ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

Anthony (Tony) W. Thomas
JLab Chief Scientist
and Theory Group Leader

iovernor's Distinguished EBAF Professorship warded to JLab Chief cientist

Five Virginia universities have unanimously approved the nomination of Jefferson Lab's Chief Scientist, Anthony W. Thomas, to a distinguished professorship at The College of William & Mary. Thomas, a theoretical nuclear physicist, has been JLab's Chief Scientist and Theory Group Leader since March 2004. Thomas now joins William & Mary's physics department as a distinguished professor.

"The association of Jefferson Lab's key science leaders with Virginia's research universities is important to the nuclear physics community as we strive to maintain our leadership position in the basic sciences during these

Continued on page 7

JLab's April 16 Open House draws record attendance

Public attendance hit a record high at Jefferson Lab's April 16 Open House, according to Public Affairs Manager Linda Ware. Turn out for the seven-hour event was estimated at more than 7,000 people — about 2,000 more than the estimated attendance for the 2003 Open House.

"It was an incredible turn out, especially when you consider the less than ideal weather that day," said Public Affairs Manager Linda Ware. "These events are always a wonderful opportunity to share our research and accomplishments with the broader public."

"The enthusiasm of the 300-plus Jefferson Lab volunteers was obvious to every visitor who attended," she stated in an All Staff email after the event. "Please accept my sincere gratitude for making this important community event such an incredible success. Many of you played an instrumental role in planning and helping to prepare for this major event, and all of you spent Saturday welcoming our visitors and telling them about our exciting science and technology programs. Thank you for giving your time and energy so generously."

"The number of visitors this year far exceeded crowds from previous years, and there were important 'lessons learned' on managing large numbers of people on site," she continued. "With feedback and ideas offered thus far, we have already begun planning improvements for the 2007 Open House. I welcome your additional feedback and suggestions for our next Open House."

Continued on page 2

Huge turn out for April 16 Open House...

Continued from page 1

More areas of the Lab were open to the public than ever before. Areas open for the day or made accessible through staffed displays or activities included: a portion of the accelerator tunnel, all three experimental halls, the Machine Control Center, Free-Electron Laser Facility, 12 GeV Upgrade and Hall D, the SRF, CASA and SNS work in the Test Lab, Science Education, JLab's graduate student program, the Computer Center, the Lab's medical imaging work, data acquisition capabilities, Human Resources, and the Library. In addition JLab's always-popular Liquid Nitrogen Demonstration was given every hour; and affiliated universities — including Norfolk State, Hampton Univ., Old Dominion, The College of William & Mary and Christopher Newport engaged visitors with a variety of interactive displays and activities or showed off their laboratories in the Applied Research Center. Also participating in the World Year of Physics event were exhibitors from NASA Langley Research Center, Virginia Living Museum, Virginia Air & Space Center, the Children's Museum of Virginia and the Mariner's Museum.

Dear Colleagues:

With the Continuous Electron Beam Accelerator Facility's energy upgrade to 12 GeV (billion electron volts), the Department of Energy will reaffirm Jefferson Lab as the world's premier hadronic-level research facility. The Upgrade will put the United States at the forefront of a wealth of opportunities for new discoveries and potential technological advances and enhance the vital international research community that will take the field of nuclear physics to new levels in the 21st century.

At 6 GeV, CEBAF has made significant contributions to understanding the building blocks of matter. The 12 GeV Upgrade continues this Laboratory and its user community's tradition of groundbreaking physics. For the first time, we will be able to probe the quark and gluon structure of strongly interacting systems to determine whether QCD (quantum chromodynamics), the theory we believe describes strong interactions, gives a full and complete description of hadronic (3 quark) systems. JLab at 12 GeV will make profound contributions to the study of hadronic matter—the matter that makes up everything in our world.

In particular the 12 GeV research program will allow breakthroughs to be launched in five main areas:

--Through the search for exotic mesons, in which gluons are an unavoidable part of the structure, we will explore the fascinating and complex vacuum structure of QCD and the nature of confinement.

--Through extremely high precision studies of parity violation, developed in order to study the role of hidden flavors in the nucleon, we can explore physics beyond the Standard Model, on an energy scale that cannot be explored even with the proposed International Linear Collider.

--The combination of luminosity, duty factor and kinematic reach of this machine will far surpass anything available up to this point, allowing the nuclear physics community a previously impossible view of the spin and flavor dependence of the valence parton distributions — the heart of the proton, where its quantum numbers are determined.

--We will be able to take a revolutionary look into the structure of atomic nuclei, exploring how the valence quark structure is modified in a dense nuclear medium. These studies will give us a far deeper and more fundamental understanding of the structure of atomic nuclei with far-reaching implications for all of nuclear physics and nuclear astrophysics.

--The Generalized Parton Distributions will allow us, for the first time, to engage in nuclear tomography, discovering the true three-dimensional structure of the nucleon.

No other nation is able to carry out such a program of discovery using the amazing precision of the electromagnetic probe. The United States alone carries the torch for these studies, which are both central and essential to 21st century nuclear science. Basic nuclear physics research provides a foundation for research and applications in many other fields, including chemistry; high-energy and astrophysics; the biological sciences and medical imaging; nuclear stockpile and waste stewardship; and nuclear power. Nuclear physicists, worldwide, are excited and eagerly seeking the opportunity to benefit us all through their future discoveries with the 12 GeV Upgrade.

