ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

Major upgrade underway

Computer Center equipment enhancements fortify Lab's data-handling capabilities

by James Schultz

Building a bigger highway doesn't always put an end to traffic congestion. Higher volume can lead to further bottlenecks, as use eventually matches increased capacity. But give drivers multiple interstates leading to the same destination, and even the biggest surges can be easily and indefinitely accommodated.

When equipment enhancements at the Lab's Computer Center are complete, researchers will have the metaphorical equivalent of high-capacity superhighways to process experimental data. The Center's fortified data-handling capabilities should solve chronic access problems that have intensified in recent months.

"We're in the middle of a major upgrade," says Ian Bird, Computer Center head. "We're basically doubling everything, from the size of the computer farm to our hard disk capability. In addition, the entire network infrastructure will be running at gigabit-per-second speeds. We hope to have most of the improvements in place by mid-June."

Designers originally intended that centralized JLab computer systems would handle only first-level data reconstruction. More sophisticated and later stages of data analysis would be handled offsite, by institutions and universities actually conducting experiments. But the superlative performance of the accelerator's electron beam has resulted in many more "keepable" subatomic events, all of which must be archived.

"At the beginning there was the feeling that there would be a terabyte of data gen-

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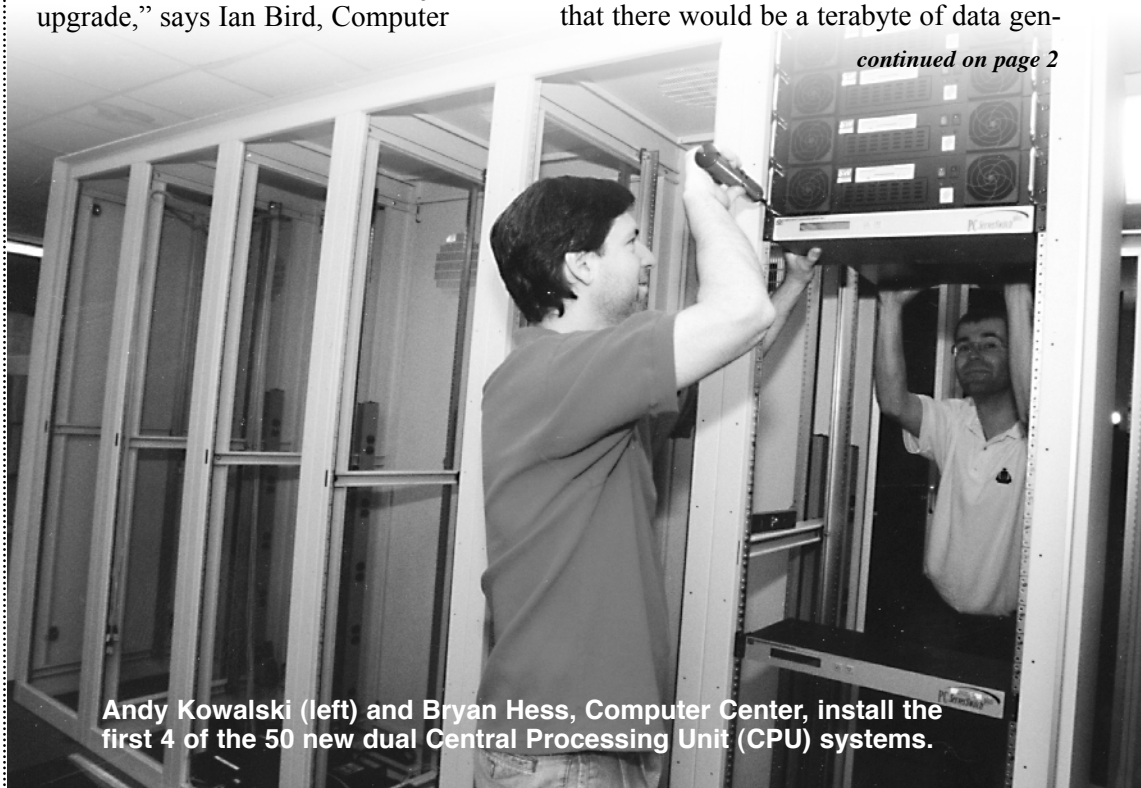

Andy Kowalski (left) and Bryan Hess, Computer Center, install the first 4 of the 50 new dual Central Processing Unit (CPU) systems.

