December 2002

ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

Experiment generates THz radiation 20,000 times brighter than anyone else; breakthrough lights way for application development

An experiment conducted with Jefferson Lab's Free-Electron Laser has shown how to make a highly useful form of light — called terahertz radiation — 20,000 times brighter than ever before.

The name "terahertz radiation" derives from the frequency of the radiation — of the order of one trillion oscillations per second. The corresponding wavelength is of the order of tenths of a millimeter. Terahertz radiation is thus located in the spectrum of electromagnetic radiation between the upper end of the microwave range (mm wavelength) and the far infrared (hundredths of mm). Terahertz radiation is non-ionizing and shares with microwaves the capability to penetrate a wide variety of non-conducting materials.

Gwyn Williams, JLab's Free-Electron Laser Basic Research Program manager, conceived and led the multi-laboratory team conducting the experiment, which took place during November 2001. The results were published in the Nov. 14, 2002, issue of the international science journal *Nature*.

Among the prospective benefits, the breakthrough lights the way toward better detection of concealed weapons, hidden explosives and land mines; improved medical imaging and more productive study of cell dynamics and genes; real-time "fingerprinting" of chemical and biological terror materials in envelopes, packages or air; better characterization of semiconductors; and widening the frequency bands available for wireless communication.

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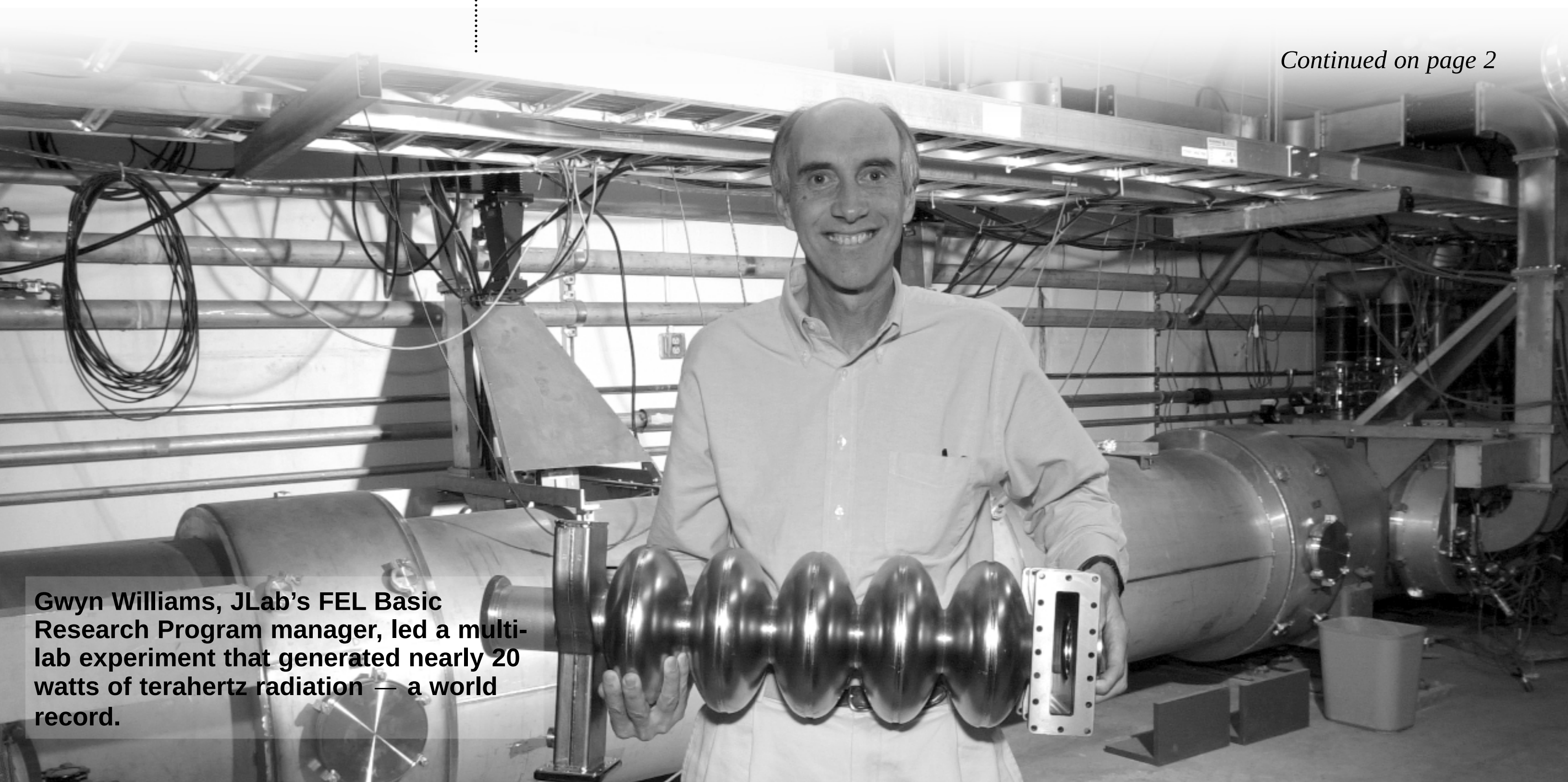

Gwyn Williams, JLab's FEL Basic Research Program manager, led a multi-lab experiment that generated nearly 20 watts of terahertz radiation — a world record.

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FEL experiment generates THz light...