Now is the time for each of us — staff and users — to share our excitement of CEBAF@12 GeV with our sister national laboratories and the many universities and international institutions with whom we collaborate. As I stated in our All Staff Meetings on June 17, every one of our staff members plays a role in making the 12 GeV Upgrade a reality. Make any task regarding this endeavor your top priority; work smart and efficiently, and be frugal in your expenditures. The 12 GeV Upgrade is our future as a lab, and together as a team we can build this project.

Editor's note: More information about CEBAF@12 GeV: Future Science at Jefferson Lab is available at www.jlab.org/12GeV/.

Christoph Leemann
Jefferson Lab Director

In pursuit of 12 GeV science at JLab

From the Director

APS thesis award goes to JLab scientist

Eduard Pozdeyev recognized for pioneering research in beam physics

by Judi Tull

Eduard Pozdeyev, an accelerator physicist with Jefferson Lab's Center for Advanced Studies of Accelerators (CASA), has received the American Physical Society's 2005 Award for his doctoral thesis research in beam physics. He accepted the award May 18 at the Particle Accelerator Conference in Knoxville, Tenn. The Oak Ridge National Laboratory's Spallation Neutron Source and Jefferson Lab hosted the conference.

The award, for his pioneering research on space charge effects of beams in the isochronous regime, carries a prize of $2,500.

Pozdeyev came to JLab last year, after finishing his Ph.D. at Michigan State University (MSU). He originally came to the U.S. on a six-month visa to work as a visiting scientist at Cornell University, and applied to MSU while he was there. Prior to that, he worked as a researcher at the Budker Institute of Nuclear Physics in Novosibirsk, Russia, from 1992 to 1996. He received his bachelor's degree in physics from Novosibirsk State University.

At MSU, he went directly into the Ph.D. program, rather than going after a master's in physics, which would have required sitting through additional classes rather than getting right into research, which was his goal. "I had a very good education in Russia," he noted, "and a master's was not my goal. In physics, you push to the maximum. There are no half measures."

He was notified in January that he had won the APS award, something that came as a surprise to him, although he believed wholeheartedly that his work was excellent. "It was especially gratifying because my work is not from a big school like Stanford," he noted. He will share his prize money of $2,500 with Alberto Rodriguez, a former MSU graduate student who is currently at CERN. "Without him," Pozdeyev said, "this work would have been impossible."

Born in Sakhalin, an island off the eastern coast of Russia, Pozdeyev attended a small public school that included all ages and all grades of students. The turning point in which he decided on a career in physics came when he was 16, and was invited to attend a special math and physics school in Novosibirsk after placing well in a physics Olympiad.

He decided to leave Russia because, he said, it's very difficult for a scientist to survive there. "In this country, on the contrary, I saw more opportunities for doing research and living a decent life. Like 200 years ago, the United States is still the Land of Hope and Opportunity."

Although he had English classes in lower school and the university,

Continued on next page

Continued from previous page

Pozdeyev found his language training to be much less adequate than he anticipated when he arrived in the U.S. Although he was able to read and understand English, speaking it on a day-to-day basis turned out to be a different challenge. “I did OK in general,” he recalled, “but if I went to a car repair shop, my English failed!” On a road trip to Florida with a friend from Chicago, they decided to take a shortcut and wound up somewhere in Alabama where they stopped for some food. Not only was everyone speaking English, they all had southern accents. “It took me 20 minutes to get a sandwich,” he said with a laugh.

On the other hand, Michigan’s cold and snowy weather hardly fazed him. “When you’re from Siberia,” he said in something of an understatement, “Michigan seems like a resort.”

Like many foreign physicists, Pozdeyev has not been back to his native country since coming to the U.S. because of the difficulty of getting a visa to return in a timely fashion. “It’s been very, very difficult since September 11,” he said, “and many scientists are choosing to remain in Europe. It’s a real problem in the international physics community.”

Although he applied for and was accepted by several other research labs, Pozdeyev chose to come to Jefferson Lab because the work here appealed to him, even though it is different from his previous research. “For now,” he noted. “I want to continue working in energy recovery, and some of the best people in the field are here.”

Particle Accelerator Conference 2005 highlights JLab accomplishments

Jefferson Lab and Oak Ridge National Laboratory’s Spallation Neutron Source hosted the 2005 Particle Accelerator Conference, the 21st in the series, in Knoxville, Tenn., May 16-20.

PAC05 represents the world community of particle accelerator scientists who assemble for the conference every two years. The conference and its more than 1,200 attendees covered new developments in all aspects of the science, technology and use of particle accelerators. A number of JLab Accelerator Division staff participated in the conference. Dozens of media representatives and science and technical writers who cover trends and discoveries in particle accelerator science also attended.

Topics of interest at this year’s conference revolved around the World Year of Physics, which marks the 100th anniversary of Albert Einstein's “miraculous year” of 1905, when he published three papers that revolutionized the physical sciences.

Tennessee Governor Phil Bredesen, a physics graduate of Harvard University, welcomed conference attendees on May 16. Cecilia Jarlskog of Lund University, a member of the Nobel Prize committee, described in the opening remarks how Einstein won the Nobel Prize for Physics in 1921. An “Einstein and the World Year of Physics” session on May 18 featured talks by Nobel Laureate Carlo Rubbia of CERN and the National Science Foundation’s Michael Turner.

Scientific presentations and seminars included plans for and the status of existing and next-generation particle accelerator facilities. Conference topics also included the planned scientific applications of the Spallation Neutron Source and other high energy and nuclear physics facilities. Highlights included the latest in superconducting linear accelerator technologies and the latest achievements in the realm of particle accelerator physics.

