September/October 2004

ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

Institutional Management Review panel rates JLab 'outstanding'

Members of the Department of Energy's Institutional Management Review panel rated Jefferson Lab "outstanding" during the committee's visit, Aug. 30-31.

The DOE requires an Institutional Management Review at Jefferson Lab on a biennial basis, to evaluate management and operation of the Lab. Review categories included strategic planning, managerial effectiveness and organizational culture. The review panel received briefings from JLab staff and management, facility users and DOE representatives, conducted discussions, and toured the facility during its short stay at JLab.

In the IMR Executive Summary the committee wrote, "Our evaluation is that Jefferson Lab is outstanding overall with each of the individual elements rated outstanding as well. The Laboratory is clearly making its mark in quark physics and is viewed worldwide as a unique institution. The Lab has a clear vision of its future, which includes significant focus on the 12 GeV upgrade. Operationally, the Review Panel found that the Lab is delivering on its commitments. The Lab culture is viewed as robust and the energy and enthusiasm of the Director is evident."

Charles Shank, associate director-at-large of Lawrence Berkeley National Lab served as panel chair. Committee members included Jerry Bellows, associate director for lab operations at the National Renewable Energy Lab; Michael Derbidge, chief operating officer for Argonne National Lab; Walter Henning, director of GSI; and Bernard Maguire, a management consultant.

Other Department of Energy contract-metric required reviews conducted this year included the Administrative Peer Review, On-Site Review, Science & Technology Review, and the Radiation Control Program Peer Review. Metrics from each review are tracked, measured and reported. At year's end, DOE rates Jefferson Lab, based on the combined results of Lab self-assessments, review results, and DOE appraisals.

The Institutional Management Review panel, flanked by JLab leadership and staff, visited the upgraded accelerator Machine Control Center during the panel's facility tour. Mike Spata, MCC group leader, (right foreground) explains some of the improvements for the group.

RadCon earns outstanding rating

Peer Review team commends Lab's radiation protection program

Erik Abkemeier
Radiation Control
Group Leader

Jefferson Lab's Radiation Control Group recently completed its biennial Radiation Control Peer Review with high marks. The review committee cited several "noteworthy practices," and identified no findings during the evaluation, which took place from Aug. 30 through Sept. 1.

The review team scored the Lab's program with a 90 out of a possible 100 points — moving up two points from the last review — and the highest score of the last three RadCon Peer Reviews. The committee also identified several noteworthy practices — procedures or activities that enhance the Lab's RadCon program that should be shared with other national laboratories. Noted practices included a silicon carbide beam diagnostics device developed by Pavel Degtiarenko and Dan Dotson (and colloquially known as the "Pavelometer") that senses the position of the electron beam on the face of the Hall A and Hall C beam dumps; use of an automated check-out system based on the MorseWatchman Keywatcher® system to enhance accountability for sealed radioactive sources; and lengthening the wear period for personal TLDs (thermoluminescent devices) from three months to six months, resulting in program cost savings without loss of performance.

The committee examined every aspect of the Lab's Radiation Control program, and evaluated how well JLab's RadCon program is meeting federal, state and local regulations and requirements. Areas looked at included radiation worker training, dosimetry, work controls and workplace monitoring, environmental monitoring, record keeping and reporting, and radioanalytical services and quality assurance.

The review is a Department of Energy contract metric requirement; and the review committee includes a variety of external experts in the management and practice of radiation control. This year's committee included Steven Frey, committee chair, from Stanford Linear Accelerator; Kathleen Shingleton, Lawrence Livermore National Laboratory; and Kamran Vaziri, Fermi National Laboratory.

They toured the CEBAF injector, north linac, beam switch yard, one of the experimental halls, and in the Test Lab they visited the Vertical Test Area, the Cryomodule Test Facility and the Injector Test Cave. On the second day the committee toured RadCon's facilities, including the work group's laboratory and calibration range. Over the course of the review, every member of the RadCon group briefed the committee on his or her part of JLab's radiation control program. The committee interviewed RadCon team members and several individuals from work areas that rely on or interact regularly with RadCon staff.

While the committee members had no findings during the closeout meeting, they did make a handful of recommendations they believed would help RadCon optimize its operations. RadCon staff began planning for implementation of some of these suggestions before the closeout began. "Erik [Abkemeier] and the RadCon team are doing a great job, and this review bore that out," said Bob May, Accelerator Division EH&S officer. "Erik has overseen several very worthwhile improvements to JLab's RadCon program; and the results of this review demonstrate that."

JLab's RadCon group stands in front of their new Keywatcher® system, used to secure the materials needed to calibrate the detector equipment in the experimental halls. From left to right are Dave Hamlette, Justine Jackson, Earl Ratliff, Becky Mosbrucker, Zach Edwards, George Walker and Dan Dotson. Unavailable for the photo are Pavel Degtiarenko, Melvin Washington and Keith Welch.

From the Director

Christoph Leemann
Jefferson Lab Director

Successful maintenance down prepares Lab for new round of experiments

Dear Colleagues:

Together, Jefferson Lab's employees and users share a scientific vision that includes conducting world-class physics experiments, and identifying and setting priorities for an outstanding scientific program, and developing technical innovations for applications of potential benefit to society. Jefferson Lab's CEBAF accelerator and the three experimental halls are the tools that enable this exciting work.

Like all tools, the accelerator and the halls must be properly maintained in order to run effectively and efficiently. We recently concluded a five-week maintenance down. This is a several-week period scheduled twice each year, when the accelerator and halls are shut down for repairs and planned maintenance, as well as to make critical improvements. An extensive amount of work was scheduled and successfully completed during this maintenance period. More than 200 projects topped the list, with each of those being broken down into dozens of smaller tasks and procedures. In the Physics Division, extensive maintenance took place in each of the experimental halls, in addition to equipment installation for new experiments in Halls A and B. In Hall C, the G-Zero magnet and detector assembly was repositioned and prepared for its next run period. The Accelerator Division undertook renovating and upgrading the Machine Control Center, installing a clean room around the electron beam injector and performing extensive work on the cryogenic plant. In addition, the division conducted extensive preventive maintenance on the rf (radiofrequency) system, installed vital diagnostic equipment in the beam switch yard and continued cryomodule warm-window maintenance and replacements.