To produce for the first time ever, intense terahertz radiation, researchers from JLab and two other Department of Energy laboratories — Brookhaven National Lab and Lawrence Berkeley National Lab — made use of the fact that the driver linac of JLab's Free-Electron Laser is made up of intense electron bunches that are a few tenths of a millimeter long, i.e. comparable to the wavelength of terahertz radiation. Sending any energetic electron beam through a magnetic field makes the beam emit radiation, so-called synchrotron radiation, a process that is greatly enhanced (coherent synchrotron radiation) when the length of the electron bunches is as short or shorter than the radiation wavelength of interest.

For over a decade, scientists worldwide have been pressing the study of light in the terahertz region and looking for better ways to generate and use it. The light is also referred to occasionally as T-rays, T-light or T-lux. An August 16 *Science* magazine article, "Revealing the Invisible," reported that "much research is being directed toward the development of T-ray sources and detectors, particularly for applications in medical imaging and security scanning systems." Xi-Cheng Zhang, a T-ray expert at Rensselaer Polytechnic Institute, predicts that terahertz light will be "the future 'killer application' ... in biomedicine."

Gywn Williams (left to right) and his two JLab co-authors for the *Nature* paper — George Neil and Kevin Jordan — stop for a quick photo in the FEL vault.

Picometrix Tochigi Nikon Corporation and Teraview — a Cambridge, England, start-up associated with Toshiba — have begun commercializing low-power terahertz systems. A few hospitals are already testing comparatively dim sources of terahertz light for detecting skin cancer.

Overall, though, terahertz light still constitutes a gap in the science of light and energy. It inhabits a region of the electromagnetic spectrum not that well understood. Now that a way to generate it at high power has been demonstrated, terahertz light can potentially extend and add widely to the wave-based technologies that have defined the last 150 years: from the telegraph, radio and X-rays to computers, and cell phones.

Up to this point, no other method of generating terahertz waves had yielded more than two-thousandths of a watt in power. But Williams and his colleagues extracted nearly 20 watts — some 20,000 times more. "Think of a candle and then think of a flood-light," says Williams.

But no matter how bright they are, terahertz light rays can't penetrate metal or water. So they can't be used to inspect cargo containers on arriving ships or to diagnose conditions deep inside the human body."Nevertheless," says Williams, "the growing awareness of terahertz light's usefulness is like what happened a century ago with X-rays — only terahertz light will have a much wider range of applications. The task now will be to develop those uses."

About 10 years ago Williams wrote a paper proposing a method for generating large amounts of terahertz light. In the mid-90s he started following the development of the Free-Electron Laser at JLab. Williams arrived here from Brookhaven National Lab in the spring of 2000; he actively began pursuing his experiment last June, when he drove a van to Brookhaven to bring back a spectrometer on loan from his old laboratory. Kevin Jordan and George Neil soon had it installed and proof-of-principle experiments took place. The final run, with a better spectrometer and detector, took place in early November 2001 and included Larry Carr from Brookhaven, and Michael Martin and Wayne McKinney

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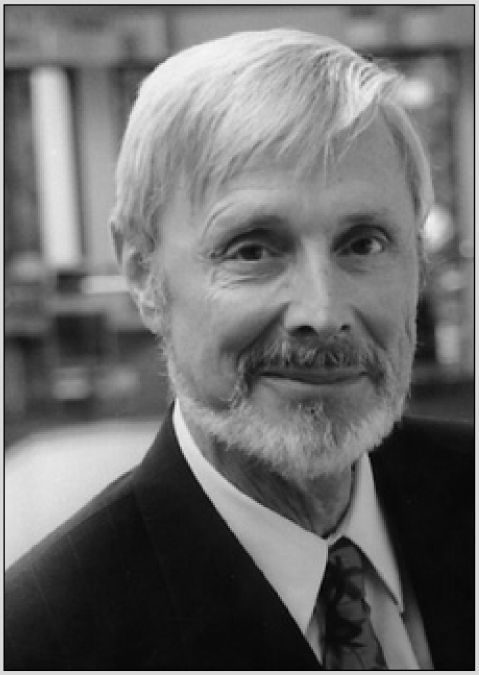


Christoph Leemann
Jefferson Lab Director

Thanks for the hard work

From the Director

Dear Colleagues:

As we approach the end of the year it is a good time to look back and appreciate how far we've come and to look forward to realizing the vision we have articulated for Jefferson Lab and its future. As I contemplate our accomplishments, I want first and foremost to thank all of you for your contribution to the Lab's achievements. These achievements are proof of the talent, dedication, and creativity that you bring to bear here at Jefferson Lab, and your successes are well-earned through your determination, dedication, intelligence and ingenuity. The fruits of your efforts are evident all around us as we look at Jefferson Lab as a growing, maturing research institution.

Our proudest achievements include the compelling and beautiful physics results that are forthcoming. We are truly pushing outward the boundaries of knowledge and shedding light on the fundamental properties of nucleons. This pursuit is a daunting task and it takes a highly diverse, multi-disciplinary effort to progress from initial concept through the realization of a cutting edge experiment and the interpretation and communication of results. Another top-notch effort is the work on SNS cryomodules — exceeding expectations considerably — where we apply our core competencies to good use in the interest of the DOE's Office of Science mission. Our success has been acknowledged in the outstanding ratings we received in reviews of our Science and Technology, Administrative Practices and most recently, Institutional Management. The advances made in accelerator technology by the FEL team as they work toward the 10 kW upgrade have benefits in the greater scientific community far beyond Jefferson Lab. Our success is also evidenced in the recognition Jefferson Lab's K-12 education program has earned at the regional and national level, and the APS Fellowships and other awards and recognition that have come to the Lab through your outstanding work.

