September/October 2002

ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

Christoph W. Leemann
Lab Director

Allison Lung
Assistant Director

Kelly Caccetta
Associate Director
Administration Division

Lab's strategic vision sets stage for re-organization: To maximize world-class science, develop capabilities for future

Wise planning and tremendous work over the last 17 years have put Jefferson Lab at the top of its game in the world of (hadronic) sub-nuclear physics research, notes Lab Director Christoph Leemann. "The Lab's science program is coming to fruition and is making significant contributions," he says. "We must be committed to excellent science; after all it is our central business."

But this isn't the time for the Lab to be resting on its laurels. Jefferson Lab faces numerous challenges in the years ahead as it takes its place in the world scientific community and evolves into a unique world-class research facility. The past two years have been a transition phase for the Lab and its highly accomplished and dedicated staff — the first year with Leemann as interim director while potential director candidates were interviewed, and the last 11 months with Leemann officially at the helm. "It's been a very busy year — three Department of Energy reviews and one more later this month. Now that the dust is settling," he asserts, "we need to take stock of our capabilities, focus our efforts and commit to the Lab's vision with specific milestones."

The objective is to enhance and expand our already very good science program by directing our energies toward the short-, mid- and long-term objectives necessary to reach those goals. To position the Lab for the challenges to come and to best capitalize on our scientific and technical capabilities, Lab management has been working with a consultant to develop a management structure and commensurate processes that will allow the Lab to reach its potential.

"My colleagues and I are absolutely committed to producing the best physics possible at this laboratory, now and for the future," Leemann comments. "To make this a reality, we've made some proactive adjustments to the Lab's organizational design." The re-organization and related process improvements are all designed to optimize our productivity in a changing environment, according to Leemann. "We need to do this so we can best meet our current commitments and capitalize on new and future opportunities," he points out. "Bottom line, these changes will help us to enhance Lab operations by putting more into the halls."

One short-term goal of recent management improvements is to gain enough efficiency in the entire system to be able to put 10 percent more beam on target for physics in two years. "It is a measurable goal. I know we can do it," he states. "We're striving for a 12 GeV machine by 2010; and looking even further outward, we envision the possibility of a 25 GeV/Electron Ion Collider operation by 2025.

We and the Office of Science are also concerned about the Lab maintaining its technological edge in superconducting radiofrequency work. This expertise and capability is crucial to the Lab's and the nation's science and technical programs.

The most visible management changes include the creation of an Assistant Director position that will be filled by Hall C staff scientist Allison Lung in mid-November. The short delay

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Larry Cardman
Associate Director
Physics Division

Swapan Chattopadhyay
Associate Director
Accelerator Division

Fred Dylla
Chief Technology Officer

Roy Whitney
Chief Information Officer

Lab undergoes re-organization...

Continued from page 1

in having her move into the newly created role will allow her as the G0 project manager to get that major experiment underway. A new office designated Project Management will oversee all major projects on site; and Claus Rode has been named the Lab's Project Management Officer. Legal Counsel Rhonda Scales now reports directly to the Director, providing more direct access to counsel when needed. Jim Murphy continues to head the renamed Office of Assessment.

The Chief Scientist, Chief Technology Officer, Chief Information Officer and newly created Chief Financial Officer positions all report directly to the Director. An extensive search for a new Chief Scientist has been underway for several months. The position has been vacant since the death of Nathan Isgur last summer. The vacancy has been a concern of Lab leadership, and they hope to soon have it filled as an offer has been made to an outstanding candidate for the position.

Fred Dylla, Free-Electron Laser Program Manager, will continue doubling as the Chief Technology Officer. As CTO, he pursues the creation of new business for the Lab, based on our core competencies. And Roy Whitney, formerly the Administration Division's Associate Director, has become the Chief Information Officer. As CIO, he oversees Management Information Systems (MIS), the High Performance Computing Group (HPCG)/Lattice QCD (Quantum Chromodynamics) program, and Information Resources.

"Too often we find ourselves working repetitively to track down important information, starting from scratch each time; we must do a better job of identifying the information we need in order to make decisions and find ways to have that information accessible when we need it," Leemann comments.

A search committee has been formed to identify potential candidates for the Chief Financial Officer position. The CFO will manage Financial Systems, Financial Processes, and the Lab Budget and Program Support Office. Mark Waite, Business Services director, is currently serving as the Lab's interim CFO.

The Director's Council is charged with pursuing the Lab's larger issues and managing the big picture, while three newly instituted working groups take care of, and make decisions pertaining to daily business: an Operations Committee that will look at all areas of Laboratory operations headed by Swapan Chattopadhyay and Andrew Hutton; a Science Program Committee headed by Larry Cardman; and an Infrastructure Committee to handle administrative and plant infrastructure issues.

At the Division level, Larry Cardman remains the Physics Division Associate Director and Dennis Skopik stays as his Deputy Director. Swapan Chattopadhyay continues as the Accelerator Division's Associate Director, and he will appoint a deputy. Former Human Resources and Services Manager Kelly Caccetta is the new Associate Director for the Administration Division, with Mark Waite, appointed as her Deputy.

