September 2003

ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

JLab safety, emergency management programs undergo evaluation

In less than a month's time this summer, Jefferson Lab completed three safety reviews: its biennial Emergency Management Review, a Nuclear Regulatory Commission (NRC) audit and an Occupational Safety and Health Agency (OSHA) audit.

The Emergency Management Review, which occurred August 6-7, is a Department of Energy contract requirement and alternates every other year with the Radiation Control Peer Review.

The review team includes an emergency manager from another DOE lab, a member of the local EM response community, a representative from a facility that shares traits with JLab, and a JLab manager. The team is charged with examining and evaluating the Lab's Emergency Management Program. They toured the site, and received presentations from and queried staff representing the range of JLab's emergency response activities.

With a final score of 99 out of a possible 100 — a slight increase over the last review — the Lab's rating was "outstanding." This score is one of the metrics required in the Lab's performance-based contract.

"This [the results] was a continuation of the great work done by Tom Hassler and the program he built up over the years as Emergency Manager," pointed out John Kelly, JLab's Emergency Manager since October 2002. "We've got a good, strong program."

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JLab programs undergo evaluation...

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The review team identified several areas as program strengths, including: a well-developed working relationship with the local emergency management community; key Lab staff participation in emergency response training exercises; integration of safety and EM responsibilities throughout the staff; development of emergency procedures for the Machine Control Center; efforts to improve emergency communications in the Lab's below-ground areas; and other efforts, all indicating JLab's commitment to continuous improvement in its EM program.

"These reviews offer us an outstanding opportunity for crossfeed," Kelly noted, "to share ideas and methods with safety professionals from our community, other national laboratories and institutions that have similarities with JLab. Having gone through this review, I have a new appreciation for the great relationship we have with Newport News. We get outstanding support from our local police and fire departments. We are very fortunate to have such good neighbors; and it underscores the importance of the Lab continuing to be a good neighbor."

For more information visit Jefferson Lab's Emergency Management web page, accessible from www.jlab.org/safe.html.

The next two assessments were audits designed to estimate the cost of moving to congressionally mandated external regulation at DOE facilities. Four Nuclear Regulatory Commission inspectors arrived July 28 and departed July 31 after their closeout meeting. The audit included all aspects of laboratory operations involving ionizing radiation-producing machines and materials.

According to the NRC Site Visit Report, the team identified no major deficiencies that would prevent the NRC from licensing JLab. During discussions "the team observed that the Lab's procedures matched up well with what the NRC would require." They noted that in some areas, the Lab's procedures were even more stringent than the NRC would require.

The team did identify six action items with cost implications if JLab's radiation control program was to be regulated by the NRC instead of by DOE as it currently is. JLab division and Radiation Control heads have provided DOE and Lab management with cost and time implementation estimates for these items.

The team worked with the DOE Site Office Environmental, Safety and Health manager, Barbara Morgan; Jim Murphy, Director, Office of Assessment; Bob May, Accelerator Division Safety Officer; Erik Abkemeier, JLab's new Radiation Control group head; and Keith Welch, RadCon group associate coordinator.

Finally, Aug. 11-15, the Lab went through a comprehensive OSHA audit. "It was a wall-to-wall look at safety hazards and compliance," explained Jim Murphy, Director of the Office of Assessment. "Overall, I think we did well. There were no non-compliances that the inspectors felt posed imminent danger."

"The OSHA team was very complimentary of JLab and our staff," Murphy continued. "They found their escorts knowledgeable and felt that the audit went very smoothly. They appreciated the openness with which information was shared. In some areas, most notably our medical programs, they said we far exceeded anything OSHA requires."

"In addition," he added, "the three experimental halls had few violations and the Test Lab, which is a challenging environment, had very few instances of hazards noted."

When asked what areas the Lab should continue emphasizing, Murphy commented, "Seventy-six of the 258 items noted during the assessment — that's almost 30 percent — were electrical. I think we all agree that electrical hazards are among the most significant hazards at the Lab." Using extension cords in lieu of permanent wiring and blocked access to electrical panels were common non-compliances cited.

"The audit went smoothly because a lot of people cooperated to make it

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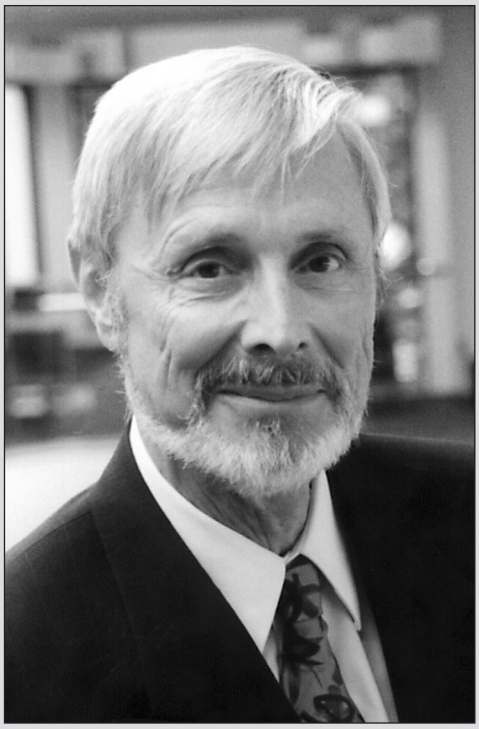
From the Director



Christoph Leemann
Jefferson Lab Director

Scientific knowledge must be pursued safely

Dear Colleagues:

We cannot lead productive lives without taking risks, well calculated and considered risks, but for us at JLab those risks cannot and must not include injury on the job. Scientific knowledge must be pursued in parallel with a commitment to safe work practices. I must be assured that all of you will leave JLab every day whole and healthy — the same way you started the day or shift. This goal of an injury free work environment is achievable if we all set our minds to it, and I know that in the long run, when we get there, we will not only be safer but also enjoy better work processes and create higher quality products.

Towards the end of August the Lab experienced a number of incidents, among them an electrical shock and an accident that led to a hand injury that required sutures. I ordered a Lab-wide Safety Stand-down on Tuesday, September 2.

