July/August 2001

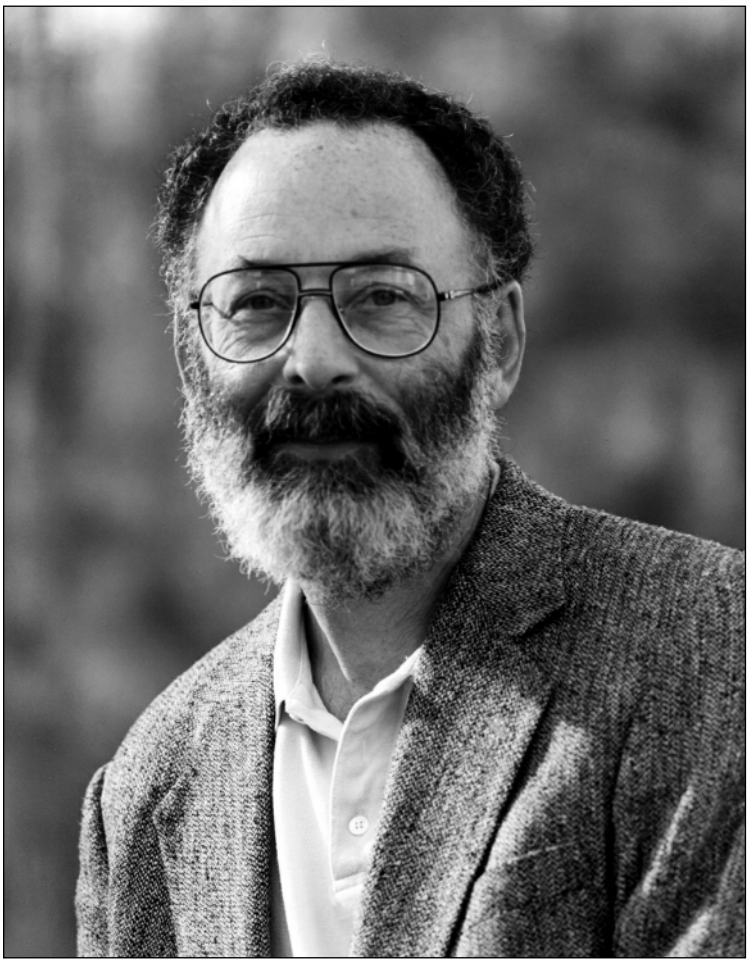
# ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY



## *FEL reaches 2.25 kW*

On July 5 the Free Electron Laser achieved a new record. The laser in the vault reached 2.25 kilowatts. Power at the end-of-line power meter measured 1.48 kW. The previous FEL best in the vault was 1.72 kW.



Nathan Isgur
1947-2001
Jefferson Lab Senior Theorist,
Chief Scientist and Theory Group Leader

*"Nathan defined new directions for our experimental program, particularly with his famous question: 'Where's the Glue?'"*

-- Christoph Leemann

Nathan Isgur died July 24 after a long and valiant battle with multiple myeloma, a rare cancer of the bone marrow.

Born in South Houston, Texas, on May 25, 1947, Nathan was raised and educated in South Houston, and it was there his interest in science was born. A 1964 hometown newspaper clipping describes Nathan's participation in a junior science trainee program in Biomedical Sciences at the University of Texas. There he learned how to operate and program a computer. That fall he entered the California Institute of Technology in Pasadena, intending to major in molecular biology.

Nathan loved the outdoors, and enjoyed hiking and white water canoeing. As a result of desert hikes with Richard Feynman and Max Delbrook, two well-known Nobel scientists, he had a chance to learn first-hand that discussion did not suffice, that it took hard work, too. Exposure to the Feynman Lectures, Feynman himself, and a poor memory for chemical names led Nathan to switch to physics, in which he earned his Bachelor of Science degree in 1968. Nathan went to the University of Toronto for his Ph.D., which he obtained in 1974, and was appointed a member of the Toronto faculty in 1976. He was a superb teacher and lecturer and many of his undergraduate and graduate students now have faculty positions at U.S. and Canadian universities.

