

ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

Lab Director plans
for annual Service Awards;
recognizing people and their
accomplishments

Hall A experiment
works to clarify Real
Compton Scattering

FEL researchers
explore promise of carbon
nanotubes

In their own words
with Xiaochao Zheng

JAG announces
children's party, office door/
cubicle decorating contest

JLab rates 'outstanding' during Institutional Management Review

Jefferson Lab completed its final Department of Energy review of the year on Oct. 23, as the Institutional Management Review came to a close. The review committee's report, recently received by Lab leadership, includes many favorable comments and gave the Lab an outstanding rating.

This bi-annual review is a requirement of the performance-based contract between DOE and the Southeastern Universities Research Association regarding the management of Jefferson Lab. The review committee received extensive briefings over Oct. 22 and 23 from Lab staff and management, facility users, and DOE representatives. The review involves an assessment of JLab's Strategic Planning (40 percent of the overall rating), Managerial Effectiveness (40%), and Organizational Culture (20%).

In the Executive Summary of their report to DOE and SURA, the

Institutional Management Review Committee wrote, in part: "Our evaluation is that Jefferson Lab is outstanding overall, with each of the individual elements rated outstanding as well. We found an institution that has a clear vision of its future; that is effectively and efficiently managed, exceeding expectations; and an organizational culture that is both delivering on its mission and displaying innovative and novel approaches to community outreach and education that should be the envy of every DOE national laboratory."

In the area of Strategic Planning, the committee was briefed on JLab's operations, results from completed experiments, and short-, mid-, and long-range goals. They discussed the unique role JLab plays in the world's nuclear physics effort as the operator of the highest energy, continuous electron beam facility.

Based on the briefings and committee member's discussions with Lab management, the committee noted in their report:

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The Institutional Management Review committee toured JLab on Oct. 22. They stopped at the Test Lab to view Spallation Neutron Source cryomodule production work. Pictured from left are Mike Telson, reviewer; Larry Cardman, Physics Division associate director; Andrew Hutton (behind), Accelerator Operations director; Bruce Chrisman, reviewer; Charles Shank, IM Review chair; John Armstrong, reviewer; Donald Langenberg; reviewer; and Warren Funk, Superconducting Radiofrequency Institute director.

Lab rates outstanding...

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“The management of JLab has presented a truly impressive road map for the future, building upon the core competencies developed by the Lab and [its] extraordinary contributions to science. Jefferson Lab is producing scientific results of the highest quality, both technically and intellectually. These results exceed expectations and put JLab in the first rank worldwide.”

The reviewers commended the Lab for identifying and cultivating its expertise in superconducting radiofrequency technology. “...SRF as a core competency advances the national and international knowledge and resource base, and establish[es] international leadership.”

“The case for the proposed 12 GeV upgrade has been strengthened and consolidated, with substantial input from, and in collaboration with, the broad user community.... The fact that the DOE/NSF NSAC Long Range Plan identifies the 12 GeV upgrade, as one of its four priorities is a major accomplishment. The case has been made; only DOE approval of the CD0 is necessary for the construction project to begin.”

The group also commented favorably on the Lab’s LQCD effort. “[It] could have a major impact on the program...and, could help put the [JLab] theoretical group at the forefront worldwide.”

Under the Managerial Effectiveness category, the review committee com-

plimented management’s effectiveness at understanding and articulating a clear understanding and commitment to the primary mission of the Laboratory. They cited Lab management and staff as being intelligent and resourceful in meeting the needs of the research program. They perceived the Lab’s “use of DOE’s Office of Science funding to be efficient; and described it as “thoughtfully using its funding to give its users the best possible array of services it can provide, while its operations appear to have low overhead.”

JLab management discussed some significant areas of concern — the 12 GeV upgrade project, sources of future funding for the Free-Electron Laser effort, and the successful completion of Spallation Neutron Source work — with the review committee, and how they (Lab management) are actively addressing those issues.

In the area of Corporate Culture, the review committee was also very complimentary. In their report, writing: “...JLab continues to embody a corporate culture that strongly supports its mission and that has contributed substantially to its many stellar achievements, scientific and otherwise. ...The employees are proud of their institution. Staff members appear to enjoy good personal and working relations with their colleagues, based on mutual respect. ...A pervasive commitment to the mission of the Lab and to the scientific users whom it serves is evident.

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Warren Funk (left front), Superconducting Radiofrequency Institute director, explains cryomodule production activities in the Test Lab to the IM Review committee during their Lab tour. On the tour are (left to right) John Armstrong, reviewer; Charles Shank, IM Review chair; Lab Director Christoph Leemann; Andrew Hutton (behind), Accelerator Operations director; Donald Langenberg (behind), reviewer; Bruce Chrisman, reviewer; Walter Henning, reviewer; Larry Cardman, Physics Division associate director, and Mike Telson, reviewer.



2002 Service Awards

Jefferson Lab recognizes 123 employees

The 2002 Jefferson Lab Service Awards celebration is scheduled for Thursday, Dec. 5 from 10 –11:30 a.m. in the CEBAF Center auditorium, and all Lab employees are invited to attend. A breakfast reception will be held beforehand, beginning in the atrium at 9:30 a.m. One hundred twenty-three employees will be recognized for reaching their 5-, 10-, or 15-year employment anniversaries.