I felt that the timing of the stand-down was important as we were approaching a month-long shutdown period during which a great deal of work is to be accomplished. I recognized the temptation to pile more projects into that period than is possible to accomplish. I admire and applaud ambition, but I also have an unwavering commitment to conduct and a culture that accepts no compromise regarding safety. Under no circumstances is anyone at any level of the organization allowed to compromise: first, safety, and second, quality of work. Nothing and most certainly not schedule can get in the way of these goals.

Throughout the Safety Stand-down, I toured the Lab, observing individual work groups and speaking with them about the importance of hazard identification, hazard controls, work planning, and working within controls, and the need to incorporate these deeply into the way we work everyday. It was gratifying to see some impeccable workspaces, and overall I saw a good and serious effort, but there are also some areas that could benefit from improved housekeeping. I hope that everyone will start to appreciate how serious I am about safety matters.

Work can be accomplished expeditiously and safely if properly planned. I understand hazard analysis and work planning not as abstract paper exercises but the systematic process of evaluating the job at hand: step by step, what you need, what has to be in place, and what could go wrong. If you find yourself high up on some elevated platform without the right tools, you didn't plan. If you find yourself in some materials handling situation hopelessly short of another pair of hands, you didn't plan. If you try to get out of such situations by some makeshift means, or hurry and cut corners to make up for time lost, you create a hazard for yourself and possibly others.

You know your work, you know the dangers: plan to stay safe. Most importantly, if you have ideas of how the Lab leadership can improve your safety, contact your Safety Officer or Associate Director or let me know. I welcome all serious concerns and suggestions from staff.

Chief Financial Officer

Mary Erwin takes on newly created JLab role

Mary Erwin
Chief Financial Officer

by James Schultz

Even for those with modest incomes, balancing the family budget can be a chore. By comparison, minding the money for a $600 million federal laboratory with an annual operating budget of nearly $100 million, that includes staff, contractors, and visiting researchers, is challenging. Simply getting the bills paid is one thing; quite another is creating a budget that aligns with programmatic goals, tracking present and future outlays for capital expenditures, equipment purchases, filing and processing travel claims, and new hires.

Although Jefferson Lab has always handled these activities properly, to deepen its commitment to effective and appropriate fiduciary management the Lab, early this year, appointed a chief financial officer (CFO) to add additional oversight to the process. Mary Erwin assumes the post with extensive experience in both the public and private sectors. She arrived at JLab in March from a position as chief of staff to the chief financial officer for Los Alamos National Laboratory, in northern New Mexico.

Financially speaking, Erwin says her initial impressions of JLab have been positive: "From what I can tell, the Lab stacks up very favorably in terms of managing taxpayer dollars." She has familiarized herself with the JLab financial systems, including those pertaining to budget planning, payroll, accounts payable, travel, time reporting and budget analysis.

Erwin wants to better understand how projected expenses related to research play out as experiments are conducted, and equipment and staff time are accounted for. Timeliness of cost data will also be a priority: how quickly the latest information is entered into systems, books are closed and reports provided.

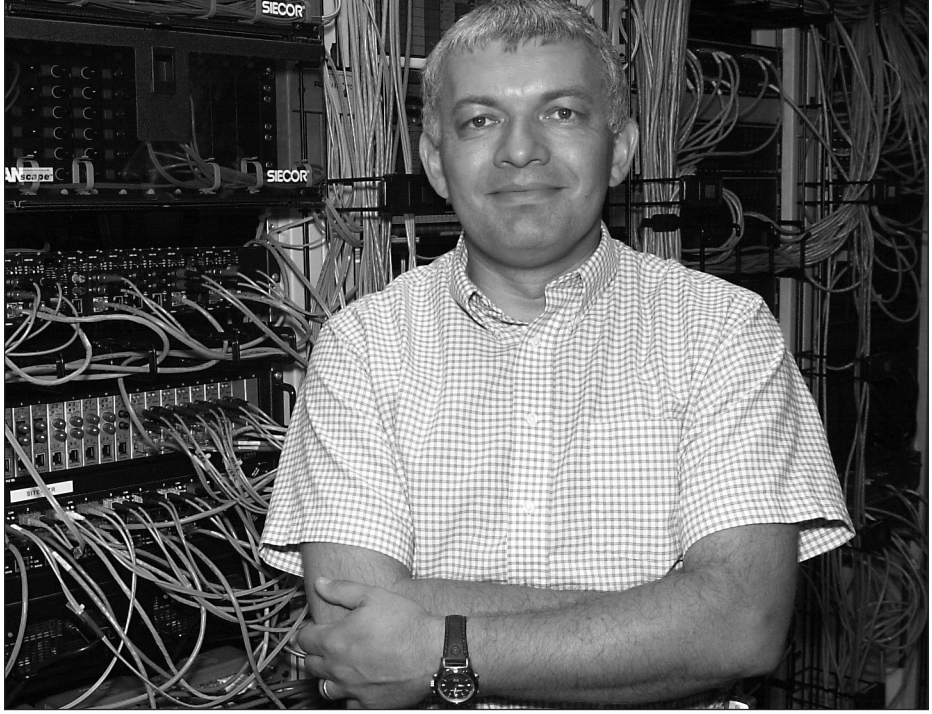
Erwin says she is also making a point of talking with the Lab's associate directors to determine how she as CFO can help them with programmatic goals. Do the divisions have the money they need, where they need it, to do the work their sponsors expect of them? Are vendor invoices being paid quickly? Are travel claims expedited and promptly processed? How can Erwin and her 20-person staff improve delivery of services?

"My job is to be both a strategist and a monitor: to look into the future and determine funding needs, and to always see where things currently stand," Erwin says. "Because we can spend money pretty quickly, tracking is very important. We must reach the end of the fiscal year with all budget areas covered."

Having moved to Newport News earlier this year, Erwin says it was "time for a change" for her and her family. They lived in New Mexico for 10 years, with jobs and homes in Texas and Tennessee before that. "I'm thrilled to be here. This is an opportunity to support the Lab and everything the Lab wants to achieve in the future," she says.