Now as we look to the year ahead, we face new challenges in a changing world. Maintaining or increasing funding for basic science in the face of other national priorities, realizing the 12 GeV upgrade, building on our core competencies and advancing the state of the art within funding constraints are just some of those we face. To continue our record of success and even build and expand on it will take good planning, effective processes, and innovative ideas. Each of you brings unique qualities and strengths to the Lab, and those unique qualities, channeled toward the vision of Jefferson Lab for the future is an unstoppable force. While these challenges are real, I look forward to working with all of you to continue our progress. As we move into the new year, I hope that you will find professional satisfaction in your work, that you come to work most days feeling that you are making a difference, and that your talents are being used effectively to advance the vision of Jefferson Lab as a leading research institution. Management and I will work to provide an environment where that is not only possible but expected. I encourage you to become engaged in the pursuit of excellence in all that you do and ask for your input, suggestions and ideas so that together we can continue to provide world leadership in science and technology that benefits our field, the region, the Department and our nation.

Best wishes to all for a safe and prosperous New Year!

JLab technology takes center stage in SNS construction

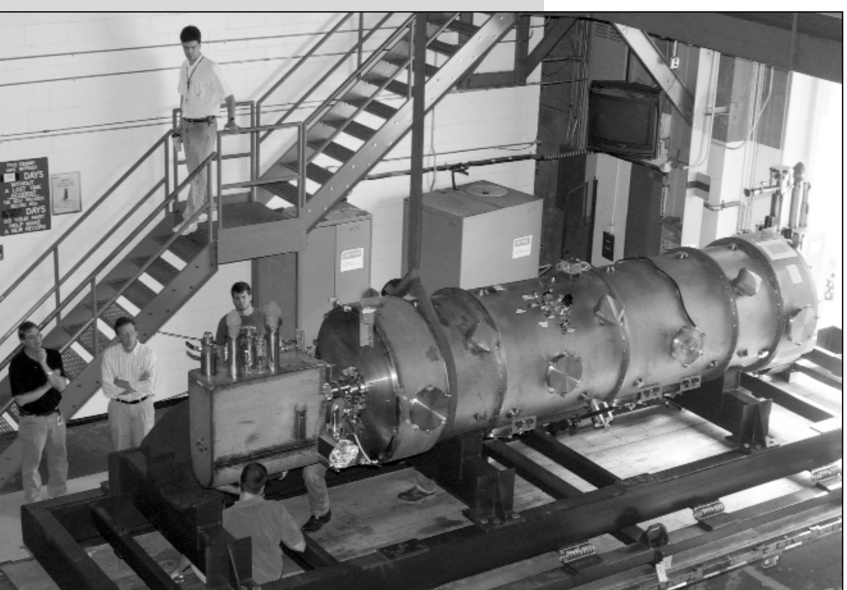
by James Schultz

Thermos bottles usually don't weigh nearly five tons or measure almost 26 feet end-to-end. But these aren't run-of-the-mill containers for soup or coffee. Rather, they're the complex, state-of-the-art supercooled components in which particle beams are accelerated for scientific research.

JLab technology is once again taking center stage, as Lab scientists, engineers and technicians mobilize to provide what eventually will be 81 niobium cavities for 23 cryomodules for a new federal laboratory, the Spallation Neutron Source, or SNS, under construction in Oak Ridge, Tennessee. JLab is part of a team of federal laboratories — including Argonne, Brookhaven, Lawrence Berkeley, Los Alamos and Oak Ridge — assisting in the design, engineering and construction of the $1 billion-plus SNS, which will provide the most intense pulsed-neutron beams in the world for scientific research and industrial development.

JLab's director of Project Management, Claus Rode, is senior team leader for all SNS work being done by Jefferson Lab.

"We're definitely world leaders in this kind of technology. We've been trailblazers," says Isidoro Campisi, senior scientist with JLab's Institute for Superconducting Radio Frequency Science & Technology. "We're helping to make another generation of machines become practical."



JLab staff prepare to load the medium β cryomodule onto a flatbed semi for its road test.

The Lab's engineers and technicians are creating two types of cryomodules. One is known as the "medium β (beta)," version with three cavities per module, and is thus shorter and lighter than its four-cavity "high β" sibling. As at JLab, superconducting radiofrequency techniques and advanced cryomodule design are being incorporated within the SNS accelerator complex to enable low-cost, high-efficiency operation.

Because the speed (represented by the β symbol) of the SNS's negative hydrogen-ion beam will be slightly less than the electron beam in JLab's accelerator, the internal structure of the cavities was slightly adjusted, or "graded," to match the reduced velocities. Therefore, the shape of SNS niobium cavities are flatter ellipses, more like oversized pancakes than their fatter CEBAF predecessors. The operating frequency of RF cavities is measured in cycles per second, given the name hertz to honor the 19th century German physicist Heinrich Hertz, who carried out numerous experiments to clarify the nature of electromagnetic radiation. Most RF cavities operate at very high frequencies, where the appropriate unit is millions of hertz, or megahertz (MHz). SNS cavities operate at 805 MHz, compared to 1497 MHz for CEBAF cavities.