The Director's Council has developed the roles and responsibilities for each of these positions, and is in the process of developing the list of deliverables each person is responsible for. "Most aspects of the re-organization went into effect Oct. 9, but please bear with us as we make minor adjustments necessary in its implementation," Leemann comments.

"This re-organization will allow each of us to better meet the challenges and opportunities before us today: to do great science, run an outstanding laboratory, and meet DOE and our users' needs," the Director explains. "But just as important, it is also laying the groundwork for us to do a better job of developing and carrying out the Lab's strategic plan. It is vital for DOE, the health of the Lab, the science we are producing, and our diverse user community that we have a well thought out long-range plan and that we are positioned to implement it. I look forward to discussing this and other Lab topics with you."

New organizational charts and other information pertaining to the re-organization are posted throughout the JLab web site.

From the Director

Christoph Leemann
Jefferson Lab Director

Re-org needed for Lab to survive, thrive in today's dynamic world

Jefferson Lab is a unique institution, unique in its facilities and the cutting-edge research capabilities it offers the international scientific community, and extraordinary in the quality, commitment, and enthusiasm of its staff. JLab also faces unprecedented challenges in today's volatile and highly dynamic world, characterized among other things by fierce competition for research funds, ongoing pressure on the support available to physical sciences, and therefore close scrutiny and difficult choices within the physical sciences.

Not only to survive but to thrive under these conditions calls for extraordinary efforts. When I talk of success I mean being able to realize our vision of JLab as the world's leading institution in the field of hadronic physics, as the R&D provider of choice in such key technologies as rf superconductivity, as an asset for education and economic development in our region, and as an employer of choice for highly talented and educated people. To succeed in this sense calls for many things, most importantly: close and coordinated cooperation with and service to the Department of Energy's Office of Science; the careful, ongoing cultivation of our relations with the Lab's many stakeholders, particularly our users; close alignment and joint building of key relations with SURA; and of central importance, sustained high performance of the Laboratory.

The realization and completion of many of our objectives, such as the explanation of quark confinement with 12 GeV experiments, will be beyond my tenure as Lab Director; but the likelihood of success, the quality of the organization ultimately entrusted with these accomplishments depends on the steps we take today. With that outlook in mind I am committed to do my utmost to bring about the success factors I have outlined above. Among those most directly under our control, and most directly the responsibility of Laboratory management at all levels is the component of Lab performance.

By this I mean, the capability of an enthusiastic staff working in a community valuing our presence to produce safely, securely, and ever more cost-effectively, the highest quality science and technology possible. Currently, Jefferson Lab and its users produce marvelous physics of the highest quality, and they provide us with strong reasons to be proud and with paradigms of excellence to be emulated in all our endeavors.

With this goal of enhanced performance, I have retained Charlie Duke a respected and experienced R&D manager in his own right, to work with Laboratory leadership to take a look at ourselves, to take up again the quality journey, and to put us on a path of continuous improvement. Charlie has based his work on an extensive assessment of the Lab, to which many of you have contributed through your frankly expressed comments, observations, judgments, and thoughts. As an outcome, Lab leadership has redefined, and will continue to redefine at levels of greater detail its work processes. As a consequence, you should see in the future, better and faster decisions, clearer assignments, more knowledgeable assessments, less buck passing, and above all stronger, clearer, and more clearly visible commitment to the agreed upon high-priority Lab deliverables and desired outcomes. Your work life will in many ways become simpler and easier. Don't be surprised though, if you'll also encounter increased demands on your commitment and performance.

I am strongly committed to a participatory style of management and we have reaffirmed amongst the leadership this choice that enhances empowerment and accountability. We have clarified our decision-making process and when you hear that the Director's Council has decided something you'll know that all members agreed, none objected, and all have committed to the decision's communication, implementation, and if necessary, enforcement. We have clarified the concept of commitment, and you'll encounter it down the road; the concept of signing up without reservation to accomplish what one has agreed to accomplish. Talent, education, and commitment are great and are very important ingredients, but without the appropriate systems and organization they can be utterly frustrated. In my assessment, we have as an organization an opportunity to improve significantly many of our processes, and to this end we have developed and modified our organizational structure. We have re-examined and clearly spelled out roles and responsibilities, and have defined for the organization and its key leaders' deliverables, in concrete, measurable, and tangible objectives and outcomes.

GLUE X CITATIONS PERIMENT

Groundbreaking science anticipated from proposed experimental hall

by James Schultz

A certain kind of physics research might be compared to rummaging at night, blindfolded, in a windowless basement trying to find a treasured family chest wherein lies a rumored heirloom. Is the heirloom an antique? A collection of hundred-year-old jewelry? A gold ingot? Coins or paper money? No one will know until the chest is opened.