FEL upgrade funding arrives at the Lab!

The FEL upgrade project s underway. Funding for he project arrived on une 1 and purchase rders started flowing the ame day.

Computer Center fortifies Lab's data-handling capabilities. . .

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erated per day, and most of that would be thrown away. That's never really happened," Bird explains. "We keep much more data after the first pass. The fraction of good events has been much better than anyone anticipated. Now, we get around 500 gigabytes per day, most of it clean, and so the processing requirements have really gone up."

Boosting Computer Center capacity is the addition of 100 central processing units, or CPUs, that will bring to 250 the number in operation. Also available will be nine new, powerful file servers running on the computer operating system known as Linux, which is expected to significantly increase overall network performance. The installation of next-generation hard drives and linear tape systems will combine with the aforementioned equipment to speed researchers' access to experimental data.

A higher capacity uninterruptable power supply is slated for installation in August, replacing the current, 11-year-old unit now in place. The new unit will be sufficient to accommodate further expansion over the next few years.

Fortunately, as overall computer storage capacity has risen, costs have fallen. Bird contrasts the relatively modest cost of the upgrade, $250,000, with the high value of the computer power purchased.

"If you just look over the past two years, there has been this incredible jump in data-storage capacity," he points out. "Not only that, but as capacity has jumped up, costs have jumped down. What used to cost 18 cents a megabyte now costs 3 cents. Two years ago, only nine-gigabyte hard disks were available. The current disks we're buying contain 73 gigabytes. We fully expect 100 gigabytes per disk by next year."

The only downside to the Center's modifications is a growing lack of physical space. Former offices have been converted as lodgings for the ceaselessly running, rack-mounted CPUs. Within a year, any remaining chairs and desks should be gone, replaced by the new servers and additional CPUs.

Bryan Hess (left) and Andy Kowalski examine one of the new File Servers containing nearly a terabyte of disk space. Just three years ago a terabyte of storage space would have filled three 4-foot tall cabinets.

The Lab's data-handling needs seem sure to increase. Bird suspects that by the time the Lab's planned 12 GeV upgrade occurs, a separate stand-alone building may be needed to house the next generation of high-speed, high-storage computers and peripheral equipment.

Lab earns environmental excellence award

Hampton Roads Sanitation District (HRSD) recently awarded Jefferson Lab its "Gold Pretreatment Excellence Award." The Lab was complimented for being one of the relatively few major facilities in the Greater Hampton Roads area to receive no technical or administrative violations during 1999.

In a congratulatory letter to JLab officials and staff, DOE Site Office Acting Manager Jerry Conley wrote, "This illustrates a commitment by Jefferson Lab management and staff to actively pursue environmental excellence."

The award recognizes HRSD permittees who had perfect compliance records for the entire calendar year, according to Ronald E. Johnson, HRSD Chief of Industrial Waste. The Gold Award is the highest level of recognition given to HRSD permittees.

Next step underway

Lab activates CANS for building access after hours, on weekends

The Central Alarm Notification System (CANS) will be activated for after-hours and weekend access to CEBAF Center, the Applied Research Center (ARC), the VARC and the Experimental Equipment Lab (EEL) Stockroom on July 6.

"We're tying up the last of the loose ends in bringing the system online, so we are ready to bring a number of our main buildings into the site-wide access system," explained Dave Kausch, CANS Administrator.

Other Lab facilities (i.e., Trailer City, experimental halls) will be added to CANS at a later date. And after that, single purpose office areas and special use areas will be added to the system.

Signs explaining access procedures are being placed near the cardreaders at the entrances to all of the buildings included in the system. Phones are also going in at the main (front) doors to each of these facilities. The phones can be used to contact the security guard at the Main Gate if your card doesn't allow the door to open or you are having trouble getting into a facility, according to Kausch. "Dial ext. 5822 and let the guard know your name and the building you're trying to access. The guard will pull up CIS and be able to tell you why your card isn't letting you access that location," he said.

CANS use requires that you:

-- Have an active file in the CEBAF Information System (CIS).