This is the second largest group of employees ever to be recognized during the annual Service Awards. “This year we will be recognizing the accomplishments of fifty 15-year employees, fifty 10-year employees, and 23 individuals with 5-years of service to the Lab,” points out Kelly Caccetta, JLab’s former Human Resources and Services director and the new associate director of the

Administrative Services Division. Because of the growing number of employees to recognize during the Service Awards, the decision was made this year, to separate the Service Awards and the State of the Lab Address. “Each of these annual events is very important in its own right and deserves its own time and emphasis,” Caccetta explains.

A reception with cake and punch in the CEBAF Center atrium will take place after the employee recognition ceremony in the auditorium. Individual award recipient photos were taken during November for the creation of 5-, 10-, and 15-year JLab Service Awards posters for 2002.

The State of the Lab Address is scheduled for 2 p.m. Monday, Jan. 6, 2003, in the CEBAF Center auditorium.



2002 Service Award Recipients

Five-Year:

David Bigelow, Alex Bogacz, Kyong Broeker, Richard Evans, Albert Johnson, Michael McCrea, Theodore McGuckin, Christine Hummel, Cynthia Lockwood, Kisha Owens, Douglas Roeder, Allison Lung, Hugh Williams, Pam Turk, Geoffrey Barth, Cornelis de Jager, Vardan Gyurjyan, Jens-Ole Hansen, Christopher Keith, Robert Lukens, Vladimir Popov, Dennis Weygand, Elliott Wolin

Ten-Year:

Joseph Beck, Stephen Benson, Valerie Bookwalter, Yu-Chiu Chao, James Clark, James Coleman, Stephen Cooper, Anthony Day, David Eardley, Harry Fanning, David Hamlette, Kelly Hanifan, Alicia Hofler, Andrew Hutton, Bonnie Madre, Stephen Manning, Robert Manus, Edward Martin, Nikolitsa Meringa, Rebecca Nevarez, John Seeberger, Barry Shinault, Timothy Siggins, Holly Snowburg, William Sommer, Mark Stapleton, Keith Welch, Brian Williams, Suresh Chandra, Paul Powers, William Rust, Katrina Sample, Yvonne Scott, Elizabeth Beeler, Deborah Dowd, Stephen Gagnon, Sarah Ingels, Jie Chen, Hugh Loweth, Denise Vitale, Peter Bonneau, Lawrence Cardman, Susan Ewing, David Griffith, Stephen Hickson, Mark Hoegerl, Paul Hood, Paul Letta, Liguang Tang, Jeffrey Wilson

Fifteen-Year:

Ralph Afanador, Robert Bennett, James Boyce, John Brawley, Isidoro Campisi, Brian Carpenter, Richard Dawes, Thomas Elliott, Willis Folsom, Al Guerra, Leigh Harwood, Thomas Hassler, John Heckman, James Hovater, Kevin Jordan, Marie Keesee, Peter Kneisel, Ronald Lauze, Charles Murray, Ganapati Myneni, Julie Oyer, Thomas Powers, Charles Reece, Thomas Reid, Steven Suhring, Larry Turlington, Robert Vignato, Linda Williams, Kenneth Worland, Henry Adams, Julia Leverenz, Danny Lloyd, Robert Rice, William Small, Mary Beth Stewart, Patricia Stroop, Heidi Derby, Sylvia Smith, Elois Morgan, Roger Carlini, Steven Christo, John Domingo, David Doughty, Edward Folts, Alan Gavalya, Steven Lassiter, Sirish Nanda, Arunava Saha, Douglas Tilles, Stephen Wells

Hall A

Experiment E99-114 works to clarify Real Compton Scattering



The Real Compton Scattering experiment spokesmen take a short break for a photo. From left is Bogdan Wojtsekhowski, JLab staff scientist; Charles Hyde-Wright, physics professor at Old Dominion University; and Alan Nathan, physics professor at the University of Illinois and chair of the JLab User Group.

Jefferson Lab experiment E99-114 — the so-called Real Compton Scattering, or RCS, experiment — explores the scattering of few-GeV photons off the proton at large scattering angles, under which conditions the quark structure of the proton is expected to be revealed best.

The collaboration of 85 physicists, representing 20 institutions spread across six countries, built, tested, installed, and commissioned the specialized detectors needed to do this experiment, which ran from January to March 2002. Three spokespersons lead the team: Charles Hyde-Wright, physics professor at Old Dominion University; Alan Nathan, physics professor at the University of

Illinois and chair of the JLab User Group; and Bogdan Wojtsekhowski, JLab staff scientist.

“We seek to answer the question, ‘How do high-energy photons interact with the proton when the photon scatters at a large angle?’” Wojtsekhowski explains.

