

## Cold snap

High Flux Isotope Reactor's cold source will bring a new class of neutron research

**E**xpect unprecedented cold in Melton Valley this fall. The chill will be confined mostly to one of the High Flux Isotope Reactor's neutron beam facilities.

Although much of the autumn fanfare around ORNL will be a couple of ridges over at the by then completed Spallation Neutron Source, its companion facility for neutron research, HFIR, will be channeling neutrons down the new beam line with a new but long-sought feature. For the first time, HFIR will be offering its neutrons cold.

HFIR's new "cold source" will give the research reactor's users the ability to apply neutron analysis to additional classes of materials, says Steve Nagler, interim director of the Center for Neutron Scattering.

"ORNL will be unique in the world in having both high intensity pulsed and continuous neutron sources," says Steve, referring to the SNS and HFIR respectively. While the accelerator-based SNS will produce neutrons in pulses, HFIR, a nuclear reactor, produces neutrons at a continuous, steady state.

"Certain kinds of experiments, particularly those with small-angle neutron scattering, work extremely well with continuous neutron sources," Steve says. "While the SNS will be the world's leading facility for pulsed neutron

science, the HFIR's continuous stream of neutrons combined with its new cold source will enable it to perform certain types of measurements that would be difficult to do at the SNS."

This is the banner year for the neutron community. More than 200 researchers attended a SNS and HFIR User Group meeting last October to learn more about ORNL's neutron science user program. About 500 researchers annually are expected to take advantage of HFIR's upgraded beamlines and experiment stations. When finished, these will include eight sta-



Curtis Boles

HFIR's chilled neutrons will travel down this beamline inside a hydrogen-chilled chamber for the small-angle neutron scattering experiment.

tions for "thermal" neutron experiments and seven for cold neutrons.

Researchers prefer their neutrons cold for certain experiments mainly because of their

(See COLD, page 4)

## Human Resources retools with new faces, programs

**I**n a recent *ORNL Reporter*, an item quoted ORNL's new director of Human Resources: "...be confident in making decisions. You'll be right 85 percent of the time, 15 percent of the time you'll be wrong but you can fix it, and the other five you'll just have to ask forgiveness."

Several readers spotted the *Reporter's* typo: The math added up to only 105 percent. We'll correct the record here: The new HR director's level of effort has rarely dropped below 110 percent since she took the position last August.

ORNL's Human Resources organization has undergone a significant retooling, orienting itself much as the Laboratory has toward attracting and keeping world-class staff members for a world-class facility.

Lori, an Arizona native who came to ORNL from Pacific Northwest National Laboratory, recently shared her views on her goals and the Lab's HR challenges.

*HR has brought in a lot of new people. Are there major changes in HR's mission or focus, as well?*



Curtis Boles

**Human Resources Director Lori Barreras counts effecting an HR culture change and building credibility as the biggest challenges in her job.**

HR's overall goal is to provide expert, professional HR services to our customers throughout the Lab. By building a strong infrastructure, we will enable the Laboratory to attract, develop and retain an engaged and exceptional work force. We assessed the Laboratory needs and set out a number of goals. However, we realized that in order to meet our aggressive HR goals, we needed additional resources.

Over the past few years, we have realigned our organization and added additional key positions. We are now better staffed to deliver HR expertise in all areas: labor relations, compensation, organizational development, benefits, recruiting, equal employment opportunity/affirmative action, international services and human resource generalists.

*What HR-related things are coming up that will affect ORNL staff the most (in terms of, for example, changes in PADS or new development opportunities)?*

Realizing that the changes will take a multi-year effort, we identified a number of new programs, tools,

(See HR, page 5)

# Wadsworth: New Lab facilities attracting interest

The growing globalization of R&D, which ORNL Director Jeff Wadsworth has seen at first hand in his recent trips abroad, was one of the subjects of this year's first Senior Managers Meeting on March 23.

As Energy Secretary Bodman indicated in his 2005 visit, other nations are expanding their science programs. On last fall's trip to China, Jeff visited a new nanoscience facility in Beijing, financed by a Taiwanese billionaire. Foreign researchers who have come to the United States are being lured back home by such facilities, he said. Similar initiatives in India, South Korea and other developing nations point to a much more competitive global science scenario.

Competition is particularly heated in computing, where, as Jeff noted, 1998's high mark of 1.8 teraflop/s now barely cracks the Top 500. However, to house these increas-

ingly powerful machines, "you need a facility most people don't have," he said. ORNL's Computational Sciences Building, with its electrical power supply and cooling capacity, represents that sort of facility. Similarly, while the Spallation Neutron Source will lead neutron science, other countries, particularly South Korea, are planning lesser neutron sources.