Key members of both divisions spent weeks planning the maintenance to be performed and lining up the expertise, equipment and materials needed to complete the work safely. For Physics, this included pulling the septum magnets and cryogenic target system in Hall A so the hall could be reconfigured for experiments studying the deeply virtual Compton scattering of the proton and the neutron. Work was completed to improve the Hall B CLAS detector's data acquisition rate, several drift chambers were repaired, and the PrimEx Hybrid Calorimeter was installed. Within the Accelerator Division, an impressive renovation to the Machine Control Center is streamlining information accessibility and flow to enhance accelerator diagnostics and operation. The injector clean room installation also went exceptionally well, was completed ahead of schedule and is now a classification level better than originally planned. The preventative maintenance done in the cryo plant has resulted in a more efficient system. Refrigeration capacity has been recovered, and the Lab has been able to cut two weekly nitrogen deliveries — that's nearly a $3,000 savings each week.

Many teams worked long days and weekends to get the work completed. A number of individuals worked extra diligently through the last weekend of the down to implement a procedure that was cited as an important "lesson learned" after Hurricane Isabel. Called a "Collaborative Checkout," the Accelerator Division puts beam into the halls for several days with no demands on the beam. This innovative idea allows the accelerator operators, technical and research staff, and visiting scientists to use the halls and accelerator to parameterize the beam. and ensures that accelerator staff is fully prepared for productive beam delivery to the experimental halls by the planned start date.

Every accelerator maintenance down offers its own unique set of challenges. During this down, the Accelerator Division was able to recover a few of the cavities that had been nonfunctioning since Isabel. This maintenance period has prepared the accelerator to run in a more stable,

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Effective Model of the Atom Gets More Realistic

Thomas, Guichon construct the nucleus from the ground up

by Kandice Carter

Scientists have been studying the nucleus of the atom ever since Ernest Rutherford first discovered it in 1909. Twenty-five years later, scientists were already describing the nucleus as a conglomeration of indivisible, ball-like protons and neutrons. Despite major advances in our understanding of nuclear matter since that time, nuclear physicists still use a slightly modified version of this seven-decades-old view of the nucleus for interpreting data from today's cutting edge experiments.

A new paper coauthored by Jefferson Lab's Chief Scientist may change that. It provides the first tool for describing the nucleus in terms of the most basic building blocks of everyday matter: quarks and gluons.

Quarks were first theorized 40 years ago, followed by gluons about half a decade later. Three quarks and a host of gluons, so-called because they glue quarks together, are found in each proton and neutron. The nucleus, in turn, is comprised of one or more protons and may also contain neutrons.

"People have built the nucleus out of what they know. So in 1910, it was protons and electrons. In the 1930s, it started being protons and neutrons, and that's continued. Since the 1970s, we've known that there are quarks and gluons," says Jefferson Lab's Chief Scientist and Theory Group Leader Anthony (Tony) W. Thomas.

To get a complete view of matter, scientists have attempted to describe the nucleus in terms of quarks and gluons, but the mathematical calculations are forbidding. So scientists have relied on effective theories to understand the nucleus. Such theories "effectively" describe a process, but they disregard some information, or make assumptions, to make the math simpler. In the case of the nucleus, effective theories often assume that protons and neutrons are point-like objects with no internal structure. The math is further simplified by treating these protons and neutrons as "free" — existing outside the packed environment of the nucleus. These assumptions allow scientists to learn about the nucleus through experiments with protons and neutrons, while ignoring the messy math needed for quarks and gluons.

"That's the way nuclear physics currently works. That is, nuclei are built with protons and neutrons that are really treated as elementary particles. One totally ignores their structure. They have forces between them, and quantum mechanics can be used to describe these forces in terms of two-body forces between pairs of protons and neutrons, three-body forces between three nucleons, and so on," he says.

In their paper, Thomas and French Nuclear Physicist Pierre Guichon (SPhN-DAPNIA, Commissariat à l'Energie Atomique (CEA), Saclay) proposed a new effective theory that, for the first time, takes into account the quark-gluon structure of protons and neutrons inside the nucleus. The paper, "Quark Structure and Nuclear Effective Forces," was published in the September 24, 2004, issue of *Physical Review Letters*.

Think of protons and neutrons (collectively called nucleons) as squirmy bags containing quarks and gluons. A bag's shape at any one moment in time depends on its environment. Bags found inside a nucleus are going to look and act differently from those that roam free. That's partly because the quarks inside the squirmy bags are interacting with the quarks inside other bags in the nucleus by exchanging particles called mesons. Each time a meson is exchanged, the structure of these squirmy bags, or nucleons, is changed.

"So we don't see the nucleon as a free proton or neutron with a definite shape, we see it as a cluster of quarks whose structure is just delicately altered by being placed in the nucleus," Thomas explains. These quark-quark interactions via the exchange

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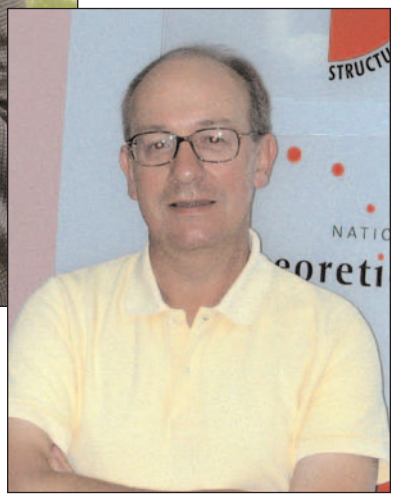
A paper co-written by JLab Chief Scientist Anthony (Tony) W. Thomas (at left) and Pierre Guichon (below), a nuclear physicist at SPhN-DAPNIA, the Commissariat à l'Energie Atomique, Saclay, offers a new way of looking at the nucleus of the atom. Their paper was published in the Sept. 24, 2004 issue of **Physical Review Letters**.



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of mesons generate the forces between nucleons that keeps the nucleus intact.

Thomas and Guichon took this model of interactions, called the Quark-Meson Coupling Model, and calculated the forces between the nucleons due to the quark-quark interactions. "And so, what we were able to do was to take a model of the nucleus built up from the quark level and write the model as an effective interaction," Thomas says, "Even though we start with a completely different view of nuclear physics, it is not inconsistent with the conventional way of doing things. It just gives what I find to be a deeper and more satisfying explanation for what is going on."

Thomas and Guichon suggest that experiments at Jefferson Lab and the Johannes Gutenberg-Universität Mainz (Germany) provide a promising way to test these theoretical ideas. Thomas says he hopes the theory's calculations will prove useful in further elucidating nuclear structure.