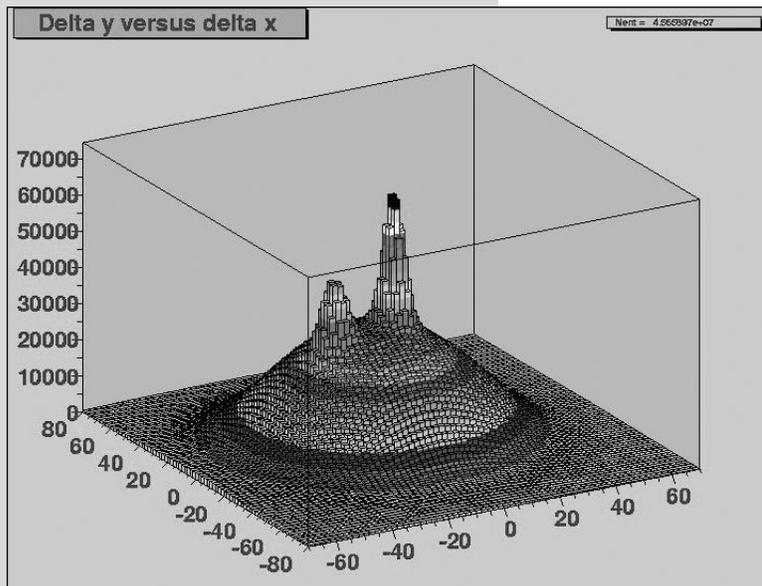
“The experiment illustrates both the

wave and particle nature of quarks inside the proton,” adds Hyde-Wright. “We are testing whether in each scattering event, the photon bounces off a single quark in the way described by Compton for scattering from isolated electrons, and as predicted by Radyushkin, who is both a professor at Old Dominion University and a member of JLab’s Theory Group. Or does the scattering involve the cooperative behavior of three quarks, as predicted by pQCD?”

Design and construction for the experiment started in 1997, after it was approved by the Program Advisory Committee. “Jefferson Lab’s stable, polarized beam gave us the tool we needed to do this experiment at a level of detail never before available,” comments Nathan. Other specialized equipment for the experiment included a photon spectrometer built by the RCS collaboration, and a polarimeter for the protons, which was developed by a group of Hall A users from the College of William & Mary, Norfolk State University and Rutgers University. “The RCS experiment was made possible,” Nathan points out, “because of the effective cooperation between JLab and its users.”

A significant challenge for the researchers involved sifting through the millions of interactions taking place to identify the small number of relevant RCS events.

The experiment made two types of measurements. In the first measurement the scattering probability was



An RCS graph showing the kinematical correlation between the recoiled proton and the detected photon.

Compton scattering is a process whereby light scatters from matter. It was first discovered in 1923 by Arthur H. Compton, who won the Nobel Prize in 1927 for demonstrating that the process revealed the particle properties of light and in whose honor the process is named. The discovery of Compton scattering played an important role in the development of quantum mechanics during the 1920s.

When particles of light — photons — scatter from isolated electrons, which are point-like particles with no substructure, the physics and theory describing the reaction — Quantum Electrodynamics, or QED — are very well understood. It is the same theory that describes all of atomic physics, such as the structure of atoms. However, when a photon scatters from more complicated objects, such as the electrons that are bound in atoms, then the theory is also more complicated but much can be learned about the structure of that object. For example, the scattering of photons in the few kilo-electron-volt (keV) energy range from electrons in solids is a major tool for solid-state scientists in their efforts to reveal the electron structure of new materials, such as high-temperature superconductors and plastic semiconductors.

Protons and neutrons, the building blocks of the atomic nucleus, are themselves complicated objects. They are built of quarks and gluons, which are believed to be point-like particles (just like electrons) and the fundamental constituents of matter. Just as Compton scattering from solids or atoms can reveal their electron structure, so too can Compton scattering from the proton reveal information about its quark structure. In order to interpret this information, it is essential to understand the mechanism whereby the photon scatters from the proton. Part of this mechanism — where photons interact with individual quarks — is described by QED and is very well understood, just as Compton scattering on individual electrons is well understood. However, another part — where quarks interact with each other to form a proton — is described by the theory of the strong

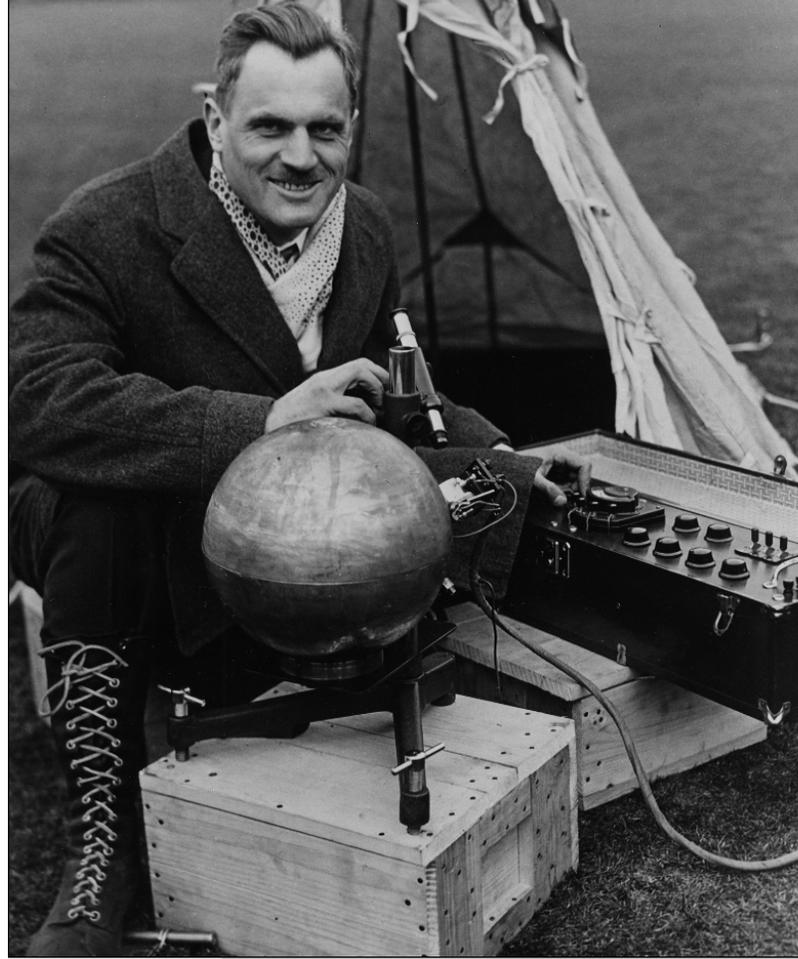
interaction known as Quantum Chromodynamics, or QCD, and is not as well understood.