Lawmakers and policymakers are responding with legislative initiatives such as the President's American Competitiveness Initiative, which addresses the recommendations of a recent report from the National Academies, "Rising Above the Gathering Storm." This report, requested by senators Lamar Alexander and Jeff Bingaman, is a wake-up call that includes contributions by several Lab staff members.

Jeff noted that Sen. Alexander and Gov.

Phil Bredeesen both have asked him questions about ORNL's stances on energy policy and education during recent visits, and he thanked Lab staff for their response to these challenges.

Bright spots of Jeff's presentation included the Lab's nuclear nonproliferation programs, where ORNL is now a "preferred provider" among labs, with a very significant share of the budget. The Multipurpose Research Facility, nearing completion on the east campus, will further spur growth in that area.

He reported that there is interest from industry in building a research center on the mostly empty northwest portion of the Lab's central campus. Other institutions are eyeing the Lab's new facilities, with their new and robust infrastructures, as grounds for future partnerships.—B.C.

## SNS's Holtkamp tabbed for ITER management team

Norbert Holtkamp, director of the Accelerator Systems Division at the Spallation Neutron Source, has been nominated to be principal deputy director-general of ITER, the international fusion reactor project.

Norbert has led the development of the accelerator portion of the SNS. With the successful commissioning of the accumulator ring earlier this year, the front-end, warm and cold linac and ring components of the SNS are essentially complete. The complicated job has gone more smoothly than expected.

"Working at SNS has been the experience of my lifetime. Being deeply involved in the management of a multi-lab collaboration was exactly the qualification I needed to be able to apply for ITER, where the SNS way of building a large science project is now applied on an international scale," Norbert says.

A native of Germany, Norbert came to ORNL from Fermilab. Last May his standing in the physics community rose as he chaired the Particle Accelerator Conference 2005 in Knoxville, Tenn., attended by 1,500 researchers from around the world.

Fusion Energy Division Director Stan Milora agrees that ITER sought Norbert because of similarities in the ITER and SNS construction task.

"Much of the challenge with ITER, by nature of its being a fusion experiment in general and its ambitiousness in particular, will be in integrating complex systems and components that are highly interactive and interdependent. Integration is a very big part of ITER, and Norbert's efforts in integrating the six-lab effort of the SNS has been remarkably successful," Stan says.

Norbert will join Ambassador Kaname Ikeda, who was named as the ITER project's director-general nominee in November 2005.

The ITER project is an international fusion effort involving the European Union, India, Japan, South Korea, China, Russia and the United States. The project will be built in Cadarache, France. The U.S. ITER program office was relocated to ORNL earlier this year. The Lab's experience of large project procurement was a leading reason for the move.

"This is a tremendous honor for ORNL and for Norbert, who has established a sterling

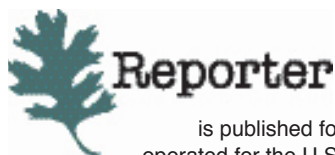


Gov. Phil Bredeesen (right) spoke at the opening of Particle Accelerator Conference 2005, held in Knoxville last May and chaired by Norbert Holtkamp (left).

record as director of the Accelerator Systems Division," Lab Director Jeff Wadsworth said in his message to Lab staff members, who noted that the program office would likely often bring Norbert back to Oak Ridge.

ITER is a major step toward an abundant, environmentally benign and economical energy source. A fusion power plant would produce no greenhouse gas emissions, use abundant and widely distributed sources of fuel, shut down easily, require no fissionable materials, operate in a continuous mode to meet demand and produce manageable radioactive waste.

"I will miss everybody on the SNS project. I have never had the honor of working with such a dedicated group of people and the success speaks for itself. I'm glad that the U.S. ITER project office is in Oak Ridge, which will bring me back from time to time to visit colleagues that became friends," Norbert says.—B.C.



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# Lab Notes

- Their theory disproves the Theory of Relativity.
- They have created “free energy.”
- The subject is an “independent thinker”; that is, has no affiliation.
- The theory is not backed up by mathematics.
- There has been no attempt to publish the work.

Lemonick cautioned that the checklist is not foolproof.

Several “cranks” have turned out to be correct, such as Alfred Wegener, who proposed continental drift to the howls of his peers, and Srinivasa Ramanujan, the early 20th-century math prodigy from rural India who contacted Cambridge University with his self-taught, and incredible, calculations.

Lemonick says some claims are plausible and thus hard to judge. A man from Romania claims to have discovered the secret of the Stradivarius violin—the wood was submerged in briny water. Maybe. “We don’t know yet,” Lemonick said.

## Uranium atoms go it alone

A recent paper published in *Physical Review Letters* illustrates how the High Flux Isotope Reactor continues to serve researchers who need neutron analysis capabilities (see story, page 1). A team led by Los Alamos National Laboratory researcher Michael Manley, in collaboration with Mohana Yethiraj of ORNL’s Center for Neutron Scattering, subjected heated uranium crystals to HFIR’s neutron beams to investigate vibration effects in the crystalline solid.