Erwin has set up an end-of-calendar-year to-do list, including upgraded accounting protocols that will regularly and accurately refresh financial information. She wants to guarantee that any audits that may take place at JLab will result in "clean opinions" — that is, no implied or explicit deviation from accepted financial procedures.

"You can never figure out every question that's going to be asked," Erwin explains. "But if you can gather information with more detail up front, then you're covered when additional questions are raised."



Physics Division gets new group leader

Graham Heyes assumes post as Computer Center Director

by James Schultz

For a child fascinated by science fiction, it seemed natural to mimic what he saw on television or in film: boxes with flashing lights on the front, and maybe a sound effect or two for good measure. Years later, Graham Heyes smiles at the recollection. Little did anyone suspect in the 1960s the rapid miniaturization of hardware, the eventual rise of the World Wide Web and software that would revolutionize everything from databases to personal music files.

"What I made didn't do anything behind the scenes," Graham recalls. "But I was a kid. I just enjoyed watching the science fiction and always hoping it would come true."

In a way it has. In his new post as director of the Jefferson Lab Computer Center, Graham seems sure to oversee installation of equipment that, as a young man, he would have considered worthy of any sci-fi epic. As computers grow ever faster and more powerful, so too does the capacity of the Computer Center's machines — accessible to both physics researchers and JLab staff.

Enhanced capability will be required for the challenges ahead. While Graham credits his immediate predecessors, Sandy Philpot and Ian Bird, for a "great job," Computer Center staff will be pressed to handle the challenges of the future. The first is the most near-term: the construction of an additional wing to CEBAF Center and the physical relocation of the Computer Center from its current second-floor location to the first floor of the new wing.

"Even though the new Computer Center will be on the first floor, we'll have to provide networking for all three stories, move our own offices and keep the current Center running during the transition," Graham points out. "It's like trying to move to a new operating room while the patient is still in surgery."

The two other major projects that will involve Computer Center staff are the proposed 12-billion-electron-volt (GeV) upgrade to the accelerator and the allied construction of another experimental hall, Hall D. Both will require significantly enhanced data acquisition and data analysis capabilities. The new hall will add new Laboratory staff and users, which will require additional Computer Center staff to provide support.

The centralized JLab computer systems handle the initial phases of data acquisition and analysis. Later, more sophisticated analysis is handled offsite by the institutions and universities actually conducting experiments. The need for additional computational prowess derives from the continuing first-rate performance by the Lab's

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Providing service to JLab community

Machine Shop can fix you up right!

by Judi Tull

Whether you need a tiny part no bigger than your fingertip or something much more substantial, the 13-member crew at Jefferson Lab's Machine Shop can fix you right up.

What started out as a small shop located in the Forestry Building with used, surplus Department of Energy equipment has emerged into a full-service facility, housed at the south end of the EEL (Experimental Equipment Lab) building, equipped with conventional and CNC (computer-numerical controlled) machinery supported with full 3D CAM (computer-aided manufacturing) software. But it might just be the best-kept secret at the Lab.

"Only a fraction of the people who could use our services probably are doing so," said Machine Shop supervisor David McCay.

The shop operates as a full-service, freestanding business, just like a commercial enterprise, but with one big difference: it doesn't — and can't — make a profit. If the charges made against Lab projects during the course of the year exceed the operating expenses for salaries, overhead and materials, the money is proportionately refunded to each project. Even "overtime" has the same hourly rate as straight time.

"At the end of the year," McCay said, "the books balance."

Some of the jobs the shop works on are long-term, but many are spur-of-the-moment quick turnarounds. Often, the shop staff has the luxury of working from a complete set of plans and doing a turnkey job from start to finish. Just as often, however, a researcher will rush through the door with a hand-drawn sketch for a part that's needed immediately.

And that, according to McCay's deputy supervisor, Casy Apeldoorn, is when things really swing into gear. "We do everything in our power to accommodate them," he said.

The shop is also available to work with student researchers, who lack direct access to engineers but who know what they want. "We'll pretty much bend over backward to help them," Apeldoorn said, "because their need is so great."

Part of the shop's mission is to provide customized, timely, cost-effective production or modification of standard and unusual parts. "We particularly like to manufacture parts that may be difficult to procure on the outside because of ability or cost effectiveness. One such task was a target cell for Hall B, because of the shape of the cell and the thickness of the window, .0005 of an inch thick, we could not find a local vendor that would take on this task. Shop members, working with the customer, came up with a procedure to consistently produce this cell. This ability of the shop has enabled research personnel to test out their ideas and thus further enhance the goals of the Lab." McCay said.

Since it's virtually impossible to predict a uniform workflow and the shop is due date driven, the shop uses about 10 outside vendors located between Richmond and Norfolk who will take on work if the shop can't get it done by the required date. Some of those vendors are minority- and women-owned businesses so that DOE small business subcontractor requirements are met, McCay said, and each of them specializes in some aspect of the machining that needs to be done.

However, some jobs will never leave the Lab, and those are the ones requiring ultra-high vacuum welding. There's a special booth set up to do this high-precision, clean-environment work for parts that are used in the accelerator and the FEL.

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At any given time, the shop has about 40 jobs in progress, McCay said. Even though some jobs are contracted out, the shop has never had a work shortage. "We always keep enough work in the shop to keep everyone busy," he added.

All of the shop's employees have been at the Lab for at least five years, a fact that enhances the expertise they bring to understanding the JLab staff's and users' needs. McCay and Apeldoorn have 60 years of experience between them and have worked together for decades, apprenticing at the same shop doing shipyard work and then later working at other local machine shops doing NASA work before coming to the Lab in the late 1980s. Their work styles and personalities complement each other, and after year's of working together they can finish one another's sentences or expand on a mutual thought.

Each of the shop's machinists is responsible for inspecting their own work, but McCay and Apeldoorn bear the ultimate burden for quality. "Once it's out the door," McCay said, "it's got my name on it."