With the proposed 12 billion electron volt (12 GeV) upgrade to Jefferson Lab's accelerator, the construction of a new experimental hall, Hall D, and the installation of an experiment known as "GlueX," researchers hope to do the equivalent of finding an inherited treasure. Only in this case, the prize is expanded knowledge of the properties of quark-antiquark pairs and the subatomic "glue" that hold both together. By taking advantage of a more powerful electron beam, in concert with a new GlueX/Hall D detector, physicists hope to shine a metaphorical light into the darkest of subatomic corners.

In particular, experimentalists will be looking for particles known as exotic hybrid mesons (unlike the electron that acts like a point particle, mesons have structure more like an atom, consisting of a quark and antiquark, while protons and related particles known as baryons contain three quarks). Researchers expect these exotics to result when GlueX's specialized equipment produces a beam of polarized photons, which in turn will affect the mesons' constituent quarks, the subatomic particles thought by many scientists to be the basic building blocks of all matter. The hybrids will be produced as the photon beam intersects with the quarks and the force-carrying particles known as gluons that hold the quarks together.

"You can pull out an electron. You can pull out a proton," says Alex Dzierba, Hall D spokesperson and professor of physics at Indiana University. "But no matter how hard you hit a quark, you can never pull it out of a meson or a baryon. That phe-

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GlueX/Hall D spokesperson Alex Dzierba (left), Indiana University, and deputy spokesperson Curtis Meyer, Carnegie Mellon University, take a break while participating in JLab's Institutional Plan Review held in August.

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nomenon is called confinement. One of the challenges of the theory known as quantum chromodynamics, or QCD, is to quantifiably explain why quarks can't be individually extracted."

What is the mechanism of confinement? Theory strongly suggests that the force-carrying gluons between a quark and anti-quark in a meson are confined in a cylinder-like structure that leads to a kind of string, known as a "flux tube," that connects the quarks. Calculations show that the forces along the flux tube are enormous, about 16 tons. Unlike the electrical force or gravitational force, the flux-tube force remains constant as the particles move farther apart. In ordinary mesons the string is taut, and when "plucked" or struck by an energized beam, it vibrates, creating a new family of mesons, some of which have properties that ordinary mesons cannot possess. The signature of such mesons is unique, with properties dependent on the details of the flux tubes. The experimental details of these new mesons will be crucial for theorists, as they test their picture of the confinement mechanism.

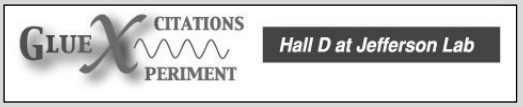
"The most fundamental question right now in understanding quarks and gluons is why and how they're confined. It's at the heart of understanding how the constituents of matter interact with one another," Dzierba says. "We want to learn in detail about the character, the properties of the flux tube. It's the flux tube that's responsible for this confinement mechanism."

At current beam energies, the proposed GlueX/Hall D experiment wouldn't be possible. Although unique research has been and is still conducted in Halls A, B and C, the upgrade will enable scientists to push beyond what they've already learned. In order to accomplish that, says Dzierba, the proper equipment must be designed, built, installed and commissioned before research can begin.

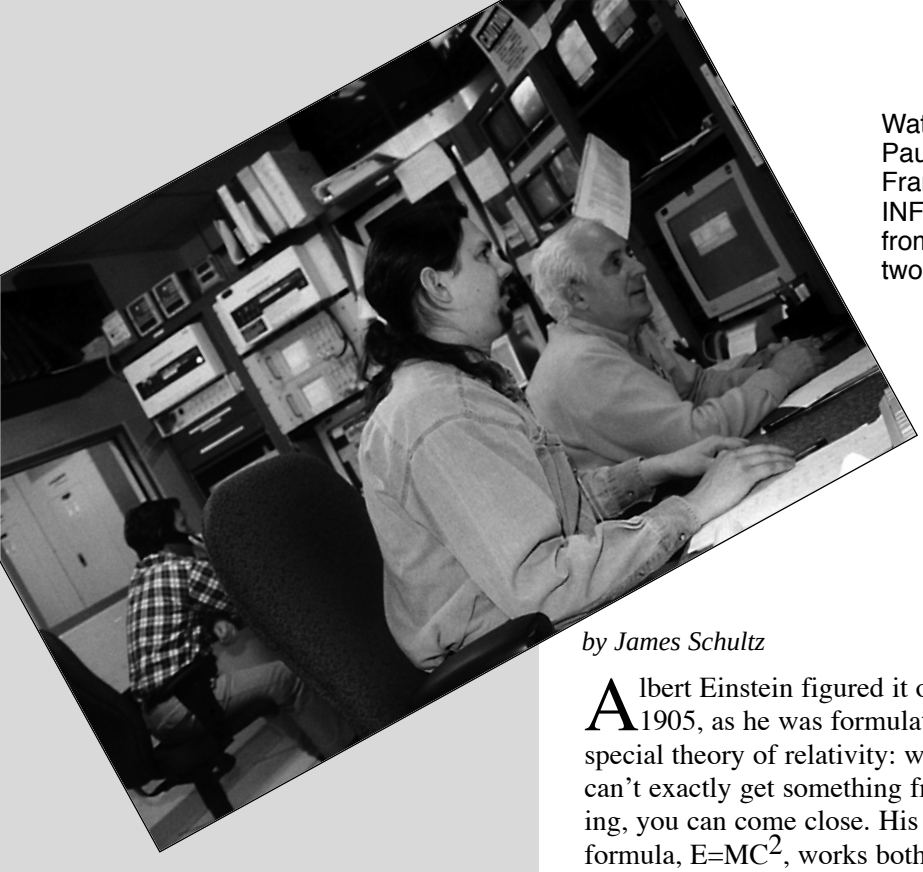
"Outside and inside the Lab, people believe the opportunity exists to do new physics. That's going to require the building of a new hall, with a new beamline and a new kind of detector," he asserts. "That's the key to the GlueX/Hall D program. The reason we haven't seen this new family of exotic hybrid mesons is because we've been using the wrong kind of probe. There's a smoking gun signature. We think we'll actually be able to detect a new form of matter."