Electromagnetic power is fed into the superconducting cavities via RF couplers. The SNS couplers have been designed to handle a much higher power level than the original CEBAF couplers and so provide a pulsed power — SNS operates in pulses and not in a continuous wave as CEBAF does — with a peak value of over 100 times that of the CEBAF couplers. Campisi was responsible for development of the high-power RF coupler required for the SNS modules.

"For the first time, we're making superconducting elliptical cavities not matched to the speed of light," he points out. "Everybody is pretty excited. We've been working hard to get to this point. We're the youngest of the federal labs involved in the SNS project, so we're happy that we can deliver on what we promised."

In October, a prototype SNS cryomodule was taken on a road trip to Virginia's mountains near

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Charlottesville. Campisi says the sojourn was essential to test the modules' many sensitive parts — among them the "window" that allows for the introduction of radio waves, the vacuum seals between the inner cavity and the outer cryomodule, and the welds that hold everything together — to withstand the inevitable insults of highway travel.

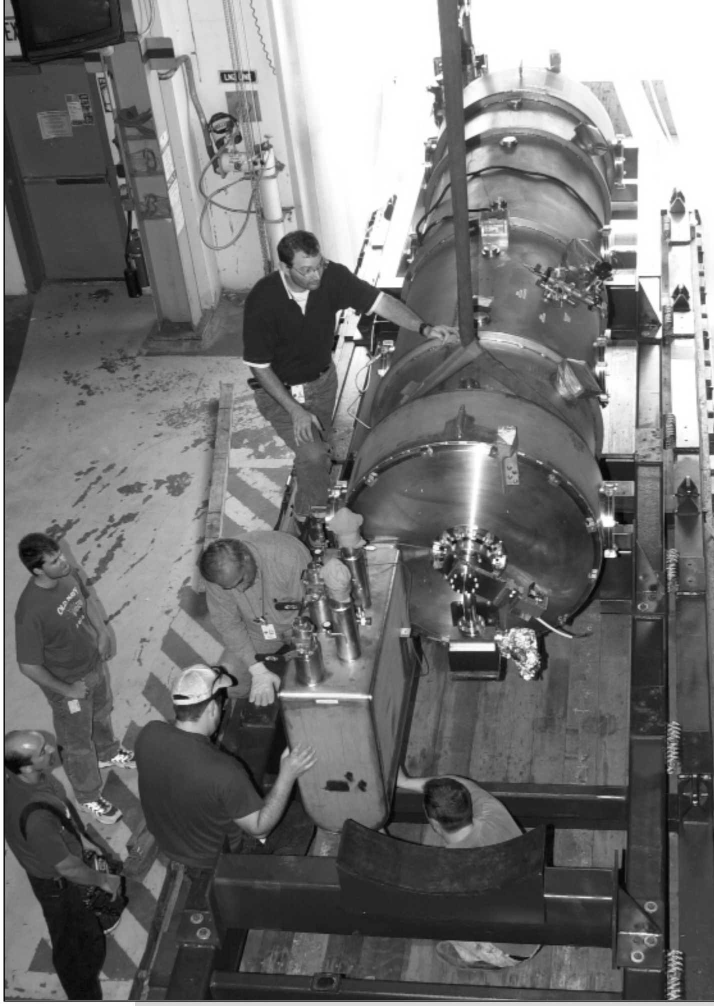
"All cryomodules made here will go by truck to Oak Ridge," he explains. "So we had to evaluate all the factors in that trip. What would happen when you go over bumps in the road, or if you stopped quickly or had to accelerate suddenly? We have to make sure all parts are working correctly before we dare put power in."

In most respects, the SNS cryomodules are virtually identical to their JLab cousins. The innermost components of the cryomodules' three-part system includes the superconducting cavities, a cooling tank to hold the liquid helium, and a Thermos-bottle-like structure known as a cryostat that provides insulation — allowing the cavities to remain cooled to two Kelvin, or nearly absolute zero. At such a temperature the surface currents associated with the introduced radio waves lose all electrical resistance, and provide acceleration with a power dissipation of less than a millionth of that used in energizing accelerators made of normally-conducting materials, such as copper.

At the SNS, four different linear accelerators, or linacs, will accelerate a beam of hydrogen ions to 1 billion electron volts, or 1 GeV. The first three accelerators, the Radio Frequency Quadrupole (RFQ), the drift-tube linac and the coupled-cavity linac, will be made from copper, operate at room temperature and accelerate the beam to 187 million electron volts. The fourth accelerator will make use of JLab cryomodules and accelerate the hydrogen-ion beam an additional 813 MeV. Sixty times per second, the accelerator will produce a one millisecond-long burst of hydrogen ions, a pulse that would stretch for about 270 kilometers (or 168 miles) if the beam were not intercepted. Instead, the beam is wrapped around a ring of magnets, called an accumulator ring, until the whole pulse has been captured in roughly 1,000 turns, like wire on a spool. Then, the opening of an electromagnetic gate allows all the accumulated ions to be delivered to the mercury target in a single microsecond-long pulse. The resultant short, sharp bursts of neutrons are what researchers will be using for their neutron-scattering investigations.

When the SNS facility is complete, researchers will be able to obtain detailed snapshots of material structure, and stop-action images of molecules in motion. Like a strobe light providing high-speed illumination of an object, the SNS will produce pulses of neutrons every 17 milliseconds, with more than 10 times more neutrons than are produced at the most powerful pulsed-neutron sources currently available. The neutrons will scatter from materials under study in such a way as to reveal that material's subatomic structure and properties.