JLab highlights from the conference are covered in this issue of On Target and will continue in the next issue.

Theo Larrieu receives award at PCaPAC 2005

The Isamu Abe Prize

The Isamu Abe Prize honors the memory of the Personal Computers and Particle Accelerator Controls (PCaPAC) committee co-founder Isamu Abe from KEK (Japan) who passed away suddenly in June 2002. The prize is awarded to junior researchers with the best contributions among those presented at the PCaPAC international workshops. The award, presented for the first time in October 2002, is intended to recognize and encourage people in their early career — for their innovative ideas, achievements and applications of personal computers in the field of accelerator controls. All PCaPAC attendees considered to be early in their career and authoring either oral or poster contributions are eligible for the prize.

by Judi Tull

Theo Larrieu, an Accelerator Division computer scientist, received the Isamu Abe Prize at the 5th International Workshop on Personal Computers and Particle Accelerator Controls (PCaPAC), for his work on advancing the use of electronic logbooks. The conference was held in Hayama, Japan, March 22-25, and the award included a prize of ¥50,000 (approximately $500).

The main objectives of the workshop were to continue dialogue on the use of PCs for controls of accelerators and to give scientists, engineers and technicians working in this field a forum for discussion and opportunities to further their mutual understanding.

Larrieu came to Jefferson Lab in December 2000 after spending seven years at Vanderbilt University in Nashville, Tenn., where he graduated with a Master's in geology. While pondering whether to continue his education or seek full-time employment, he spent the summer after graduation setting up a UNIX system and customizing software on it to analyze side-scan sonar data collected from the mid-Atlantic ridge by a faculty member. That summer there was a widespread network security compromise at the university and during a meeting to inform departmental system administrators of the repercussions, the director of Central Computing commented that his department was short-staffed. The next day, Larrieu went to the director's office with a resume and then spent the next five years working for Vanderbilt University Central Computing on numerous security and infrastructure projects.

In 2000, with the anticipated birth of their second child, he and wife, Kathy, decided to return to Virginia to be closer to their families. His brother, Christopher, who was working here at the time, suggested that Theo explore openings at JLab. As a graduate of the College of William & Mary, Larrieu was familiar with the Lab, and happy to return to the area.

His experience with UNIX software and relational databases such as Oracle was a good fit for upcoming projects in the Accelerator Controls Group, where an effort was underway to better manage the configuration of software use to operate the accelerator. As at other labs, the trend is to replace the thousands of difficult-to-maintain configuration and data files with database tables, which are more readily searched, versioned, and controlled. One project he began shortly after arriving at the Lab was revamping the electronic logbook, which serves as the legal record of everything that goes on during each shift.

Continued on page 14

Thomas awarded distinguished professorship...

Continued from page 1

times of fiscal constraint," said P. Geoffrey Feiss, Provost of The College of William & Mary.

"Virginia universities are particularly important to the present and future of Jefferson Lab. I'm looking forward to joining The College of William & Mary's physics department and working with the people there, especially the graduate students," Thomas said after SURA made the distinguished professorship announcement. "I regard graduate students as the driving force for future research at Jefferson Lab, and this appointment gives me the opportunity to work with these bright students and involve them in research at the Lab." Thomas is responsible for fully developing the connections between the theoretical, experimental, and advanced computational and simulation activities of JLab's scientific program.

In September 2004, Physical Review Letters published a paper co-authored by Thomas and collaborator Pierre Guichon, with the Commissariat à l'Energie Atomique (Saclay), in which the scientists 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, titled "Quark Structure and Nuclear Effective Forces" provides a new way of looking at a nucleus and how nuclei are built from quarks and gluons.

With more than 30 years of professional experience, Thomas' most recent position before coming to JLab was at the University of Adelaide (Australia), where he was the Elder Professor of Physics, Director of the Special Research Centre for the Subatomic Structure of Matter, and Director of the Australia National Institute for Theoretical Physics. He has also served as President of the Australian Institute of Physics and is a Fellow of the Australian Academy of Science, the American Physical Society, and the (UK) Institute of Physics. He has received numerous awards, including the Harrie Massey Medal (IoP), the Thomas Ranken Lyle Medal (Australian Academy of Science), a von Humboldt Research Prize (Alexander von Humboldt Research Foundation) and the Walter Boas Medal (AIP).

The Governor's Distinguished CEBAF Professorship/Governor's CEBAF Scientist (GDCP/GCS) honors were established in the early 1980s by the General Assembly and Governor of the Commonwealth of Virginia to enable the Southeastern Universities Research Association (SURA) to attract distinguished scientific talent and leadership for Jefferson Lab. SURA constructed and now manages and operates JLab for the Department of Energy. SURA President Jerry Draayer, noted, "Without the support that Virginia has provided to SURA for this program, we would be constrained in our recruitment and retention efforts for some key scientific positions at the Lab. These positions are unique, and few individuals are qualified to lead Jefferson Lab's forefront science program. We need to be able to bring the best of these scientists to the Lab, and the association with Virginia's top research institutions is mutually beneficial."

The Commonwealth of Virginia has provided approximately $1 million annually to SURA to support these honors and applied research projects benefiting Virginia university and industry partners. The five public Virginia universities that review nominations include: University of Virginia, Virginia Tech, Virginia Commonwealth, Old Dominion, and The College of William & Mary. Thomas joins Lab Director Christoph Leemann and Associate Director for Physics Lawrence Cardman, as current GDCP honorees. Two current Lab staff members, Peter Kneisel and Claus Rode, hold Governor's CEBAF Scientist awards.