At sufficiently high energy, the quarks interact weakly with each other and the full theory of QCD gives way to a simpler theory known as “perturbative QCD”, or pQCD, making it possible to do exact calculations of the Compton scattering reaction. These calculations show that the reaction proceeds by the cooperative action of the three

so-called valence quarks that make up the proton, so that Compton scattering provides important information about correlations in position and momentum among the three quarks. Unfortunately, the energy at which the pQCD mechanism is dominant is not known and is even hotly debated among theoretical physicists. Calculations using pQCD were first made by Stanford Linear Accelerator Center theoretician Stan Brodsky, and Glennys Farrar, now at New York University. Their predictions were tested experimentally only once, at Cornell University in 1977. Within the limited accuracy of the Cornell measurements, some but not all of the predictions of pQCD were confirmed by the experiment, leaving the mechanism of the reaction in doubt.

Two important recent developments, one theoretical and one experimental, ought to shed more light on this puzzle. On the theoretical side, Anatoly Radyushkin, who is both a professor at Old Dominion University and a member of JLab’s Theory Group, has proposed an alternate reaction mechanism in which the photon interacts with only a single quark

AIP Emilio Segrè Visual Archives



Arthur Holly Compton, shown here setting up for an experiment, was born Sept. 10, 1892, in Wooster, Ohio.

A little history on Compton Scattering...

FEL Researchers explore promise of carbon nanotubes

by James Schultz

Miniature cylinders are strong, versatile, damage tolerant

Scientists and technologists of all stripes are working intensively to explore the possibilities of an extremely strong and versatile cylinder so tiny that millions — which in bunches look like an ebony snowflake — could fit easily on the tip of a pin. The objects in question are known as carbon nanotubes, first discovered in 1991 as the elongated form of an all-carbon molecule.

Sometimes called CNTs, nanotubes take up an extremely small space but can connect together materials with different properties, even as their own properties can be adjusted depending on formulation. The tubes' "aspect ratio" is enormous: that is, they are

very long but not wide, and like an ultra-strong rope, can be extended without sacrificing strength. CNTs have potential applications in molecular and quantum computing and as components for microelectromechanical sensors, or MEMS. The tubes could also function as a "lab on a chip," with attached microelectronics and components that could detect toxins and nerve agents in vanishingly small concentrations.

Nanotubes could also lead to an entirely new generation of materials: as strong or stronger than steel, but very lightweight. CNTs are amazingly damage-tolerant, generally displaying nearly total "elastic recovery," even under high-deformation conditions. If bent, buckled or creased the tubes are usually able to reassume their original shape once external stressors are removed.

"Nanotubes take up a very small amount of space but can connect a lot of material together," says Brian Holloway, an assistant professor in the College of William & Mary's Department of Applied Science. "You can imagine replacing metal components with nanotubes that could weigh maybe a tenth as much. One of the big reasons NASA is interested is obviously because of the cost of getting to space."

A research team led by Holloway is also intrigued by the tubes' potential. Holloway's group has used Jefferson Lab's Free-Electron Laser (FEL) to explore the fundamental science of how and why nanotubes form, paying close attention to the atomic and molecular details. Already, in experiments, the William & Mary/NASA Langley collaboration has produced tubes as good as if not better than those at other laboratories or in industry.

The next step will be to increase quantity while holding costs down, which Holloway believes will be possible using the Lab's upgrade of the FEL to 10 kilowatts.



Brian Holloway, William & Mary professor, prepares the nanotube oven, a component that helps produce nanotubes with light from JLab's Free-Electron Laser.

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“Right now we’re interested in making more nanotubes,” Holloway says. “The FEL offers a way to efficiently and cost-effectively make large amounts of high-quality tubes.

Nanotubes come in a variety of flavors; the thought is we could eventually control what we call ‘tube chiralities,’ [properties like] structure, length and diameter.”

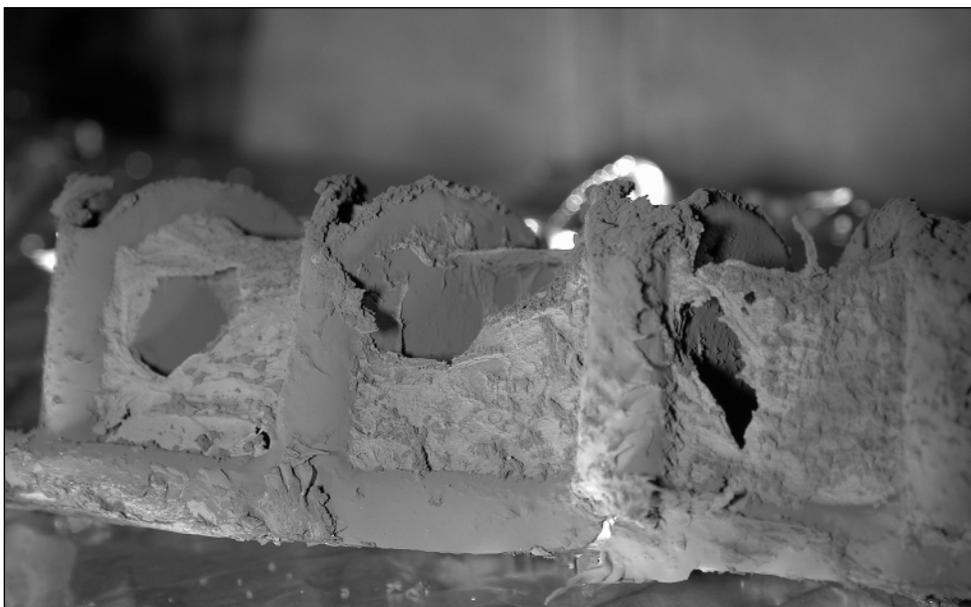
The CNT collaboration makes the tubes by striking a metal-impregnated carbon target with FEL light. The laser vaporizes layers of a graphite annulus, essentially a thick ring mounted on a spinning quartz rod. Atoms discharge from the annulus surface, creating a plume, a kind of nanotube “spray.” Under the right conditions trillions upon trillions of nanotubes can be so formed within an hour.