JLab's first SNS cryomodule, the medium-beta prototype, passed its travel test and has been shipped to Oak Ridge. Other production models will follow, with the first tested perhaps as early as January 2003 and shipped the following month. SNS construction is slated to be complete by 2006.



On the flatbed (top to bottom): Jeff Saunders, Manny Nevarez, Jeff Campbell and Ken Worland load the medium β cryomodule, while on the floor Brian Hannah watches and Frank Humphry manages the overhead crane. Saunders and Hannah are SNS employees from Oak Ridge. Nevarez, Campbell, Worland and Humphry are all Accelerator Division staff.

Welcome Aboard!

Happy accidents bring Rimmer to JLab, RF research

Bob Rimmer
chief RF scientist
deputy director, ISRFST

At right: Bob Rimmer on the racetrack; and below, just a few of his ceramic pieces.

by Melanie Cooper
contributing writer

You could say Bob Rimmer came to Jefferson Lab by accident.

After high school, Rimmer didn't know what he wanted to do, so he enrolled in a broad-based physics and engineering degree program. He went to Lancaster University near the Lake District of northwest England, partly for the scenery but mostly for the course content. His degree was sponsored by EEV Ltd, a company that made vacuum tubes, and a summer placement there piqued his interest in radiofrequency (RF) technology. Rimmer then decided to pursue a Ph.D. at Daresbury Laboratory, examining the failure of ceramic windows in high-power RF cavities.

From there, he stumbled into accelerators. "It was an accident that I got involved in the first place," comments Rimmer. "My career has been a series of happy accidents."

When Rimmer heard that Lawrence Berkeley National Lab was developing a light source similar to what he worked on at Daresbury Lab, he thought he'd give that a shot. In 1988 he moved to Berkeley Lab to work on the Advanced Light Source (ALS). What began as a two-year contract stretched to more than 13 years, including a seven-year stint helping to construct the PEP-II Collider.

For 10 of those years, Rimmer worked under Swapan Chattopadhyay, who eventually lured him to Jefferson Lab. Rimmer was looking for a new challenge when Chattopadhyay called him and suggested the move. "I have known Rimmer since he finished his Ph.D. and joined us at Berkeley more than a decade ago. Soon after joining the Beam Electrodynamics Group at my center at Berkeley, the Center for Beam Physics, he was contributing at the highest level," Chattopadhyay recalls. "We are fortunate that Bob has agreed to join us at Jefferson Lab and further enhance our outstanding SRF Institute team in the capacity of its deputy director. Jefferson Lab has gained an outstanding scientist, which will go a long way in positioning us for exciting future possibilities. I look forward to working with Bob in the years to come."

In May 2002, Rimmer joined Jefferson Lab as its chief RF scientist and deputy director of the Institute for Superconducting RF Science and Technology (ISRFST) under Warren Funk. Institute work takes up most of his time, with four major projects underway: cryomodule construction for the $1.4-billion Spallation Neutron Source (SNS) accelerator complex in Oak Ridge, Tennessee; a replacement module for the CEBAF machine; an identical module for JLab's Free-Electron Laser (FEL) upgrade; and

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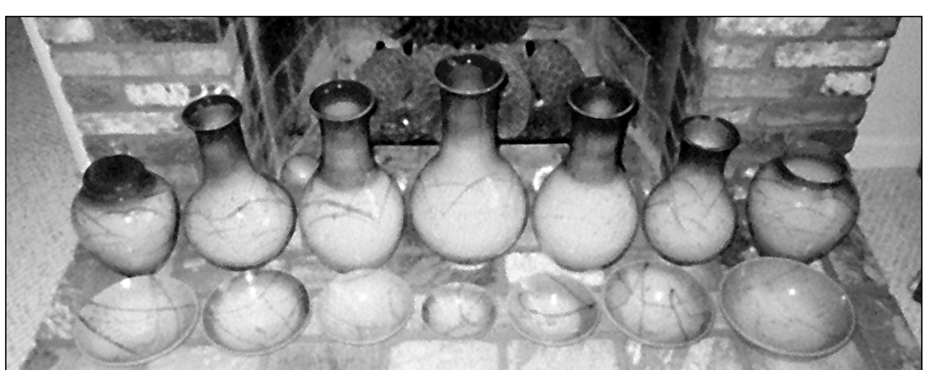


Congratulations!

Accelerator Division's Steve Benson recognized as 2002 APS Fellow

Another member at Jefferson Lab has earned the distinction of being elected a Fellow of the American Physical Society. The Accelerator Division's Steve Benson learned last month that he had been selected as a 2002 Fellow — one of the highest peer honors in the world of physics.

According to the citation, Steve Benson, a senior research scientist with JLab for 10 years, was nominated for the distinction by the APS Particles and Beams Division for his "critical contributions to the development of free-electron lasers, including the first demonstration of lasing at harmonics and of multi-kilowatt lasing with an energy recovered linac (ERL)."

"Mainly, I'm grateful for all the people who helped me get there," Benson says of receiving the honor. "It wouldn't have happened without the letters of recommendation and the support and encouragement I received."

Benson isn't new to the world of free-electron lasers. Before coming to JLab he worked on two FELs at Duke University — in charge of installing and commissioning one system and designing a second system.