The researchers also used X-ray analysis in their attempt to delve into the element’s molecular structure to explain its properties.

Typically, atoms in a crystal structure when disturbed will vibrate in unison as if connected by springs, like ripples spreading across a pond. But the experiment showed that uranium atoms, when heated to 450 Kelvin, can oscillate for a long period of time without affecting neighboring atoms, a phenomenon known as intrinsically localized modes.

The effect, which was predicted 20 years ago, had never been conclusively seen and could explain some peculiar properties of materials, such as why uranium loses ductility at high temperatures.

## ‘Critical’ book reveals day-to-day

Jeff Wadsworth took along a show-and-tell piece to his talk (see page 6) at the UT conference on Winston Churchill March 29: the lab notebook in which “Critical achieved!” was inscribed the

morning of Nov. 4, 1943, when Enrico Fermi’s “Clinton Pile” first went critical.

Attendees, including former Sen. Howard Baker, crowded to see it after his talk. *ORNL Reporter* then couriered the priceless artifact back to Lab Records.

But not without thumbing through it (with protective gloves) first: The book is full of notes, instrument readings and instructions for the succeeding shift. Those instructions reveal that things haven’t changed a lot, including concern for safety.

*Oct. 22, 1943: “Mr. Brown, construction night mgr. says he noticed several operations men climbing across safety rail from elevator using ladder to control board. Says he’ll make us a platform to make this a safe operation if he’s given an order.”*

Important keys were being misplaced.

*Oct. 29, 1943: “A lock has been put on the Men’s Room door but there is no evidence of any keys to fit it.”*

*Oct. 30, 1943: “Didn’t think it was possible, but the brass key ring was lost for several hours tonite. There is now a nail in the wall of the supervisor’s office just over the book case. Let’s hang it there until the control desk is in operation.”*

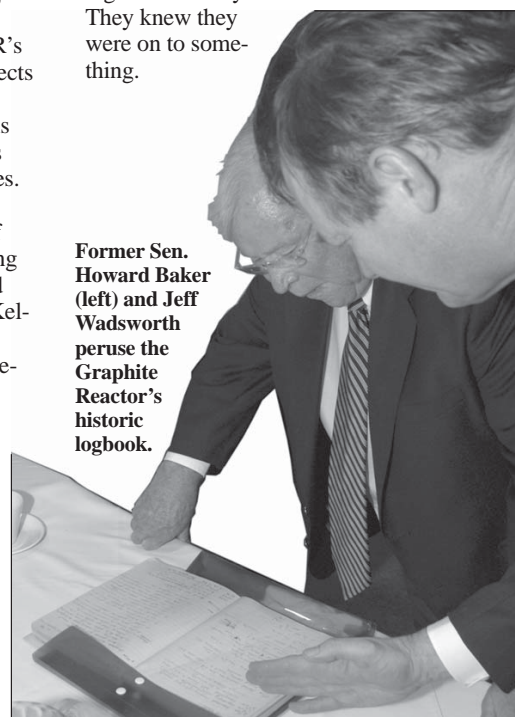
Strict adherence to procedures was also emphasized.

*Nov. 1, 1943: “Under no conditions must we touch the inside of any of the instruments. There have been several cases of instruments being monkeyed with lately and thrown out of adjustment...”*

Incidentally, November 4 is entered in the logbook as “Day 1.”

They knew they were on to something.

**Former Sen. Howard Baker (left) and Jeff Wadsworth peruse the Graphite Reactor’s historic logbook.**



University of Tennessee, Jack Williams

*Reported by Bill Cabage*

## ORNL, NIST team on PET tech

ORNL’s Metrology Lab, featured in the March *Reporter*, dedicated its new partner lab with the National Institutes of Standards and Technology on March 30. NIST’s satellite facility in Building 5510A will promote measurement accuracy for nuclear medicine imaging.

NIST scientists will use the Nuclear Medicine Calibration Laboratory to prepare and measure radioactivity standards used for Positron Emission Tomography, the non-invasive imaging technique that helps doctors diagnose and treat diseases. An estimated 650,000 PET procedures were performed in 2003; the number is expected to reach as many as two million annually by 2010.

The procedure involves the injection of a low-dose radiopharmaceutical that is metabolized in the part of the body being imaged. PET scanners create an image of the location and intensity of the radiopharmaceutical in the body. A PET image can be used to differentiate between healthy and cancerous tissue. For instance, a tumor uses more glucose than normal tissue and therefore appears brighter in an image.

NIST Director William Jeffrey and ORNL Director Jeff Wadsworth dedicated the facility, which will serve as a pilot for a series of facilities across the nation.