One hundred collaborators from 25 institutions and six countries are involved in the GlueX/Hall D effort.

The 12 GeV-upgrade project supports groundbreaking physics endorsed by the Department of Energy's Nuclear Science Advisory Committee. The upgrade is one of the four major recommendations endorsed by the NSAC in its Long Range Plan for Nuclear Science, published in April 2002.



www.gluex.org



Watching data roll in during the experiment's run are Paul King (foreground), University of Maryland, and Franco Garibaldi, INFN-Rome, while Mauro Iodice, INFN-Rome, talks with a collaborator over the phone from the Hall A control room. Garibaldi and Iodice are two of the other spokespersons on the kaon experiment.

Hall A

Successful experiment examines how energy becomes matter

by James Schultz

Albert Einstein figured it out by 1905, as he was formulating his special theory of relativity: while you can't exactly get something from nothing, you can come close. His famous formula, $E=MC^2$, works both ways. Just as matter can be converted into energy, so too can energy become matter.

That's just what five dozen researchers were counting on with a Jefferson Lab experiment in Hall A that used the Lab's electron beam and a liquid hydrogen target to bring to life an unusual particle known as a kaon. The kaon's unique structure could prove of great help to cosmologists, who should be able to use the results of experiments like the Hall A effort to develop structural models of stellar objects made up of exotic, or "strange" matter, matter that includes kaons as part of their own subatomic architectures.

Preliminary findings indicate that kaon production results from the interactions of the particles of light known as photons. The photons create more than just kaons, however. They also produce other particles, known as lambda and sigma, with their own distinctive quark structure. All arise from a constantly churning sea of "virtual" particles that can't exist until bumped by a jolt of energy such as that provided by the Lab's accelerator.

"When these things get produced, we're trying to understand how they're made," says experiment co-spokesperson Pete Markowitz, associate professor of physics at Florida International University in Miami. "And: what do they look like? We're trying to come up with a detailed picture of how quarks 'live' in the nucleus."

The first challenge confronting the Hall A researchers in their experimental run that concluded this past March was to actually make enough of the rare, fleeting particles. The task was a difficult one, considering that kaons contain a matter-antimatter pair of an "anti-strange" quark and one "up" quark (quarks are thought by many scientists to be the basic building blocks of matter). Should a particle of antimatter collide with one of normal matter, both particles are instantly converted to energy, a process that doesn't lend itself to easy observation.

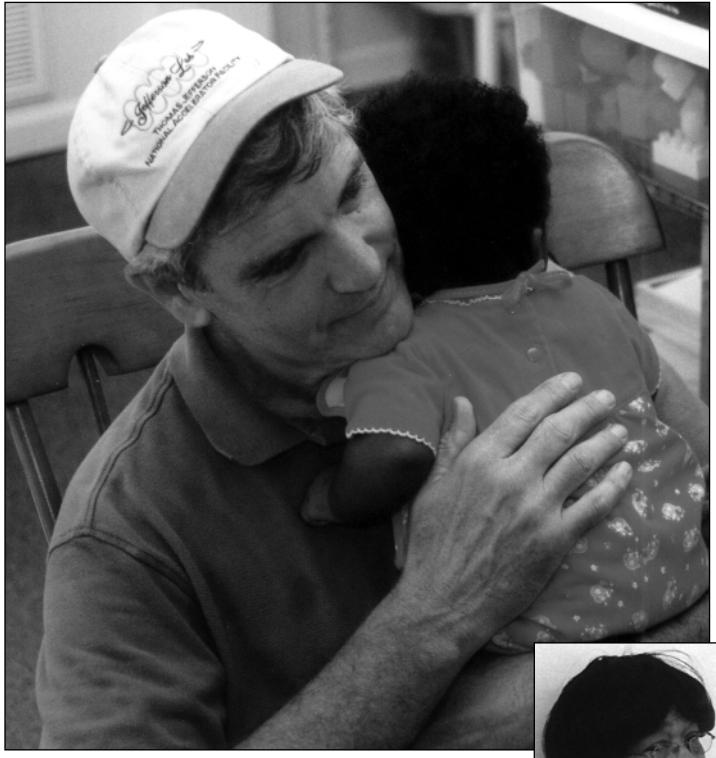
The Hall A scientists succeeded in making enough kaons for long enough to be able to probe the particle's internal details. In essence, the researchers "paid" for the kaon-constituent quarks to come into existence by using the electron beam's energy. "We created a kaon essentially out of nothing by giving it a jolt of energy," Markowitz says. "Then our job was to measure the properties of that creation. We wanted to determine which parts of the kaon are quark-like. We'd like to identify exactly how kaons get made. What description, theoretically speaking, is the most appropriate?"