Detector Group builds imaging device for German Cancer Research Center

Several members of the Detector Group stand with the small-animal mini-gamma camera imager they built for the German Cancer Research Center (DKFZ) to study physiological information on animal models of human disease. From left are Detector Group members Vladimir Popov, Detector Group Leader Stan Majewski, project manager for this effort Mark Smith, Brian Kross, Randy Wojcik and Ben Welch.

Late in April, three Jefferson Lab Detector Group members traveled to Heidelberg, Germany, to assemble and bring on-line a small-animal imaging device the group developed and built for the German Cancer Research Center (DKFZ), an institute similar to the National Cancer Institute within the National Institutes of Health in the United States.

While nearly every member of the Detector Group played a role in developing or fabricating the device, Mark Smith, project manager for this effort, and Detector Group members Vladimir Popov and Ben Welch went to the DKFZ during the week of April 24 to assemble, bring on-line and calibrate their mini-gamma camera imager for small animals. Popov's primary responsibility was the camera's electronics, while Welch worked on data acquisition and the user interface.

"Joerg Peter, leader of the DKFZ Functional and Molecular Emission Computed Tomography Group, was pleased that the first quality control images were taken within a day of our arrival and that the first animal images were obtained by the end of the week," Smith said after his return to JLab.

"In December we shipped the larger components and the electronics rack; and during the April trip we hand-carried the delicate electronics," Smith explained.

"We're very excited about getting the system operational," he continued. "The imager will be used for research projects to gain physiological information on animal models of human disease. The detector head was successfully integrated with the previously shipped components of the imaging system and with a pinhole collimator developed by the DKFZ. Calibration and quality control tests were successfully performed; and Ben Welch provided a thorough introduction on the use of the imaging system to DKFZ researchers during these tests." Mastering the machine's capabilities and the calibration process are critical to the cancer researchers' work as they will be using more than a dozen different radiopharmaceuticals in their research.

Jefferson Lab's work on the project began in June 2004. The Lab received approximately $86,000 from the DKFZ to build the gamma camera under a Work for Others Agreement. "This type of high-resolution device isn't available commercially and the German research center didn't have the capability to fabricate its own," Smith explained. The basic device is along the same line as other small animal imaging gamma cameras developed by the Detector Group. However, group members are constantly refining their work. This imager design is based on a new concept developed by Vladimir Popov

Continued from previous page

(idea has been submitted for a patent) which resulted in highly improved detector performance. "This device has notable improvements, and we built it with a new type of flat panel position-sensitive photomultiplier tube," Smith said.

The effort to develop international collaborations such as this one began a few years ago when Detector Group Leader Stan Majewski requested that Mark Smith seek out potential scientific partners in Europe, to provide additional, crucial evaluations of JLab-designed imagers by implementing them in real biomedical projects.

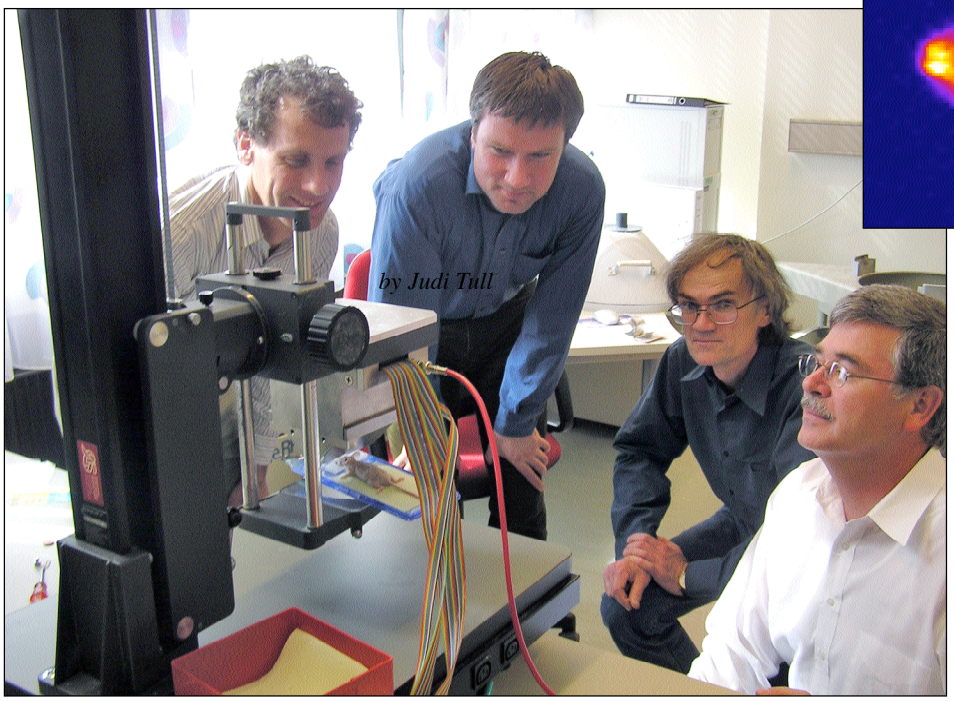
Smith traveled to Europe and after visiting several places in the Netherlands and Germany, returned with the DKFZ collaboration plan. Smith's long-time friendship with a senior DKFZ scientist, Joerg Peter, was a plus in developing the working relationship. The two researchers have known each other since their years at Duke University Medical Center. "We stayed in touch over the years. Ideas grew up during our conversations during professional conferences, based on our mutual interests," Smith said. "He knew the sorts of things we could build here, so when they needed a small-animal imager, we were a good fit to build it for them."