Conventional means of nanotube production involves a tabletop laser. In this more traditional manufacturing approach, perhaps 10 milligrams — about one-tenth of an aspirin-bottle full — of the tubes can be produced per hour at costs up to \$200 per gram. Conversely, with a one-kilowatt FEL, up to two grams per hour, or about 100 times more nanotubes can be

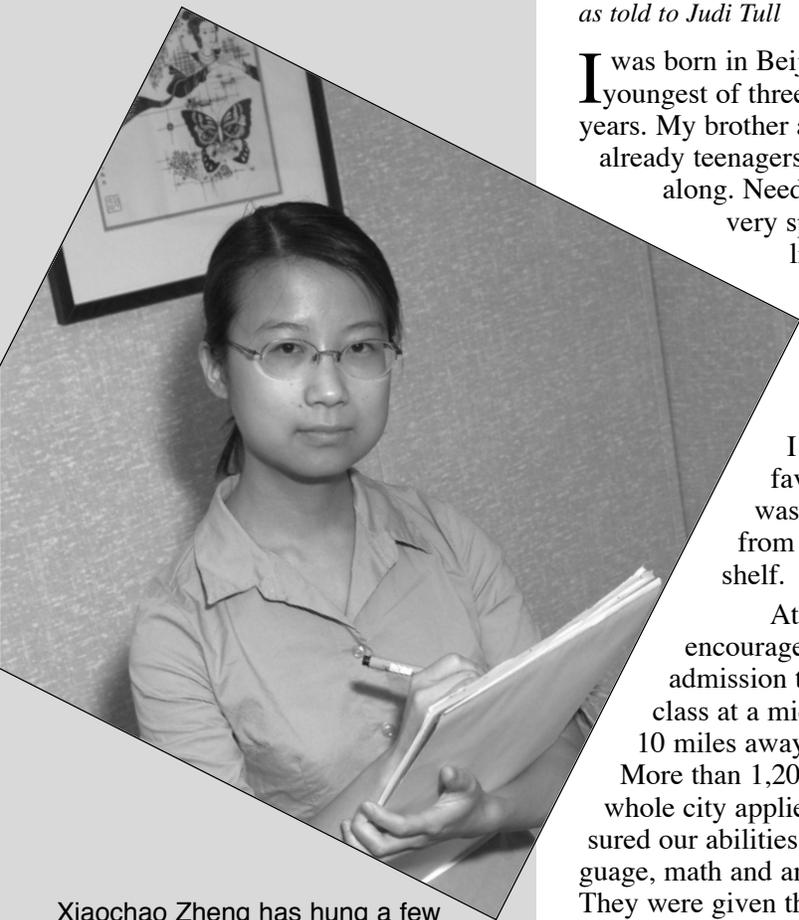
made, at a cost of \$100 per gram. A 10-kilowatt FEL could radically alter that equation. To that end, Holloway is seeking funding from NASA and the Office of Naval Research for a three-year project whose goal would be to optimize nanotube production with the upgraded FEL in order to manufacture large quantities quickly and cheaply.

According to Gwyn Williams, FEL Basic Research Program manager, researchers are anticipating learning much more about the details of the photochemical processes involved in nanotube production once the new FEL comes back on line in 2003. Demand for the tubes is intense and growing. Whoever finds a way to make them reliably and affordably could reap the rewards, financially and otherwise, as commercial interests beat a figurative path to researchers’ doors.

“A lot of people can make nanotubes. Very few can make grams or kilograms of nanotubes on time scales less than weeks,” Holloway points out. “Factors other than price can drive demand. Right now there’s no one who could sell you one kilogram of nanotubes per month all of the same quality, at any price.”



Webs of nanotubes form on collector plates during the collaboration’s FEL experiment. (Photo of collector near-actual size).



Xiaochao Zheng has hung a few of her ink drawings in her office. One piece of artwork can be seen over her head.

In their own words

*Xiaochao Zheng
reflects on her
childhood,
interests,
physics pursuits*

as told to Judi Tull

I was born in Beijing, China, the youngest of three children by many years. My brother and sister were already teenagers when I came along. Needless to say, I was very spoiled by them. We lived on the campus of TsingHua University, where my father is a professor in engineering. When I was little, my favorite thing to do was to read old books from my father's bookshelf.

At 10, my mother encouraged me to take the admission tests for a special class at a middle school about 10 miles away from our home. More than 1,200 students from the whole city applied. The tests measured our abilities in Chinese language, math and analytic thinking. They were given three times, each time harder than the last as students who did not get the highest scores were eliminated. I was accepted and, since it took about one hour and a half to go there by bus, I went to live there. It was very exciting to study, live and play with my schoolmates.

