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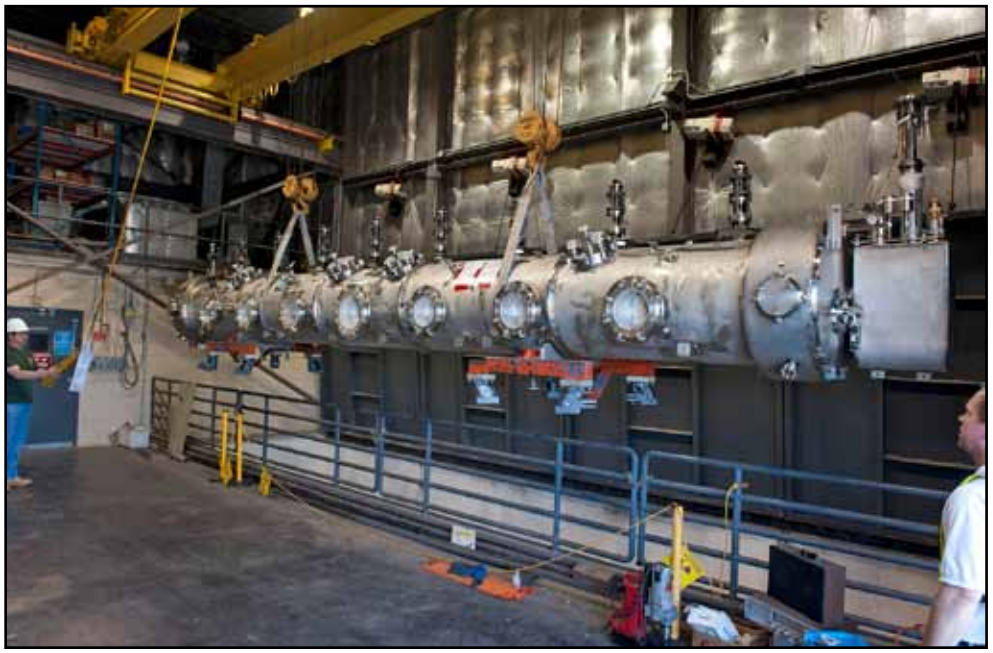

A C100 cryomodule is prepared to be lowered into the accelerator tunnel by Dave Bigelow (left) for installation, as John Hogan looks on.

Bright Future for Energizing Electrons: 12 GeV Cryomodule Test a Success

In the wee hours of May 18, the last crew to run the 6 GeV CEBAF accelerator caught a glimpse of the future: Its newest section of hardware had operated for an hour at its full design energy for the first time. That meant while the machine was about to be shut down for well over a year for an upgrade, the core acceleration technologies that would make the upgrade a reality had just passed an ultimate test.

"That run was the culmination of a decade's worth of effort," said Leigh Harwood, associate project manager for 12 GeV Upgrade accelerators. First proposed in detail in 2001, the 12 GeV Upgrade is a $310 million project that will enhance the research capabilities of Jefferson Lab's CEBAF accelerator by doubling its energy from 6 to 12 billion electron volts, or GeV, along with other upgrades and additions. The upgraded facilities will provide scientists with unprecedented precision and reach for studies of the particles and forces that build our visible universe.

The May test focused on new sections of accelerator, called cryomodules, and their associated systems.

"We did it literally years ahead of when we were supposed to have

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demonstrated it. So that's why it was a big deal," said John Hogan, a staff engineer in the lab's SRF Institute. Hogan is responsible for the final design, parts acquisition, manufacturing, initial testing and installation of the new cryomodules, called C100s.

Building a Module

At the core of a cryomodule are eight cavities: hollow metal cylinders with seven connected compartments that roughly resemble a stack of doughnuts. These cavities are designed to harness energy that is pumped into them, focusing it onto, and thus accelerating, a thin beam of electrons.

Before the cavities can be built into a cryomodule, their interior surfaces must be thoroughly cleaned and prepared using an acid wash. SRF Production Manager Tony Reilly said that exposing the surfaces to acid both smooths the surfaces and helps to strip away impurities. For the acid wash, there were two choices: buffered chemical polish, which had been used to prepare the cavities in the original CEBAF accelerator, or a relatively new procedure called electropolishing.

"At JLab, electropolishing has become a more mature surface treatment process. In our application as a final chemical polish, EP has shown to be stable and repeatable which, based on cavity performance, seems to have translated into reproducible cavity surface finishes," said Reilly.

The system that was used for electropolishing the cavities was originally intended for use with cavities that Jefferson Lab processed for the Spallation Neutron Source at Oak Ridge National Lab. However, the technology and the process wasn't ready to be used on those cavities. But since that time, Jefferson Lab staffers gained valuable experience and improved the process.

"We added a spray cooling system to the electropolish cabinet to control the temperature of the process," Reilly said. "Now, the process for each cavity is more tightly controlled, which seems to give us a more consistent surface finish on the inside of these cavities."

The cavities are made of a metal called niobium. At just a few degrees above absolute zero, niobium cavities become superconducting, allowing energy to flow through them without resistance. The cavities are encased in a helium vessel, where they are bathed in a constant stream of liquid helium to keep them cold. The vessels are cocooned with a variety of insulating material, including aluminized mylar, the stuff of shiny party balloons. Tuners are attached to the ends of the cavities, which allow for adjustment of the cavities' ability to harness the energy pumped into them. Other mechanical necessities, wires and parts are suspended in a space frame, and the entire assembly is then encased in the outer stainless steel shell, sometimes called the vacuum vessel.

"From a single cavity to a finished cryomodule is easily six months," Hogan said. "A cavity alone takes two months to get through the whole qualification process. And once you have eight cavities qualified, you build them into a string. Once the string is complete, it takes nominally three months to build it out from a string to a complete cryomodule."