Despite the fact that the shop is inherently one of the most dangerous places at the Lab, it also has one of the best safety records, according to Apeldoorn. "There's such a chance for injury here, we've hammered home the importance of safety concerns," said McCay.

Both men lament the fact that many Lab staffers are unaware of the shop's capabilities. "We build stuff that no one on site knows we make," McCay said, citing as a recent example the four BE magnets for the Accelerator Division's Energy Recovery experiment.

No day is like the one before or the one to come at the machine shop, and McCay and Apeldoorn share the excitement of not ever really knowing who's going to come through the door next or what they're going to need. And they love it. "Sometimes it's a nightmare," Apeldoorn commented, "but it's always fun!"

Shop at a Glance for 2002

1,785 job requests processed

1,116 outside labor purchases totaling $664,965

Materials, stainless steels, aluminum, plastics purchases totaling $144,681

Hardware purchases totaling $25,907

Shop operations for FY 2002 totaled $780,616

Shop machinery valued at $1,189,636

Machine Shop staff pose for a group photo: (left to right) Bob Manus, William Berkley, Jeff Dail, Ron Smith, Gail Franco, Casy Apeldoorn, Jim Breeding, Mike McCrea Sr., Al Johnson, Bob Martin and David McCay. Unavailable for photo: Gary Slack.

One size doesn't fit all

Hightower defuses combustible safety issue

Charles Hightower shows off one of the new propane gas storage containers (upper, right) he designed to hold small propane cylinders.

by John Anderson, II
Public Affairs intern

Recently JLab's Physics Division safety coordinator, Charles "Chas" Hightower, was faced with a "one size doesn't fit all" dilemma. He noticed that several groups within the Physics Division didn't have adequate storage containers for the small propane cylinders they had started using.

His challenge was two-fold: to educate employees on the propane cylinder storage requirements listed in the Environment, Health & Safety Manual, Appendix 6610-T6 Chemical Procurement and Storage; and to find and purchase the correct type of storage containers needed for the pressurized cylinders. He started talking to JLab workers and other safety specialists and searching safety supply catalogues and the Internet for a small, ventilated storage cabinet.

"I was just sure that some company manufactured what I needed, but none of the supply companies made ventilated cabinets that were the right size," Hightower said. So he took measurements and developed a suitable design. The final product is only 12 inches by 12 inches by 9 inches.

"I didn't do anything that fancy," the safety coordinator commented. "I just saw an opportunity to improve safety for the Lab by designing a designated storage area for the small cylinders."

Hightower's next step was to contact Casy Apeldoorn, the Machine Shop's deputy supervisor. Apeldoorn made some improvements to the design, like substituting heavy gauge screen for perforated metal (saving money on each cage built). Once the design was finalized, Apeldoorn had a contractor produce a dozen of them for the Physics Division.

The cages have been distributed throughout the Physics groups and are being used. Other JLab departments needing small propane cages may contact the Machine Shop (with the desired cabinet dimensions) for assistance, ext. 5906 or 7300.

Hampton University Graduate Studies

HUGS celebrates 18th year with record enrollment

by Randy Sharp
SULI intern*

Contrary to an apparent national downward spiral of interest in the physical sciences, the summer 2003 Hampton University Graduate Studies' (HUGS) participants celebrated the program's 18th consecutive year by posting the largest enrollment ever, making a defiant statement to naysayers of science yet to come.

The program — funded in part by Jefferson Lab, and a Department of Energy nuclear physics grant to Hampton University — usually accepts 15-20 students. This year however, because of a flood of applications, program administrators scrounged to find the funding for 10 additional applicants — bringing this year's group size to 30.

Cynthia Keppel, Director for HUGS, doesn't see the rise in applicants as a spike, but the beginning of an upward momentum. She remains confident in the staying power of the program, and with good reason. "We will always be able to fill the program, largely because of the energetic Jefferson Lab community."

Physicists from around the world, who are used to speaking in lecture halls to professionals, come to teach this up and coming group. Extensive notes are prepared outside of their normal academic lectures, and much time is taken for extra diagrams and explanation. All of this work is performed willingly for a payment equal to the mass of a photon. (Yes, ladies and gentlemen, that's just shy of nothing!)

"This is a lot of work for the lecturers; they spend time preparing for this outside of the classroom and in addition to active research programs," says Keppel. "They do it out of dedication to the field, and for the enjoyment of helping future scientists. It's actually quite beautiful."

Internationally known physicist Frank Close was one of those speakers who decided they just didn't have enough on their plate, and since he is among the foremost pioneers in the study of hadrons and gluons, who better to tell the HUGS students about them? As JLab's Interim Chief Scientist since the death in 2001 of colleague Nathan Isgur, Close notes that taking time to speak to these students is "just the kind of thing Nathan used to do." While he spends two weeks away from his native England to take care of duties at JLab, he lectures to the students. Close considers it an "interesting way to further the future of the Lab."

Bob Williams, Theory Group, who supervises the program, gets the chance to see the differing personalities in each year's group. "This year's was a very active group. They were not intimidated, and had a lot of personality," remarked Williams. Both Keppel and Williams know that three weeks (June 2–20) isn't going to "change anyone's life," though both of them were, at one time, HUGS students.

"We aren't trying to train them," said Williams. "We want them to learn what kind of ideas drive the Lab, and to begin [personal] networking."

Close holds to the hope that they will return to JLab or another facility to continue research. "In an ideal world, they will have the opportunity to return to hear how all of our [Close and his associates'] theories were flawless," he adds with a laugh.

While most HUGS students may not find themselves as involved at JLab as the HUGS organizers or lecturers are, it is almost certain that many of these budding scientists will find their way back to Jefferson Lab at some point. For now, as the students return to college, they will take with them (amongst lectures spoken entirely in deltas, GeVs, and functions) fireworks from the Norfolk Harborfest, sunburns from Va. Beach, and the knowledge that there are more people than they ever thought who wish to see them do great things with their education.