I started learning English there. It was very difficult for me at the beginning. Our teacher was very strict and if we mispronounced a word she made us stand up in front of the class and repeat it over and over until we got it right. It was very embarrassing and I hated that part. But from that experience I learned that sometimes people benefit from what they hated before.

In China, middle and high school usually take six years to complete, but everyone in this special class finished in four years. I went to TsingHua University and graduated from there with a bachelor's degree in engineering in 1996. Then I switched to physics for my master's degree because I was getting bored with engineering classes. We were studying mostly technical things and I didn't find them challenging enough. I found physics much more appealing. I still remember a high-energy physics class

I took during my senior undergraduate year. The teacher showed us a picture of SLAC (Stanford Linear Accelerator Center). I remember saying to myself: "Someday I'll go there and become a physicist."

I was accepted at MIT (Massachusetts Institute of Technology) and came to the United States in 1999 after I received my master's. I wanted to come here because the study of physics in China is not ideal. It seemed like I spent all my lab time fixing equipment, not doing experiments. When I first arrived in Boston, I was relieved to find that it was not as difficult to adjust to life in America as I had thought. Anyway, once the semester started, there wasn't much time to think about it!

After taking the written parts of the doctoral qualification examination, I knew it was time to start doing research for my thesis. People at MIT told me that if you want to do good physics, Jefferson Lab is the place to go. So I moved here in June 2000 and have stayed here since then. My dissertation is called "Precision Measurement of A1N in the Large XBJ Region" based on an experiment that took place in Hall A during the summer of 2001. I expect to be finished and graduate in December.

My daily life is filled by physics, but I do have a few favorite things to do during spare time — swimming, and occasionally writing and drawing. In the spring of 2001, I heard from friends about the Lab's Spring Art Festival. I have always been interested in art but never had time to learn it. We used to have painting and music classes in high school, but none of them lasted very long since we were supposed to concentrate only on science. This time I thought, maybe I can do something. I made three black-ink drawings of Chinese women and one of them won the People's Choice Award. In my spare time, I do much smaller ones for my own enjoyment. I like drawing; it calms and relaxes me, and I guess it satisfies the human nature of pursuing the beautiful side of the world.

Hall A experiment...

Continued from page 4

surveyed over a wide range of scattering angles at four different photon beam energies. The manner in which the scattering probability depends on energy and angle, Wojtsekhowski explains, is very different in the two competing theories.

The second measurement concerned the direction of the spin — or polarization — of the recoiled proton. The Radyushkin theory predicts that the proton is polarized along the direction of its momentum, whereas the pQCD theory predicts that it is polarized in the opposite direction. The magnitude and direction of the polarization was measured in the experiment.

During a recent workshop at JLab the RCS collaboration presented preliminary results indicating that protons are polarized *along* their line of momentum, thereby providing confirmation that the single-quark scattering mechanism advocated by Radyushkin is dominant at this energy.

“After we complete our data analysis, we hope to have a significantly better understanding of the nature of Compton Scattering in the GeV energy range,” explains Wojtsekhowski, who



RCS collaborators move a cable rack into Hall A in preparation for Experiment E99-114. Lending a hand are (from left) Armen Ketikyan, Yerevan Physics Institute; Yuri Shestakov, Budker Institute of Nuclear Physics; Dimitri Margaziotis, California State University; Charles Perdrisat, William & Mary; and JLab's Bogdan Wojtsekhowski.

in 1995 conceived the concept of this high-accuracy experiment. “The productivity of our experiment was 1,200 times higher than the one run at Cornell in 1977. The high quality of JLab’s continuous-wave beam allowed for the use of a mixed electron-photon beam.”

“We are quite happy with the experiment’s run,” comments Hyde-Wright.

“Nearly every item on the run plan was done according to the schedule. And the event rate was a few times higher than our expectations, which means our statistics should exceed expectations.”

Full analysis of the experiment, which will be the subject of four Ph.D. theses, is expected to be complete in about two years.

In their own words...

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I swim three or four times a week; I enjoy and benefit from it. In high school, I didn’t know how to swim at all, but they made us learn by throwing us into the pool. If we started to sink, they would poke a long bamboo pole at us so we could grab on to it, and even grabbing the pole was thought to be kind of a shame. Soon after everyone was able to swim for 50 meters! We were asked to stay in the water during the whole class, about one hour. I did 1050m and almost couldn’t walk afterwards.

During weekends I spend time with friends I’ve made here. One of our favorite Chinese restaurants is Fortune Garden near AMC24 in Hampton. We

often go out for dinner and then a movie. I don’t like most American food, but I have had split pea soup and found it really nice.

I have accepted a post-doc position at Argonne National Laboratory. I chose it mostly because of the people there and the freedom they are giving me to pursue the research I want. Moving to a big city like Chicago is also something to look forward to, although I don’t want to leave my friends here. I haven’t had much chance to see other parts of this country, except while attending conferences. I’ve been to New Mexico, New Hampshire and Hawaii.

I was asked what else I’d like to tell others about myself. Well what can I say? I am just a plain and shy person. But just to close this story, I would share the following: “Dream is not in the sky but in your heart. Success is not on the ground but under your feet.”

I got this through email from somebody I don’t know. He said it is the right theme for my Chinese writing homepage so I added it there. Maybe I am a little idealistic and don’t want to give up pursuing what I want. That is why sometimes I feel life is rough and get frustrated by it. Fortunately, that is not always the case and as you have read, I have been very lucky.