Once complete, a cryomodule is three feet in diameter and 30 feet long. It

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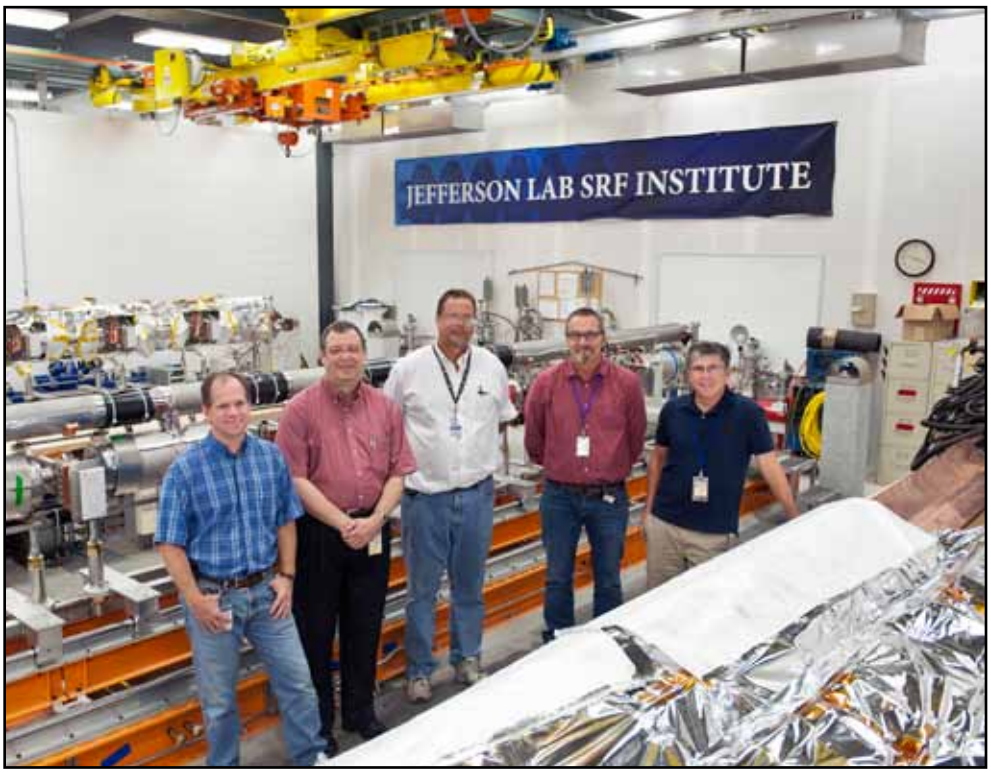

Left to right: John Hogan, Leigh Harwood, Arne Freyberger, Mike Drury and Curt Hovater pause for a photo in the new Test Lab Addition cryomodule assembly area. Around them are partially assembled, 12 GeV Upgrade cryomodules.

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weighs in at roughly 12,000 pounds and contains at least 1,000 major parts, many of which were designed here and are now patented technologies.

Testing and Installation

To make sure that a completed C100 cryomodule is in good working order, it is then tested by a team led by Mike Drury.

"Over in the Test Lab, we have a facility called the Cryomodule Test Facility — it looks like a big cave. When they finish building the cryomodule and they're satisfied with it and done all of their pressure tests and leak checks and stuff like that, it goes into the cave. We hook it up and run our series of tests," Drury said.

Each cryomodule is first hooked up to systems analogous to those it will connect to in the accelerator. Then it is slowly cooled, its helium vessels filled with liquid helium for the first time. Next, the cavities are tuned, adjusting the cavities' ability to harness the energy pumped into them. Finally, Drury and his colleagues will send energy into each cavity, a kind of dry run of its ability to harness energy. The full process takes about four weeks.

Once a cryomodule has cleared the tests in the cave, it is transported to the accelerator site, where it is installed in the CEBAF accelerator.

"It's about a half-day operation to get it out there and get it installed on the stand. And then you have another group of guys that make sure everything's lined up right. The vacuum guys come in, and they hook up the actual beamline. Then we hook up the waveguides. Then we have to connect and check out all of the instrumentation, make sure everything works, and then we'll do the cool down," Drury explained.

Powering Up the System

The first two 12 GeV-style, C100 cryomodules were installed during the six-month down in 2011. The down preceded the last months of running of the 6 GeV accelerator. (The final 6 GeV run was January - May.)

"The plan, back in 2005, was to have them all put in during the Long Shutdown. But we were making good-enough progress, that we were confident that we could try to get them in for this run and try to get a little experience with them," said Hogan.

For some of the run, the new cryomodules were handled by the accelerator operators. But operating the cryomodules during the tests fell primarily to Curt Hovater, a senior staff engineer in electrical engineering, and his group.

Hovater's group designed the new radiofrequency system that powers the cavities. They completely re-worked the original system, taking it from analog to a mostly digital system. The digital system includes new klystrons, which provide the energy that is sent into the cavities, a new digital interface to control the system and a new cooling system for the amped-up equipment.

"When we are running our tests with beam, we're there to mainly operate the C100 cryomodules. We need experts there to track what's going on

A C100 cryomodule is lowered into the accelerator tunnel for installation.

and try to minimize any types of trips or incidents," Hovater said.

According to Arne Freyberger, head of Accelerator Operations, the first real tests of the cryomodules in the CEBAF accelerator began in November 2011, when the accelerator was not scheduled to deliver beam for experiments. "We had a dedicated week in November for testing of the modules without a user. And those tests went reasonably well. But then when we first turned them on to send beam to the user, the beam wasn't quite good enough, and we had to turn them off," he said.

Through the winter and spring, Hovater's group worked to integrate the new RF system with the new cryomodules. The group also had to make sure the new equipment would work well with the older control system used to run the rest of the accelerator. The group calibrated measurements of the cavities' performance, improved the modules' up time and shortened the time it takes to recover

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from an incident that forces them to shut down — from a half hour to just six minutes.

"A whole team of individuals since September have been working on procedures and algorithms to make the cryomodules useable for operations," Hovater said.

Last-Minute Test Success

All the hard work finally paid off on the morning of May 18, Hovater's group staffed the controls of the new cryomodule dubbed SL25. Approaching an hour after midnight, they tentatively ramped the module up to its full design specification and ran it there for a minute. It successfully ran at its full specification, imparting 108 Megavolts of power to the electron beam (C100 refers to this ~100 MV design specification). In comparison, the average original CEBAF cryomodules impart just 20 MV of power to the electron, with the best original module reaching just 32 MV.

Then came the real test: could the cryomodule run at full specification, while also delivering the most demanding beam ever required of CEBAF for experiments in two halls simultaneously?

The team attempted the one-hour test three times in quick succession. The third proved the charm. At 2:55 a.m., the cryomodule had achieved an hour of stable running at full specification.

"This test has demonstrated that the integrated cryomodule plus microwave-power system can successfully deliver the performance that was envisioned in 2001, and which is needed for the planned nuclear physics research program in the 12 GeV era," said Leigh Harwood, associate project manager for the 12 GeV Upgrade project. "We've demonstrated that there are no fundamental design problems that we overlooked. We now

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Dozens of Jefferson Lab staff members are involved in the research, development, parts procurement, assembly, testing, installation and commissioning of the 10 new cryomodules to be installed in CEBAF for the 12 GeV Upgrade.

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know we can rely on this critical new technology."

Freyberger agrees."This was a significant accomplishment, which I've already said, and it took a lot of work. It also took a lot of cooperation with the users as well, the scientists. And so, I thank them for their patience. And I think it shows that we can do more than one thing at once here, and do it all exceptionally well."

Mike Drury (left) and Curt Hovater act as spotters as a C100 cryomodule is transported to the accelerator.