While at Toronto he collaborated with Gabriel Karl of the University of Guelph on the physics of baryons in the quark model. The (Quantum Chromodynamics) QCD-improved quark model for baryons was very successful and is still the benchmark for baryons.

On various leaves at Oxford, Nathan collaborated with Jack Paton, on flux-tube models for gluons in hadrons. Their model made predictions for new excited hadrons involving gluonic excitation; investigating these

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(At right) At a meeting in 1993, (l. to r.) Florida International Univ. president Modesto Maidique; Hermann Grunder, then JLab director; Nathan Isgur; Dennis Barnes, then president of SURA; and Warren Buck, then Hampton University joint professor take a moment to discuss the Memorandum of Understanding for bridged faculty positions at Florida International Univ. (Photos: top, l.) Nathan and wife, Karin at Hermann Grunder's Virginia Scientist of the Year dinner in 1998. (Top, c.) John Domingo, Nathan, and Warren Buck enjoy lunch on the CEBAF Center deck, the day of the deck dedication in May 1992. The deck was one of Nathan's most favorite spots at the Lab. (Top, r.) Nathan whitewater canoeing. (photo by Cameron Hayne)

*"Nathan could take an extremely complicated phenomenon buried in mathematics and extract a core idea. He had the special ability to translate complex scientific concepts into terminology that nonscientists could understand and appreciate."*

-- John Domingo

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predictions is a major motivation for the proposed Hall D experimental program. In another notable collaboration with Chris Llewellyn Smith, the applicability of perturbative QCD to exclusive processes was discussed.

Nathan's most celebrated work was with Mark Wise, one of his former undergraduate students who is now at Caltech. They studied semi-leptonic decays of heavy mesons, with charm or beauty quarks; this led to the discovery of heavy quark symmetry in QCD. This symmetry, which becomes exact in the limit of infinite quark mass, allows an economical description of many heavy meson decays. Two of their seminal papers each have more than a thousand citations on the SPIRES database at SLAC, and appear on Stanford's international list of "all-time top-cited high-energy physics articles." Their discovery also led to the award of the American Physical Society's J.J. Sakurai Prize in the spring of 2001 to Isgur, Wise, and Voloshin.

In 1990, Nathan moved from Toronto to Jefferson Lab to assume leadership of the Theory Group. He was attracted both by the opportunity to build a new theory group, and to play a role in guiding the experimental program of the new facility. Simultaneous with his appointment at the Lab, he joined the faculty at the College of William and Mary and was honored as a Governor's Distinguished CEBAF Professor.

At Jefferson Lab, Nathan initiated a program to strengthen ties with the local and regional nuclear physics groups. Through joint appointments with local universities, he was able to double the number of positions in the Theory Group; following this success, the Lab extended the approach to joint experimental appointments. Nathan also instituted a program of bridged positions, which allowed universities to recruit bright young nuclear physicists for positions a few years before the incumbents retired. These two programs resulted in more than 60 new nuclear physics faculty positions in the southeastern U.S. He devoted a great deal of effort to these programs and

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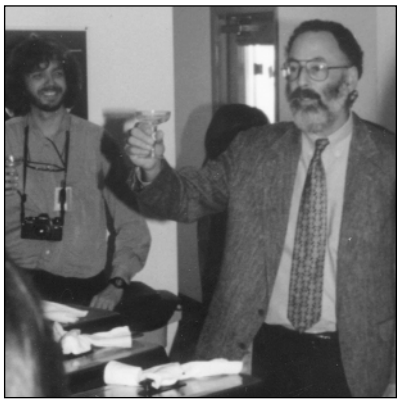
(At right) During his 1994 visit, Nathan (l.) and John Domingo (r.) explain to then Gov. of Virginia George Allen, how spectrometers work. Gov. Allen left much informed! (Photos: top, l.) Nathan commenting at the Hall B, ODU Drift Chamber Delivery ceremony in 1996. (Top, c.) During the Institutional Plan Review tour in 1993, Martha Krebs, then Director of the DOE Office of Energy Research, signs a cryomodule as then Accelerator Division AD Christoph Leemann and Nathan watch. (Top, r.) Nathan announces the T-shirt design winner at the 1998 Run-A-Round.