Milestones for October 2002

Hello

Christopher Behre, Jr., Staff Engineer, Accelerator Division

Jeffrey J. Campbell, SNS Assembly Tech-Parts Cleaner, Accelerator Div.

Jeffrey T. Ewing, Electro-Mechanical Technician, Physics Div.

David B. Fazenbaker, Draftsman, Administrative Services Div.

Byron A. Golden, SRF Assembly Tech-Parts Cleaner, Accelerator Div.

James D. Gordon, SRF Assembly Tech-Parts Cleaner, Accelerator Div.

Christina J. Johnson, Human Resources Assistant, Administrative Services Div.

Paulo S. Medeiros, Hall C Designer, Physics Div.

Tong Wang, Post Doctoral Fellow, Accelerator Div.

Goodbye

Ginny L. Gettys, PC System Administrator, Administrative Services Div.

Catherine Thomas, Accelerator Physicist, Accelerator Div.

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

United Way contributions for 2002 drop slightly

The campaign ended Oct. 31 with Lab employees giving \$44,701 in contributions and pledges to the annual fundraising event.

While the month-long campaign takes place nationwide, the money donated in this region stays in this area, explains Christine Hummel, JLab's executive assistant to the asso-

ciate director of Administrative Services and this year's Give Smart coordinator. The money is used to support a wide range of community support programs for individuals and families in crisis or need.

Employee participation dropped this year to 23 percent, from a participation rate of 30 percent last year. "It's unfortunate that participation dropped; I suspect the poor economy made its impact on this year's fundraising effort," Hummel says. "We hope to see participation get back up around 30 percent next year. Many of the local businesses and government agencies, comparable in size to JLab, have Give Smart participation levels of 40 percent or higher."

"Even though the participation level dropped by 7 percent, contributions and pledges made by Lab staff only dropped by about \$2,300. The people who gave were very generous this year. It's important to support the many charities and agencies represented by the United Way, because their work is critical to helping those in our communities who need a helping hand."

JAG sponsors variety of holiday events, activities

Plans are underway for JLab holiday events being sponsored by the Jefferson Lab Activities Group (JAG).

The Children's Holiday Party is set for Saturday, Dec. 14, from 9 – 11 a.m. in CEBAF Center. All children of Lab employees, contractors and users are invited to participate in the event. Each family participating is asked to bring a new toy for the Toys For Tots drive, and a finger food or snack to share at the party. Plates and drinks will be provided. An appearance by Santa Claus is planned, and the youngsters will be able to take part in games and activities. All children must be accompanied by an adult.

JLab is participating in the U.S. Marines Corps' annual holiday toy drive: Toys For Tots. After

Thanksgiving, donation boxes will be placed in all of JLab's major facilities, including CEBAF Center, the ARC, VARC, Trailer City, Test Lab and MCC. New, unwrapped toys for children ages 1-12 may be placed in the boxes through Dec. 14. The toys will be collected, and presented to a Marine Corps representative at the JLab Children's Holiday Party on Dec. 14.

JAG is also sponsoring the annual Holiday Office Door/Cubicle Decoration Contest. Cash prizes will be awarded for the Best Decorated, Most Original Decoration, and the Silliest. Any employee, contractor or user with an office or cubicle on site who wishes to participate in the contest should contact JAG chair Dave Williams, ext. 7183, e-mail williamd@jlab.org; or JAG member Diane Sarrazin, ext. 5055, e-mail sarrazin@jlab.org by Dec. 16. Judging will take place Tuesday, Dec. 17.

Decorations may go up as early as Dec. 1; and must be taken down by close-of-business before leaving the Lab on Friday, Jan. 3, 2003. Decorating materials should be fire resistant and only UL-approved lighting may be used for on-site holiday decorations.

Event fliers will be posted around the site after the Thanksgiving holiday, according to Williams. "Mark your calendars. Watch for more information on the JAG web page and the fliers. Plan on being part of the fun!"

Science Education offers e-way to stay in event information loop

The Science Education office is now providing a convenient, electronic way for everyone (JLab employees, as well as the public) to become informed of public/educational events being held at Jefferson Lab.

A new subscription e-mail service dubbed "stay in the loop" at <http://education.jlab.org/maillinglists/> allows anyone with Internet access and an e-mail

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address to subscribe to electronic mailings of upcoming, public JLab events (i.e. Science Series and book signing events, JLab Open House, etc.). Just follow the simple instructions on the web page to subscribe or to unsubscribe to this e-mail service, says Steve Gagnon, JLab's Science Education webmaster. "This will provide a quick, easy way for the public to find out about upcoming educational events at the Lab."

BEAMS wins Best Practice award

Becoming Enthusiastic About Math and Science — BEAMS — Jefferson Lab's popular middle school, activity-oriented math and science program recently earned its second award of the year.

BEAMS was one of 50 Best Practice awardees nationwide being recognized by a National Institute of Standards and Technology/Department of Energy/Dept. of Commerce/University collaboration. JLab's BEAMS program was one of four awardees from across all DOE offices and contractor sites.

"We're delighted with the award," comments Jan Tyler, Science Education program manager, "but we couldn't have done this without the wonderful help we get from all of the JLab staff and users who voluntarily participate in this program. BEAMS is centered around the students' interactions with the volunteers; they have made BEAMS the program it is. I thank all of our dedicated volunteers for their tremendous support."