The Upgrade Continues

The CEBAF accelerator was shut down at 8:18 a.m. on May 18 for the Long Shutdown. Over the next year-plus, Jefferson Lab staffers will be busy preparing CEBAF — the accelerator, the experimental halls, the cryogenics system and all other related systems — for operations at 12 GeV.

The racetrack-shaped CEBAF originally operated with about 20 cryomodules in each of its two straight sections. For the upgrade, each straight section will get an additional five cryomodules, for a total of 10 new modules. All of the components of the new radiofrequency system, along with the many other support components, will also be installed. Many of the magnets in the accelerator, used to control and steer the electron beam, are being refurbished so they can handle electrons at higher energies. The cryogenic system, needed to keep the cavities superconducting, is also undergoing a major upgrade and maintenance.

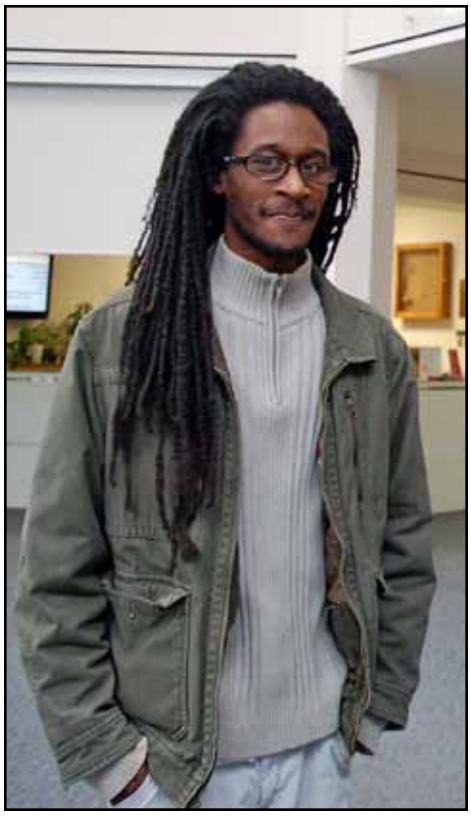
So far, six cryomodules have been completed, and the rest are in various stages of construction. This fall, Harwood expects that half of the new cryomodules will be installed. By next fall, the machine and all its systems will be gearing up for the first, weeks-long commissioning run of all of the new modules and systems.

"The effort that was put in from November to May in understanding all the control issues to get the cryomodules working correctly, that effort was very productive and resulted in these modules reaching their design energy," Freyberger said. "In November 2013, when we come to commission this machine, we're going to be so much further up the learning curve in how to run this machine. The C100s are the major new component to the CEBAF accelerator. There will be new magnets and there will be new power supplies for magnets, but those are not as challenging to commission as a new cryomodule. So to get this far up the learning curve is a tremendous advance."

A spring run in 2014 will provide more commissioning time, and it's hoped that the newly upgraded accelerator will deliver its first beam to the newly built Experimental Hall D for the first time. The 12 GeV Upgrade project is expected to be complete in 2015.

By Kandice Carter
Science Writer

Student Focuses on Accelerator Science With Help of Research Assistantship



Thoth Gunter, a Hampton University physics major, was the recipient of the 2011-2012 Jefferson Science Associates Minority Undergraduate Research Assistantship.

Thoth Gunter, a rising senior physics major at Hampton University, has participated in a range of research related to Jefferson Lab, but over the last several months he got the opportunity to focus and accelerate his efforts.

The Chicago, Ill., native was the recipient of the 2011-2012 JSA Minority Undergraduate Research Assistantship.

He used the assistantship to carry out research that is being used to help establish a low-energy linear accelerator at Hampton University. The university plans to build a small electron accelerator for physics staff and students, opening new opportunities for research, and providing training to students and faculty in multi-disciplinary areas.

Gunter used simulation tools to model a thermionic (electron) gun that Jefferson Lab has given to Hampton University, helping in the development of its Low Energy Linear Accelerator (LELIA) project.

The assistantship provided Gunter with the opportunity to become more familiar with a variety of simulation software, to carry out electron gun modeling and simulations, and then compare those results with existing data. He learned about accelerator optics simulation tools, as well as diagnostics tools and got some hands-on experience with the hardware.

He used a simulation tool called the Static-field Analysis Toolkit Educational software, or SATE, to create a two-dimensional model [of the radial cross section] of the field generated by the electron gun. After gaining experience and understanding by manipulating a simple design, he studied a mesh (field pattern) whose geometry more closely resembled the thermionic electron gun that will be used for LELIA. He also studied effects on the beam resulting from a change in the voltage of the electron gun's control cathode.

Growing up, Gunter recalls always being interested in science and technology. "But," he said, "it wasn't until my freshman-sophomore year in high school that I decided physics was the field for me. I chose physics out of all the STEM fields because it held equal parts math and experimentation, which is what I wanted."

After his freshman year of college, Gunter participated in a National Science Foundation-funded Research Experiences for Undergraduates internship through HU and MIT. He started out by creating geometries using Geant4 simulations to help in designing a detector for an electron ion collider – a possible research facility being studied for Jefferson Lab's future. (Geant4 is a geometry and tracking modeling software toolkit developed at CERN that uses Monte Carlos methods to simulate the movement of particles.)

"It was just a small aspect in helping to flesh out a possible EIC design," Gunter said.

Through the same joint HU/MIT REU, he also worked on aspects of a proposed experiment dubbed DarkLight, where researchers will attempt to create and measure a dark matter force-carrying particle. Beam-target aperture interception tests for the proposed experiment were done at JLab's Free-Electron Laser.

Participating in these projects piqued Gunter's desire to learn more about accelerator physics. After discussions with Paul Gueye, one of his HU Physics professors, he became

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JSA Fund Supports Minority Research Assistantship

The JSA Minority Undergraduate Research Assistantship Program at Jefferson Lab offers opportunities and support to minorities and underrepresented students pursuing degrees in engineering or science at universities that are members of the Southeastern Universities Research Association, or SURA, the science partner of JSA.

The JSA research assistantship provides outstanding opportunities for the recipients and provides Jefferson Lab a source of technical students from underrepresented groups early in their professional careers. It also has the potential to fill critical positions in the future with candidates who both know the lab environment and who have specialized in an area of particular need. At the same time, the lab provides the students with opportunities not available elsewhere. "The program offers a unique opportunity to build a pipeline of minority candidates while, at the same time, addressing critical-skill shortages," according to Elizabeth Lawson, JSA Board liaison and Initiatives Fund program manager.

Criteria for selection are based on the scientific quality of the proposed project, its relevance to the Jefferson Lab program, and the student's academic record. Additional information about the assistantship is online at: http://wwwold.jlab.org/div_dept/admin/HR/research.

JSA provides a stipend through the JSA Initiatives Fund to support the student at their university during the academic year, and travel funds to visit Jefferson Lab and/or to attend a research-related workshop. Information about the JSA Initiatives Fund program is available at: http://www.jsallc.org/IF/IFIndex.html.