## Science writer’s G.U.T. feeling

*Time* magazine’s senior science writer, Michael Lemonick, was this year’s speaker at the annual Alfred and Julia Hill Lecture at the University of Tennessee. Owing to his line of work, people often contact Lemonick with their ideas. His topic, “Crank or genius: How does a science writer tell the difference?” exposed a dilemma for a science writer for a leading publication; i.e., is the person on the other end of the line a crank or the next Einstein?

Usually, it’s the former. Lemonick listed some tell-tale signs.

- They often have a Grand Unified Theory (G.U.T.) of something.
- They refer to Einstein.

# Cold

Continued from page 1

longer wavelength. The SNS will also have a cold neutron source.

"Neutrons are quantum particles in that they have a wavelength. That wavelength is shorter when their energy is higher," Steve says.

Those high-energy, short wavelength neutrons are referred to as "thermal" neutrons.

"Thermal neutrons are well suited to harder, more dense materials, but with softer materials you want cooler neutrons with longer wavelengths. This is because these softer materials have larger molecules and structures that can be analyzed more effectively with cooler, longer wavelength neutrons," Steve says.



Nagler

Neutrons from reactors are produced by fission. Researchers get access to them by what amounts to tapping into the side of the reactor.

"Think of the neutron source in nuclear reactor as a giant light bulb filled with neutrons. If the black cover surrounding the bulb has a hole, the neutrons stream out. They can be sent down a tube or a beamline to the instruments," Steve says.

"If the bulb is at a low temperature, it will glow reddish, emitting neutrons with a longer wavelength. A hotter bulb glows white, and the higher the temperature the shorter is the typical neutron wavelength," he explains.

The neutron scattering pioneers, who included Ernest Wollan and Clifford Shull at ORNL, realized that a major advantage with neutrons, along with their lack of an electrical charge, was that they detected not just the heavier atoms, as light sources do with X-rays, but also the lighter atoms, even hydrogen. That made neutron scattering popular for analyzing light-atom materials.

With their new cold sources, the SNS and HFIR will also be suited to materials with larger-sized molecules and structures.

"With thermal neutrons, the wavelengths are about one-tenth of a nanometer. With softer materials, which include biological and polymer materials, for example, the structures you want to study are more like several nanometers in size, so you want a better-matched wavelength that is closer to one nanometer, which is the wavelength of a typical cold neutron."

The HFIR ideally runs at its designated power of 85 megawatts to produce an optimum number of neutrons (this is what "high flux" refers to). Its raw-material neutrons are the higher energy room temperature thermal neutrons. To obtain "cold" neutrons, the thermal neutrons are literally cooled down with a super-cold fluid.

HFIR's neutrons will be chilled to a frosty 20 Kelvin with hydrogen pumped into a beam tube from a refrigeration unit outside the building. Initial testing of the cold source will be with cold helium gas, which is a more inert material but less well suited to chilling neutrons.

HFIR's cold neutron beam facility is housed in a structure adjacent to HFIR's original quarters, representing a significant addition to the facility. The hangar-size high-bay area, with its beam lines that are designated CG-1 through CG-4, will feature two culvert-sized, cadmium-lined cylinders, about nine feet in diameter and 70 feet long, that will contain detectors for the Small-Angle Neutron Scattering, or SANS, instruments. Several other instruments are planned for the Cold Source Experimental Hall, including, among others, a U.S.-Japan Cold Triple Axis spectrometer, a reflectometer, and the inelastic neutron scattering spectrometer called STAR.

The neutron science community is eager to have these new facilities.

"Everything we have is totally dependent on materials. Think of it through the ages—the Stone Age, the Iron Age, the Bronze Age—we've depended on materials to advance," Steve says.

"Back in the '60s everyone was laughing at Maxwell Smart's shoe phone. It was preposterous to think that a telephone could be packed in a shoe," he says as he twirls a tiny cell phone between his thumb and forefinger.

"Cell phones are only possible because we have the materials to make them with, but first we had to understand how those materials behave. For example, decades ago we were using vacuum tubes to rectify electronic signals. Then someone realized, by studying

the properties and behavior of electrons in silicon, that transistors could be built that did the same thing in a much smaller space and much more efficiently," he says.

Researchers will increasingly taking advantage of new tools, such as computer modeling and ORNL's new neutron sources, to delve into the mysteries of advanced materials in



Curtis Boles

HFIR's Cold Source Experimental Hall is dominated by the two huge tanks for the Small-Angle Neutron Scattering Experiment.

hopes of making them perform some useful function for us.

"Some materials have magnetic properties with very strange quantum effects. Cold neutrons are a real asset for studying those," Steve says.

HFIR's upgrade project, which has been in progress over the past several years, has also included, in addition to the installation of the cold source, a new beryllium reflector for the reactor vessel and enlarged beam lines to accommodate the advances in instrumentation that have occurred since the reactor was designed and built in the 1960s.

