboration, required a super-efficient system. Miller, in fact, came to ORNL originally to oversee the SNS procurement process.

“Standardizing contracts is important in a huge project like SNS. Even simple things — you don’t want five different types of locksets installed in a facility just because it was built by five different labs,” Miller said.

One example of the AMS’s success through diligence is a \$58,000 saving through an import duty exemption for the Center for Nanophase Materials Sciences, a project where much of the instrumentation is acquired offshore, similar to other large projects like the SNS.

Through close collaboration with other organizations such as ORNL’s Office of General Counsel -- which has helped immensely with standardizing contracts -- these kinds of savings are becoming more frequent than ever. The laboratory’s acquisition system has worked so well that it’s being adapted to other large DOE projects, which likely will use the multilab collaboration model.

The ORNL group’s successes at saving dollars, coupled with its attention to detail, are winning the trust of the DOE customer, Miller said. ORNL, in fact, will handle several large procurements for the United States’ role in an international fusion megaproject, the International Thermonuclear Experimental Reactor. The ORNL-Princeton Plasma Physics Laboratory partnership won the ITER program management role with 40 percent of the DOE evaluation criteria focusing on procurement practices and methodologies that were in large part begun on the SNS project.

The Contracts Division will continue to have its work cut out for it as the modernization effort comes to fruition and ORNL programs continue to grow. One national security program, for instance, has already jumped from \$2 million to \$69 million, undoubtedly creating work for the buyers.

“We can respond,” Miller said. “Our acquisition teams are good and getting better every day.” -- *Bill Cabage*

Purchase cards: Worth redemption

Purchase card programs were instituted at the national laboratories in the 1990s as a cost-saving convenience: Give staff members a quick way to acquire low-cost items as they are needed. They worked great.

In fact, they worked too well. Occasionally shaky bookkeeping and some alleged abuses drew auditors’ ire and even made national news, putting the P-card programs at risk across the DOE complex.

At ORNL, however, the P-card lives on. The reason, said Contracts Division’s Barry Miller, is that they still are an important component of the procurement process that, for the most part, are being used wisely by ORNL staff members.

“If we lost our P-card program, we would have to hire 20 buyers and probably at least that many more administrative people,” he said. “They would be needed to prepare requisitions and process invoices for about 40,000 procurement transactions a year.” The laboratory’s P-card transactions are shepherded by the

equivalent of only 1.5 full-time staff members.

One lab, in fact, did away with its P-card program, replacing it with 19 express buyers “who chase down every purchase through the acquisition system,” Miller said.

ORNL’s program is managed with close collaboration between the Contracts Division and Audit and Assessment Services.

There also are fewer P-cards in circulation: The number of cardholders has dropped from a peak of 540 to 390, a number that is likely to continue to decrease as a more robust AVID system comes on line.

“It’s important for cardholders and approving officials to continue using the P-card in accordance with established ORNL practices,” Miller added.

“We cannot afford to jeopardize the integrity of the program and incur all of those costs for people and slower acquisition support,” he said.

In the spotlight

Bush visit, other events make ORNL a focus for media in 2004

The July 2004 visit by President George W. Bush and the earlier announcement of DOE's selection of ORNL to lead the effort to build the world's most powerful supercomputer were highlights in a year that saw intensive media coverage of laboratory programs and people.

When President Bush came to the laboratory July 12 to deliver a policy address on terrorism and view equipment from Libya's nuclear program, he was accompanied by several busloads of media representatives. The Central Research Library temporarily became the Communications Center and satellite White House Press Office, hosting reporters from local and regional media, the five major networks, The New York Times, USA TODAY and the Los Angeles Times.

The group also included reporters from Mideastern news agencies Al Jazeera, Alhurra and Al Arabiye. Coverage of the Bush visit appeared in more than 220 television news stories and in more than 40 national or international publications.

ORNL also had been a media focus the previous May, when DOE announced that the

laboratory would lead the department's efforts to build the world's most powerful supercomputer by 2007. Coverage of the announcement appeared in more than 80 television broadcasts and more than 50 print outlets, including USA TODAY, The Washington Post and Newsday.