JSA is a joint venture between SURA and the Computer Sciences Corporation-Applied Technologies Group to operate and manage Jefferson Lab for the U.S. Department of Energy.

Gunter Pursues Accelerator Science Research...

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interested in working on the LELIA project.

"I've gained so much exposure to all that physics has to offer," Gunter said about the benefits of the internships. "And the training and skills I can use no matter what career path I take."

Gunter is especially appreciative of the JSA research assistantship because it was for a longer period than his previous internships, and allowed him to become more involved in a project and to make more of a contribution.

He likes the sense of accomplishment he gets when achieving his research goals and by contributing to a larger group effort. "I really hope to leave my mark on the HU campus with this project," he said.

The assistantship enabled Gunter to perform preliminary studies needed for the construction of a low-energy accelerator. In collaboration with Ken Law, a JLab Accelerator Division staff scientist, they developed a more accurate model of the 100 keV LELIA electron gun and verified the device's field emissions.

While the assistantship has come to an end, Gunter plans to continue with the next step in his research and development work for the LELIA project. He plans on attending graduate school after completing his bachelor's degree in 2013, and is currently preparing for his GRE and physics tests.

Thoth Gunter, recipient of the 2011-2012 JSA Minority Undergraduate Research Assistantship, carried out modeling research for a thermionic (electron) gun that will be used to help establish a low-energy linear accelerator at Hampton University.

JSA Awards Seven JLab Graduate Fellowships

Jefferson Sciences Associates recently announced the award of seven JSA/Jefferson Lab graduate fellowships. The doctoral students will use the fellowships to conduct research at their universities and at Jefferson Lab.

The 2012-2013 fellowship winners include:
• Zachary Brown, The College of William and Mary
• Min Huang, Duke University
Vojtech Krejcirik, University of Maryland
• Zhaozhu Li, College of William and Mary
• Ziyue Li, North Carolina State University
• Evan Phelps, University of South Carolina
• Christian Shultz, Old Dominion University

The students' research proposals cover a broad scientific spectrum, including experimental physics, theoretical physics and particle accelerator research and development. Brown, Huang, and Li are repeat JSA fellowship recipients who completed the 2011-2012 academic year at Jefferson Lab.

Each fellowship award is comprised of one-half of an academic year research assistant stipend, plus a $2,000 supplement. Each student's home institution matches half of the research assistantship. An additional $2,000 is available for research-related travel support for the student.
The committee that reviewed and selected this year's fellowship recipients was chaired by JSA Board Director June Matthews from the Massachusetts Institute of Technology.

"We are pleased with the strong pool of applicants for JSA/JLab graduate fellowships this year. The quality of the proposals by these students shows that young researchers continue to be drawn to the theoretical and experimental nuclear physics program conducted at Jefferson Lab as well as the accelerator technology development that is one of the lab's core competencies. The program provides opportunities for students to enhance their research capabilities by linking their academic studies with the lab's science and technology programs," said Matthews.

JSA President and Jefferson Lab Director Hugh Montgomery noted, "We are very pleased that we continue to attract the best and brightest students in our field to spend time at Jefferson Lab. During the year, these young researchers will become fully immersed in their research and tap into the unique capabilities of the lab. JSA's continued support for the Graduate Fellowship Program has contributed to the lab's achievement of producing about one-third of the U.S. Ph.D.'s in nuclear physics each year. Also, importantly, we are helping to educate and train the next generation of science leaders and increase science literacy in society and to advance knowledge of the structure of matter."

JSA/JLab fellowship recipients attend universities that are members of the Southeastern Universities Research Association, a consortium of more than 60 leading research universities. The SURA Board of Trustees first established the fellowship program in 1989. Since the program's inception, more than 170 fellowships have been awarded to students from 19 different SURA-member universities. The JSA/JLab Graduate Fellowship Program is now supported by the JSA Initiatives Fund.

The JSA Initiatives Fund program is funded by Jefferson Science Associates, to support efforts that further the scientific outreach and promote the science, education and technology missions of Jefferson Lab and the lab's user community. Information about the JSA Initiatives Fund program is online at: www.jsallc.org/IF/IFIndex.html.

Lab Mourns Passing of Hugh Loweth, Longtime Staunch Advocate

Hugh F. Loweth, 90, longtime SURA staff member and staunch advocate of CEBAF/Jefferson Lab, died peacefully at his home in Annandale, Va., on June 27.

He is survived by his wife Elizabeth Loweth; sons Douglas Loweth and Todd Loweth and brother, The Rev. Gerald P. Loweth. He is also survived by his step children: Barbara Worthington, Brad Kauffman and Janet Andraka.

He was predeceased by his daughter Christine L Finnerty and Marion P. Loweth, mother to Douglas, Todd and Christine.

He had a 42-year career in the Office of Management and Budget for the U.S. government. He served for many years as the OMB deputy associate director for energy and science. According to an announcement in the July 21, 1986 issue of Chemical & Engineering News archives, Loweth was a key policy official who had more direct influence on science budgets and priorities than any other federal figure. The statement read, in part: "Whatever the field - space, energy, general science, or industrial innovation - Loweth was the one person who most affected the budgets, priorities and ways of thinking in those areas."

In December 1986, he joined SURA as the Special Assistant to President Harry Holmgren with the primary responsibility to advise the SURA Board on its oversight responsibilities for the CEBAF project. Over the ensuing two decades, Loweth supported and advised former SURA presidents William Wallenmeyer and Dennis Barnes as well as current President Jerry Draayer. As he had worked with SURA's four presidents, it was noted at his memorial service that he had served four U.S. presidents as well. Upon his retirement from OMB, former Presidents Nixon, Carter, and Ford, and then President Reagan sent notes of appreciation for Loweth's dedicated federal service.

In an excerpt from a letter to Loweth's wife, Elizabeth, Lab Director Hugh Montgomery wrote:
"It is with great sadness that the Jefferson Lab community received the news of the passing of Hugh Loweth. His pivotal role in guiding science during his time at OMB is documented in many historical documents and retrospectives. … His impact on science in this country is undeniable and a great legacy.

"I have spoken with many of my colleagues who remember him with a combination of respect and fondness. Respect because they knew Hugh as a dedicated, no-nonsense OMB examiner who brought his skills to SURA to help build and commission the lab then known as CEBAF. Everyone knew that if you went to Hugh you would get a straight answer. He was never afraid to say what needed to be said just because people weren't ready to hear it, a real gift when you work in Washington DC. His dedication to SURA and to Jefferson Lab was a real key to constructing the lab and gaining the support needed to make it happen.

"The fondness is due to the personal connection that Hugh made with the Jefferson Lab management and staff. He always remembered names and made it a point after the myriad of reviews and assessments that came during the birth of the Lab to thank the staff at every level for their part in making it a success.