He is eagerly looking forward to first beam with the upgraded FEL, which he anticipates achieving in early 2003. He is ready to try out the new machine after the very successful run of the Infrared Demo FEL. "It was exciting to work with the IR Demo machine," he comments. "It was outstanding for research and allowed us to lase at high power. We learned an enormous amount while using the IR Demo. It also had an excellent diagnostics system and a very robust electron transport system, designed by Dave Douglas, which allowed us to learn a lot about the machine. No one had ever before done what we did in building that machine. Some people were skeptical, so it was very satisfying when it all came together and we got one kilowatt lasing."

Using the IR Demo machine, Benson demonstrated lasing at both the 2nd and 5th harmonics, and explored the physics of recirculating FELs. (When electrons oscillate you get harmonics: Much like plucking a string on a violin, a note sounds but it also produces other octaves of the same note.) He, along with George Neil of the FEL group, are credited with being the first to lase at the 5th harmonic and the 2nd harmonic. "The 5th harmonic was difficult to achieve," he noted, "but the biggest surprises came at the 2nd harmonic, which exhibited unique behaviors. I think there is a new type of lasing involved."

Much of Benson's work during construction of the FEL revolved around the wiggler (magnet) and optical systems. Once the upgraded machine is complete, his primary responsibilities will include commissioning and laser safety.

In the coming months, he will receive his fellowship certificate from APS. This year 192 new Fellows were elected. The APS Fellowship Program was created to recognize members who have made advances in knowledge through original research and publication or made significant and innovative contributions in the application of physics to science and technology. Each year, no more than one-half of one percent of the current membership of the Society are recognized by their peers for election to the status of Fellow in the American Physical Society. Each new Fellow is elected after careful and competitive review and recommendation by a fellowship committee on the unit level, additional review by the APS Fellowship Committee and final approval by the full APS Council. Fellows currently number 3,775 out of an APS membership of 42,000.

Steve Benson stops for a photo by the infrared wiggler in the FEL vault.

In their own words

with postdoc experimental physicist Wendy Hinton

as told to Crystal Storey
Public Affairs intern

I was born in Tacoma, Washington, and if I say the date you will know my age, so we'll just pass over that. I attended college at Washington & Lee in Lexington, Virginia, but I received my Ph.D. at Hampton University.

I grew up in a military family. That is how I ended up on the East Coast. I've lived in Maryland, New Jersey, and now Virginia. I like the East Coast and really have no intention of returning west.

I stay pretty busy; I am very involved with my church. I am currently responsible for our church multimedia team, which includes the design and update of our web page. This allows me to express my artistic creativity. I enjoy reading and crocheting as well. These are the things that help me relax.

I've been at Jefferson Lab about nine years now. I currently work in Hall A, analyzing data from various experiments. I have recently been working with a student from Sweden, and that has been an interesting experience!

I started out working here as a graduate student while I was attending Hampton University. For the better part of the past two years I've been working on my post-doc. It is an in-between step; I have my degree but I'm not yet considered a full researcher or professor. I'm still receiving training. It brings more responsibility than a doctoral student, but not quite as much as a staff scientist.

The title of my dissertation was "Quasifree Electroproduction of Lambda and Sigma Hyperons on Carbon and Aluminum." It was based on the first Hall C kaon experiments: E91-16 and E93-18.

I became interested in science in high school. I took a few classes — math and science mostly — and enjoyed them. However, cutting things up — like in biology lab — was not what I wanted to do. So I explored a different route: physics. I really enjoy the research aspect of this field.

The only concern I have about my field of study is that there are not many minorities or females [in it]. I remember the majority of my classes in college being predominantly male. If more females and minorities would go into this area of study, they would bring different views with them; and I feel it would be very helpful to have those perspectives.

I'm happy where I am; I will definitely stay in this field. My ultimate goal is to teach physics at the university level, although I do not have a preference as to where.

Wendy Hinton, a JLab Post Doctoral Fellow, takes a break on the CEBAF Center patio.

Science Bowl 2003

JLab needs your help to conduct academic event

Teams of students from dozens of high schools from across the Commonwealth are hitting the books. Honing their memorization skills, testing their reaction time and feeling the adrenalin surge, as they take "Science to the Core" in preparation for the upcoming Virginia Regional Science Bowl.

The event returns to Jefferson Lab on Saturday, Feb. 8, 2003, and according to Jan Tyler, Science Education program manager, close to 60 volunteers will be needed to run the day-long academic competition.

"We're very excited to be hosting the 2003 regional Science Bowl competition," exclaims Tyler. "The 2002 event was a great success, and last year's Virginia Regional Science Bowl winner, Thomas Jefferson High School for Science and Technology from Alexandria, Va., went on to finish in first at the nationals. It is a fast-paced day of excitement, intensity, and fun."

On Feb. 8, portions of the Lab will be taken over by nearly 120 high school students, their coaches and the scores of volunteers needed to conduct the tournament. By early December, 23 teams had already pre-registered for the event. The morning will consist of a round-robin tournament, followed by double-elimination rounds in the afternoon. "By 4 or 4:30 p.m. we'll be down to one team," Tyler explains. "The top three teams will win cash prizes for their respective schools; and the top team wins a trip to the Science Bowl Nationals held in Washington, D.C., May 1–5, 2003."

"This event is a great way to promote education, academic excellence and an interest in math and science," Tyler points out. "Competing with their peers is a great confidence builder and a fantastic way to motivate young minds."

"This is a fantastic opportunity for the Lab to show support for science education in Virginia," Tyler continues. "Hosting a Science Bowl tournament gives us the chance to encourage our youth to pursue higher education, and careers in science and math."