"So one question is: if you started trying to build the nucleus out of quarks and gluons, would you learn anything new? Would you get any new insight into nuclear structure? And that's one thing we want to find out," Thomas says.

The authors began this research during a visit by Guichon to the University of Adelaide, where Thomas was the Elder Professor of Physics in the Department of Physics and Mathematical Physics, director of the Special Research Centre for the Subatomic Structure of Matter and director of the Australia National Institute for Theoretical Physics.

Thomas says, "For me, this new way of looking at a nucleus is the beginning of answering one of the main questions at Jefferson Lab, which is: how are nuclei built from quarks and gluons? If you don't try to build theory based on quarks and gluons, you can never answer that question."

JLab detector technology aids in development of cystic fibrosis therapy

Imaging device pinpoints transferred gene

Drew Weisenberger
Detector Systems Physicist

by Kandice Carter

More than 10 million people in the United States carry the defective gene responsible for cystic fibrosis, a debilitating disease that affects about 30,000 Americans. There is no cure for the disease; treatments focus on relieving the symptoms and preventing life-threatening infections. But studies in mice with a new imaging technique perfected by Jefferson Lab's Detector Group suggest that researchers at Case Western Reserve University may have found a way to replace the gene that causes cystic fibrosis.

Cystic fibrosis is a good target for gene therapy. The disease is caused by a defect in a single gene, which scientists refer to as CFTR. What's more, a therapeutic CFTR gene, a synthetic copy of a working human CFTR gene, is already available. But researchers are leery of using conventional gene therapy to deliver the therapeutic CFTR gene to patients.

In conventional gene therapy, a virus is used to deliver a therapeutic gene to target cells. But this method may not be viable for cystic fibrosis patients, who are already battling chronic lung infections and inflammation. "If we deliver a virus to the lungs, even if it's a hollow virus, it will initiate an inflammatory response, making the patient even sicker. So that's the last thing we need in the cystic fibrosis patient," explains Zhenghong Lee, a researcher with Case Western Reserve University and University Hospitals of Cleveland.

In research with mice at his home institution, Lee and colleagues Assem Ziady and Pamela Davis are looking for a different mode of delivery. In a previous study, they found that dripping a solution containing the CFTR gene into the noses of mice could successfully deliver the gene into the lungs. But successful gene therapy depends not only on delivery of the gene, but also on good gene transfer -- the ability of cells in the body to take and express the new gene as one of their own.

To test how well the gene is transferred with the inhalation delivery method, Lee and his colleagues repeated the experiment with a gene often used to measure successful transfer. A day later, the experimenters injected a radioactive tracer and acquired x-ray and gamma images of the mice with Jefferson Lab's custom-built small animal imager -- a planar gamma scintigraphy device with an adjunct small commercial x-ray detector. The study revealed that the mice cells were expressing the new gene in the lungs. It also showed that JLab's small animal imaging system is capable of imaging gene functionality in living animals.

Lee says the next step is to continue improving Jefferson Lab's small animal imager to get an even clearer picture of gene function after gene therapy. "We want to introduce a third imaging modality, bioluminescence, which can be measured with an optical camera. These imaging methods will be independent and cross-check each other," Lee says.

Drew Weisenberger, JLab principal investigator on the project, agrees, "I think a tri-modal imaging device has the potential to bring a very powerful tool to biomedical research. The first modality, x-ray, tells you about structure. The other two modalities, gamma emission and optical, can both give you information on function, allowing doctors to measure two different functions at the same time," he explains.

Stan Majewski, Detector Group leader, is also intrigued by the prospect of building a tri-modal imaging system; he originally proposed adding the third imaging modality to the system for this and other Detector Group projects. "We're talking about building the first tri-modality imager. And the more I hear about the optical part, the more excited I get about meeting the challenge," he says.

Lee says he wants to further develop and test the inhalation gene therapy technique to prove its safety and effectiveness in small animals. Eventually, he wants to use a therapeutic CFTR

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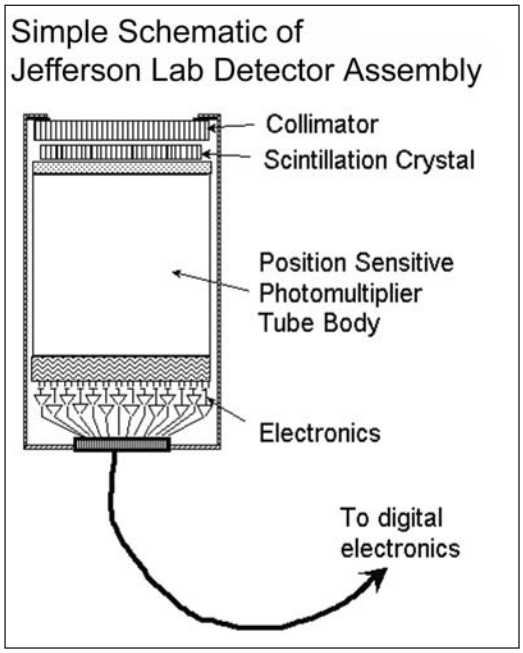
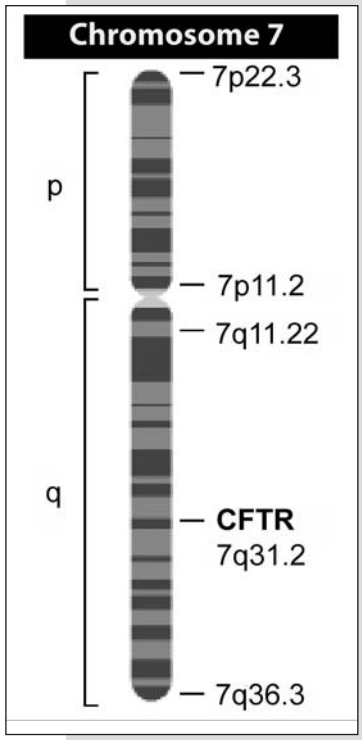
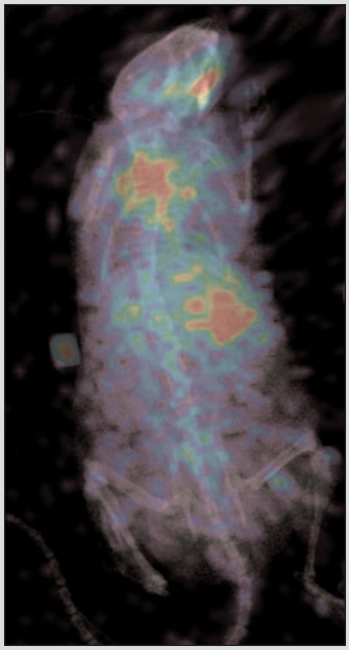


As the radioactive element decays, it releases energy in the form of gamma radiation photons. Photons emitted in the direction of the detection system pass through a collimator (essentially a slab of lead with very small, parallel holes in it), which lets only those photons with paths that are parallel with the holes through, making it possible to calculate the paths of the photons.