JLab recognizes its military veterans

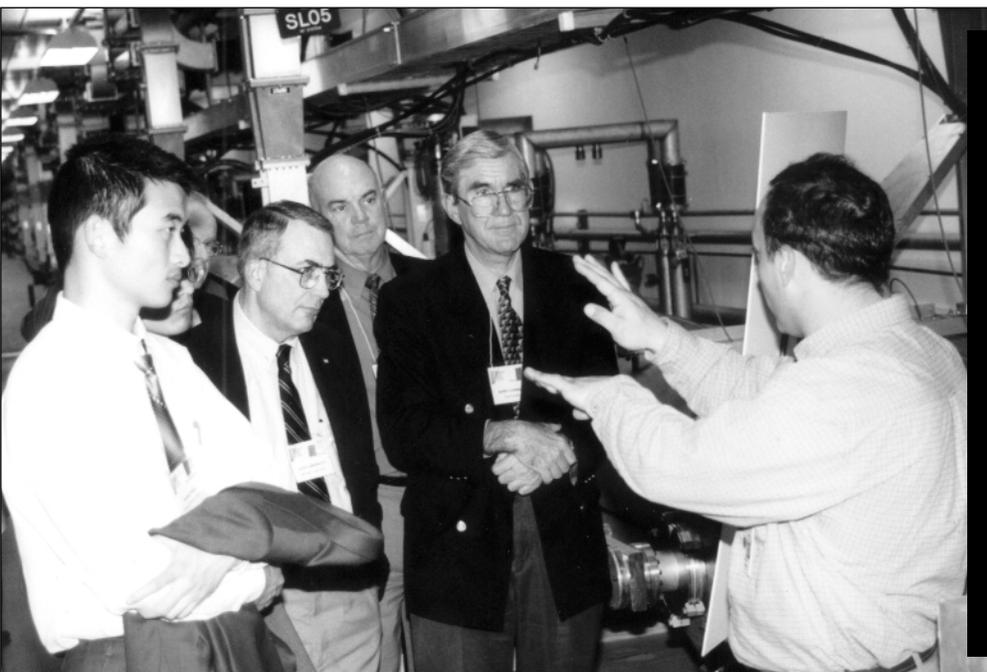
In observance of Veterans Day on Nov. 11, JLab served red, white and blue cake in the CEBAF Center atrium. Staff Services provided a white board for JLab's military veterans to sign. More than 45 JLab employees signed the board that day and included the military branch they served in.

A link to the list has been posted on the Insider web page (www.jlab.org/insider/) and on the On Target newsletter archive web page. Any JLab employee who is a veteran, who would like to be added to the list, may e-mail Debbie Magaldi at magaldi@jlab.org.

History of Compton Scattering...

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rather than the three valence quarks. If this proves to be the correct mechanism, then the Compton scattering process will provide new information on the spatial and momentum distribution of quarks in the proton. Radyushkin and others have done detailed calculations of the Compton process, also using the theory of QCD. They argue that this should be the dominant reaction mechanism in the energy range of a few GeV, which is accessible at Jefferson Lab. On the experimental side, an experiment that unambiguously distinguishes between the two very different reaction mechanisms became possible with the construction of the Continuous Electron Beam Accelerator at Jefferson Lab.



Industrial Physics Forum members tour JLab

The American Institute of Physics Industrial Physics Forum conference was held in Williamsburg during late October. The event is attended by the presidents of several professional societies (APS, AIP, OSA), research directors from several major corporations (IBM, Agilent, Dow, Ford and GM) and key science reporters from Physics Today and Nature. They toured JLab and visited laboratories in the Applied Research Center on Oct. 28. Pictured: Mike Spata, Operations Group leader, (on right) discusses accelerator operations with a small group of IPF visitors during the tunnel tour. Dozens of JLab staff assisted with the tour.

Lab rates outstanding...

Continued from page 2

...there is a general attitude that everybody is part of a team pursuing important and widely understood goals.”

On the recent reorganization, the committee noted: “The Lab’s reorganization seems to be well focused and carefully thought through. [It] seems to have been designed and implemented deftly and adeptly, with careful attention to the evolving circumstances of the Lab and to its consequent changing managerial needs. Most of the attendant new appointments have been made from within the organization and appear to be of very high quality.”

The committee complimented the Lab on developing and maintaining excellent relationships with local government authorities, and offered high praise for the Lab’s K–12 math and science education program. They applauded the Lab’s concerted effort to apply the scientific talent of JLab to improving math and science education

in the region’s schools. The committee described the program as “without peer among the national laboratories...and worthy of national attention and emulation.”

They acknowledged current federal budget shortfalls, saying: “These are stressful and uncertain times for all institutions and individuals. It is very much to JLab’s credit that in this environment it has developed, maintained and continues to enhance an organizational culture that is a major asset in the Lab’s struggle to maximize performance using severely constrained resources.”

The Institutional Management Review committee included leaders in the arena of business, hadronic physics, DOE, and national lab senior leadership. Chairing this year’s IM Review was Charles Shank, director of Lawrence Berkeley National Lab. Team members included: John Armstrong, retired IBM vice presi-



JLab Director Christoph Leemann briefs the Institutional Management Review Committee.

dent; Bruce Chrisman, associate director for Administration at Fermilab; Walter Henning, scientific director at GSI Darmstadt and a professor at the University of Frankfurt/Main; Donald Langenberg, Maryland’s Chancellor Emeritus and Regents’ professor of education K–16, and a professor at the University of Maryland; Mike Telson, director of National Laboratory Affairs in the University of California’s Washington Office; and Brad Tippens, DOE’s program manager for Hadron Nuclear Physics.



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