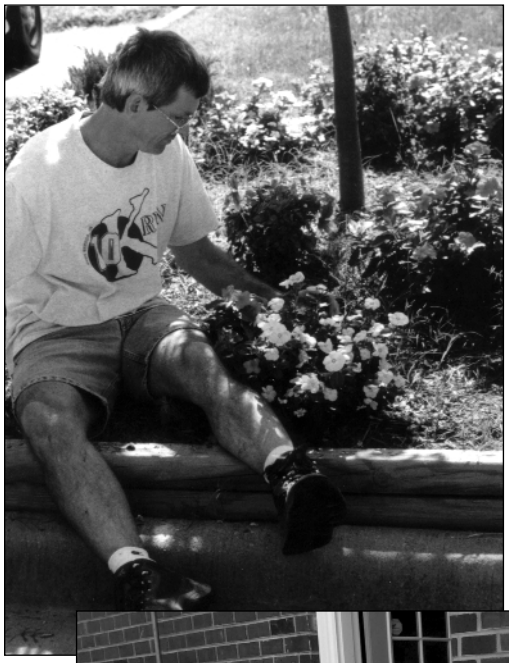
Planning for the first kaon experiment began in 1993 when Markowitz first conceived the idea. A follow-on investigation that will study another strange-matter particle, known as a hyperon, is scheduled for 2004 and will involve a team of up to 80 researchers, most of whom worked on the kaon experiment.

"[The hyperon study] will be the first time in history that people will be able to see what's going on, and at high resolution," Markowitz says. "We'll be creating a new form of matter. I'm really excited about this experiment."

Day of Caring

20 Lab staff spend day helping out at Menchville House





Bruce Ullman (top left, clockwise), calms a little one while Carol James gets another infant to take a nap. Greg Arnold mows the lawn, while Dawn McGinnis (on left in photo) and Brian Carpenter handle a painting project, and Christopher Slominski weeds a flower bed. Twenty Lab employees gave their time on Sept. 12 at Menchville House, a shelter that assists women and children in need. Lab staff helped with babysitting, child care, lawn and landscaping work, painting, window washing and basic house maintenance tasks.

Capturing Stardust!

Area teachers embark on scientific adventure

Carlos Salgado (l.to r.), Norfolk State/JLab, poses for a group photo with the teachers participating in the laboratory portion of the Frontiers of Astrophysics workshop. Teachers include Lester Wright, Meherrin High School; Diana Scofield, Bayside H.S.; David Scanlin, Crestwood Middle School; Cameo Slaybaugh, SECEP; and Michael Knapp, Hickory H.S.

Late this summer Jefferson Lab's Experimental Equipment Lab (EEL) opened its doors to a group of teachers participating in a workshop designed to enhance their knowledge and teaching skills of astronomy. But, for that group, the experience wound up being a whole lot more.

The first part of the Norfolk State University/NASA workshop — Frontiers of Astrophysics — started in mid-July and included classes covering the fundamentals of cosmology, particle physics and the latest NASA astrophysics missions. The second part, which was held at JLab, involved developing practical classroom activities. Here, under the guidance of Carlos Salgado, Norfolk State University associate professor and joint JLab scientist, the group embarked on an adventure none of them had been on before.

Huddled intensely over their work in the depths of the EEL, they built and tested their very own cloud chambers. Their goal: to "see" cosmic rays — those "invisible" particles coming from the sun, and the depths of outer space — that bombard us, every minute of every day. "We studied cosmic rays during the classroom portion of the workshop. Now being able to see them is amazing," exclaims Cameo Slaybaugh, a SECEP teacher from Suffolk. "It's like we're watching a miniature meteor shower. This experience will be great for students," she beams, the thrill and excitement of the experience visible on her face.

"We're interested in bringing this to our students, but we're equally excited about sharing what we've learned with other K-12 teachers," the teacher of nine years adds. "The more teachers we can share this experience with, the more students will benefit."

Michael Knapp, Hickory High School, Chesapeake, points out, "This is a great way to teach science; it will be a great addition to my science lessons. With these cloud chambers the students will be able to experience science while it's happening. This workshop has been very helpful. It laid the groundwork for developing demos that get concepts across. Activities like the cloud chamber will allow us to share the latest discoveries in astronomy with our students."