*Department of Energy, Science Undergraduate Laboratory Internship

Physics Enrichment for Science Teachers

Teachers, JLab staff help prepare middle-school science teachers

by John Anderson, II
Public Affairs intern

As part of Jefferson Lab's commitment to science education across the region, it held its fourth annual P.E.S.T. (Physics Enrichment for Science Teachers) program, July 7–31. The program is designed to further the knowledge of middle-school science teachers by providing them with a mini-course in basic physics: material and information that they might not have seen in years, or, depending upon their college curriculums, may never have received at all.

Two local teachers taught the course: Instructors Joe Garrity, an Advanced Placement Physics teacher at Poquoson High School; and Neal Jenkins, a retired Senior Naval Officer who teaches AP Physics and AP Calculus at Norview High School in Norfolk. Both teachers have watched the program evolve over the years to meet the changing needs of the middle-school curriculum.

Garrity explained, "The program is constantly evolving to accommodate the changing needs among teachers. We try to find the happy medium between lessons and hands-on activities that will increase knowledge. It's a balancing act. We greatly appreciate the feedback given to us before, during, and after the class is taught."

This year's four-week program drew 21 people: mostly teachers from the Peninsula and Tidewater, but including participants from as far away as Minnesota, Kentucky and New Jersey. Many of the teachers had not taken physics classes in college. Therefore, the program was extremely beneficial as it provided the teachers with a solid knowledge foundation, as well as ideas for teaching the material in the classroom.

"Teachers teaching teachers is an important aspect of this program," noted Stacy Ring, JLab's Science Education specialist and P.E.S.T. coordinator. "Our two instructors have a fantastic understanding of physics and what works when teaching it in the classroom. They understand classroom dynamics and interacting with students so they can really relate with the P.E.S.T. participants. Occasionally

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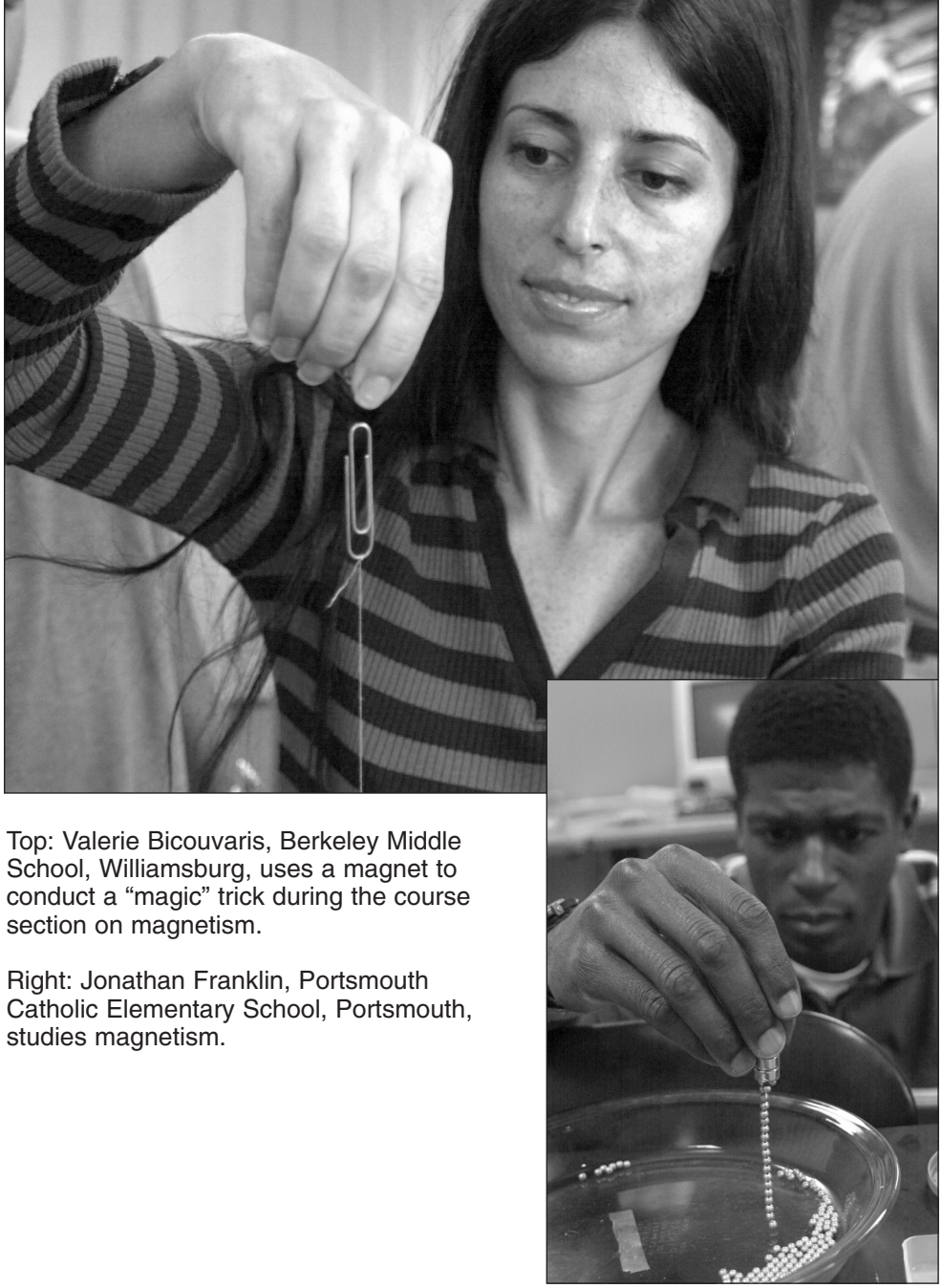
Left to right: Joan Ammon and Lisa Bolin, middle school science teachers respectively from New Jersey and Minnesota, take part in a magnetism experiment with Sue Covert, John Yeates Middle School, Suffolk.



Top: Valerie Bicouvaris, Berkeley Middle School, Williamsburg, uses a magnet to conduct a "magic" trick during the course section on magnetism.

Right: Jonathan Franklin, Portsmouth Catholic Elementary School, Portsmouth, studies magnetism.