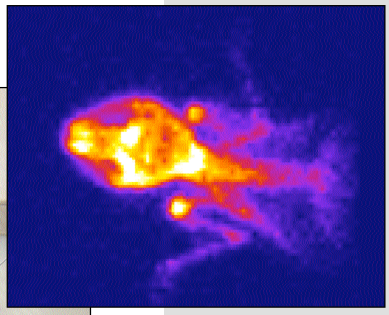
The DKFZ research institute has integrated the gamma camera with a non-JLab optical camera that images bioluminescence and fluorescence markers for dual modality small-animal imaging, which will make it easier to correlate the information provided by the different imaging modes.

"Also during the visit, we jointly prepared an abstract titled 'Development and Initial Results of a Dual-Modality SPECT/Optical Small Animal Imager', for the 2005 IEEE Medical Imaging Conference," Smith said.

The Detector Group primarily assists with the design and construction of apparatus for the highly complex detection systems that gather data on subatomic particles in nuclear physics experiments conducted at JLab. The group has also used its core detector instrumentation expertise to develop a variety of clinical and biomedical research imaging devices. Other members of the group who participated in this project are Randy Wojcik, Brian Kross and Stan Majewski.

by Judi Tull





Above: Mouse images were obtained after injection of Tc-99m MDP — technetium-99m methylene diphosphonate - a bone-imaging radiopharmaceutical. Image captured by Ben Welch, JLab.

At left: Mark Smith, Joerg Peter, DKFZ, Vladimir Popov and Ben Welch (left to right) observe a mouse bone study at th German Cancer Research Center being performed with the new small-animal imager built by JLab's Detector Group. Photo courtesy of Josef Doll, DKFZ.

Using nstrumentation built in collaboration with JLab

CWM researchers study radiation blockers while con - ducting nuclear imaging of Iodine uptake

College of William & Mary scientists have found that an equivalent dose of potassium iodide five times higher than the FDA-recommended dose for humans, in the event of a nuclear accident, is needed to protect small animals effectively from radioactive iodide in medical imaging procedures. This study was performed as part of a long-term animal nuclear imaging project conducted by a collaboration of biology, physics and applied science researchers from The College of William & Mary (CWM) and Jefferson Lab.

The research, performed at CWM with a Jefferson Lab and CWM-built medical imaging system, involves investigational studies of mice. Bob Welsh, a JLab/CWM jointly appointed professor, is one researcher working on the project. The research demonstrates that scientists can learn about how the body uses certain substances of interest — such as insulin, the fat-regulating protein leptin, and a wide range of other biological compounds — by tracking how these substances move through the body of a mouse.

The way one can follow these substances is by attachment of a radioactive isotope of iodine, Iodine-125, which emits a low-energy gamma ray which can be tracked with the very precise detectors that have been designed and built by the JLab Detector Group.

The thyroid needs iodine to regulate metabolism and is unable to distinguish between regular dietary iodine and ingested radioactive iodine. So the researchers weren't surprised when, in the course of the project, they noticed that the rodents' thyroids always absorbed a significant amount of radioactive iodine. In addition to being potentially bad for the mice, the thyroid's absorption of radioactive iodine made the images difficult to interpret and could provide false-positive readings or possibly obscure substantial iodine uptake in nearby tissues.

The team was aware that potassium iodide (KI) was the FDA-recommended drug for blocking radioactive iodine absorption by the thyroid in humans in the event of a nuclear accident. Thus the scaled FDA dose was administered to the mice prior to imaging with I-125. CWM undergraduate William findings at the American Physical Society (APS) April 2005 Meeting, participated in this phase of the research for his senior thesis project.

The researchers started with the potassium iodide dose that's recommended for humans in the event of a nuclear incident, 130 mg (milligrams), scaled to the mass of the mouse. They administered a solution of potassium iodide to the mice, injected the radioiodine for imaging an hour later, and then imaged the mice.

"What we noticed was that the dose that was the exactly scaled human dose did not completely block the uptake of radioiodine. But when we tried three times, five times, 10 times the scaled human dose, we obtained results indicating that 10 times the scaled human dose blocks 1.5–2 times better, though five times the scaled dose is just about as good as 10 times," Welsh explains.

The researchers recognized that the extra benefit gained by the largest potassium iodide dose administered could in some cases be outweighed by potential side effects. To protect their mice in future imaging studies, they're planning to use the potassium iodide dose that's five times the scaled-down human dose.

"When it comes to small animals, I think the results from this research should be taken into consideration when planning future work. But, as for larger implications," Welsh notes, "the results from this study cannot simply be applied to humans. Instead, the results could be indicating that a mouse's metabolism is so different from a human's that you can't just scale the human dose down for mice."

This research was made possible by a collaboration of JLab Detector Group scientists: Drew Weisenberger, Randolph Wojcik, Vladimir Popov, Brian Kross and Stan Majewski; JLab/CWM scientist Robert Welsh; and CWM physicists Julie Cella, Coleen McLoughlin, Kevin Smith and William Hammond; biologists Eric Bradley and Margaret Saha, and CWM applied science graduate student Jianguo Qian. The work was supported by the National Institutes of Health, the Department of Energy and the Howard Hughes Medical

In their own words

with Hall A experimentalist Lisa Kaufman

by Judi Tull

I was born in the Hudson Valley of New York, not far north of New York City, but my family moved to Haymarket, Virginia, when I was three, so I really grew up there. I went to public schools, and, from the very beginning, I challenged myself to do well. I received an International Baccalaureate diploma and then was accepted at [the College of] William & Mary.