Hugh Loweth will be forever a part of the Jefferson Lab family, and he will be sorely missed."

Elizabeth Lawson, SURA's chief governance officer and Loweth's colleague since 1986, remembers him fondly, "Hugh brought to SURA not only the wisdom of his years at OMB, but also the respect of those who collaborated with him. He founded the graduate fellowship program which has enabled hundreds of graduate students to conduct research at Jefferson Lab as part of their academic pursuits. And for many years he ran the SURA/ORNL summer co-op program in material science. The training and nurturing of a new generation of scientists was very important to Hugh and this is a part of the legacy he leaves us."

He was known for his cutting wit and was an accomplished organist.

A Requiem Eucharist Service for Loweth was held at Grace Episcopal Church, Alexandria, on July 6. His brother, Rev. Loweth delivered the homily.

Gifts in memory of Hugh may be made to Grace Episcopal Church, 3601 Russell Road, Alexandria, VA 22305. Please designate "Hugh Loweth/Food Fund" in the memo line.

Editor's note: This obituary notice is an edited version of the notice published in The Washington Post. The Washington Post obituary notice and Guest Book are posted online at: http://www.legacy.com/obituaries/washingtonpost/obituary.aspx?n=hugh-f-loweth&pid=158367884

Lab Earns Enviornmental Stewardship Award

Jefferson Lab was recognized recently by the Hampton Roads Sanitation District for its environmental stewardship. The lab was among the nine businesses, industries and agencies earning a 2011 HRSD Platinum Award for perfect permit compliance for five consecutive years (2006-2011).

The Hampton Roads Sanitation District held its annual awards luncheon on May 5 in Portsmouth. During the event, HRSD recognized the award recipients for their exemplary wastewater pretreatment excellence and for their outstanding pollution prevention measures.

An open letter from HRSD reads, in part: "Congratulations … for exemplary permit compliance and outstanding pollution prevention measures. These businesses pretreat their industrial wastewater before discharging it to HRSD's system.

Jefferson Lab was recognized recently by the Hampton Roads Sanitation District with a 2011 Platinum Award for perfect permit compliance for five consecutive years (2006-2011).

Their efforts help protect our waterways and other natural resources."

This recognition is a reflection of the Jefferson Lab community's execution of our Environmental Management System, according to Bill Rainey, JLab's Environmental, Safety and Health Department manager. "Permit compliance is a constant focus and this level of performance is only possible because the line organizations understand their critical role and take it seriously," he said.

Scott Conley, who works on the environmental team, attended the recognition event to accept the award for the lab.

Contact Rainey, ext. 7898, or email wrainey@jlab.org, for information about the lab's sustainability program and efforts. He would also like to be informed about pollution prevention improvements underway in 2012 that could qualify for an HRSD or other award or recognition.

HRSD serves a population of 1.6 million in 17 cities and counties in southeastern Virginia. Its 13 treatment plants can handle up to 249 million gallons of wastewater every day.

Program Helps Young Scientists Prep for Academic Job Market and Raise Awareness of Nuclear Physics

The academic job market is very competitive and applying for a faculty position requires a range of skills that many young scientists haven't explicitly been trained in. Now, a program supported by the JSA Initiatives Fund is helping these young researchers work on the skills crucial for a successful job search.

The JSA Promising Young Scientist program helps postdoctoral researchers develop and fine tune a range of skills necessary for succeeding in the tight academic job market, according to Wouter Deconinck, assistant professor of Physics at the College of William & Mary and principal investigator of the program.

"The program helps our junior nuclear physicists work on their public speaking, communication and job interview skills, as well as with preparing application materials such as their resume, CV (or Curriculum Vitae), a teaching statement and a research statement, and crafting and delivering a colloquium," Deconinck notes.

"Crafting and presenting an accessible colloquium-level talk," he points out, "is likely the most important aspect of the academic job interview process. This program provides the participants with guidance and feedback so they can successfully develop, organize and deliver an outstanding colloquium."

The postdoctoral fellows selected for the Promising Young Scientist program get feedback and guidance from the program's committee on their application packages and their colloquium presentations. Each individual goes through a "mock" interview at one of the participating institutions, which includes giving his or her colloquium.

"Our primary goal is to improve the young scientists' odds of getting permanent faculty and staff positions," Deconinck emphasizes, "and in the process, we hope to re-invigorate the tradition of the colloquium geared to a general audience, which will help improve the understanding of and appreciation for nuclear physics research."

He maintains, "This public accessibility is crucial to ensure that nuclear physics retains funding and support from the larger community.

"We just finished this year's selection, and we have selected five promising young scientists who will each be invited to a university," Deconinck said on behalf of the selection committee. Those selected will give a colloquium in the coming fall or early spring of 2013.

-- John Leckey, a postdoc at Indiana University, working on the Gluonic Excitations Experiment, or GlueX, in Hall D, has been invited to present a colloquium at Christopher Newport University.

-- Seamus Riordan, a postdoc at the University of Massachusetts, working on parity violation and nuclear structure experiments in Hall A, has been invited to present a colloquium at Mississippi State University.

-- Pedro Jimenez-Delgado, a postdoc at Jefferson Lab, working on parton distribution functions in the Theory and Computational Physics group, has been invited to present a colloquium at Idaho State University.

-- Narbe Kalantarians, a postdoc at Hampton University, working on the Super High Momentum Spectrometer drift chambers for Hall C and the DarkLight experiment in the Free-Electron Laser facility, has been invited to present a colloquium at the University of New Hampshire.

-- Vince Sulkosky, a postdoc at Massachusetts Institute of Technology, working on short-range correlation experiments in Hall A, has been invited to present a colloquium at the College of William & Mary.

"I think we provide a great service to our postdocs, and they are grateful for the opportunity to practice skills that you otherwise only use when you are in a real job-search situation," Deconinck said. "Previous participants have said that this experience helped them tremendously in their first job interviews!"

Jean-Francois Rajotte, Massachusetts Institute of Technology, participated during the 2011-12 academic year. Afterward, he said, "I feel lucky to have been selected for the JSA Promising Young Scientist program. I don't see how else I

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Program Helps Prep Scientists Seeks Academic Jobs…

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could have learned about the faculty application process in such a concrete way. I am thankful to the physics department of Mississippi State University, especially professors Dipangkar Dutta and Gautam Rupak who welcomed and guided me for three days on their campus. Several professors spent time with me discussing their research and their life as faculty members. In addition to the colloquium, I also gave a lecture at the undergraduate level, another useful experience that does not come often to a postdoc."

"This program not only offers valuable entries for my CV, it is also informative about the life of a professor and reveals a 'behind the scenes' look at a faculty position interview," Rajotte added. "I recommend everyone who is considering an academic career to apply for the program."