-- Have the new Jefferson Lab photo ID badge with the bar code on the back.

-- Have a current Individual Training Plan (ITP) in your CIS file.

-- Have successfully completed all safety training required for your Division granted access.

-- Have completed a Personal Data Verification (by going to "my page" on the http://mis/ Web page and ensuring all "my page" information is current and accurate).

"The system's database and hardware are running smoothly. If someone can't access a facility they regularly use, it is more than likely because some part of their safety training has just expired. Everyone needs to make sure they've completed SAF100 EH&S Orientation, and make sure they keep their training record current," he emphasized.

"Some folks have wondered if their card is working. If the cardreader beeps when you flash your card in front of it, your card is fully functional," Kausch explained.

CANS has been running at the Accelerator access point (Main Gate) for the last several weeks, according to Kausch. To verify safety training and to assist the crew chief in responding to urgent situations, entrance to and exit from the Accelerator site is monitored by CANS 24-hours-a-day, seven-days-a-week.

All Jefferson Lab staff are invited to attend a June 29 celebration recognizing the Lab's outstanding safety performance since 1998.

The event will begin at 3 p.m. in the CEBAF Center auditorium, then move into the atrium at 3:30 for refreshments.

A number of Lab Safety professionals and staff will be honored and their work recognized; and all staff will be congratulated for the Lab's safety performance.

In their own words: Grad students share their perspective

Roche works to improve grad student experience at Lab

Interviews by James Schultz

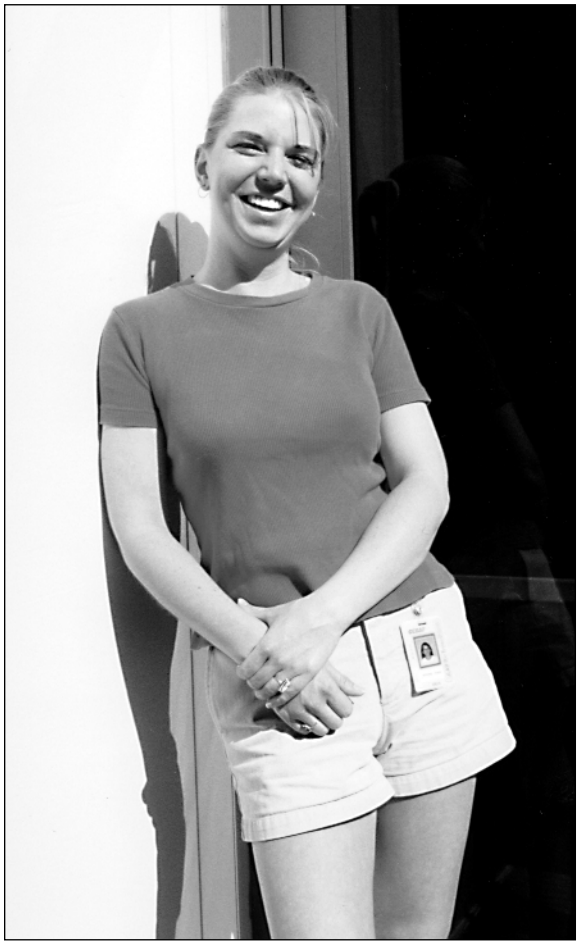
Rikki Roche grew up in Bardstown, Kentucky, 30 miles south of Louisville. She is a Ph.D. candidate in experimental physics.

I've always loved science. I was always interested in math, too, and really enjoyed it. But not physics per se. But when people talked about the moon and space, I got really interested. When I played outside at night, when I was little, I'd always look up and see the stars. I felt it was pretty amazing. I wanted to know more.

When Halley's comet last came along, I was 13. On my birthday, my cousin and I stayed outside all night long to see it. We never did, since it was so low on the horizon.

I remember being interested in how things work. But while I knew people who used to take things apart — one guy I knew took apart one of his parents' television sets, which irritated them — I didn't do any of that. The most mechanical thing I ever did was help my brother build a tree house. I did a lot of riding bikes and climbing trees. I did a lot of reading and swimming. I took ballet and tap and played the piano until college.