I'd studied physics in high school, and decided to try it in college. I thought about majoring in Spanish and physics because I really like languages, but there were too many conflicts in scheduling with the physics courses that I needed, so I focused on math instead. I've always loved math, and physics gave it a purpose. I realized that math has physical meaning. This is the perfect synthesis.

I first came to Jefferson Lab as part of the Research Experience for Undergraduates program while still at William & Mary when I worked with David Armstrong on the Rad Phi experiment in Hall B. He became my advisor for my senior research project and honors thesis, also based on Rad Phi.

Studying physics in college was really a challenge for me. I had to work really hard at it, and at first that was pretty scary. But I was surrounded by a good group of people and found out that everyone was struggling that first year. It was really helpful to be able to talk with the others — it was a very fostering environment for all of us.

As graduation was getting closer, I knew I wanted to do more in physics, so I applied and was accepted at several schools. I chose the University of Massachusetts (UMass) at Amherst because I really liked the program and I fell in love with the area. I decided to stay in medium-energy nuclear physics instead of high-energy experimental work because I wanted to be part of a smaller project where I could learn more.

I absolutely loved Amherst, and I still miss it. I miss the whole university experience, but I miss the town, too. You could walk almost everywhere — great public transportation, lots of restaurants, that sort of thing — so I didn't need a car like I do here. I met a lot of people from the international physics community there, and I've picked up a smattering of knowledge in a lot of different languages, although I'm still not fluent in any of them. Making friends with people from other countries paid off for me last summer when I went to Germany to stay with some UMass friends there. I'd never been to Europe before and spent two weeks traveling around Germany. We even took a day trip to Switzerland. I'd love to live in Europe some day.

While I was at UMass I had the opportunity to work on the E58 experiment at SLAC and then came to Jefferson Lab to conduct my thesis work on the structure of protons using parity-violating electron scattering. We ran the second generation of HAPPEX (the Hall A Proton Parity Experiment) in June and July 2004, and submitted our results for publication earlier this month. We'll run the experiment again this summer, and after that I expect to finish my thesis around the summer of 2006. Then, of course, I get to look for a job or a post-doc position.

I was fortunate when I came back to this area that my college roommate was still here; she's working on her Ph.D. through a William & Mary program at NASA. So we're living together again, and that's really fun. It made the transition from UMass much easier for me. And my office-mate, Kent Paschke, is a post-doc who had been here a year when I arrived, so he was a big help getting me started, helping me set up my computer and figure things out. Another friend from the Lab, along with his wife, got me interested in bowling, so I do that once a week; my average is 145 and I've even gotten some trophies. One

Continued on page 14

JLab's annual Take Our Children to Work Day a success

Activities center on safety theme

On April 28, more than 50 sons and daughters of JLab staff, users and contractors took a break from their regular classroom activities to learn about safety at the Lab's annual Take Our Children To Work Day (TOCTWD). Sponsored by JLab's Science Education staff, the event included an afternoon of special safety activities, games and a movie.

The children were arranged in four groups based on the event's safety theme: helmets, sunscreens, extinguishers, and seat belts. Science Education's Dave Abbott, who planned the event, noted, "The kids learned about bicycle safety, electrical safety, safety out in the sun, fire safety and safety devices." Early arrivals, like six-year-old Elizabeth, also got to learn about general science and math by playing the "Who Wants to Win $1,000,000?" game on the Science Education web site with their TOCTWD pals in the CEBAF Center auditorium.

At 1 p.m., the youngsters split into their assigned groups and walked out to the flagpoles in front of CEBAF Center. There, they were greeted by the JLab bicycle team, who taught the children about bike and helmet safety. In one demonstration, the team dropped honeydew melons from ladders. Three melons were protected by helmets, while the other three weren't. The demonstration showed the children, as Accelerator Operations' Steve Suhring explained, "Why you wear a helmet on your melon."

The groups then took part in four, 30-minute activities. Steve Gagnon, Science Education, used a Van de Graaff generator to teach the youths about static electricity and electrical safety. Science Education's Stacy DeVeau taught the youngsters about ultraviolet light. She helped them conduct an experiment with beads that change color when exposed to ultraviolet light to determine how well different materials protect skin from the sun's rays.

In the CEBAF Center auditorium, Dave Kausch, JLab's fire protection engineer, taught the youngsters about what it takes to make a fire (heat, fuel and oxygen); demonstrated the effectiveness of smoke alarms; talked about the different fire extinguishers; and explained multiple techniques for putting out fires. Lisa Surles-Law, Science Education, had the children build protective packages with cotton balls, toothpicks, Styrofoam, bubble wrap and other materials for mailing a potato chip safely across town. The team from each group with the best-protected chip received a prize, and every child came away with a little experience in designing safety equipment and the importance of using it. A snack break and a viewing of the movie "Osmosis Jones" rounded out the afternoon.

The children seemed to take home at least a few new safety tips. Aaron, an eight-year-old, said, "I learned that you have to use helmets and always buckle up in the car." Friends Kendall and Taylor, also eight, enjoyed the ultraviolet light experiment. "We learned how to change beads' colors," they chorused. Fourth grader, James, was similarly impressed by the afternoon. "We learned about how carbon dioxide can change straight from a solid to a gas, about what materials can protect from UV, and how static electricity can shock you," he said. While six-year-old Elizabeth commented that she liked packing up the potato chip.