Another participant from last cycle, Juliette Mammei, also had very positive comments about the program.

"I have only been a postdoc for two years, but people told me to apply early and often so I decided to apply for several tenure-track faculty positions at universities that I felt would be a good match for me," she said. "I also applied for the JSA Promising Young Scientist program, and was very happy to be accepted.

"Before I even gave my colloquium," she continued, "I had already received valuable feedback on my research plan and teaching statement, which were part of the application for the program. I was invited to give a colloquium at William and Mary. Afterward, some of the audience members gave me constructive criticism; they were very encouraging and helpful. In addition to getting feedback about the colloquium, the department also conducted a mock interview, with visits to various faculty members as well as an interview portion with faculty who had volunteered to serve as a search committee. The whole experience gave me confidence by letting me know what to expect during my subsequent interviews."

"I went for my first real interview a week after I gave the colloquium at William and Mary," Mammei said. "A month after the JSA Promising Young Scientist mock interview and practice colloquium, I went for an interview at the University of Manitoba, and am proud to say that I will be starting there as an assistant professor this fall."

The JSA Initiatives Fund Program is funded by Jefferson Science Associates, to support efforts that further the scientific outreach and promote the science, education and technology missions of Jefferson Lab and the lab's user community. JSA, a joint venture between the Southeastern Universities Research Association and the Computer Sciences Corporation-Applied Technologies Group, manages and operates Jefferson Lab for the U.S. Department of Energy. Information about the JSA Initiatives Fund program is online at: www.jsallc.org/IF/IFIndex.html.

Lab Engineers Share Their Jobs, Professional Insights With Students

Early this year Jefferson Lab hosted a visit for four local high school students interested in careers in STEM fields (science, technology, engineering and math).

Dubbed "Introduce a Girl to Engineering" Day, the mentor/shadowing experience was conducted by Jefferson Lab's Human Resources Department and Engineering Division during National Engineers Week in February.

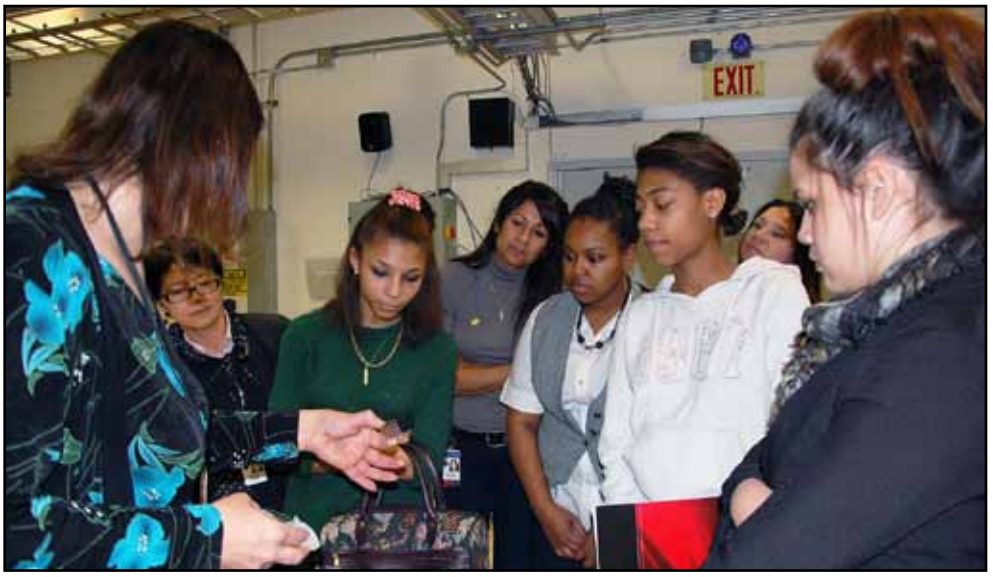
Jefferson Lab first participated in the program in 2011 as part of the lab's on-going effort to promote diversity in the field of engineering, according to Bruce Ullman, Training and Performance manager. "The program is designed to encourage girls to pursue STEM in college and in their future careers by showing them examples of successful female engineers up close and personal," Ullman explained. "The expectation is that the students will learn firsthand about a career in science and engineering from a practitioner in the field. A shadowing event like this can provide a way for them to see how math and science is used at work."

The Newport News students each shadowed a Jefferson Lab female engineer: Dianne Napier, a 12 GeV Upgrade project engineer and a veteran of last year's inaugural event; HyeKyoung Park and Shirley Yang, mechanical engineers in the Engineering Division; and Celia Whitlatch, a mechanical engineer from Facilities Management and Logistics.

Participating in this year's event were three girls from Heritage High School, an engineering and technology magnet school, and one student from Menchville High School. The students were Lauren Floyd from Menchville, and Brittany Suarez, Mylika Wade, and Khaliyah Brown from Heritage.

The students received a lab overview from Ullman before the lab's head engineer, Will Oren, spoke with them about the ways engineers support the projects and experiments carried out at the lab. Each of the participating engineers briefly shared with the group how she got interested in the field of engineering, her day-to-day responsibilities, and

Continued on page 14



Michelle Shinn (foreground, far left) discusses research at the Free-Electron Laser Facility with the students and mentors who participated in Jefferson Lab's "Introduce a Girl to Engineering" Day. Pictured are (foreground, left to right) Mylika Wade, Khaliyah Brown, Lauren Floyd and Brittany Suarez, and their JLab mentors in the background. Shinn is showing the students and their JLab mentors a set of prototypes of a new type of mirror material used for the FEL optical cavity.

Students Learn About Engineering Careers…

The students and mentors who participated in JLab's "Introduce a Girl to Engineering" Day paused for a group photo after lunch. Pictured from left to right are mentor Dianne Napier, student Lauren Floyd, mentor HyeKyoung Park, student Brittany Suarez, mentor Celia Whitlatch, mentor Shirley Yang, student Mylika Wade and student Khaliyah Brown.

Continued from page 13

the challenges and rewards of her job. The girls then got to see portions of a typical day of the engineer they shadowed. They toured the lab with their mentors and had lunch with them in the cafeteria.

When asked why it is important to encourage young people, especially under-represented groups, to consider careers in engineering, Shirley Yang, a staff engineer who has worked on Hall A experimental equipment designs, analyzing niobium cavities and designing a helium header (cryogenics component), responded passionately, "It is fun being an engineer. I like tackling challenging, interesting engineering projects, working with different groups of people, and having a sense of tangible achievements. There is no such thing as 'routine' in the engineering field, and there are always new things to learn."

Yang feels diversity in the field makes it better. "A diverse engineering community can provide different perspectives and alternative solutions to real-life problems. I feel that the females are under-represented in the engineering community. We need to encourage more girls to pursue an engineering career."