Once through the collimator, photons strike a sodium iodide scintillation crystal. The crystal absorbs the gamma radiation photons and converts them into light photons that can be detected by a photomultiplier tube. Exiting the crystal, the light photons enter a position sensitive photomultiplier tube, where the light signals are detected, amplified and converted into electrical pulses. The pulses are then digitized and sent to a computer where sophisticated software translates the digital signal into an image. (JLab graphic)



The gene that causes cystic fibrosis is located on chromosome 7. This diagram shows its approximate location. (Human Genome Project graphic)



This planar gamma scintigraphy/x-ray combination image taken with JLab's small animal imaging system pinpoints the radiotracer, which is trapped in cells containing the transferred gene in the lungs and liver of the mouse.

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gene with the therapy technique in patients. "Right now, cystic fibrosis is a fatal disease. But if everything works out, and we can make it a manageable disease, I think that would be really, really good," Lee says.

The Detector Group has designed and built several small animal imagers for use in biomedical research. "The DOE Office of Biological and Environmental Research put out a request a number of years ago for researchers to develop methods to image animals in a natural physiological state," Weisenberger explains. "The Detector Group responded to that. Our proposal was one of 17 out of about 70 white papers that DOE was interested in. We teamed up with researchers at Oak Ridge National Lab and Johns Hopkins University to propose the development of an imaging technology to image a mouse while it is still awake. Eventually, we were one of five projects that got funding."

According to Weisenberger, the imager Dr. Lee is using in his research is an offshoot of that project. "We're perfecting our system with the experience we're getting with our technology in different applications of animal research, like Dr. Lee's project," Weisenberger explains.

Accelerator Division inaugurates grad. program

JLab role: To train the next generation of accelerator scientists

Wanted: The world's brightest graduate students in physics and related technical fields. Available: Leading-edge research opportunities in electron-beam accelerator and superconducting radiofrequency technologies, polarized electron sources, energy-recovery linacs, advanced light sources and a one-of-a-kind free-electron laser.

Formally established in 2003 by Associate Director Swapan Chattopadhyay, the Accelerator Division's Graduate Fellowship Program is bringing talented physics graduate students to Jefferson Lab to conduct their doctoral research in forefront areas of accelerator science and technology. According to Hari Areti, JLab staff scientist and program administrator, bringing accomplished graduates to Jefferson Lab benefits all parties. Future doctoral candidates will receive invaluable experience in their chosen field; the Lab will strengthen ties to its partner institutions; and perhaps most importantly, JLab will play a major role in nurturing a new generation of accelerator scientists.

"There aren't very many formal accelerator physics training programs," Areti says. "Quite often, accelerator physicists come from either nuclear physics or high energy physics programs, and they come in and pick up the science on their own. What we would like to do is offer a training program specifically in accelerator science and technology. Our goal is to train the leaders of the next generation of accelerator scientists."

The program is open to all academically accomplished graduate students who have completed their basic requirements, and are enrolled in a doctoral program with the intent of conducting their doctoral research in areas of accelerator science and technology relevant to JLab. Each fellow, working in concert with a Jefferson Lab mentor/thesis supervisor and an academic advisor from his or her home institution, will fashion a program of research that will satisfy their thesis and academic requirements and benefit JLab science.

"Students may spend some time at the Lab during the summers learning about their chosen field. Once students finish coursework, they will spend time working here on a project. They'll need to develop concepts and theoretical formulations, procure or invent the equipment they need, take data, analyze it and publish their theses and defend them," Areti says. Fellows may pursue research in any one of the many branches of accelerator physics represented at the Lab, including particle and light beam dynamics, superconducting radiofrequency science and technology, novel accelerator designs, light sources and generation/diagnostic techniques for novel particle and radiation sources.

Areti expects that most students will spend three years in the program, and all participants will have completed their research and degree within five years. During their time at the Lab, fellows will receive a monthly stipend, as well as a travel allowance to attend scientific meetings and conferences. In exceptional circumstances, support for tuition may also be provided.

Initially, the program isn't aiming for large numbers. Areti anticipates that an average of three students per year will be accepted on the basis of the originality and scientific merit of their written proposal and its relevancy to JLab's research facilities and goals. Six students are currently enrolled in the formal program, and about another half-dozen are informally involved in graduate accelerator research projects. "So for a young program, we have a fairly large number of students. And there are indications that we will have more at some point," Areti remarks. For the time being, Areti aims to have just a handful of students in the program at any one time, with new students filling openings left by those graduating.