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they'll even break away from the lesson plan to discuss personal teaching experiences and creative ways to present concepts in the classroom."

The group met mornings, Monday through Thursday. Each day included two classroom sessions followed by a mini-lecture given by a JLab subject-area expert — in lasers, experimental physics, engineering, medical imaging and electrostatics — giving the P.E.S.T. participants a better understanding of current applications for physics. During the last week, participants took time to share with each other the physics lessons they created as assignments during the program.

P.E.S.T. participants receive a stipend and earn 65 participation hours toward their teacher re-licensure or re-certification. The University of Virginia recently accredited the program, allowing attendees to earn three graduate credit hours that may be applied toward a master's degree through UVa.

JLab to the rescue!

Meet Tiffany Lockett, a teacher at Jefferson Davis Middle School in Hampton. Like many middle school instructors, Lockett found herself teaching a subject that she wasn't fully prepared for. In this case, physics. Some blame it on cuts in education funding, others on the lack of teachers nationwide. Regardless, one thing is certain: if teachers aren't taught correctly, their students won't be either!

Lockett majored in biology in college. As such, she has a strong background in chemistry and even astronomy. However, she teaches physical science; a subject that includes dabbling in areas of physics. Not having had physics in college, she found teaching it to be extra challenging. She realized that she needed to strengthen her knowledge foundation.

Jefferson Lab's P.E.S.T. program made this possible. She was delighted to participate in the program and said it was very worthwhile.

Upon arrival, Lockett discovered an additional benefit: finding out about the on-line classes she could take through the University of Virginia that she needs to fulfill her teaching licensure requirements.

"Before this, I didn't know what I was going to do," Lockett said. "All the classes that I needed were only offered during the daytime." One can see the scheduling conflict that this imposes on teachers.

Young PhDs in Physics

JLab welcomes youths taking part in science camp

Educating and exciting today's youth about science and technology is an important adjunct to the Lab's scientific mission. On July 16, Jefferson Lab welcomed 10 participants to its "Young PhDs in Physics" camp. Two sessions of the three-day program, sponsored by CHROME — the Cooperating Hampton Roads Organization for Minorities in Engineering — were hosted this summer by JLab. The first session was held on site while the second session was conducted July 30–Aug. 1 on the Old Dominion University campus.

"In this program 'PhD' stands for Persons having Dreams," explains Lisa Surles-Law, JLab's Science Education specialist who ran both sessions of the physics camp. "We hope that by participating in this program, these young people will be encouraged to pursue careers in science or engineering. We planned a variety of activities to generate learning, excitement and curiosity."

The camp was designed to give rising 6th, 7th and 8th graders exposure to science through hands-on experiments and activities they may not have access to in the classroom. In addition, the program gives students the opportunity to talk with scientists and engineers and visit their work areas.

Each day of camp featured a special theme, according to Surles-Law. "The first day was 'All About JLab,' so the students could get a better idea of what we do here — the types of physics experiments we run. We do several activities that are part of the Lab's BEAMS — Becoming Enthusiastic About Math & Science — curriculum."

"The second day was Magnet Extravaganza," Surles-Law continues. "We had a magnet magic show, built electromagnets and visited Al Guerra, Accelerator Division, in his workplace."

The last day was Materials Science Day and included activities and experiments that explored matter through science. The students conducted an experiment studying the insulation properties of different materials and, firsthand, saw how ultraviolet (UV) light reacts upon beads. They even tested sunscreens to determine their levels of UV protection. A tasty highlight at the end of the third day materialized when the group got to make their very own batch of Liquid Nitrogen Ice Cream!

Each day included activities, field trips, a craft project related to the day's theme and learning new vocabulary words related to the day's activities.

Young PhDs (left to right) William Luo, Jasmine Ellis, Shaun Lightfoot and Prakriti Verma made Oobleck with mechanical designer Joyce Miller during their visit to JLab.

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accelerator and end stations that allow experimenters to digitally collect and store many more "clean" subatomic events than even the most optimistic forecasts had originally anticipated. Researchers are therefore increasingly turning to the JLab system to make possible all phases of data access and study.

Graham nevertheless worries that there may be too many tasks chasing too few qualified personnel. "The Computer Center is understaffed for the mission it has," he points out. "The challenge is to recognize the priorities, look at the skills of the people, and organize and optimize performance."

This year marks Graham's 12th at the Lab. Born in the town of Wigan, England, halfway between Liverpool and Manchester, he became aware of the Laboratory during a conference hosted by CEBAF in 1989. Graham was then a fellow at CERN, the particle physics laboratory in Switzerland. Discussions ensued with Chip Watson, now leader of JLab's High Performance Computing Group, about a post as a data acquisition specialist.

"I guess things went well," Graham says. "Chip invited me over for a look at the job. Within a week of that visit I had signed an employment agreement."