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was very pleased when they were imitated elsewhere.

He also initiated a popular mini-lecture series at the Lab on theory, where only students and experimentalists could ask questions, not the theorists in the audience.

Nathan was very effective at expressing new physics ideas in simple terms. He had a popular lecture series at the Lab whose culmination was a lecture called "Why Physicists Don't Act Normal." This ability, as well as his skill in creating enthusiasm for physics within the non-technical audience, was a great asset in discussions with policy makers and funders. In recognition of his contributions, Nathan was appointed Chief Scientist of the Lab in 1996.

When Nathan was diagnosed with his illness, he started to publish at an accelerated rate. He published some 10 papers in refereed journals over the last four years, and left about seven preprints in the process of publication. During his last two years at the Lab, Nathan established a collaborative Lattice QCD effort with MIT. This involved the addition of two new staff members to the Theory Group as well as substantial prototype computing hardware. He was committed to assuring a bright future for the Lab's experimental program through his efforts on behalf of the 12 GeV upgrade project and the proposal for a new experimental facility (Hall D) to search for exotic states involving gluonic excitation.

He was a Fellow of both the American Physical Society and the Royal Society of Canada and received many honors both in Canada and the U.S., including the Steacie Prize, the Herzburg Medal, and the Rutherford Medal.

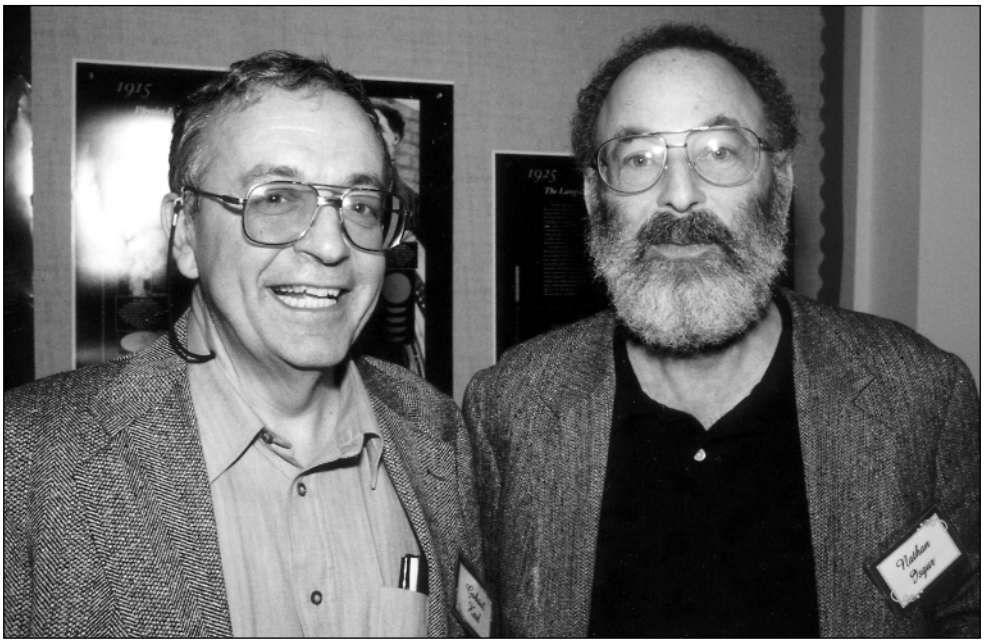
His wife, Karin Bergsagel, and his sons Bram and Ben survive him. Loving father, husband and brother, outdoorsman, quietly passionate man, brilliant scientist, eloquent teacher, and internationally recognized theorist, Nathan was many things. Those who knew him have lost a very special friend and Physics has lost a great leader and teacher.