Although the original builders of the HFIR probably did not anticipate that it would still be useful 40 years later, its reactor vessel has proved robust enough for several more decades of use. That's fortunate, because HFIR's successor research reactor, the Advanced Neutron Source, was canceled in the mid-1990s. (That cancellation paved the way for bringing the SNS to Oak Ridge.)

DOE's improvements to HFIR's infrastructure, in addition to the upgrade program, has given U.S. researchers a continuous cold neutron source comparable with the best facility overseas at France's *Institut Laue Langevin*, as well as a more powerful option to the only other domestic cold source housed at the National Institute of Standards and Technology.

"For many experiments, the SNS, with its pulsed neutron source, will be unsurpassed. For others, a reactor-based source will be more suitable. ORNL will be unique in the world with both pulsed and continuous high flux neutron sources," Steve says.—B.C.

*A cold neutron's wavelength is a better match for materials with larger molecules.*



# HR

Continued from page 1

systems and services that will be systematically introduced to the Lab in the near future.

*Some examples?*

Trending data showed that the Lab's previous performance rating system allowing seven potential ratings was not effectively being utilized as intended. Rather, only four of the seven ratings were used with frequency, so we will begin using the new four-rating system in FY 2006.

In the area of organizational development, we are in the process of identifying and designing a program to develop our future leaders. By providing tools and learning programs, we will increase overall effectiveness and groom high-potential staff.

The Employee Engagement Survey (see back page) will be sent to every staff member later this spring to assess the levels of staff engagement. The results of this survey will be delivered to each manager who has at least five responders to the survey. It will assist in starting a continuous dialogue between managers and the staff members to identify areas that are working well and areas that need additional attention for better productivity and employee satisfaction.

The way in which we recruit for talent is going to undergo a significant improvement. Expert recruiters will assist managers in sourcing top talent and finalizing offers. We will improve the Lab's ability to plan, predict and respond to our changing business environments with the right staff at the right time. Increased breadth in the applicant pools is expected and, as a result, we will ensure that we are hiring the best and brightest individuals. Robust pipelines will be available to ensure future availability of needed talent in time to meet business needs.

Comprehensive work force and succession planning must be implemented to ensure we understand our capability gaps and to ensure leadership continuity in key positions through planned development and placement of key staff over time.

Effective and efficient HR management systems will identify, define, monitor and manage risks to assure Lab compliance, system integrity and asset protection. We will conduct self-audits, expand compliance education and ensure the protection of confidential and private data.

*What do you see as ORNL's biggest HR-related challenge?*

Probably the necessary culture change in the role HR played histori-

cally and the need to demonstrate value-added HR services to gain and maintain credibility. It is overcoming a legacy and understanding that the change will come gradually as we also settle into our new roles.

*What does Jeff Wadsworth want from his HR organization?*

Jeff has consistently emphasized the need for HR to become integral business partners with the directorates and provide professional HR guidance and counsel to all staff. He agrees that we need to build a strong infrastructure to support managers in more effectively managing staff. We have discussed a need to stress management accountability throughout the various levels of management.

## New faces in HR

*Human Resources has brought in new employees to help realize the directorate's challenging goals.*

*Following are some of the new faces.*

Deborah Stairs rejoined ORNL last November to manage Organizational Development and Training. She returned to the Lab from Blue Rhino in Winston-Salem, N.C., where she was director of organization effectiveness. She has also worked for Eastman Chemical Company, Mirant Corporation and Anheuser-Busch.



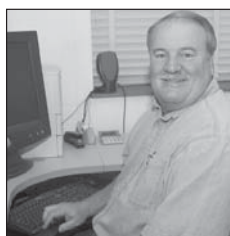
Stairs

Glenn Jennings is HR's Equal Employment Opportunity-Affirmative Action specialist. He came to the Lab from Home Depot, where he worked in EEO/AA out of Long Island, N.Y. Glenn has DOE experience; he was previously Brookhaven Lab's diversity manager. At ORNL, Glenn will focus on increasing diversity metrics, including working closely with minority and women-oriented career fairs and Historically Black Colleges and Universities.



Jennings

As labor relations manager, Les Morgan is based in Building 2518. He came to ORNL from a similar position at Arkema Chemical, a coal, steel and chemical firm. He has 20 years' experience in labor relations.



Morgan

Patricia Neal serves as senior recruiter for the Biological & Environmental Sci-



Neal

ences and Physical Sciences directorates. She comes to ORNL from the Seattle, Wash., area and previously worked for MicroSoft and Oracle.

Kathy Finnie is senior HR manager for the Energy and Engineering Sciences Directorate.



Finnie

She came to the Lab from Tecnoglas, formerly Owens-Illinois, in Columbus, Ohio.

Kari Durham came to the Lab in December from North Carolina, where she worked for Solecron Corporation and St. Andrews College in Laurinburg.