The group worked methodically, and as with most scientific research, was driven by both success and failure. Their first venture into building cloud chambers or simplified cosmic ray calorimeters thrilled them as they witnessed the fleeting vapor trails created by cosmic particles racing through the super-cooled rubbing alcohol atmosphere inside the cloud chamber. However, the adhesive holding the floors and sides of their chambers did not withstand the rubbing alcohol and/or the cryogenic temperatures of

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the dry ice needed to cool the atmosphere inside the chambers. The box-shaped containers fell apart.

In light of their adhesive problems, Lester Wright, Meherrin High School, Newsomes, comments, "Hands-on activities like this demonstrate how to follow scientific method; and to persevere when things don't go right the first time. Just because something doesn't work, the students must not assume it is wrong."

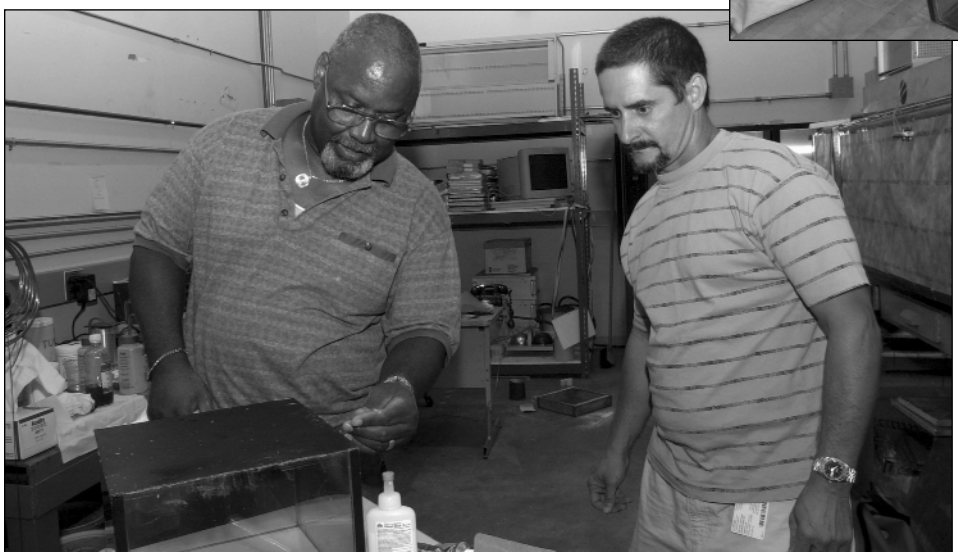
In addition to teaching perseverance, says David Scanlin, Crestwood Middle School, Chesapeake, activities like this bring the excitement of discovery to the students. "If I'm excited, the students will be excited and enthusiastic. An activity or experiment takes the lesson out of the book and puts it into the students' hands."

The workshop was designed to introduce K-12 science teachers to the world of modern astronomy, how to teach it, and how to develop practical classroom activities, according to Salgado. It was sponsored by Norfolk State University, with funding coming from a three-year grant from NASA's Office of Space Science. Norfolk State is working to increase the region's knowledge and interest in astronomy. It is setting the stage for developing an astrophysics program within the university's physics department.

In addition, Salgado adds, providing teachers with current knowledge in the field, and helping them develop interesting hands-on activities will also help students better handle astronomy material on the state's Standards of Learning exams.

"Getting the teachers excited about astronomy and astrophysics is the first step," Salgado explains. "Right now Norfolk State is recruiting K-12 teachers who will be able to transmit their excitement and knowledge to students. NSU is also giving planetarium shows, hosting school-group field trips and taking our traveling telescope off campus so we can expose a larger audience to the wonders of astronomy and astrophysics."

"This [astrophysics] has a very real connection to Jefferson Lab because both specialties are tracking and researching the smallest of particles," the program's principal investigator continues. "Building cloud chambers to 'view' or detect cosmic rays is a good example of how the two areas cross over."



David Scanlin, Crestwood Middle School, and Cameo Slaybaugh, SECEP, share their excitement at seeing cosmic rays, while rebuilding their cloud chambers.

Lester Wright (left), Meherrin High School, and Michael Knapp, Hickory High School, try a new adhesive while rebuilding a cloud chamber.

Briefs

Milestones
for August 2002

Hello

Ravi K. Anumagalla, Physics Design Engineer, Physics Division

Debra L. Brand, Capital Projects Manager, Administration Div.

Dawn M. Pepe, Science Education Administrator, Director's Office

Julie Roche, Post Doctoral Fellow, Phy. Div.

Timothy B. Southern, Accelerator Operator, Accelerator Div.

Goodbye

Ian G. Bird, Computer Center Manager, Phy. Div.

Kyungseon Joo, Hall B Post Doctoral Fellow, Phy. Div.

Maria-Ioana Niculescu, Hall C Post Doctoral Fellow, Phy. Div.