Participants thus far have represented local institutions. Graduate stu-

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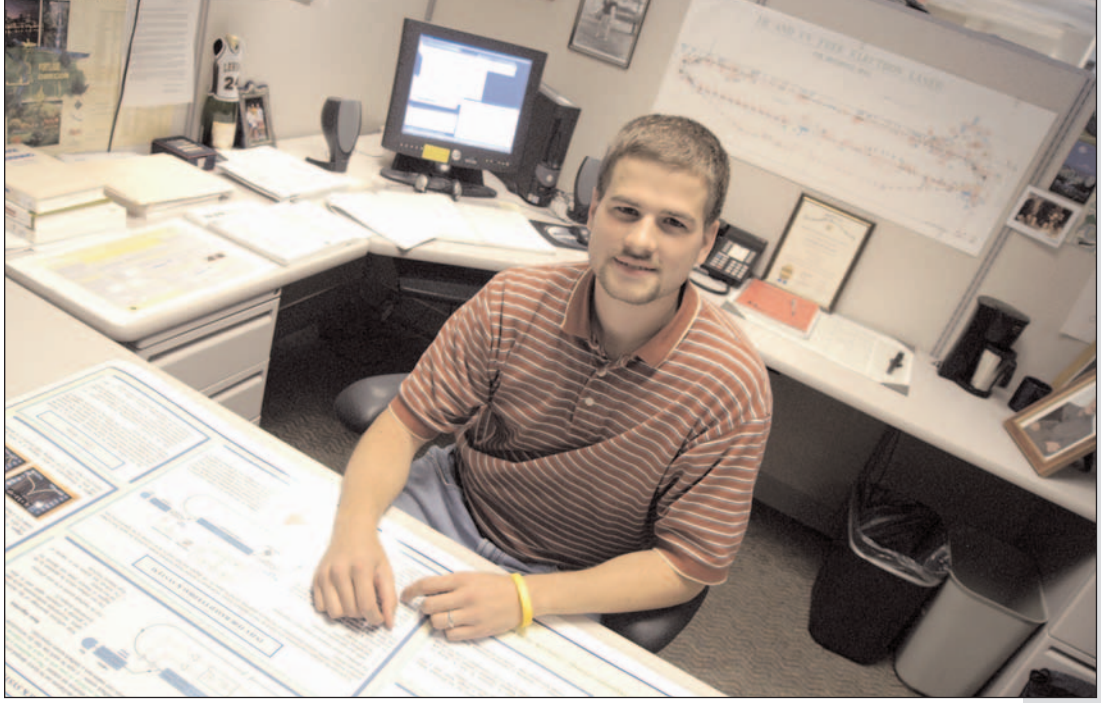

Chris Tennant sits in his workspace, surrounded by material related to his accelerator project. He and colleagues are researching a particular form of beam breakup (BBU) instability. The instability manifests itself in high current, energy recovery linacs (ERLs). The Free-Electron Laser (FEL), along with its notable records for laser power, also holds the record for the highest average beam current to be energy recovered. As a result, this summer Tennant had the unique opportunity to observe and measure this instability in the FEL. He and collaborators have done preliminary measurements to characterize the instability and to compare the data with analytical models and simulation codes. A large part of Tennant's research deals with finding methods to suppress the instability so it no longer threatens beam operations.

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dents from Old Dominion University and the University of Virginia have already begun work in the program, and collaborative efforts are underway with the College of William and Mary and Hampton University to bring in qualified students enrolled at those institutions. But Areti says he's looking to expand the program to include universities farther afield. "We currently don't have the resources to provide students with inexpensive places to stay while they're here. So this is one of the things we'll work on in the future," Areti notes.

The Accelerator Division also offers undergraduate fellowships to full-time students from accredited educational institutions. Candidates must be enrolled in a program that requires a dissertation to complete the graduation requirements, and the normal duration is either two summers or as determined by the student's home institution and JLab.

"One of the things we want to do in the future is expand our undergraduate program. Normally, undergraduates come to the Lab during the summer, but they may assist with one project one summer and a totally unrelated project the next. They may just be working for the money, and that's ok," Areti says, "but what we would like to do is have students come in and work through an entire project of their own. The first summer, they work to learn the physics. The second summer, they actually do a small project that they write up as part of a requirement for their degree. Then they come back as graduate students. This way, we are reaching talented students who might not have considered studying accelerator physics otherwise."

"This program will dramatically improve the scientific and academic standard for accelerator science in America," Chattopadhyay notes, "and by working closely with our SURA academic institutions, we can realize another important goal of the program: to create opportunities for under-represented communities to enter this field of incredible potential and scientific growth."

Applications are reviewed on a rolling basis, so there is no deadline for application materials. Applicants may apply to the program at any time by submitting a research proposal, curriculum vitae, letters of recommendation and official academic transcript. Qualified students interested in more information or in applying may contact Hari Areti via e-mail at areti@jlab.org.

Hari Areti
JLab Staff Scientist and Accelerator Graduate Studies Program Administrator

Scott Mallette joins DOE Site Office

Takes on role of deputy site manager

by Judi Tull

As an undergraduate at Purdue University, Scott Mallette, the Lab's new Department of Energy Site Office deputy site manager, thought his career path was clear and headed into blue skies. He'd beat out tough competition for a spot in the Air Force's pilot training program.

"I'd wanted to fly for years," he recalled. But the more he thought about the long-term implications of being a pilot, the more he thought it might not be for him. In the end he handed the pilot training slot over to someone else and focused his sights on environmental engineering, a decision he's never regretted.

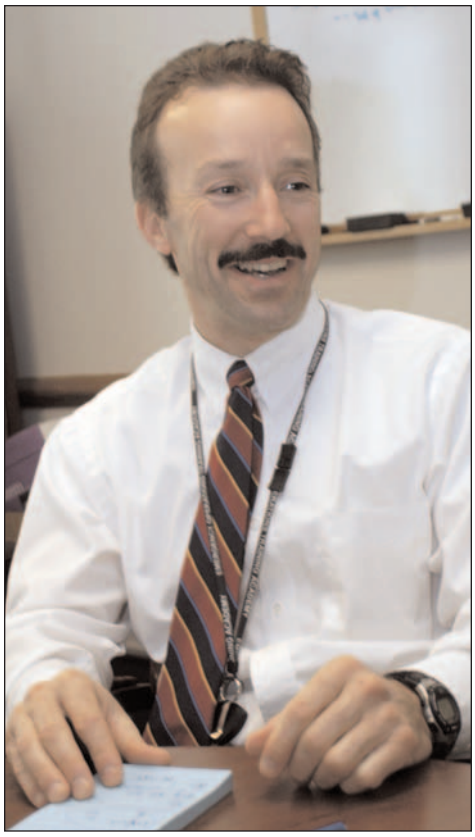
"Adding environmental work to my interest in engineering has allowed me to combine two things I really like," he noted. When he graduated from Purdue, he received bachelor's of science degrees in both engineering and environmental science.

Commissioned into the Air Force after his graduation in 1982, he eventually landed at Wright-Patterson Air Force Base (AFB) in Ohio, where he worked on weapon systems acquisitions and aerospace projects. During his time in the Air Force, he earned a master's degree in engineering management from the University of Dayton.

After leaving the military, he became a federal employee and set up the Wright-Patterson AFB environmental clean-up program. He eventually left that position to join a large architectural/engineering consulting firm as a project manager. During his eight years with the Parsons Corporation, he managed large environmental programs at several federal sites, including Fernald, Ohio, and Savannah River, S.C.