Durham

She is senior HR manager for the Biological & Environmental Sciences Directorate.

Boston native Mike Palermo is senior HR manager for the Computing & Computational Sciences Directorate. Mike's varied career has included finance and accounting. He came to the Lab for the Portland, Ore., area, where he worked for CH2M Hill.



Palermo

University recruiter Emily Bartlett previously worked for Honeywell, where she managed the university



Bartlett

relations function. She is a graduate of Baylor and Ohio State universities.

These new folks join HR managers Judy Trimble with the Spallation Neutron Source, Kevin Trent with the Physical Sciences Directorate and the High Flux Isotope Reactor, Dave Rupert with the Facilities & Operations and

National Security Directorates, Craig Parker with the Environment, Safety, Health & Quality Directorate and Janet Swift with the support directorates.

Mike Willard is an HR mainstay at the Lab, serving over the years in a number of roles. He now watches over the Lab's compensation program and HR's information technologies, which include the equally familiar Performance and Development System, or PADS.

Mark Wagner, stationed at the Commerce Park office complex near Oak Ridge, manages the Lab's Benefits program.—B.C.

Photos: Curtis Boies

# Secrets not shared

## The Americans had second thoughts about a joint U.S.-Britain bomb project

Great Britain deserves credit for being the first of the World War II Allies to think of building an atomic bomb. The Americans took their good idea and ran with it.

That could be the conclusion reached by ORNL Director Jeff Wadsworth on March 29 in a talk he gave before a lunch group for the conference, "The Legacy of Churchill's Atlantic Alliance," organized jointly by the University of Tennessee's Howard Baker Center for Public Policy and Cambridge University's Churchill Archives Centre, held March 29-30 at UT.

Many key decisions by President Franklin Delano Roosevelt and Prime Minister Winston Churchill concerning the atomic bomb are not documented. Jeff's narrative was pieced together from archived documents, war histories and historical accounts.

At the time of World War II's outbreak there was concern in both Britain and the United States that Nazi Germany was bent on building a bomb. Uranium had recently been fissioned in Germany for the first time. Physicist Edward Teller was among those convinced that German uranium research was "thriving"; he persuaded Albert Einstein to write his famous letter to FDR. (Einstein, who fled the Nazis, wrote the letter in Ger-

man; Eugene Wigner, ORNL's first research director, translated it.)

FDR may or may not have been swayed, but the British proposed a bomb in 1940, and FDR committed \$6,000 to the project (see *Reporter* No. 69, "The Total Wigner").

Britain formed a committee, code-named MAUD, for uranium research. FDR appointed Vannevar Bush, his top research advisor, to lead the U.S. uranium program.

Churchill and Roosevelt recognized that, at that point, Britain had the nuclear know-how but was also practically single-handedly holding off the Nazis' European onslaught. The United States, on the other hand, had the resources and capacity to bring off the project. They struck a deal: Great Britain would trade technology for

U.S. capacity. They handed over to the Americans information on radar, jet engines and "tube alloys," which was a code name for an initial design of an atomic bomb.

The British got little in return. The U.S. Uranium Committee chairman, Limon Briggs, took the British design and locked it in his safe, showing it to no one. The MAUD Committee urged Churchill to push for the project, insisting, presciently, that a bomb could be built in "two years."

On Oct. 9, 1941, Bush and James Conant, the National Defense Research Committee chairman, briefed FDR on the bomb project. Although there is no record of it, FDR probably decided to build the atomic weapon that day. There is one note: FDR wrote, "I think you had better keep that in your own safe."

"It was supposed to be a joint project," Jeff said. But when FDR contacted Churchill about the project, the prime minister took two months to respond. Possibly Churchill stalled because Britain at that point was still ahead of the game. Or he could have been preoccupied with the Nazi wolf at his door.

At any rate, in 1942 the Americans started going it alone. "The U.S. policy was shifting toward not sharing," Jeff said. In July of that year, Churchill agreed to transfer the project to the United States.

Bush and Conant had already decided the United States didn't need Britain's help. A December 1942 dispatch states, "no interchange on bomb."

At about that time, Enrico Fermi was suc-



National Archives

Roosevelt (left) and Churchill (right) formed a close bond during World War II, but it did not include a joint A-bomb project.

ceeding with fission at the University of Chicago.

Churchill appealed to re-engage in the project. Roosevelt agreed, but stalled. When Churchill pressed, FDR relented and sent Bush, then in London, a coded cable, stating, "Renew full exchange of information."


Historians may argue whether it was intentional or not, but in the decoding process the word "renew" was mistranslated to "review." Bush interpreted that as a signal to continue to oppose the joint exchange.

The Manhattan Project's "Clinton Pile" achieved criticality a year later in November 1943. Coming just before Roosevelt and Churchill's first Cairo conference, that success sealed the U.S. position on sharing secrets with anyone.