And there were many other national stories as well.

According to statistics kept by Communications & External Relations staff, there were more than 400 additional mentions of ORNL work in national and international print media during 2004. These included at least seven appearances in The New York Times, five in The Washington Post, nine in USA TODAY, 17 in Newsday, four in Business Week, four in Forbes, three in the Chicago Tribune, 12 in the Los Angeles Times, five in the Christian Science Monitor, eight in the Atlanta Journal-Constitution, 13 in the Miami Herald, seven in the Philadelphia Inquirer, three in the Boston Globe and 55 on the Associated Press wire.



Members of the Washington press corps made themselves at home in the Central Research Library, which served as Communications Center and satellite White House Press Office during President Bush's visit.

Other national or international publications of note carrying at least one ORNL story in 2004 included the San Francisco Chronicle, Seattle Times, South Africa's Daily News, Times of London, International Herald Tribune, Sydney Morning Herald, Guardian (United Kingdom), Agence France Presse, Canada's Globe & Mail, UK Sunday Herald, Vancouver Sun, China Post and Spain's Comunicados de Prensa.

Television coverage of ORNL activities also was heavy during 2004.

Several stories appeared in the national broadcast media, including at least seven on ABC News, six on CNN and five on CBS News. Knoxville affiliates WATE, WBIR, WVLT and WTNZ carried more than 250

stories related to laboratory activities or people, and stations in Nashville, Chattanooga and Memphis combined for more than 70 stories about ORNL.

Laboratory programs were featured frequently in trade media as well. Communications & External Relations staff tracked more than 350 ORNL items in national and international trade publications during the year. There were multiple items in New Scientist, Government Computer News, Science Daily, ScienceBlog.com, Biotech Week, PhysOrg.com, Information Week and Network Computing, as well as appearances in Science, Scientific American, the Scientist, Electronics Weekly and Physics Today.



Lots of folks wanted to see ORNL's computational sciences facility in 2004. Associate Laboratory Director Thomas Zacharia hosted University of Tennessee leaders Joe Johnson, Loren Crabtree and John Petersen.

Blindness . . .

angiography and optical coherence tomography imagery that are used to diagnose a wide range of pathologies," Tobin said. "This is a necessary step to support developing our statistical feature descriptions for image indexing, retrieval and diagnosis."

Tobin and Chaum expect this project to provide benefits not only for diagnosing and treating blinding diseases in broad-based population screening programs, but also for novel biomedical imaging and telemedicine.

"With 180 million people worldwide either

blind or at risk of becoming blind, this research has a chance to make a profound effect on people's lives," Chaum said. "By developing a computer diagnosis system to improve early detection of eye disease by non-experts and through telemedicine, we can potentially treat or prevent up to 80 percent of blindness."

Funding for the project, which began in June 2004, is provided by ORNL's Laboratory Directed Research and Development program. — Ron Walli

Continued from page 1



On Secret City Commemorative Walk

UT-Battelle to provide X-10 historical monument

UT-Battelle is supporting the Secret City Commemorative Walk — a memorial to participants in the Manhattan Project who also built the city of Oak Ridge — with the purchase of a monument for the new park.

Construction on the self-guided commemorative walk, described as an attractive, permanent and landscaped area set aside in Oak Ridge's A.K. Bissell Park, is scheduled to begin this spring. The effort is being spearheaded by the Rotary Club of Oak Ridge.

The UT-Battelle institutional monument will describe "X-10 — The Clinton Laboratories," which were original names for the laboratory.