The eight adult volunteers also enjoyed their afternoon off from the typical. Melissa Hicks, Residence Facility, volunteered because her daughter participated. "I really enjoyed the questions that the kids asked, because I learned a lot from them, as well as the presenters. They're very intelligent people." Hicks is already looking forward to volunteering again

Continued next page

Continued from previous page

next year. Tim Cannella, Procurement, said he also plans to participate again, "I love it. It's a great day with the kids."

The winning team from each group for the "potato chip packaging" activity included: the team of Daniel Dickey, Jack May and Miles Neilson in the Sunscreen Group; Miranda Schaffner, Kyle Kolczynski, Aaron Fraitas and Cory Kolczynski from the Helmets Group; Sydney Snyder, Ryan Humphry, Brock Eanes and Libby Daly of the Seatbelts; and the Extinguishers' Jeremy Schaffner, William Fenker, Tyler Yarrington and James Heyes.

Facing page: TOCTWD '05 volunteer, Will Oren, Accelerator Division, drops an unprotected melon onto the pavement with smashing results (see inset). Sitting next to the broken melon is a melon that was protected during its fall by a bike helmet.

Clockwise from top: TOCTWD '05 volunteer Jim Parkinson, Project Management and a JLab bike team member, gives youngsters a chance to check out his recumbent bike.

Several TOCTWD '05 participants learned a little about electrostatics and had hair-raising experiences with a Van de Graaff generator.

TOCTWD '05 volunteer, Barbara Swanick (right), Administration Division, helps participants with the ultraviolet light activity — determining which materials can best protect against the sun's UV rays. Also, overseeing the activity is Science Education's Stacy DeVeau (background).

A TOCTWD '05 team prepares its special packaging for the "mail a potato chip across town" activity.

Milestones

for May 2005

Goodbye

Earl Ratliff, Senior RadCon Technologist, Accelerator Division

Tara Nelson, Documentation Coordinator, Accel. Div.

Nancy Sheerin, Accounts Payable Clerk, Chief of Finance Office

Jarreas Underwood, Hall B Mechanical Technician, Physics Div.

Hugh Williams, Assessment Engineer, Directorate, retired effective May 31

Award Announcements

Henry Robertson, JLab Safety Systems Group, and two of his Christopher Newport University Small Business Institute classmates were recognized in May with a national award.

Robertson was notified of the award in January. The Case of the Year competition recognizes outstanding student work on field-based consulting cases. A panel of national judges evaluates the written cases and the award is announced at the national Small Business Institute conference. Robertson and his two teammates, under the supervision of the CNU/SBI director, produced the project judged to be the best in the nation. Robertson and his teammates were formally recognized at the CNU School of Business awards ceremony in early May.

Kelly Mahoney, JLab Safety Systems Group leader, was certified through the TÜV Functional Safety Program early this year as a TÜV Functional Safety Engineer in the field of Safety Instrumented Systems. Mahoney is among 85 engineers worldwide to receive this recognition, and one of only 12 engineers from the U.S. to be recognized by this international standards organization. For additional information about the TÜV Functional Safety Program, visit www.tuvasi.com/. The safety program supports engineers in the functional safety business to deepen their knowledge and experience in order to achieve a worldwide acknowledged know-how and practical experience within the area of functional safety according to the International Electrotechnical Commission and other international standards.

JLab earns HRSD Gold Award for 2004

Jefferson Lab was recognized twice during the May 25 Hampton Roads Sanitation District's (HRSD) Annual Awards Ceremony for pretreat-

Continued next page

Larrieu wins Isamu Abe prize...

Continued from page 6

Although an electronic logbook had already been instituted when Larrieu came on board, he set about extending the capabilities of the logbook by storing the information in a database instead of html files and incorporating into it new functionality for tracking operational problems (OPS-PRs), accelerator downtime, and most recently guidance from system experts. The guidance feature allows system experts (those to whom OPS-PRs get dispatched for trouble-shooting) to present the operator or other person making a new entry with on-the-spot advice. When an operator selects the component and problem he or she is about to log, the system immediately searches both for explicit guidance and for recent solutions to potentially similar problems. The guidance can be used to help make a complete and useful log entry (what screens to capture, what diagnostic output to include, etc.) or provide actual help for resolving the problem and obviating the need to dispatch an OPS-PR in the first place.

The work of many people went into this," he noted, calling it a group effort. For example, building an accurate hierarchical layout of all the components and subcomponents used in the accelerator to be presented as a navigable software menu required input from a dozen or more system experts. The outcome of the collaborative effort has made the JLab electronic logbook unique. While most labs use electronic logbooks, they are typically implemented as static repositories for data, whereas the JLab logbook is evolving into a two-way medium for communication.

Theo and Kathy live in Williamsburg with their daughters — Madeleine and Valerie — right across from the geology professor in whose class they met at William & Mary. "It felt like coming home," he said with a smile.

Although most of his spare time is taken up being a husband and a dad, Larrieu is studying German, an interest he developed last year when he and Kathy were planning a vacation in Switzerland. He listens to audio language courses and Radio Deutsche Welle news broadcasts during walks, and at home he likes to watch German language episodes of Disney's "Duck Tales", which the kids also love.

In their own words...

Continued from page 11

of the really good things about belonging to the bowling league is that I get to meet people who aren't in physics, and that keeps my life feeling balanced.