By the time I was 13 I knew I wanted to pursue science. It was much more interesting to me than history or English. My high school didn't have a physics class, so I took two years of chemistry. Then there was an opportunity to take the advanced placement class in physics at a nearby high school, which I did. By the time I got to college, I decided to be a chemistry major. I liked it a whole lot. But we had to take physics, since it was required for a chemistry degree. I had such a good physics professor that I decided to change my major.



Everything you see has something to do with physics. Physics applies to everyday life. All machines are based on principles derived from physics. Physics explains how the world works.

I went to Eastern Kentucky University in 1991 as an undergraduate because I received a full scholarship and my dad had gone there. Because I changed my major in my junior year, it took me five years to graduate. When Florida State gave me an assistantship, I went there in 1996. Graduate school at Florida State was much more in depth. I found it a lot tougher than anything I had experienced before. I had to spend a whole lot more time studying. My math background wasn't as good as I thought it was. I got my master's in 1998 in nuclear physics and I'm expecting to get my Ph.D. in 2002.

I've been at JLab since last June. I like it a lot. I like the weather a lot better than in Florida. This area reminds me of Kentucky. The people are really friendly.

When I first came here, the only person I knew was another FSU graduate student. I met other graduate students through him. Now, I'm the graduate student observer for the Users' Group board of directors. I've helped to come up with a Web page for graduate students [www.jlab.org/div_dept/consortium/gsa.html] that includes information on the graduate student insurance program, SURA fellowships, schedules of seminars and conferences, local activities guides, a bus schedule, stuff about local restaurants, information on the Jefferson Lab Activities Group — just general things you might need to know when you're a new student to the Lab.

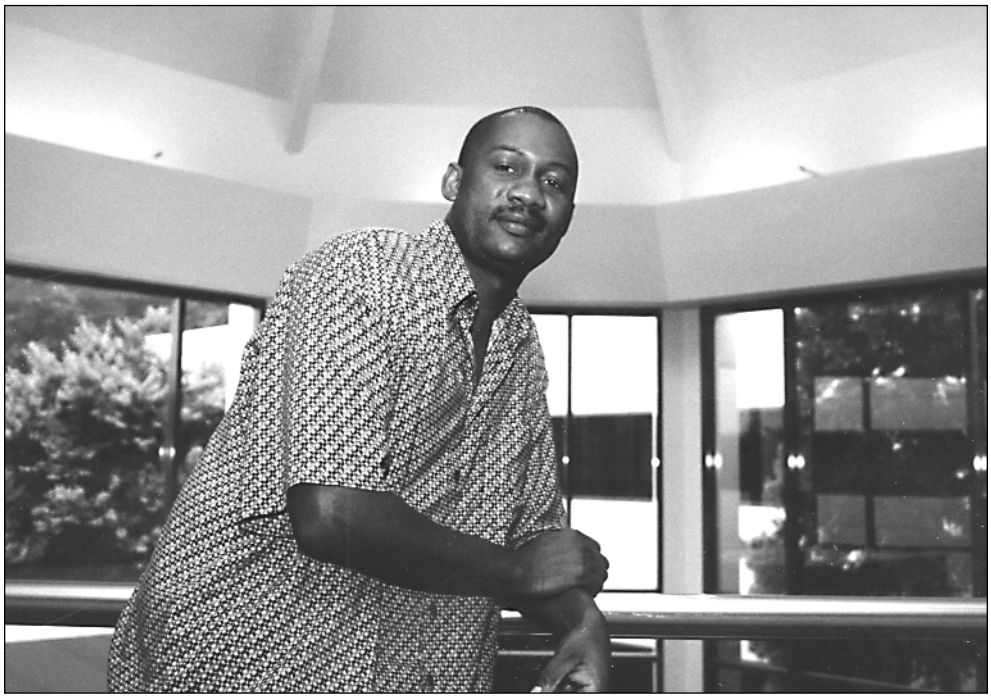
I've told the board that there needs to be more ways for graduate students to get to know each other. There also needs to be a place to take teleconferencing courses. Overall, though, JLab is really a great place for grad students. There are big seminars and conferences held regularly. You don't have to travel to learn about different things you may be interested in. I know other places where the students are just biding their time, just waiting to get out. Here, most of the people who graduate want to stay on for postdocs. Most people who work here are pretty happy.I'm working on a Hall A experiment that just started running on May 19. I'm really excited about this experiment beginning. I've been working on it and waiting for it for a year.