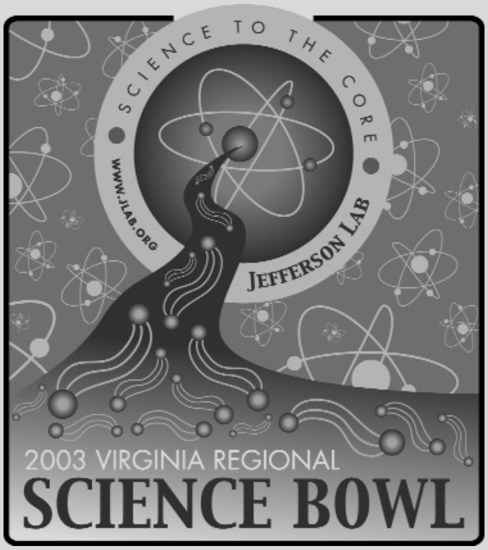
The Science Bowl is an academic competition among teams of high school students who answer multiple-choice and short-answer questions on a variety of scientific topics (chemistry, biology, physics, mathematics, astronomy, and the general, earth and computer sciences). Each team is made up of five students, and a teacher who serves as advisor and coach. Science Bowl competitions have been endorsed by the Department of Energy since 1991.

Most of the volunteers will be needed to perform as moderators, rules judges, timekeepers and scorekeepers during the morning, round-robin sessions, according to Tyler. She'll also need a small number of volunteers to act as the on-site scientific team, to be called when a student challenges a question or answer during the competition.

The moderators, rules judges, timekeepers and scorekeepers each have specific roles and responsibilities during the competition. Detailed descriptions of each position's responsibilities have been posted on the Science Education web page at http//education.jlab.org/sciencebowl.

Additional information is also on the bulletin board outside of the CEBAF Center auditorium entrance.

All participants, including volunteers, will receive a "Science to the Core" T-shirt. Volunteer shifts will run from 9 a.m.–12:30 p.m. and from 1–5 p.m. with more people needed for the morning shift. Lab employees, contractors, users, and family members age 13 and older may volunteer. "This is strictly a volunteer activity," Tyler reminds potential helpers. Anyone interested in more information or in volunteering may contact Tyler, e-mail tyler@jlab.org or call ext. 7164; or Sarah Ingels, Director's Office, e-mail ingels@jlab.org or call ext. 7444.



Milestones
for December 2002

Hello

Robert J. Feuerbach, Post Doctoral Fellow, Physics Division

Reza Kazimi, Staff Scientist, Accelerator Div.

Julie S. Maschke, Division Human Resources Administrator, Administrative Services Div.

Janet P. Smith, Payroll/Fixed Assets Supervisor, Chief Financial Office

Sheila D. Smith, Business Manager, Administrative Services Div.

Ulrike Thoma, Hall B Post Doctoral Researcher, Physics Div.

Genfa Wu, Post Doctoral Fellow, Accelerator Div.

Goodbye

Richard J. Yesensky, Project Services Manager, Accelerator Div.

"Milestones" highlights the achievements of JLab staff and users, full-time and term new hires, separations and retirements. To submit staff or users' promotions, special honors and awards send information to magaldi@jlab.org or call ext. 5102

Stay tuned for JLab info when severe weather hits

Winter weather has arrived. In the event that severe weather causes the Lab to have a late start or to close for the day, the Public Affairs office will inform the local TV and radio stations that run closing/delay announcements.

For information, turn to WTKR-TV (CBS) ch. 3, WAVY-TV (NBC) ch. 10, or WVEC-TV (ABC) ch. 13; or radio stations WNIS-AM 790, WTAR-AM 850, WCMS-AM 1050, WGH-AM 1310, or WHRO-FM 89.5, WCMS-FM 100.5, WWDE-FM 101.3, or WGH-FM 97.3.

In the event of a late start or closure the Telecommunications Group will place a recorded announcement on 269-7100. The number can respond to 14 calls at once. The Lab's web page (www.jlab.org) will have a weather alert button announcing closures or delays.

If you are still uncertain after checking the TV, radio, web and/or 269-7100, call your supervisor.

TLD badge change out set for Jan. 3, 2003

The next quarterly Thermoluminescent Dosimeter (TLD) badge change-out is scheduled for Friday, Jan. 3, 2003.

The Radiation Control group will be changing out badges beginning at 5 p.m. that day. RadCon staff reminds all Lab employees, contractors and users with TLD badges to be sure their badges are in the badge racks before leaving work on Jan. 3.

Those who aren't returning from the holiday shutdown until Jan. 6 are asked to make sure their TLDs are placed in the correct badge rack before leaving the Lab for the holiday shutdown. Anyone with questions may contact Becky Nevarez, e-mail nevarez@jlab.org, or call ext. 5048.

Oooops! Newsletter misidentifies equipment in photo caption

The front-page caption in the November issue of the newsletter mistakenly identified the cryomodule production work being shown in that photo. The cryomodule production being viewed by Institutional Management Review committee members in the photo was a JLab prototype, 12 GeV upgrade cryomodule under production, not a Spallation Neutron Source cryomodule.

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FEL experiment generates THz radiation...

from Lawrence Berkeley National Lab.

"We didn't create something new," Williams explains. "The terahertz light had always been there inside of the FEL's vacuum-sealed beam pipe. We just figured out how to open the pipe, put in a window to let the light out, and how to measure it. Williams is looking forward to performing proof-of-principle experiments of the capabilities of THz light with the upgraded FEL and a newly designed section of FEL beam pipe that should allow even more of the light out.