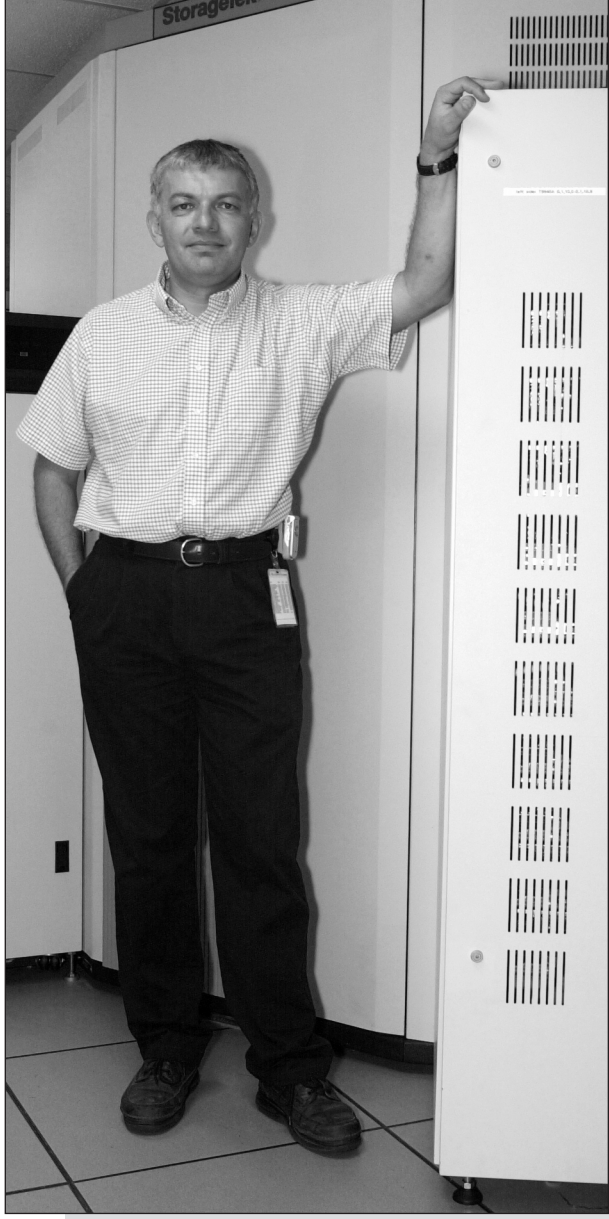
Although as a youngster Graham was keenly interested in science, technology also held his fancy. When he was 12 he constructed an apparatus to levitate an aluminum plate over a magnet and, later, built a high-voltage transformer in a coffee jar full of motor oil. He regularly took apart and put back together household items that needed repair. But it was in art that he thought he might excel, perhaps as a painter or ceramicist.

His childhood interest in computation intensified in college at the University of Liverpool, where he developed software and refined automation techniques to run experiments and homemade computers he and friends built as a hobby. That avocation would lead to his vocation, with a Ph.D. in Physics from Liverpool and subsequent choice of the CERN fellowship, which provided data-acquisition support for several experiments running there in the late 1980s.

Just a few years ago, when Graham's brother, still living in England, ran into Graham's high school physics teacher, the teacher asked about Graham. "The teacher said, 'It's a pity Graham wasn't better at physics. He could really have made something out of that,'" Graham reports. "My brother told him what I was doing and they both had a good laugh."

Now that he's a father of two — with an 8-year-old at home who builds robots in his spare time — Graham has a far broader perspective than when his interests extended to flashing lights on the front of would-be computers. Now he faces the real problems of the science "fiction" world he once dreamed about: only this one has a one-of-a-kind electron accelerator and massive amounts of information to route, organize and make sense of.

"The technology is going in the right direction. Things that would have been impossible to get 10 years ago you buy right off the shelf now," Graham notes. "I'm very optimistic about the future of the Laboratory and of the Computer Center. The physics community has provided great support for and has confidence in Jefferson Lab. It gives me great hope."



Graham Heyes becomes new Computer Center Director...

Briefs

JLab announces upcoming Fall Science Series events

The Jefferson Lab Fall Science Series kicks off on **Tuesday, Sept. 23**, with guest speaker Richard Tapia, a mathematician and professor in the Department of Computational and Applied Mathematics at Rice University, Houston, Texas. He is internationally known for his research in the computational and mathematical sciences and is a national leader in education and outreach programs.

His presentation, ***"Mathematics is Everywhere in my Real Life"*** includes his experiences with BMX bike racing and car shows. In the first part of his talk, Tapia uses lively video footage to identify and illustrate what he calls the Curse of Lane 8 or The Fair Lane Assignment Problem in BMX bike racing. He then uses his training to formulate the problem mathematically and solves it. In the second part of the talk, Tapia shows and describes the making of a video designed to accompany the showing of his 1970 Chevelle Malibu SS at car shows across the country. Both the car and video are titled "Heavy Metal."

The video attempts to depict the late 1960s and early 1970s in terms of muscle cars and heavy metal music using psychedelic video images constructed entirely using mathematics. Numerical simulations of fluid flow in and around the car are obtained using numerical methods to solve the equations that govern fluid flow. By being creative with the mathematical parameters and solution techniques, some very interesting images and patterns are obtained. In this way the video demonstrates that mathematics can take us places where physics can't.

The second event in the lecture series is set for **Tuesday, Oct. 7**, with Michael Henchman, a chemistry professor from Brandeis University, Massachusetts. ***"Multi-Million Dollar Forgeries Exposed"*** asks: is the Vinland Map the first map of America? Was it drawn 50 years before Columbus to show how the Vikings in 1000 AD first found America? Purchased in 1960 for $1 million, the map is now valued at $25M. Does that make it genuine or could it still be a worthless fake? After 50 years, why do we still have no answer?

What can a scientific detective do today that has not been tried before? This is the contest — pitting scientist against scientist, fake buster against forger. Weapons range from fancy spectrometers to rulers. Is the piece genuine or are we simply too ignorant to recognize the item in question as a fake? That is always the question.

The November event set for **Wednesday, Nov. 5**, features Tom Siegfried, Science Editor for The Dallas Morning News. His discussion topic is ***"Strange Matters: Science Headlines from the 21st Century."***

Science is full of examples of prediscovery — the prediction of new phenomena in advance of physical clues to their existence. Antimatter, black holes, even the expansion of the universe were figured out by physicists studying squiggles on paper before any observer produced real evidence. Scientists have proposed a long list of new strange ideas of things that might be out there — from strange quark matter and invisible stars to new dimensions of space and time.

All Science Series presentations begin at 7 p.m. in the CEBAF Center auditorium. The presentations last about one hour with a question and answer period at the end. The events are free and open to anyone interested in learning more about science. For security purposes during Science Series events, enter at Jefferson Lab's main entrance (Onnes Dr.). Everyone over 16 is asked to carry a photo ID and security guards may perform ID and vehicle checks. For more information, visit http://education.jlab.org/.

Annual JLab Fall Festival set for Oct. 29

JLab employees, users and contractors: Mark your calendars! The Lab's annual Fall Festival will be Wednesday, Oct. 29, from 3-6 p.m. in the field behind the Residence Facility.