I like going to the hall and seeing the equipment we're using. Theory is nice, to know what's happening and why, but performing an experiment and getting results is really exciting. It's interesting to watch the data as it comes in.

I'd love to work with NASA, maybe doing experiments in space. I want to do something that will be important to the world. I'm not sure what that is. But I'll definitely stay in science. There are so many things you can do to make the world a better place.

Meeting with U.S. professor brings Agbakpe to HU/JLab

Peter Agbakpe grew up in Ghana, in west Africa. He is currently a Ph.D. candidate in theoretical physics at Hampton University.



I was interested in science and engineering from the beginning. There was a lot of competition in my house, in terms of academics. My four brothers and four sisters were brilliant students. Although my parents never went to school at all — my mother was a baker and my dad is a farmer — they insisted that the only thing their children would do was study and do well in school. They saw it as the only way to be independent when you grow up.

We studied more than we played. Our mother took a major role in our education. We'd come home from school and be asked to do homework first. After a while, she realized we really loved to do schoolwork.

I would not have done anything else apart from school. It was automatic. I just couldn't come home with poorer grades than my older two brothers and older sister. I did listen to music, read science books, played Ping-Pong and soccer and rode bicycles. Apart from that, I was always reading. By the time I was in high school, I lived in a boarding school even though the school was only six miles away from home.

Passing from high school to college is not a guarantee. There is a competition. But I did go to college to pursue a bachelor's in mathematics. My biggest interest was in math, and I was doing well in it. I did so well that I decided I had to go to graduate school. I knew that if I remained in mathematics I would need a Ph.D. in order to work.

I got my bachelor's from Ghana's University of Science and Technology. In Ghana, we're obligated to perform national service for one year. So after graduation my national service was to teach a course in mathematics at the University of Science and Technology in Kumasi. After that, I enrolled in a different university for a year. I was thinking about getting an MBA in finance. That same year, in 1991, I went to a conference organized to help bridge the gap between African-Americans and Africans. I met professors from all over the United States. One of them asked me if I might be interested in coming to America to study physics. I never thought I'd do physics, but physics is very close to mathematics and I thought I'd like it.

I applied to Brown University, Virginia Tech, Old Dominion and the University of Iowa. All accepted me, but with no financial aid. I had also applied to Hampton because I knew aid was available. I was accepted and earned a master's in applied mathematics. I decided to go into nuclear theory.

All my life I've been a mathematician. I don't know how I'd do [as an experimentalist] sitting and watching things happen. Theoretical nuclear physics is very close to what I used to do. Physics is challenging. I'm still learning.

I've done meson theory. Now I'm studying the origin of the scalar meson, at the quark level. Being able to use Feynman diagrams and then to represent them in mathematical formulations and use those formulations to predict physics is very fulfilling.

Jefferson Lab provides a very good environment for graduate students. We all have offices. We have seminars, where grad students meet and discuss physics and other concerns. Here, people listen to students' needs and do all they can to provide for those needs.

I do have some regrets. One is that my wife and I don't have the ability to interact socially with my family. I miss them.

I'm about to finish school. I've accepted a faculty position at Norfolk State University. Unfortunately, it's in mathematics, not in physics. It is very difficult right now to get a faculty position in physics. I do love teaching. I want to keep teaching and to make a difference in the lives of students.

In my spare time, I've been a volunteer teacher at Phoebus High School. I want to understand how American students, particularly African-American students, understand and use mathematics and science.

I'm very pleased with how things have worked out. I like the United States, especially Virginia and Hampton Roads. It reminds me of home. I hope to stay here.