Williams and his collaborators presented their results at the First International Conference on terahertz Radiation in December of 2001, and shortly thereafter he wrote the experiment up and submitted it to *Nature*. Due to the novel arena, it took some time before the paper was accepted, but it finally was.

While the U.S. Navy funded the FEL's construction to investigate the science and technology of high-power laser beams whose precise wavelength can be selected, the funding to run Williams' and his colleagues' experiment was from the Commonwealth of Virginia.

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Welcome aboard Robert Rimmer...

cavity prototyping work for the 12GeV upgrade.

"Right now, it's 100 percent project work in the Institute," says Rimmer, who manages the cavity and cryomodule production groups as well as being project manager for FEL production. "SNS is our biggest project. It's a huge amount of work and a real priority."

The job is made easier by the team Rimmer works with. "I expected to find good scientists here, and we have them," he says. "But we also have excellent engineers and technicians. Just excellent."

His only minor complaint is the number of meetings he attends. As an accelerator physicist at Berkeley, Rimmer had very little managerial responsibility. At Jefferson Lab he hopes to strike a balance between the managerial side and making technical contributions. This is where his role as the Lab's chief RF scientist comes in. "It gives me license to poke my nose in all sorts of stuff," he says with a grin.

Rimmer brings with him 16 years of expertise in normal conducting RF technologies. Although he has not been closely involved in superconducting RF science before, Rimmer is learning on the job. "We're working with a young technology — there is lots to learn and lots to do," he comments.

This month, Rimmer moves into his new house in Yorktown. His 1,200-square-foot workshop is bigger than his whole house was in California, and cost him less. It's a good thing the workshop is so large. Rimmer likes to ride motorcycles and used to race them, but cut back after an accident several years ago. He still has his racing bike and takes it to the track several times a year, so the workshop will initially house his bikes. The racing mishap prompted Rimmer to become interested in a far safer hobby — making pottery. He looks forward to challenging entrants if JLab ever brings back its Arts Festival.

Rimmer says his art is not really inspired by science, although there is some symbiosis of shape, form and structure in his pottery. For example, the pattern on a bowl in his office bears a striking resemblance to the image of a bubble chamber event. But perhaps that was just another happy accident!

Street Hockey celebrates seven years of continuous noon-time play

▲ Front row (left to right): Surik Mehrabyan, Maurizio Ungaro, Scott Higgins, Mark Hoegerl, Sandy Prior, Floyd Martin and Joe Santoro and back row (l. to r.) Jim Dahlberg, Ken Baggett, Pete Francis, Kelly Tremblay, Bert Manzlak, Jay Thomas, Rich Rafter and Curt Hovator pose for a group photo to celebrate seven years of all-season field hockey play at JLab. All JLab employees, users and contractors are invited to participate in this noon-time activity. For additional information, visit the JAG web page at www.jlab.org/intralab/committees/jag/sports.html.

◄ Pete Francis, Accelerator Division, takes a slapshot during a game.

Procurement Group wins DOE Best Practices award

JLab's Procurement Group recently won an award at the 2002 Department of Energy Contractor Best Practices Competition. Procurement was recognized for its innovative approach for site-wide copy services.

In a congratulatory e-mail from the competition organizing committee, Shela Gregory, Bechtel Jacobs Company LLC, wrote: "Congratulations! Your best practice nomination for Thomas Jefferson National Accelerator Facility Site-Wide Copy Services has been selected as one of the four best practices to be recognized at the 2002 DOE Contractors Acquisition Manager Workshop and Educational Symposium."

"We received 12 nominations for best practices and they were all excellent," she continued. "You are to be commended as one of the winners."

Recognition included receiving the award during a reception at the conference, and the opportunity to give a presentation about the best practice to conference attendees. JLab's director of Business Services and Deputy Associate Director for Administrative Services, Mark Waite, and Procurement Administrator Julie Leverenz accepted the award, and she made a presentation on the various innovative aspects of JLab's copy services contract.

Jefferson Lab's Procurement Group has total responsibility for managing the Lab's copy services. This includes determining the requirements, preparing the statement of work, soliciting and awarding the subcontract; and technical oversight and administration of the subcontract. The new JLab copy services subcontract, awarded in 2002, combines an innovative incentive system with a state-of-the-art network infrastructure to promote both excellence and efficiency. Laboratory copy services include a staffed on-site copy center with pickup and delivery service, plus 26 convenience copiers for general use.

Areas of innovation cited in the award include: Creating a Jefferson Lab focus group with representatives from major Laboratory divisions and workgroups. The group identified priorities, gathered data for a site-wide needs assessment, assisted in the evaluation of proposed equipment and promoted participation in phase-in training. The group continues to be a valuable resource for feedback and disseminating information.

JLab's copy contract includes term incentives, which benefits both Jefferson Lab (excellent services and reduced procurement frequency) and the subcontractor (long-term subcontract). The mutual desire to sustain a long-term relationship fosters a spirit of partnership and innovation, as the subcontractor continually seeks ways to improve its services.

The contract also incorporates the latest network technology to improve productivity and reduce cost.

ON TARGET

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Editors
Linda Ware
Debbie Magaldi

Contributing Writers
James Schultz
Judi Tull

Photographer
Greg Adams

Check Us out on the Internet
www.jlab.org

Jefferson Lab/MS 12C
12000 Jefferson Avenue
Newport News, VA 23606

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