Stella T. Parker, Payroll/Fixed Asset Supervisor, Admin. Div.

for September 2002

Hello

Ellen W. Dawkins, SRF Assembly Technician/Quality Assurance, Accel. Div.

Michael D. Dickey, SRF Assembly Technician/Inventory Management, Accel. Div.

George T. Fleming, Post Doctoral Fellow, Phy. Div.

David J. Gaskell, Experimental Physicist, Phy. Div.

Glen A. Warren, Post Doctoral Fellow, Phy. Div.

Goodbye

Thomas A. Hassler, Emergency Management Manager/Accel. Reliability Statistics, Accel. Div. retired from fulltime status

Congratulations

John Hansknecht, Laser/Electronics Associate, Accel. Div., upon earning an A.S. degree in Science from Thomas Nelson Community College. Hansknecht earned the degree while participating in JLab's tuition assistance program. He has completed 72 credit hours since enrolling in the program in December 1998, and has maintained a grade point average of 4.0.

In Memoriam

Former JLab employee David (Dave) R. Saunders, and father of Rebecca J. Saunders, died Sept. 29. He was 54.

He joined JLab in 1988 after leaving Duke University. He started in the Physics Division and was soon heading up the new Stockroom, which he was instrumental in organizing. At that time the Stockroom consisted of several transportainers inside the Test Lab. From there he joined the Tech Shop and worked on the construction and calibration of the radiofrequency control modules. This work led to Dave becoming a member of the RF group during the accelerator's early commissioning and operation.

At the beginning of the Free-Electron Laser project he worked on the Injector Test Stand. Along with a handful of co-workers, he was instrumental in installing the RF equipment and controls in the test cave for the ITS.

He then went on to work with the High Power EE group where he was involved in the installation and commissioning of the FEL magnet power supplies and the 6 GeV accelerator power supply upgrades. He left the Lab in October 1998.

Dave enjoyed stock car racing and was an avid auto mechanic and boats man. Arrangements were handled by W.J. Smith and Son Funeral Home in Newport News.

Lab Employment Office introduces RecruitMax

The JLab Employment Office introduces its new employment system — RecruitMAX.

RecruitMAX is a 100 percent web-based employment software application that will streamline the employment process. The system will benefit the Lab through timesaving and enhanced efficiency; and will be particularly beneficial to Lab hiring managers and administrative staff. Internal and external job candidates will be able to submit and update their own resumes on-line, as well as, conduct searches of JLab position vacancies using keywords, job title, or category. Lab hiring managers will be able to submit Recruiting Authorizations and receive division approvals on-line, and receive candidate referrals via e-mail.

The new system will generate acknowledgements to all candidates who apply, automatically post new job vacancies to the JLab web page, maintain candidate and job status/history information and provide keyword search capability.

RecruitMAX has been specially customized to meet the needs of Jefferson Lab; and will automate a significant portion of the employment process without changing it. For more information, contact the Employment Office at ext. 7598. Visit the JLab Job Hot Line on the web at www.jlab.org/jobline/.

BEAMS succeeds with efforts of volunteers

Jefferson Lab's Science Education program needs your help, according to Lisa Surles-Law, Science Education specialist. "With a new school year underway, the Lab's Becoming Enthusiastic About Math and Science education program is up and running," Surles-Law comments. "And for it to continue being the success it has been, we need the help of Lab employees and users."

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Participation in BEAMS requires employees or users to volunteer an hour of their time to do a hands-on activity with a class of students, the education specialist explains. Following is a list of the activities and a brief description of each:

- Cold Stuff: Students investigate different materials to determine which makes the best insulator.
- Design and Engineering: Students work in teams to design and build aluminum foil boats, and test them to determine which one(s) will carry the most cargo.
- Electrostatics: A Van de Graaff generator is used to study charges and electricity.
- Hot and Cold: Students observe the effects of temperature extremes.
  Magnets and Electromagnets: Students construct and test the strength of an electromagnet.
- Microscopes: Students observe objects using microscopes.
- Oobleck: Students explore the properties of a strange substance.
- Role Model Visits: Students visit offices to learn about Lab employees and their careers.
- The Shape of Things: Students determine the shape of a hidden target.
- The Slow Bike Race: Students compute the speed at which they rode a bike.
- Tangrams: Students determine the area of an odd shape.
- Bridges: Students build bridges and test them to determine which one(s) will hold the most weight.
- Work and Power: Students build a machine that does work; then they calculate the power that was generated.

Individuals wishing to get involved in BEAMS may contact Surles-Law by calling ext. 5002 or e-mailing surles@jlab.org to observe any of the activities in action. BEAMS involves mostly 6th, and some 7th and 8th grade classes. For a glimpse at the full range of JLab's Science Education programs (K-12 and college level) that need volunteer help, visit the bulletin board next to the first-floor auditorium entrance in CEBAF Center.