Whitlatch, who has managed several projects at the lab and specializes in low-conductivity water system designs, air conditioning, cooling towers and heat exchanger applications, echoed Yang's comments and added, "It is important to participate in events like this because most high school students are not aware of what engineering is. I know I didn't know [about the field of engineering] when I was in school. If a student is interested in math and science then I would encourage engineering.

"I hope the students will see that they can do anything they want to. Engineering is an exciting and interesting field," she added.

The girls were excited and energized by their experience, and were eager to share highlights with their parents as they left at the end of the day. They said that the experience made them aware of career opportunities they hadn't previously been aware of. They commented on how eager everyone was to talk with them and how friendly everyone was; and they noticed how work really seemed to center on team efforts.

"We tried to place girls who requested a visit and have an interest in math and science," said Ann Ifekwunigwe, Newport News Career Pathways supervisor, of the work mentor/shadow experience. "It was fairly competitive in that not everyone got to attend."

She feels the program is beneficial and raises the students' awareness. "One of the girls, Bria Pridgen, called me after the trip last year to thank me for the opportunity," Ifekwunigwe recalled. "The student said she learned things about engineering she didn't know existed!"

"She was drifting in school at the time, and I believe this experience gave her extra drive and motivation to graduate on time. She is now a straight 'A' student at Thomas Nelson Community College. She is excited about engineering and wants to transfer to the University of Virginia to study engineering! I am confident her experience at Jefferson Lab had a lot to do with that decision!"

Jefferson Lab Offers Science Enrichment Program for Teachers

Jefferson Lab is accepting applications for its science enrichment program for fifth-, sixth- and eighth-grade teachers of science.

The after-school program is designed to increase teachers' knowledge of the physical sciences and to strengthen their teaching skills. It will run from September 2012 through May 2013 and is called Jefferson Lab's Science Activities for Teachers, or JSAT.

"At the elementary- and middle-school levels, teachers, with little or no formal background in science education often find themselves tasked with teaching the science curriculum," says Lisa Surles-Law, program administrator. "This program is a primer for them and a refresher for those with a formal education in science. JSAT provides attendees with a wealth of information, materials and activities to take back to their classrooms, and the opportunity to network with other teachers."

The 2012-13 program will include interactive activities to enhance physical science instruction at the upper-elementary and middle-school levels, and lectures by Jefferson Lab staff on the applications of science. Topics will include matter, atomic structure, energy transfer, force and motion, magnetism and electricity, waves and sound, simple machines, optics and the watershed cycle. Program participants will receive supplies and materials so they may conduct all the planned activities in their own classrooms. Participating teachers can earn up to 48 recertification points for 2012-13.

The JSAT program, funded by a grant from the Jefferson Science Associates Initiatives Fund, addresses components of National Science Education Standards and the Virginia Standards of Learning.

Fifth-grade teachers will meet on alternating Tuesday nights, and sixth- and eighth-grade teachers will meet on alternating Wednesdays. The sessions will take place between 5-7 p.m. at Jefferson Lab, located at 12000 Jefferson Ave. in Newport News.

Additional information, program dates and the application form are available at: http://education.jlab.org/jsat/ or by contacting Surles-Law at: surles@jlab.org or 757-269-5002. The application deadline for the 2012-13 program is Friday, Sept. 14.

The Virginia Mathematics and Science Coalition, an alliance of education, corporate, and public policy leaders working together to revitalize mathematics and science education in prekindergarten through graduate school, recognized JSAT in 2011 with a Programs That Work Award. According to the VMSC web site, the awards "recognize exemplary mathematics and science programs for which there is evidence of a positive impact on student or teacher learning."

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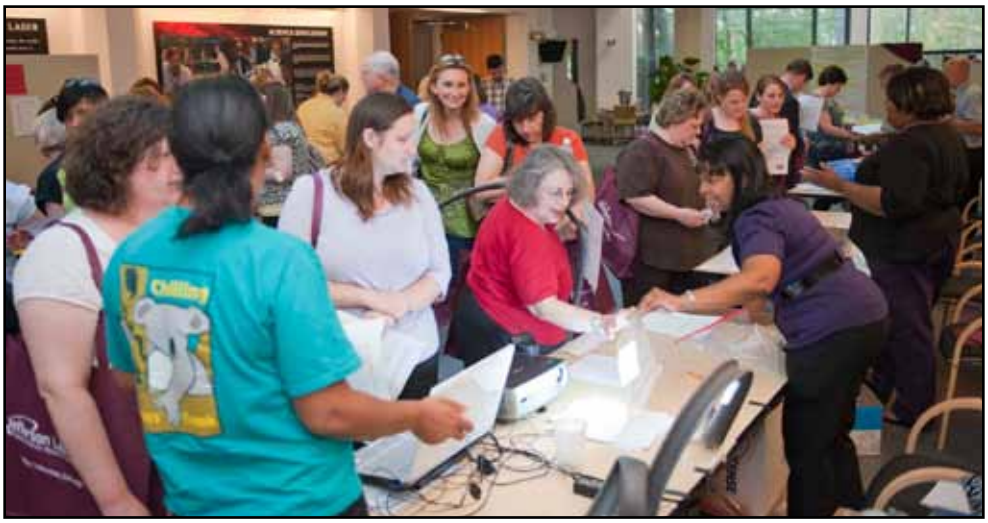

Jefferson Lab's Science Activities for Teachers, or JSAT program is designed to increase teachers' knowledge of the physical sciences and to strengthen their teaching skills. It will run from September 2012 through May 2013 and includes a special night (April 17, 2013) where participants share their best classroom activities with other teachers.

Investing in Tomorrow: Entrepreneurial Leave can be Useful Benefit

If you have an idea for a new business based on a technology developed at a U.S. Department of Energy facility, but don't think you have the time to invest in bringing that technology to market – there's an option you might consider.

It's called an Entrepreneurial Leave of Absence, and it is available to any Jefferson Lab employee.

Similar programs exist within DOE and at other national labs, where they have a proven record of promoting economic development, while introducing new technologies to the marketplace.

Under the lab's program, an employee requesting an entrepreneurial leave must "demonstrate the potential for successful deployment" of the DOE-developed technology. The first step in that process is for an employee to notify his or her supervisor in writing at least six weeks before a leave is to begin. Then, the employee must submit a proposal to the lab's chief financial officer and business operations manager. The proposal must include a letter of approval from the employee's supervisor or divisional director, plus a justification that includes a description of the DOE property involved. If you are starting a company from scratch, you will also have to provide a business plan, commercialization strategy and other measurements that provide a vision for future success.

During their review of a request for a leave, the chief financial officer and business operations manager will determine whether a conflict of interest exists and also whether the proposed leave threatens any prior agreements with other licensees.

If granted, a leave can last from three months to a full year. Extensions are also possible, but a leave plus extensions cannot exceed a total of 36 months. Also a key benefit of Jefferson Lab's entrepreneurial leave program is that if you want to return to your job at Jefferson Lab when your leave ends, you can do so with no loss of seniority.