And, ultimately, the United States developed a successful atomic weapon with Great Britain on the sidelines.

"Britain did make substantial contributions to the project but gained less from it than their leaders wished," Jeff said.

Noting the impending completion of ORNL's Spallation Neutron Source, a facility based on technology spun off from the war effort, Jeff told his audience, which included former Sen. Baker, his wife, former Sen. Nancy Kassenbaum and a number of internationally esteemed conference speakers, that the outlook for joint research between the two countries may be better now than it ever was.

"My desire is to share these facilities and knowledge with Great Britain and our many colleagues around the world," Jeff said.—B.C. 

*FDR wrote, "I think you had better keep that in your own safe."*

## ORNL People

**Tim Burchell**, leader of the Carbon Materials Technology group of the Materials S&T Division, has been selected for the Hsun Lee Lecture Award by the Institute of Metal Research, Chinese Academy of Sciences, for significant contributions to and reputation in materials science and engineering.

**Bob Hawsey** has been named acting Energy Efficiency and Renewable Energy program manager. Bob, who was managing the Lab's Electric Transmission and Distribution Technologies program, succeeds Bob Shelton, who has retired.

The Fusion Energy Division's **Nermin Uckan** has been appointed to the selection committee for the American Physical Society's Excellence in Plasma Physics Research Award. Nermin will serve as vice chair in 2006 and as chair in 2007.

## Club ORNL adds activities, discounts

The Club ORNL 2006 calendar includes a variety of events geared to a wide range of budgets and tastes. The ORNL Federal Credit Union is offering its on-site Lab branch for ticket sales to current staff and the credit union main office in downtown Oak Ridge for ticket sales to retirees. Nancy Gray (576-9479, graynl@ornl.gov) is serving as the Club's point of contact for retirees.

April 30: Tickets to *Steel Magnolias*, Oak Ridge Playhouse, 2 p.m. Contact: Bonnie Hébert, 241-9309, hebertb@ornl.gov

May 6: Club ORNL Day at the Knoxville Zoo, featuring a special exhibit

May 18: Golf tournament at Oak Ridge Country Club

June 24: Whitewater rafting trip

June 29: Vintage car display

July 8: Discounted tickets to *Hello, Dolly!* at Oak Ridge Playhouse

July 15: Smokies baseball game and picnic

August 19: Riverboat Cruise with dinner and dancing

September 9-10: Road trip to Nashville's Country Music Hall of Fame & Grand Old Opry

October 26: Fall Festival and Craft Show

November 4: Vols vs LSU

December 3-4: Road trip to Asheville's Biltmore House

Club ORNL is also in the process of signing up numerous area businesses, such as drug stores and dry cleaners, to participate in the organization's discount buying program.

Back by popular demand: Through an arrangement with Dollywood, discounted tickets to the theme park are now on sale at the ORNL FCU Lab Branch on Main Street and the ORNL FCU in Oak Ridge for retirees, with one-day admission tickets to both Dollywood and Splash Country available. Contact Leigha Stewart at lstewart@ornl.gov or 241-9485 for more information.

## New Staff Members

Nicholas Patrick Luciano, SNS Accelerator Systems

Brian Keith Lindley, David Lee Proveaux III, Christoph Ulrich Wildgruber, Pamela Lynn Morrison, SNS Experimental Facilities

Shannon Mark Mahurin, Robert Joseph Andres, Yunfeng (David) Yang and Benjamin Franklin McMurry III, Environmental Sciences

Marlon Lee McAvoy, Nuclear & Radiological Protection

Christopher Todd Cox, Aaron Cale Adkisson and Joseph Tate Hatton, Craft Resources

Sharon Christine Kohler, Safety Services

Jeremy Richard Thompson, Michael David Bachelder, Research Reactors

Judy Rogers Trego, Human Resources

Carla Heiner Decker, National Security

Sasi Sethumadhavan Kannamkumarath, Nuclear & Radiological Protection

## Service Anniversaries

### April 2006

**40 years:** Garvin J. Morris, Computational Sciences & Engineering

**35 years:** Brenda B. Hickey, Materials Science and Technology

**30 years:** Karen Keylon Thacker and Stanley G. Kimmett, Nuclear Science & Technology; David Randy James and Charles R. Foust, Fusion Energy; Deborah Ann Peters and Beverly Dianne Mackenzie, Business & Information Services Dir.; W. C. Clowers Jr., Jack M. Crawford Jr., Sarah Edwards Evans, Gary Shepherd and D. A. Irby, Craft Resources; Gary Bernard Mays, Communications & External Relations Dir.; Tina Jo Graves, Asset Mgt & Small Business Programs