*Gabriel Karl*
*University of Guelph*

*John Domingo*
*Jefferson Lab*

## Memorial set for Sept. 17

All friends, colleagues, associates and co-workers are invited to join the Isgur family in a celebration of Nathan's life, passions and achievements at the College of William & Mary University Center auditorium at 5:30 p.m. on Sept. 17. A reception will follow at the W&M Alumni House. Maps and directions are on the Web at www.jlab.org/Isgur/directions.html/.



(Above) Gabriel Karl and Nathan at the December 1999 SURA Recognition Ceremony acknowledging Nathan's contribution to JLab's science program. (Photos: top, l.) Nathan during a break at the Chiral Dynamics Workshop in July 2000. (Top, c.) Nathan and then Accelerator Division AD Christoph Leemann with then Senator Chuck Robb during his 1994 visit to the Lab. (Top, r.) Nathan offering a toast at a Lab celebration.

# Fast Electronics Group

## *Collaboration with NIH 'perfect intermingling of talents, technology'*

*by Katherine C. Showalter*
*Public Affairs Intern*

The Physics Division's Fast Electronics Group, led by Chris Cuevas, recently completed production on a series of amplifiers and circuits that will be used in a new animal imaging device being developed and tested by the National Institutes of Health.

"This project is exciting and on the leading edge of medical imaging research," Cuevas said of NIH's Advanced Technology Laboratory Animal Scanner (ATLAS). "Our collaboration with them on this project has been a perfect intermingling of talents and technology. Stan Majewski of the Detector Group guided us into this area of medical imaging research."

"For the ATLAS device, we developed signal processing amplifiers and circuit boards that will give the scanner the ability to produce high-resolution images. Our part in the project included design and development of the components, assembly, testing, and delivery of the finished product," added Fernando Barbosa, project designer/engineer. "The work was a natural progression for us because of the work we've done for the detector packages in the experimental halls. Our components will allow the scanner to capture images with a high level of sensitivity and high-resolution uniformity throughout the depth of the organ or tissue being studied."

Prototype work started about two years ago with the electronics group agreeing to develop and produce 20 position-sensitive photo-multiplier tube (PSPMT) base units for $11K. The second stage of the project began in January and called for the production of an additional 40 modified and upgraded PSPMT units and 15 sector boards for an award of $43K. Work was completed in June. The electronic amplifiers and circuits developed and assembled for the PSPMTs by the electronics group make up the heart of ATLAS, which uses Positron Emission Tomography (PET) to generate high-resolution, sensitive images of animal physiology. PET requires instrumentation that exhibits a uniform spatial resolution and high sensitivity to the object, Barbosa explains.

NIH, Jefferson Lab and the Unidad de Medicina Experimental, Madrid, Spain, are collaborating to produce this new type of scanner. NIH believes the ATLAS design can be more simply produced and at lower cost than current PET animal scanners, while maintaining a high level of image resolution and sensitivity.

The ATLAS scanner will have the capability to zero in on and collect detailed imagery on specific tissues or organ groups. Preliminary test results suggest the strategy behind this scanner design will yield an effective animal scanner and an effective PET imaging platform.

"The Fast Electronics Group enjoyed the challenge of the project and looks forward to future opportunities," Cuevas comments. "We're ready for the next round."


Dia Williams (left), electronics assembler, examines a position-sensitive photo-multiplier tube assembly with project designer/engineer Fernando Barbosa.

William Gunning, experimental surface mount device assembler, inspects the surface mount assembly for the PSPMT units. The Fast Electronics Group is located in the Experimental Equipment Lab (EEL).

# From the heart of Hall B

## *EG1 experiments shed light on proton spin mystery*

*by James Schultz*

It's a conundrum that's confounded the curious for several decades. In the past, some called it a crisis. More recently, it's come to be known as a puzzle: a mystery that has occupied the minds of thousands of researchers worldwide.