He then took a position with the federal government at Brookhaven National Laboratory as a senior environmental advisor and eventually became the director of the Operations Management Division. In addition to his laboratory operations duties, he managed the radiological monitoring and assistance program for some of the largest cities in the northeast.

In July he became the deputy manager at the Jefferson Lab Site Office. When the site office position opened, he was immediately attracted. "There's good work going on here," he said. "I saw that this position could allow me to continue to broaden my perspective at a place where I could apply the skills that I have gained over the years."



In his new position, he is responsible for DOE programs and management of the Site Office, overseeing administration of DOE's contract with the Southeastern Universities Research Association, Inc. and partnering with SURA to solve problems. Mallette will also oversee various aspects of laboratory performance measurement, environment, safety and health, facilities management, operational awareness, and project and business management. In addition he will assist the Site Office manager, Jim Turi, in strategic planning and partnering initiatives with the Laboratory to ensure successful outcomes.

Although Jefferson Lab is smaller than Brookhaven, Mallette sees the challenges as being quite similar. "Each Office of Science lab performs

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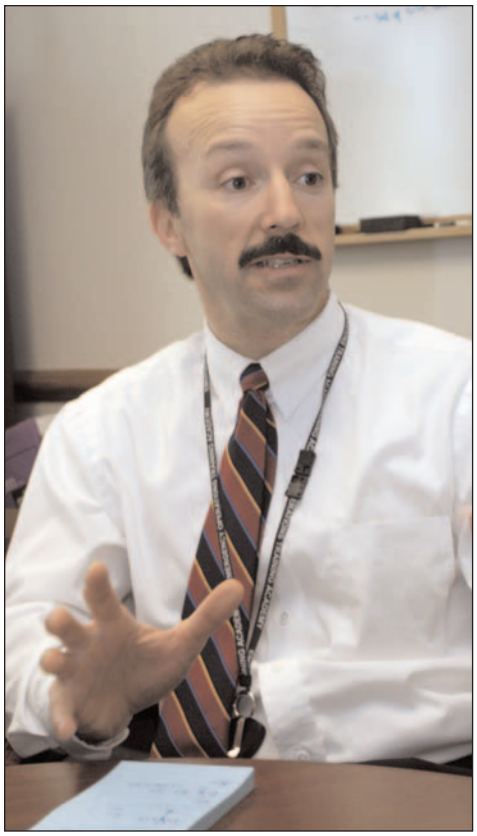

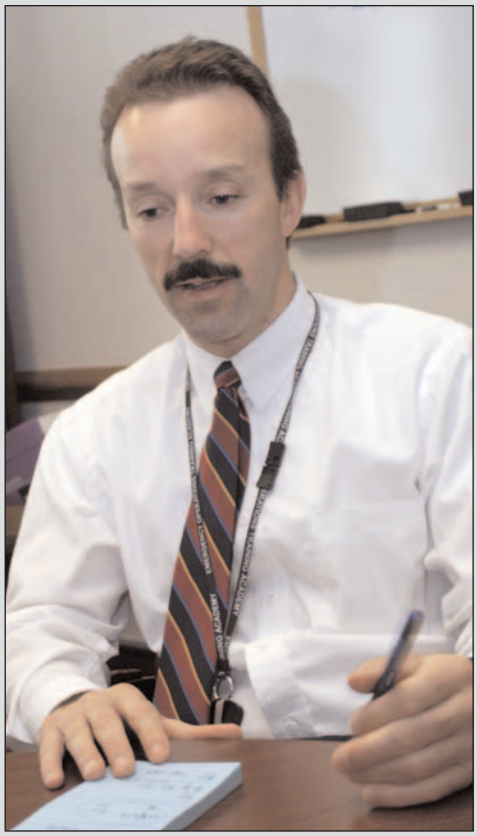

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cutting edge research and JLab is no exception," he said. "We are continually faced with the challenge of doing more with limited funds and adjusting to the responsibilities of continually increasing requirements. Each lab must ensure a safe work environment for its employees while performing world-class research. I am excited to be here and look forward to helping Jefferson Lab continue its successes."

His attention to his work made Mallette one of only 18 people chosen in the federal government in 2004 to participate in the DOE Senior Executive Service Program, and in May he was the only federal employee selected to participate in the Center for Creative Leadership program held in Colorado.

As hard as he works, Mallette is committed to leading a balanced life and spends a great deal of time with his family. He and his wife, Kim, have two daughters. Although they miss the easy access to New York City that living on Long Island afforded them, Mallette finds living close to so many scenes of U.S. history to be the equivalent of being "a kid in a candy store." They hope to find permanent residence in the Williamsburg area.

He enjoys the outdoors, once canoeing over 100 miles in a remote region north of the artic circle exploring and fishing. He likes cycling and has completed many triathlons, but is also an avid reader, especially interested in history and biographies. "I like to read about people who have persevered over obstacles," he said. "I learn from them about dealing with challenges. It's inspiring and very appealing to me."

His family has been very active in their church, where he has served as an elder. According to Mallette, his personal priorities are his faith, his family and his own character development.

Effective and caring relationships, he believes, are the key to success in the workplace. "I don't see any problem that's unsolvable," he said. "The key is respecting others and valuing others. That's what helps to ensure success for everyone involved."

DOE sets deadline for Executive Order 13148 compliance

Environmental Management System implementation underway at JLab

Jefferson Lab continuously strives to be an environmentally safe workplace for its employees and users, and for the larger Hampton Roads community. For more than a decade, the 6000-series chapters in JLab's Environment, Health and Safety Manual have provided Lab employees, users and subcontractors with guidance for protecting the environment.

"While our environmental program is very good, we now have the opportunity to make it even better," says JLab Chief Financial Officer Mary Erwin. Due to federal requirements that have come about since 2000, all federal agencies, including all DOE laboratories, must become compliant with Executive Order (EO) 13148, Greening the Government through Leadership in Environmental Management, by December 2005. This order mandates that JLab and all other DOE facilities must develop and implement an Environmental Management System (EMS), a form of environmental management oversight demonstrating that these facilities are formally addressing all of their operations and activities that have or could have a significant impact on the environment, and that objectives and targets have been set to reduce those impacts.

To start the process of complying with EO 13148, two JLab senior managers and one EH&S Reporting staff member attended a three-day EMS orientation program early this year. In April, Chief Financial Officer Mary Erwin agreed to serve as the EMS management representative; and by early May an EMS implementation team including EH&S specialists, line managers, and Lab staff from a variety of work areas had been formed. In May, the team (and alternate team members) attended a daylong training session with a consultant from AH Environmental Consultants, Inc. of Newport News.