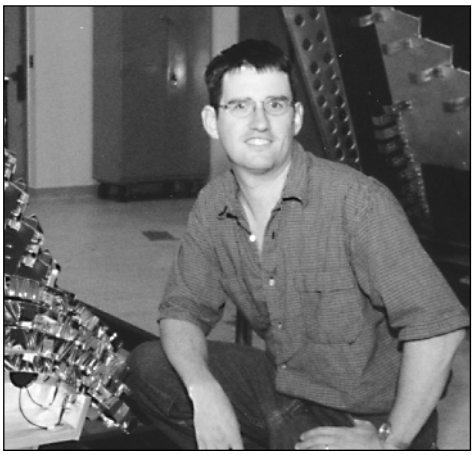
Lab staff earn awards

Averett wins DOE's Outstanding Junior Investigator Award

Todd Averett, Jefferson Lab's newest Bridge Faculty member at William and Mary, is one of the first winners of the Department of Energy's Division of Nuclear Physics Outstanding Junior Investigator Award.

This is the grant program's first year and Averett was one of six awardees from the pool of 27 applicants nationwide. The program is sponsored through DOE's Office of Science and is designed to identify exceptionally talented new nuclear physicists early in their careers and facilitate the development of their research programs. The grant program is open to tenure-track faculty who are currently involved in experimental or theoretical nuclear physics research.

Averett's grant proposal includes work on Hall C's upcoming G^0 experiment, as well as the polarized ^{3}He experiments set for Hall A next year. The grant money will help support a graduate student and a postdoctoral associate to assist with Averett's



research, and to help pay for some of the needed equipment.

He and three other physicists at the College of William and Mary are taking a lead role in the assembly and testing of the detectors to be used by the collaboration working on G^0. The W&M team, known as the Spin Physics Group includes Averett, David Armstrong, John M. Finn, and Keith Griffioen. In addition, Averett has constructed a facility at William and Mary which will be used to provide the specialized target cells for the polarized ^{3}He program.

"It was fantastic to receive this grant," Averett said. "It will provide much of the support needed to get our Hall A experiments on the floor." He is a co-spokesperson for one of the experiments (E97-103) scheduled to run in Hall A during the spring of 2001.

"We're excited about our research because the experiments we're doing now and in the next couple years will open the door to physics we will be able to do down the road when Jefferson Lab reaches 12 GeV," he added.

While Averett has received grant funding for projects before, earning this award was extra special for him. "It is a real honor to be one of the first-year recipients of an Outstanding Junior Investigator award," he said.

The assistant professor of physics joined the staffs of William and Mary, and JLab in 1998.

Wells earns CNU Outstanding Academic Excellence Award

Lyn Wells, Accelerator Division, was honored last month by Christopher Newport University (CNU). She received the CNU School of Business, Dean's Award for Outstanding Academic Excellence for the 1999/2000 academic year.

Wells graduated in December 1999 with her Bachelor of Science Degree in Business Administration. Nomination criteria for the award included grade point average, nomination by college professors, and selection by the dean. Dr. Donna Motilla, Dean of the School of Business, presented the award to Wells.

While Wells is delighted to have finally earned her degree, she has enjoyed and benefited from her academic journey. Her quest for a degree began 21 years ago when she started pursuing her bachelor's on a part-time basis.

"Staying tuned into the academic world over the years has helped me in so many ways. I've never stopped learning," she explains. "I've always been exposed to the latest information and the newest ways of doing things in my career field. And, I've been able to put many of these new [business] concepts and practices to work in my job, while learning about them.

"I have friends who flew through college but didn't stay current with the latest information in their fields. When I talk to them now, so much of what they know seems so out of date," she notes.

The Division Financial Manager credits Jefferson Lab's Tuition Assistance Program (TAP) for giving her the opportunity to pursue her degree while working fulltime. "I really appreciate the program and that the Lab was willing to help me earn a

degree. That means a lot to me," Wells admits. "I started using TAP right after my probation period. Now I have my degree and no college loans! I encourage other Lab employees to use TAP. It's a valuable, worthwhile benefit," she says.

Milestones
for May 2000

"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.

Hello

Kelly D. Dixon, Mechanical Engineer, Accelerator Division

L. Warren Funk, Project Services Manager, Accelerator Division

David P. Heddle, Hall B Physicist, Physics Division

William R. Hicks, III, Design Engineer, Accelerator Division

Michael W. Holub, Fire Protection & Security Technician, Administration Division

James M. Johnson, Export Control Manager, Administration Division

Ronald D. Lassiter, Mechanical Designer, Accelerator Division

Goodbye

David A. Bryan, Computer Scientist, Accelerator Division

Ruben Pedroza, Jr., Human Relations Administrator, Administration Division

Melvin E. Byrd, Electronic Assembly/Repair Technician, Physics Division

Medical Services gives Cholesterol, HDL levels testing appointments

Free Cholesterol Testing appointments are still available at Medical Services (VARC, room 22C) on June 28 and 29.