"We're planning all the usual Fall Fest activities," notes Dave Williams, JLab Activities Group chair. "Refreshments will be served beginning at 3 p.m. and last until they are gone. We have lots of fun activities planned — a costume contest, a pumpkin toss and the always-popular tug-o-war. Start getting your teams together now!"

"We will need lots of volunteer help to make the event a success," Williams adds. "Volunteers are needed to help with set up, food and beverage service, trash pick up, activity leaders, site clean up, etc. By the beginning of October event flyers will be posted and the volunteer sign up list on the JAG web page will be active." Watch www.jlab.org/jag/ to sign up or for more information.

Safety incident notification procedure updated

An update to Jefferson Lab's safety incident notification procedure went into effect Sept. 2. The update clarifies the procedure for notifying Lab management of safety incidents, including "near misses" that are reportable to the Department of Energy.

Each person at the Lab is responsible for promptly reporting injuries, mishaps and near misses to his or her supervisor and Medical Services. If the supervisor is uncertain whether or not DOE notification is required, he or she should assume that it is reportable and follow the steps posted on the JLab Insider web page, and on the All Staff Memo page at https://www1.jlab.org/ul/apps/news/memo/.

The change is designed to result in improved reporting and better investigations.

JLab hosts Red Cross blood drive Oct.3

The next Red Cross blood drive scheduled to take place at JLab is set for Friday, Oct. 3 from 10 a.m.– 4 p.m. JLab's point of contact for the blood drive is Vicki Barnett, Medical Services. She is currently seeking "Bloodhounds" — volunteers who help get the word out about the blood drive and sign up potential donors.

Blood donors are asked to contact Barnett, ext. 6269 or e-mail vbarnett@jlab.org to set up a donor appointment.

Continued from page 2

JLab programs undergo evaluation...

happen," Murphy emphasized. "There were a few items on the punch list that could have easily been avoided. We can use the audit findings to make JLab a safer work environment — mitigating hazards OSHA found and making good housekeeping an ongoing feature of JLab life."

"Several items noted on the punch list were taken care of during the OSHA inspectors' visit," he added. "Some will be taken care of over the next several weeks. Other items, expensive ones, we'll evaluate for their safety significance before scheduling the mitigation effort. Until the cost estimates are complete and turned in to DOE, we won't know how many of the open items might fall into this high-cost category."

"We believe a few items were incorrectly cited; we won't fix these. In the 'real world' of OSHA regulation, the Lab would appeal those findings and have them removed from the findings."

Small business given start by JLab

Now a $40M company & winning SURA/JLab Disadvantaged Business award

Jefferson Lab recognized Wildflower International, Ltd. as its top small disadvantaged business supplier for fiscal year 2002. The Santa Fe, New Mexico-based business is owned and managed by Kimberly deCastro.

In a reception held Aug. 25 at Jefferson Lab, Department of Energy Site Office officials, senior Jefferson Lab management and procurement specialists, recognized deCastro as the Southeastern Universities Research Association/Jefferson Lab Outstanding Small Disadvantaged Business Subcontractor for fiscal year 2002. Jefferson Lab Director, Christoph Leemann, presented the award to deCastro.

Danny Lloyd, (left to right) JLab's purchasing and small business manager, poses for a photo with Wildflower International, Ltd. business owner and manager Kimberly deCastro and Department of Energy Site Office contracting officer, Wayne Skinner, after the award presentation.

Jefferson Lab purchases Dell computer systems from Wildflower International. The company, a provider of technology, was formed in 1991 and is both HUBZone and 8(a) certified.

The company's first purchase order came from Danny Lloyd, Jefferson Lab's purchasing and small business manager. "I remember this company first coming to me in the early 1990s and asking for an opportunity to 'quote' some of our requirements," Lloyd said. "That opportunity has proven over the years to be very beneficial to both their company and our Lab."

From that supportive beginning, Wildflower has successfully developed its core business with other DOE facilities and national laboratories, according to the company. Wildflower's projected sales for 2003 is $40 million, with more than 85 percent of this business being with DOE management contractors.

Don’t delay! Become a BEAMS volunteer today

JLab’s highly visible, middle-school focused, science education program — BEAMS — is gearing up for its 13th year. And to be successful, the Becoming Enthusiastic About Math and Science program needs lots of volunteer help, says Dawn Pepe, Science Education specialist.

The Science Education staff is preparing for the 2003/04 school year, with the first classes of students set to arrive on Monday, Sept. 22. While here, students participate in a variety of interactive, motivational math- and science-based experiments and activities.

To be successful, the program needs employee and user volunteers to conduct these experiments and activities with the students. “This is a great way to give back to our community,” Pepe points out. “We’re helping to educate tomorrow’s adults. Some may become scientists, some won’t. But research is showing that many of our young BEAMS participants will have a better grasp of the science and technology around them and a deeper appreciation of it all by experiencing BEAMS.”

“The activities are enjoyable and are carried out by the students. A volunteer leads an activity with one of our Science Education specialists in the room to assist,” Pepe explains. “The students enjoy meeting new people and doing new things. They draw a lot of excitement and enthusiasm by being exposed to people with different presentation styles. The activities are designed to help them learn science and math concepts appropriate for their grade level, and provides them with a great deal of positive reinforcement and motivation.”

“Also,” Pepe adds, “volunteer participation in BEAMS is something that may be included on employee performance appraisals.”

She encourages everyone interested in the program to contact her and plan to attend one of the upcoming BEAMS volunteer instruction sessions. “This is a great opportunity to go over the activities and find one that suits your interests or strengths,” Pepe says. “We need volunteers for all of the BEAMS activities.

Instructional Schedule

Training sessions for the Design & Engineering, Magnets & Electromagnets, and Oobleck activities are scheduled for Sept. 24 and Oct. 1 in the Science Education classrooms (VARC, room 72A-B).

10 a.m. Design & Engineering

11 a.m. Magnets & Electromagnets

1 p.m. Oobleck

Contact Dawn Pepe, ext. 7633 or e-mail pepe@jlab.org to sign up for a session or for more information.

ON TARGET

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