EMS implementation team members were assigned to one of three smaller working groups and the environmental consultant accompanied them as they conducted their first set of environmental assessments. By the end of July the working groups had completed their EMS assessments, which required visiting more than 200 individual work and storage areas stretching from one end of the campus to the other and including an off-site warehouse, and interviewing the safety warden or supervisor for each area.

"This was a key step toward meeting the EO 13148 requirements," Erwin notes. "This was a large task, and the work groups gathered a lot of useful information that is now being loaded into the EMS database. In addition to the more-visible worksite assessments, a lot of behind-the-scenes work has also taken place for this program. Accelerator Division EH&S staff did an outstanding job developing the online database to capture the information and field notes gathered during the assessments. They created the database so it would interface with JLab's EH&S Tracking System. This should simplify the Lab's next steps in the EO 13148 (EMS) implementation process — developing objectives and setting targets."

"Initially, the program requires a significant amount of time and work," Erwin continues. "We're looking at every real or potential waste stream produced by every activity at the Lab. The benefits of going through this process are wide ranging. From a risk management aspect, doing this will help the Lab further reduce the possibility of environmentally damaging releases by improving waste minimization, reducing natural resource usage, and lowering energy usage. Doing this should also improve our safety staff's understanding of the processes taking place here, eliminate redundancies, enhance communication, and ensure consistency in adhering to JLab's environmental protection program across all of our operations and activities."

"We've been able to cover a great deal of territory quickly and thoroughly," she says. "The support of the division managers and the supervisors of our EMS implementation team members and alternates is very much appreciated. The team's efforts are helping the Lab to move forward towards meeting an important DOE contractual commitment some time next year."

"This is our opportunity to give back to the community — the community that supports the Lab."

Kelly Caccetta
Associate Director
Administration Division

JLab's United Way Day:

Annual appeal day set for Oct. 27

Wednesday, Oct. 27, will be Jefferson Lab's United Way fundraising day. "After the success we had with last year's one-day appeal, we decided it was the way to go again this year," says Tina Johnson, JLab's 2004 United Way campaign coordinator. "We are dedicating this one day to all of our 2004 fundraising efforts, and our goal is to increase JLab's participation level."

An estimated 33 percent of JLab's employees took part in last year's appeal. Just over $50,660 was raised by the 171 individuals who filled out contribution forms and several anonymous donors.

Small teams of volunteers will cover the site on Oct. 27, visiting as many work areas as possible. They will provide anyone interested in making a contribution with the United Way form, then collect the forms and provide complementary United Way pins, donuts, bottled water and fresh fruit to everyone who makes a donation or completes a contribution form. Currently, Johnson is recruiting volunteers to help staff the contribution carts.

That afternoon, in conjunction with the JAG Fall Fest, United Way Day will conclude with a prize raffle. And, everyone who participated in United Way Day will be able to catch a free, half-hour Magic Show, starting at 4:30 p.m. in the Residence Facility Great Room. Show your United Way pin for entrance; children admitted with their parents (no food or drink allowed in the Great Room).

Participating United Way agencies cover a range of activities and programs, including the Red Cross, Big Brothers/Big Sisters, Boy Scouts, Girl Scouts, Children's AIDS Network, local foodbanks, and a number of associations supporting the research and treatment of medical conditions and diseases such as mental health, muscular dystrophy, diabetes, epilepsy, cystic fibrosis, cerebral palsy, cancer and arthritis. Two programs JLab has regularly supported over the years include the Red Cross, and CHROME — the Cooperating Hampton Roads Organizations for Minorities in Engineering.

"Supporting CHROME helps at-risk youth develop the knowledge and interests that they need in order to succeed in our high-tech world. CHROME helps to make them aware of the possibilities and opportunities that lie before them. It's a great way of supporting our community today, and helping to make it an even better community tomorrow," says Jan Tyler, JLab's Science Education manager and a CHROME board member.

This area supports the United Way of the Virginia Peninsula, with a local office at 739 Thimble Shoals Blvd., Newport News. For more information about this year's appeal or to volunteer for Oct. 27 cart duty, contact Tina Johnson, ext. 7611 or email cjohnson@jlab.org.

"Giving to the United Way gives an extremely knowledgeable and helpful organization the resources to do what they do best. They get help to those who really need it."

Lisa Surles-Law
Science Education Technician
Director's Office

"I choose to support the United Way because I feel obligated to help those less fortunate, and the United Way provides a unique and effective means to do so. I particularly like the 'community charities' option whereby my payroll deduction is spread among many worthwhile charities that I would like to assist, thereby sparing me the need to address each one individually."

Hugh Williams
Assessment Engineer
Office of Assessment

"It's an easy way to donate to two of the organizations whose missions are, in my view, important to the community. The Salvation Army fills so many needs, and Transitions, for abused women and children is trying to break the cycle of abuse in families. I have never had to call on the services of either, but I believe their work makes communities better places."

Bonnie Madre
Computer Scientist
Accelerator Division

"Through payroll deduction I'm able to support many organizations that I truly believe in and are in need of financial support. I've always supported the YMCA because of the services they provided my firstborn. The YMCA was the first preschool he attended, which was affordable for me and created a well-rounded healthy child.

I've also supported the Tuskegee Airman of this area so they could dispense scholarships to deserving underrepresented students. I've given to many organizations down through the years. Having the ability to earmark my contributions increased my giving because I felt I knew where my money was going."

Leon Reynolds
Accelerator Operator
Accelerator Division

Milestones
for August 2004

Hello

Russell Mattox, Construction Inspector, Administration Division

Goodbye

Daniel Dale, Staff Scientist II, Physics Div.

Hovanes Egiyan, Post Doctoral Fellow, Phy. Div.

John Hammons, Accelerator Operator, Accelerator Div.

Christopher Larrieu, Staff Computer Scientist II, Accel. Div.

Heather Larrieu, Staff Computer Scientist I, Phy. Div.

Barbara Prisco, Administrative Support, Admin. Div.

Scientists representing 17 institutions from the United States and abroad met at Jefferson Lab Sept. 9-11 for a GlueX Collaboration Meeting. The meeting was held to prepare for the Oct. 20-22 (proposed Hall D) GlueX Detector Review. Information about JLab's proposed Hall D and GlueX (the Glue Excitations Experiment) is available at www.gluex.org. Some of the physicists on hand for the meeting posed for a group photo during a break.