**25 years:** Richard Wayne Counts, Computer Science and Mathematics; Terry L. Payne, Tech Transfer & Econ. Dev. Dir.; Margaret Donahue Parker, Logistical Services; Linda Terry Malone, Computing & Computational Sciences Dir.; Donald E. Welch and Bradley S. Richardson, Engineering Science & Technology; Jeffrey Alan Zollar, Materials Science and Technology; Paulette McGil and Randal Roberts, Laboratory Protection

**20 years:** Kathy W. Hylton, Engineering Science & Technology; Jewel L. Brown, Facilities Management

## 'ORNL kids' win in state, national contests

ORNL kids" who won at the state Math Counts competition, a national math enrichment program, on March 18 included top-four scorers Ryan Liu, son of Yun Liu, Computer Science and Mathematics Division, and Denis Liyu, son of Andrei Liyu of the Spallation Neutron Source. Trophies for best countdown performance went to Ryan, first place, and Denis, second. The Jefferson Middle School team that included Neesha Pinnaduwa, daughter of Lal A. Pinnaduwa, Life Sciences Division, and Denis and Ryan Liu placed first in the team competition.

An Oak Ridge High School team that

placed fourth at the Tennessee Science Bowl included Xinshu Wang, daughter of Wei Wang of the Environmental Sciences Division, and Jessie and Alice Gu, daughters of ESD's Baohua Gu.

Andrew Swisher, grandson of retiree Kenneth Wallace, won the National Radon Action Month poster contest, sponsored by the Environmental Protection Agency and the 4-H. Andrew, a seventh grader at Norris Middle School, won a trip to Washington, D.C. Granddad Kenneth worked in the health physics organization.

## Retirements

Marilyn McLaughlin of the Communications and External Relations Directorate retired March 31 after 29 years of service.

Marilyn has been a mainstay with the Lab's Community Outreach programs, particularly in her work with the public



McLaughlin

tour and other tour programs, ORNL's History Room and countless VIP and community outreach events.

Her skills as a host and presenter have factored into numerous successful functions that have involved ORNL's interactions with the public.

Marilyn has also been active in several community causes, as well as being a tireless advocate of preserving the Lab's history. She resides in Lenoir City.



## Employee Engagement Process will seek out groups' best practices

ORNL staff members will have an opportunity in May to express their views on their work environment as the Lab begins the Employee Engagement Process.

The process will begin with a survey containing 12 questions developed by the Gallup Organization—a recognized name in polling and scientific sampling. All employees are encouraged to take the survey, which will give Lab managers a baseline to begin a long-range program to glean best practices from work groups highly regarded by their members and apply them to groups that have indicated areas needing improvement.

Some staff members complain of being survey-weary-and-bleary. In a departure from past surveys with, in some instances, scores of questions, the survey consists of a dozen key questions and can be completed in about 15 minutes.

"Gallup has statistically demonstrated that responses to these 12 questions are related to positive outcomes, such as increased productivity, improved attendance and better employee retention," says Debbie Stairs, organization development and training manager in Human Resources.

The concise survey asks staff members to rate their feelings on the general environment of their jobs, ranging from whether they feel their development is encouraged to if they feel their opinions are listened to.

Opinions will be completely confidential; no personal responses will be revealed. Responses go directly to Gallup, where the results will be compiled into a series of

reports that contain no specifics as to the identity of the participants.

The process merely begins with the survey; in the succeeding months, a "scorecard" from the survey results will be shared with leaders of groups of five or more respondents. (Oth-



erwise responses will be grouped with the next level in the line organization.) In turn, staff will be provided feedback. Training will be provided to all managers on interpreting their score cards and holding Team Feedback and Action Planning sessions. Trends in the survey information will guide managers and staff on both areas to improve within their own work groups and best practices within the Lab.


"Numerous studies over the past few years, including Gallup's research, reveal that employees want a meaningful work culture, a good manager and a chance to develop their strengths," Debbie says. "Workers who

don't find these traits in their jobs often leave. ORNL is determined to be a preferred employer in the science and technology field, so it is vital that the Laboratory develop a work environment where staff feel engaged."

"The 12 questions relate to things that managers control or can directly influence, but the questions are about work environment. They are not intended to be an evaluation of the manager," Debbie says. "The goal is to build a world-class work force, which means addressing existing work environment issues."

UT-Battelle has gauged employee opinions before, most notably in the Quality of Work Environment Survey of 2001. While many employee surveys fail in the follow-up phase, UT-Battelle has followed up when it has sought opinions from the staff. A number of initiatives sprang from the QWE polls, including the Fitness Center and Wellness Program, the Director's Message e-mails from Lab Director Jeff Wadsworth and a series of focus groups on Lab communications, diversity and fear of retaliation.

Several major firms have undergone the Gallup process, including Battelle, and have seen positive results in their work environments, Debbie says.

Watch for the survey announcements in May. —B.C. 



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