This is, of course, just a quick summary of the highlights of the entrepreneurial leave of absence program. If you want to learn more details, you can read about it in Section 207.12 of the lab's administrative manual, which you can find online at this location: http://www.jlab.org/adminmanual/200/207.12.html. The lab's Human Resources can also assist aspiring entrepreneurs.

Under a 2011 DOE policy statement on Technology Transfer at DOE Facilities, the DOE encourages and supports its laboratories in getting technology out to industry as quickly as possible. Taking Entrepreneurial Leave is one way to help make this happen. In the policy statement, Energy Secretary Steven Chu, writes, in part, "Technology transfer supports the maturation and deployment of DOE discoveries, providing ongoing economic, security and environmental benefits for all Americans."

Lab Mourns Passing of Patent Attorney A. Jackson

Auzville Jackson Jr., 85, passed away on July 27, 2012, after a brief battle with cancer. He served as Jefferson Lab's outside patent counsel for more than 20 years. He assisted in putting Jefferson Lab's patent and technology transfer programs in place and prosecuted the labs first patents.

He is survived by Estelle, his wife for almost 59 years; son, Robert Auzville Jackson; daughter, Sarah Jackson Sakach; son- in-law, Ronald Gene Sakach; two grandsons, a niece, and a grandnephew.

For a time Jackson was the youngest Eagle Scout in the United States, receiving the badge in two years' time. While living in Alexandria, he attended George Washington High School. He enlisted in the Army at the age 16 and after a competitive exam, attended Carnegie Tech to study engineering. On active duty at the beginning of the Cold War, Jackson became a lieutenant at the age of 19. Back home in Richmond, he studied for two years at Richmond Professional Institute, and after two more years, graduated from Virginia Tech in 1950 with a degree in metallurgical engineering.

While working as a patent examiner for the United States Patent Office in Washington, D.C., he enrolled in law school at George Washington University, and after graduation, worked for the Office of Naval Research. Five years later, he received a call from Louisville, Ky., offering him a job with the Reynolds Metals Company. He moved to Richmond with the company, and later joined Robertshaw Controls Company, as vice-president and chief patent counsel. In succeeding years he served as the first president of the Tennessee Technology Foundation, and later became a partner at Staas & Halsey. Later, he decided to set up the Jackson Patent Group, which practiced patent, trademark, copyright and other intellectual property law since 1991.

Jackson served as an adjunct associate professor of intellectual property law at the University of Richmond and a lecturer on intellectual property law at the College of William and Mary. He had a number of hobbies, especially an interest in developing a commercial use for the chinquapin nut. He belonged to the Second Presbyterian Church, the Cosmos Club, the Industrial Research Institute, the Northern Nut Growers, Fishing Bay Yacht Club, and was the president and founder of the Small Business Technology Institute. One of his favorite sayings, "It's not a matter of falling down; it's a matter of getting back up."

A memorial service for Jackson took place on July 30 at Second Presbyterian Church in Richmond, Va. Condolences may be left at: http://www.woodyfuneralhomeparham.com/dm20/en_US/locations/47/4710/index.page

Editor's note: This obituary notice is an edited version of the notice published in the Richmond Times-Dispatch. The full obituary is online at: http://www.legacy.com/obituaries/timesdispatch/obituary.aspx?n=auzville-jackson&pid=158799072&fhid=11640#fbLoggedOut

ON TARGET

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Briefs

Public Affairs Seeks Your Feedback on Newsletter

The Jefferson Lab Public Affairs staff is seeking your help in improving OnTarget.

To that end, we are conducting a survey about the OnTarget newsletter and encourage your participation. The survey is 10 questions long and should take five minutes or less to complete. This is an anonymous survey – no personal data will be collected.

Results from the newsletter survey will help Public Affairs better determine readers' interests and information needs.

The survey is available on the web. You may copy and paste this link into your Internet browser to access the survey: https://www.surveymonkey.com/s/JK7BZT6

The survey is a JLab-approved link to a business (SurveyMonkey) that provides survey tools. If you have any questions regarding Survey Monkey, contact JLab Public Affairs. Please take the survey before 5 p.m. Friday, Aug. 17. Results will be presented in the next issue of OnTarget.

Thank you very much for helping Public Affairs make the newsletter a better and more useful publication.

2012 Lab T-Shirts Back by Popular Demand; Order by Aug. 9

The Jefferson Activities Group is ordering one more round of apparel items featuring this year's winning T-shirt design, which was unveiled at the Run-A-Round.
The design will be available on short sleeve T-shirts, long sleeve T-Shirts and hooded, pullover sweatshirts. Sweatshirts are only available by preorder. To ensure you get your favorite style in the right size, place your order at the CEBAF Center front desk or by calling Dave Abbott at ext. 7190 or Bridget Paul at ext. 7306, by close of business Thursday, Aug. 9.

Prices are:
• Short Sleeve T-Shirts – $7
• Long Sleeve T-Shirts – $10
• Sweatshirts (available by preorder only) – $20

Quantities are limited, so be sure to place your order by Aug. 9.

DOE Sponsors Food Drive at JLab, Aug. 6-16

The Department of Energy, including the Thomas Jefferson Site Office staff, is again participating in the Feds Feed Families food drive campaign. Site Office staff will place food-donation collection barrels near the entrance of CEBAF Center Aug. 6-16.

Lab staff contributions to this food drive are welcome, with the understanding that participation is strictly voluntary. Anyone wishing to participate may place non-perishable donations (non-glass items) in the marked barrels. For more information on the program, contact Steve Neilson at ext. 7215. This Virginia Peninsula Foodbank poster includes a list of the most-needed items: http://www.hrfoodbank.org/images/stories/finalfooddriveboxes.pdf

Milestones-June 2012

Hello

Cameron Kowaki, Electrical Engineering Student Intern, Free-Electron Laser Division

Scott Madaras, FEL Accelerator Operator, FEL Division

Jacob Morgan, RF Systems Co-Op, Engineering Division

Sebouh Paul, Hall B Student Intern, Physics Division

Christopher Perry, Cryogenics Mechanical Engineer, Engineering Division

Ryan Smith, Cryogenics Student Intern, Engineering Division

Leslie Trainor, Facilities Draftsperson, Facilities Management and Logistics

Goodbye

Albert Johnson, Engineering Division

Nathan Kofron, FEL Division
Dia Williams, Accelerator Division

These Milestone entries, listed alphabetically, are full-time, term, casual and student actions posted by Human Resources for June 2012.

Jefferson Lab is currently seeking qualified individuals for a small number of technical and scientific positions. All current employment opportunities are posted at: http://www.jlab-jobs.com/search?q=

Information about career opportunities at Jefferson Lab is available at: http://www.jlab-jobs.com/