Join in JAG Fall Fest fun set for Oct. 27

The annual JLab Activities Group Fall Festival is set for Wednesday, Oct. 27, from 3-6 p.m. in the field behind the Residence Facility. "Employees, users and their immediate family members are invited. Mark your calendars, dust off the costumes and get ready for the fun! We're planning a great line-up of activities," notes Dave Kausch, JAG chair.

Refreshments — including German potato salad, two types of sausages, Brunswick stew, and treats like apple crisp, popcorn and roasted peanuts — will be served beginning at 3 p.m. and last until they are gone. Activities planned include a costume contest, tug-o-war, guessing how much candy is in the jar, and pumpkins for tossing, carving, and weight guessing. "Start getting your teams together for the tug-o-war," Kausch suggests.

To run a successful event, JAG will need a number of volunteers to help. Volunteers will be needed to assist with set up, food and beverage service, trash pick up, activity leaders, site clean up, etc.

Watch for event flyers for more information. The JAG electronic volunteer sign at www.jlab.org/jag/ should be live before mid-October.

This annual event, funded by the Southeastern Universities Research Association (SURA) will conclude JLab's United Way Day campaign with a prize raffle. Everyone at the Fall Fest who participated in the United Way campaign will also be able to catch the Magic Show starting at 4:30 p.m. in the Residence Facility Great Room — show your United Way pin for admittance to the show (children admitted with their parents).

Lab sets policy on wearing bike helmets

Beginning Nov. 1, anyone riding a bicycle (or using a scooter, skateboard or in-line skates) anywhere on the Jefferson Lab campus will be required to wear a properly fitting, approved bicycle helmet. In addition, anyone riding a JLab-owned bicycle will be required to wear a helmet when biking off site.

A person may wear his or her own helmet; but for anyone without a helmet, the Lab will provide one, according to a memo sent out by JLab Director Christoph Leemann. An order for helmets was made Oct. 1. After Nov. 1, helmets for staff will be available from the Stockroom. Users will be issued a helmet when they check out a bicycle from the Residence Facility. For more information, contact your division safety professional.

Check your office newsletter distribution

Public Affairs is updating the JLab newsletter distribution list. If your office would like to receive paper copies of the Lab's *On Target* newsletter, or if your section has recently moved to a new Mail Stop, please contact Debbie Magaldi, ext. 5102, magaldi@jlab.org. Give us your work section's name, Mail Stop, and the number of newsletters you need and we will update your section's entry in our distribution database, or if you aren't currently on it we'll get you added to the list, Magaldi says.

The *On Target* newsletter — with color photos instead of the printed black & white version — is available as a pdf document through the Lab's News web page (http://www.jlab.org/news/), as well as from the Insider page. Paper copies of the newsletter are distributed across campus and mailed out about a week after the electronic version is posted.

From the Director...

Continued from page 3

controllable and dependable fashion. It is now delivering beam — 5.75 GeV — for use in the halls, and is well on its way to reaching our [lowered] rf fault rate goals.

We did have two safety incidents during the down that resulted in recordable injuries. One of our contractors hurt his back while installing a tuner, and one of our employees was injured by a wire while taking a gasket out of an rf flange. We are very fortunate that neither of these incidents was life threatening, but both provided opportunities to improve our application of personal protective equipment (PPE) and work process planning. We must continue to emphasize and improve our safety culture and statistics; even one incident no matter how minor, is one mishap too many. Please continue to work with senior management, your division safety experts and your supervisor and co-workers to make Jefferson Lab the safest possible place to work. Careful planning, such as we had prior to the maintenance down, not only allowed for efficient use of resources but encouraged safe work practices. This approach to any job at the Lab will have a lasting impact on meeting our scientific goals in both a safe and timely manner.

I want to extend my thanks to everyone who made this maintenance period so productive. The CEBAF accelerator and experimental halls are marvelous tools, designed and built to meet the very specific needs of JLab's research program. They are demanding and challenging machines to maintain and to run, but with determined spirit and fresh ideas, the talented teams working on them ensures that JLab is ready for producing ever more interesting and exciting science.

More than two dozen individuals turned out over the course of about a week in late August to help with "Beam Brightening" — basic housekeeping throughout the accelerator tunnel. On a periodic basis the accelerator components are gently dusted and the floor is swept, according to Ned Walker, Industrial Safety representative. This was the most complete cleaning since the machine has been running. "We were able to clean nearly every area of the tunnel at the end of this maintenance down," he noted. On Sept. 8 several of the volunteers met at the Machine Control Center for pizza.

BEAMS curriculum is changing

Science Education needs JLab volunteers to continue successful program

In the past, BEAMS—Becoming Enthusiastic About Math and Science—students came to Jefferson Lab for three to five consecutive days. But now, to better correlate the experiments and hands-on activities the students do while they are here with the lessons they are getting at their schools, students will come for one day during each of the school year's four grading periods. And to better align BEAMS with the students' curriculum requirements, the Science Education staff has spent the summer fine-tuning some new labs for BEAMS volunteers to conduct with the students.

For the first marking period, BEAMS is including a brand new "go far race car" experiment involving potential and kinetic energy and how they affect the distance a car goes down a ramp placed at different heights, and the "Cold Stuff" experiment that studies insulating capabilities of different materials. Science Education needs new and veteran BEAMS volunteers for these activities. Individuals interested in BEAMS and veteran volunteers learning a new activity may observe Cold Stuff and the race car activity or assist with these activities in the BEAMS classrooms (VARC, 72A and 72B).

The activities began Sept. 30 and will run through early December. Any Lab employee or user interested in volunteering or watching one or both of these classroom activities may contact Science Education Technician Stacy DeVeau, ext. 7560, or email stacy@jlab.org.

In November, the Science Education staff will hold a training and orientation session for the two activities that BEAMS will share with students during the second marking period, which will start during the first-half of December.

"Jefferson Lab volunteers make our BEAMS program unique and account for its success over the last 13 years," points out Science Education Program Manager Jan Tyler. "We're excited about the changes we have planned for this year, and we hope you will be too. Please use this as an opportunity to get involved in BEAMS, or to try out a new activity. I think you'll find that the experience of sharing your enthusiasm, knowledge and perspective with our BEAMS students to be as rewarding for you as it is beneficial for them."

ON TARGET

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