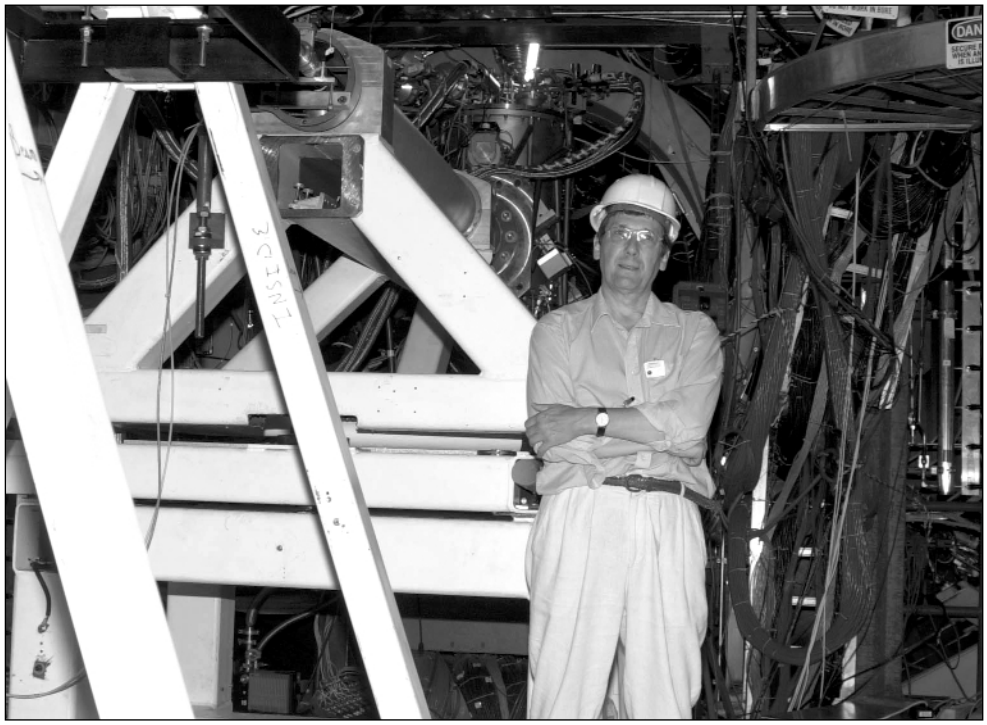
Call it the Case of the Missing Spin. A mathematical property of all subatomic particles, including quarks, spin is roughly equivalent to the physical rotation of an object in the macroscopic world.

Physicists have long wondered how the properties (including the spin) of the protons and neutrons inside an atomic nucleus can be explained in terms of quarks, their most elementary building blocks.

Although seemingly limited to the realm of the infinitesimal, those properties eventually affect all things of "normal" size, since ordinary matter is comprised of these smallest building blocks. Now, a series of experiments recently concluded in Hall B may be leading researchers toward a better understanding of the spin of protons and neutrons.

"The effort in the past has always been to see how much of the proton spin was coming from the quarks," says Volker Burkert, Hall B senior scientist and an EG1 spokesperson. "The goal was and remains learning about the internal structure of protons and neutrons. The extremely surprising thing we found out is that the spin of the quarks is not contributing much to the proton or neutron spin: maybe 25 percent, or even less. That is contrary to the expectation of most scientists working in the field, and is unexplained in simple models."

In a landmark program called "EG1" (comprised of several related experiments) scientists used the sophisticated particle detector at the heart of Jefferson Lab's Hall B to acquire a much more detailed picture of the proton's internal structure. Called CLAS, for CEBAF Large Acceptance Spectrometer, the detector's components include time-of-flight counters, energy-measuring calorimeters and particle-tracking drift chambers. CLAS records, on average, 2,200 particle interactions per second on 40,000 data channels. And during EG1, there were times the detector actually recorded up to 4,000 interactions per second.



Volker Burkert, Hall B senior scientist and an EG1 spokesperson, stands in front of the CEBAF Large Acceptance Spectrometer target area. The photon beam line is visible over his right shoulder.

To derive their EG1 data, researchers collected 26 billion "events," or interactions, over the total running time of 10 months. The first series of experiments, EG1a, took three months and concluded in December 1998, with 3 billion events on tape. The second run, EG1b, took seven months to complete, ending this past April 20 and recording 23 billion events.