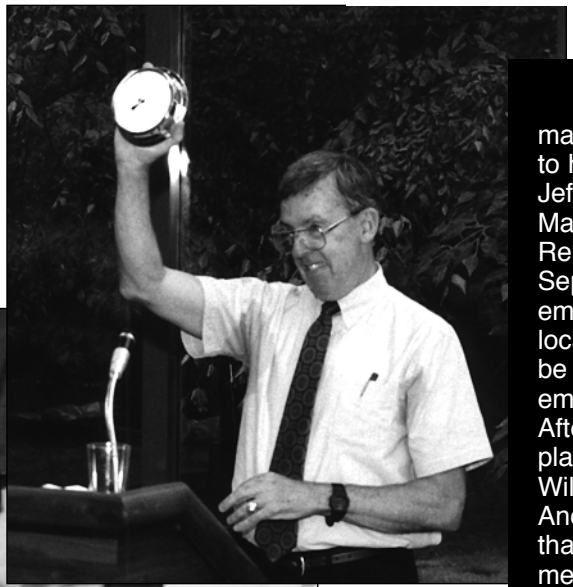
Promptly report all work-related injuries

Several recent on-site mishaps resulting in injuries to JLab staff members were not promptly reported to their supervisors or Medical Services, according to Carter Ficklen, Environmental, Health and Safety Reporting Office manager.

"Reporting injuries promptly to your supervisor and Medical Services is each individual's responsibility as a JLab staff member, Ficklen emphasizes. "The consequences of several relatively minor injuries incurred so far during 2002 were made worse by the failure to promptly report them and receive proper medical attention."

Staff members may get more detailed information on work-related injury reporting by reading the information brochures located at the First Aid cabinets around the Lab. For additional information check Chapter 6830, Medical Management of Occupational Injuries and Illnesses, in the Jefferson Lab EH&S Manual or call Medical Services at ext. 7539.

Happy Semi-Retirement, Tom Hassler!



Dozens of Lab staff, and local emergency management specialists gathered on Sept. 26 to honor Tom Hassler for 15 years of service to Jefferson Lab. Tom, the Lab's Emergency Management manager and Accelerator Reliability statistician, retired from the Lab on Sept. 30 and returned on Oct. 1 as a casual employee. He will represent the Lab on two local emergency management committees, and be available to help with special projects in emergency management and time accounting. After work hours he is leading a team that is planning to build a new church facility near the Williamsburg-James City County courthouse. And his wife, Ellen, has a long list of activities that have been on hold awaiting Tom's "retirement." Far left: staff signed a specially made "Super Doppler Tom" poster recognizing Hassler's work as the Lab's emergency manager. Above: he shows off one of his many retirement gifts. For Hassler's reflections on 15 years at JLab, visit the On Target archive web page.

Fall Science Series

JLab adds three popular events to schedule

Three popular presentations have been added to JLab's Fall Science Series schedule.

On Wednesday Oct. 23, Sean M. Carroll from the University of Chicago's Center for Cosmological Physics, brings to the Lab his discussion of "Dark Energy and the Preposterous Universe." A variety of observations have led cosmologists to conclude that the universe is dominated by a mysterious form of "dark energy" (in addition to the well-established "dark matter," which now seems prosaic by comparison). Carroll will give an overview of the theoretical proposals for dark energy and the observational constraints, which any model must satisfy. This dynamic, young professor, who is also a member of NASA's Structure and Evolution of the Universe Roadmap Tea, gives his special presentation at 4 p.m. in the CEBAF Center auditorium.

Then internationally known physicist and Jefferson Lab's Interim Deputy for Science Frank Close comes to the Lab on Wednesday, Nov. 6. Beginning at 7 p.m. in the CEBAF Center auditorium, he will take his audience on an exhilarating tour of the subatomic world with his presentation: The Particle Odyssey, which is based on his new book "The Particle Odyssey: A Journey to the Heart of Matter," written by Close, with Michael Marten and Christine Sutton.

Many of the images he will show are from the book, which has been cited as having more than 100 of the best particle "event" photographs ever taken. These images — often considered mysterious, abstract and beautiful — track subatomic particles as they speed, curve, dance, or explode through cloud and bubble chambers, stacks of photographic emulsion, and giant multi-element detectors. He describes the history of experimental particle physics: its origins in the discovery of X-rays in 1895; the dissection of the atom; the unexpected revelations of cosmic rays; the discovery of quarks and the rise of the "standard model" in the last part of the 20th century. He will also look at the questions physicists face today: Where did antimatter go? What is dark matter? Can there be a theory of everything?

The third event added to the schedule is the Expansion of the Universe by Lawrence Berkeley National Lab Scientist Michael Levi. He will be featured at 7 p.m. on Monday, Nov. 11, in the CEBAF Center auditorium. Levi is a major participant in SNAP, the Supernova/Acceleration Probe program, studying the dark energy of the universe.

The events are free and open to the public. They last about one hour and end with a question and answer period. For security purposes during Science Series events, enter at the Lab's main entrance (Onnes Dr.).

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