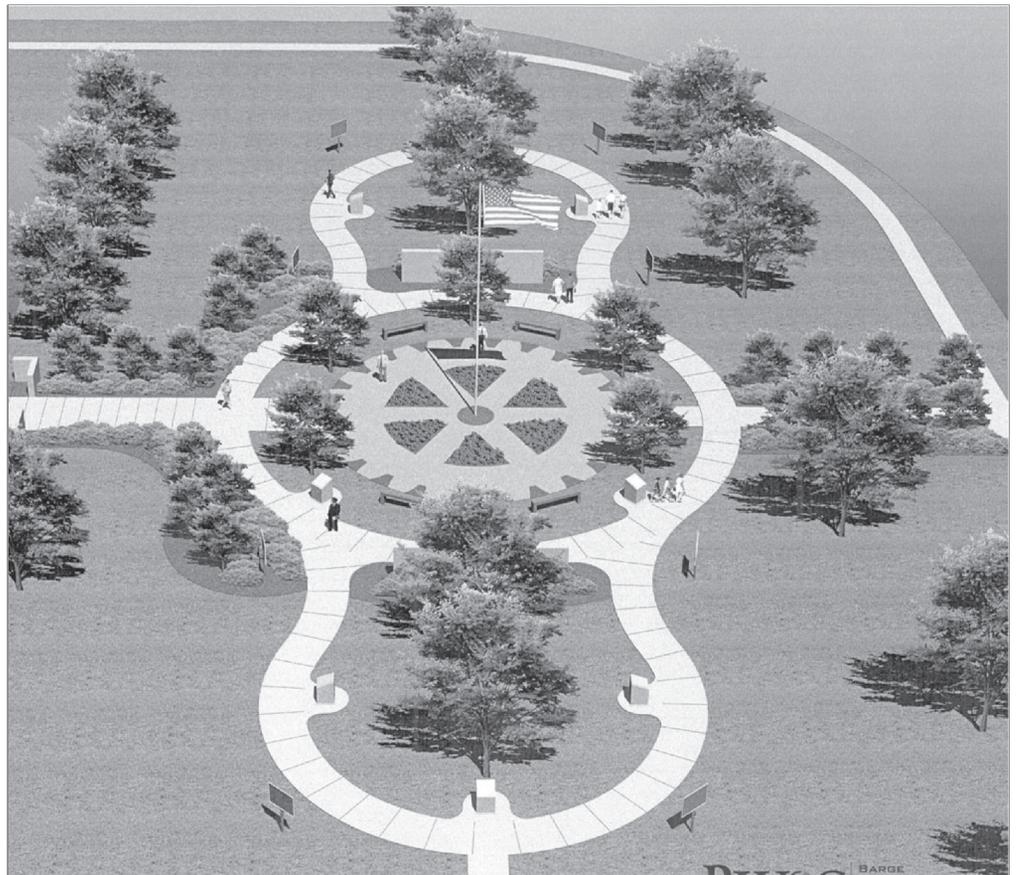
"ORNL's history is directly tied to that of the city of Oak Ridge," said Laboratory Director Jeff Wadsworth. "The Manhattan Project is one of the most fascinating stories of our time, and the establishment and growth of the city of Oak Ridge and of ORNL are major elements of that story."

The Secret City Commemorative Walk project is being funded by corporate and private donations through the Rotary Club of Oak Ridge.

UT-Battelle's plaque will describe the laboratory's beginnings with the construction of the Graphite Reactor — the world's first operating nuclear reactor — and its growth into a multidisciplinary research facility.

An institutional monument such as UT-Battelle's represents a \$10,000 donation to the campaign. The commemorative walk will feature 10 of these monuments.

Other designated donations to the memorial walk include founder's wall plaques for \$150



The Secret City Commemorative Walk at A.K. Bissell Park will provide a memorial to participants in the Manhattan Project. The UT-Battelle monument, which will describe "X-10 -- The Clinton Laboratories," will be one of 10 such monuments on the self-guided walk. (Image courtesy of the Rotary Club of Oak Ridge)

and \$300 and levels of donor support from \$100 (supporter) to \$1,000 (benefactor). There will be one \$5,000 historical marker for

each year that Oak Ridge was a "secret city" — closed to the outside world from its inception in 1942 until 1949.

Reporter

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Procurement team saving \$\$ for laboratory, page 6

ORNL in media spotlight, page 7

The logo for UT-Battelle, featuring a stylized green mountain range above the text "UT-BATTELLE" in a bold, sans-serif font.