When I first came to the Lab, I really missed the student environment I'd been in. This is a lot like a "real job." But I've gotten to meet a lot of different people throughout the Lab, and they've all been terrific. And the hours that I keep fit really well with my night-owl tendencies.

Continued from previous page

ment excellence and pollution prevention.

JLab once again received an HRSD Gold Award for having no administrative or technical violations during calendar year 2004. The Lab had also submitted a nomination of the Test Lab Acid Neutralization System that became operational in 2004 for an HRSD Pollution Prevention (P2) award. While Fort Monroe won the P2 award in the mid-level waste-generator category (same category JLab is in), the Lab received a P2 plaque recognizing its "significant pollution prevention achievements" in 2004.

The awards luncheon, held in Virginia Beach, was attended by Erik Abkemeier, Radiation Control group; Brett Lewis, Institute for Superconducting Radiofrequency Technology; and Accelerator Division Industrial Hygiene staff Patty Hunt and Steve Singleton.

SURA awards 9 JLab fellowships for research

The Southeastern Universities Research Association recently announced the award of nine fellowships to graduate students from SURA-member universities for research at Jefferson Lab for the nine-month academic year beginning in September 2005. The awards were presented to eight students enrolled in experimental or theoretical nuclear physics programs and one in accelerator physics.

In presenting the recommendation on awards, Fellowship Selection Committee Chairman Thomas Clegg of the University of North Carolina, stated in his letter to SURA President Jerry P. Draayer: "The Committee noted with pleasure that the overall quality of the applicant pool was very high, which speaks well of the attractiveness both of JLab and of its users for such high-quality student talent.... We are confident that the students recommended for awards will carry the SURA and JLab flags well. SURA can be pleased to have its name associated both with them and their research."

SURA fellowships pay one-half the stipend of a graduate student at his/her home university plus $2,000 and a travel allowance of an additional $2,000. Applications were received this year from 21 students and were evaluated by the five-member SURA Fellowship Selection Committee.

In noting the exceptional talent pool considered, Clegg added, "This year, for the first time, one of our awardees is deeply involved in R&D at the Free Electron Laser, indicating that it too is becoming a focus of student research." While SURA normally awards eight fellowships, based on the strong recommendation of the Fellowship Selection Committee, Draayer agreed to fund an additional fellowship for the 2005-06 academic year.

Congratulations go to: Hovhannes Baghdasaryan, Old Dominion University; Nathan Baltzell, University of South Carolina; Aidan Kelleher, College of William & Mary; (CWM) Alvin Kiswandhi, Florida State University; Yingchuan Li, University of Maryland; Xin Qian, Duke University; Yi Qiang, Massachusetts Institute of Technology; Christopher Tennant, CWM; and Richard Thomson, North Carolina State University.

JLab and Hampton University presented a World Year of Physics concert "Einstein and his Violin" May 4 at Christopher Newport University's Ferguson Center for the Arts. A selection of Albert Einstein's favorite music was performed by internationally known violinist Jack Liebeck and pianist Inon Barnatan. The event began with accelerator scientist, Brian Foster, Oxford University, presenting an introduction on Einstein's love of music and his passion for the violin. Alex Chen (background) turned the music for Barnatan. Alex is the son of JLab's Ying Chen and her husband, Hongwei Chen.

Clay Sell Sworn in as Deputy Secretary of Energy

Jeffrey Clay Sell was sworn in as Deputy Secretary of Energy during a small ceremony held at the Department of Energy headquarters in Washington, D.C., on March 21. Sell was sworn in by Energy Secretary Samuel W. Bodman after being unanimously confirmed by the Senate on March 17.

"Clay brings a tremendous amount of knowledge and experience to the department, which will be critical as we seek to ensure an affordable, reliable energy supply for America's future," Secretary Bodman said. "As Deputy Secretary, Clay will play a critical role in the management of our nuclear stockpile and the effort to continue America's leadership in science and basic research."

"I am honored to be sworn in as Deputy Secretary of Energy," Sell said. "I have great regard for the significant work and outstanding employees of the Department of Energy. I look forward to working hand-in-glove with Secretary Bodman to help ensure continued excellence in our national and economic security, as well as scientific missions."

Between February 2004 and March 2005, Deputy Secretary Sell served as a special assistant to the President for Legislative Affairs, specializing in coordinating and promoting the President's legislative agenda in the Senate with a primary focus in the policy areas of energy, natural resources, budget, and appropriations. Previous to his work in the Legislative Affairs Office, he served as a member of the President's National Economic Council and as special assistant to the President for Economic Policy. As such, he was the President's primary advisor on issues pertaining to energy and natural resources, and he coordinated the development and implementation of the Administration's energy policy.

Prior to his service at the White House, Deputy Secretary Sell was the staff director and majority clerk of the Senate Energy and Water Development Appropriations Subcommittee, working directly for the subcommittee chairman, Senator Pete Domenici of New Mexico and the full committee chairman, Senator Ted Stevens of Alaska. Deputy Secretary Sell led the Republican staff of the Energy and Water Subcommittee from January 2000 to July 2003.

Previously, Sell served as part of the energy policy team during the Bush-Cheney Transition. From 1995 to 1999, he served on the staff of Congressman Mac Thornberry of Texas, functioning the last two years as the Congressman's administrative assistant.

Before moving to Washington, Sell practiced law in Texas. He received his bachelor's degree from Texas Tech University and his J.D. from the University of Texas School of Law.

ON TARGET

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