Total Cholesterol and HDL Levels will be measured. SURA/JLab, Dept. of Energy, and state employees may sign up for the remaining appointments. No preparation is needed for these tests.

For more information or to schedule an appointment, call Vicki Barnett in Medical Services, ext. 6269.

Get ready for fun at Lab's summer Luau

Fun in the sun! That's how planners are describing this year's Lab summer Luau, set for 3-7 p.m. on Friday, July 28.

Becky Nevarez, event coordinator, urges everyone to come out for an afternoon of great fun.

"The party is designed for everyone's enjoyment, but geared especially for children and families," Nevarez says. "Some of the amusements we are planning include a Misting Tent, Velcro Obstacle Course, Bubble Machine, Karaoke, Gladiator Joust, and a Dunk Tank. A firetruck from Newport News Station 6 will be on display. The menu will include hamburgers and hotdogs.

"We figure the weather will be hot, so dress comfortably and bring your sun screen," she adds.

The party is put on through the Jefferson Lab Activities Group (JAG). In the coming weeks, Betty Beeler, JAG volunteer coordinator, will be seeking people to help with food preparation and service, the beverage tent, and running the special activities. Contact her by e-mail (beeler@jlab.org) or call her at ext. 7491.

Watch for more information about the Luau on JAG bulletin boards, the JAG Web page and on the Lab's news Web page.

HUGS 2000

Twenty-five Hampton University Graduate Studies (HUGS) participants visited the Lab from May 30 through June 16. They attended lectures, participated in special activities, and on June 6 and 7 they toured the accelerator site. Here Steve Suhring, Accelerator Division, explains the workings of the Injector.

Lab colloquia discuss potential RIA research projects

To help address staff and users' questions about the interest in and potential research opportunities for a Rare Isotope Accelerator (RIA), JLab has scheduled colloquia on a variety of RIA topics.

Peter Parker from Yale University presented a lecture on "The Astrophysics Impact of RIA" at JLab on May 31. He discussed the opportunities for advancing astrophysics research with the variety of radioactive nuclei available from RIA.

The next RIA colloquium is set for June 28. The lecture will feature Guy Savard, Argonne National Lab, presenting "RIA Physics and Technology." He will delve into the physics motivation and the technical concept for the proposed RIA.

On July 12, Witold Nazarewicz, from the University of Tennessee and the Physics Division at Oak Ridge National Lab, will discuss the "Physics of Radioactive Nuclear Beams: Exploring the Nuclear Landscape." He will talk about RIA research into the uncharted regions of the (N, Z) plane. He contends such research can answer many questions of fundamental importance for nuclear physics. He will also discuss some of the challenges and opportunities for nuclear structure research with the radioactive nuclear beams from RIA.

Guest speaker Jerry Garvey is scheduled to bring JLab the latest information on ERHIC on July 26.

All colloquia are free and begin at 4 p.m. in the CEBAF Center auditorium. Refreshments are served beginning at 3:45 p.m.

bright spot on the web

http://www... http://www... http://www... http://www... http://www... http://www... http://www... http://www...

Editor's note: If you have or know of a Web Site that could be informative or useful to Jefferson Lab staff, call the public affairs office at ext. 7689 or e-mail Linda Ware (ware@jlab.org).

The annual Atlantic hurricane season is upon us. The tools for predicting the path and severity of hurricanes has increased dramatically of late, and the World Wide Web has met the challenge of getting the information to the world. The National Hurricane Center's Tropical Predication Center at www.nhc.noaa.gov/ is a source for much information about hurricanes past, present and future. Located on the campus of Florida International University in Miami, this arm of the National Oceanographic and Atmospheric Agency (NOAA) keeps tabs on all major storms in the Atlantic and East Pacific. The Web page features current data on developing storms, full-fledged storms and hurricanes, and general information on tropical storms and hurricanes.

ON TARGET

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