"By the time we analyze the data we just took, we should end up making a major contribution to the understanding of proton structure," says Sebastian Kuhn, the EG1 experimental coordinator and associate professor of physics at Old Dominion University. "What we're looking at is the transition between the microscopic and the submicroscopic."

### The Medium View

Seen individually, at high resolution and at small distances, quarks are point-like, and appear independent from each other. But subatomic particles (like protons) are essentially "built" at medium distances; that is, the interactions of one or more quark varieties at intermediate ranges determine the structures of protons and neutrons. It is at these distances that the quarks are coupled to one another, like springs in a mattress that move together in response to weight.

Scientists think that the "missing" spin could in fact be hidden in plain view, a component of the complex, extended structures that include quarks and the quark-binding particles known as gluons. As quarks move around, they may exchange gluons at medium distances. By understanding such interactions, and how they determine and affect spin, scientists will have a far clearer knowledge of how protons and neutrons hold together inside a nucleus, enabling atoms, and eventually molecules, to form and endure.

"If you think of a motor or a watch, you can take it apart and see all the pieces," Kuhn says. "But that doesn't tell you how the watch works. You need to know how all the parts work together. That's the point of the EG1 experiments, which probe medium distances so we

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# Funding to total $1.3 million

## *JLab gets green light from DOE for biomedical imaging project*

*by Katherine C. Showalter*
*Public Affairs Intern*

The Dept. of Energy has given the green light to JLab and its collaborators to begin preliminary work on a new biomedical imaging capability.

If fully successful, the technique could eventually allow for real-time, high-resolution, three-dimensional medical images of patients, according to Drew Weisenberger, Detector Group staff scientist and principal investigator of the project. Specifically, the process shows potential promise for basic research into human disease and pharmaceutical development for cancer detection and treatment.

The $1.3 million DOE grant for work on the project, being carried out jointly by JLab, Oak Ridge National Lab, and Johns Hopkins University, begins in August. The University of Sydney and the Royal Prince Alfred Hospital in Sydney, Australia, are also participating in the study.

To determine the success and viability of the imaging procedure, upcoming research will involve taking anatomical and body function imaging of radioisotope-labeled molecules in non-anesthetized, minimally restrained, lab animals.

The new methodology being proposed by Weisenberger and his colleagues uses Single Photon Emission Computer Tomography (SPECT) to gather images over time. An animal's position, in a minimally confined space, will be recorded during the scan and the SPECT data will be registered to the animal's position and orientation over time. The system will permit registration of body function images from SPECT, with the anatomical images obtained through X-ray computed tomography (CT), taken before or after the functional images.

In developing a method that does away with the need to anesthetize and restrain the research subject, Weisenberger believes the research team he leads can make advances in nuclear medicine imaging, because he points out, anesthesia and/or physical restraint may disrupt the neurological or physiological processes under investigation.

"Not only will this help immensely in cancer research and other biomedical research involving animal models, the developed motion correction technology will have immediate clinical relevance for pediatric patients or patients with neurological or other disorders who cannot remain motionless during nuclear medicine imaging," Weisenberger comments.

## From the heart of Hall B...

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see what's happening in the transition region, where quarks are no longer free and individual, but conspire to form protons and their resonant excited states."

A technical challenge and accomplishment of the EG1 experiments was the construction of a polarized target with which photons generated during the experiment could interact, producing far more useful data than was the case in past attempts. Polarization refers to the alignment of spin, insuring that particles within an atomic nucleus spin in the same direction. An international collaboration of researchers from JLab, and universities in Virginia and Italy used ammonia that, when place in a strong magnetic field, created the desired polarization.

"This experiment was a massive effort, involving more than 100 collaborators preparing the apparatus, planning each step of the experiment, and taking data, around the clock, for 7 months," Kuhn comments. This work will be matched by an equally large effort to analyze the data stored on computer tapes and to extract the vast amount of information they contain.

"This work will go on for several years (at least) and should enable us to take the next big step in our understanding of proton and neutron structure. Additional experiments are ongoing or planned in all three halls at Jefferson Lab," Volker Burkert notes. "Together with the results from many other JLab experiments, and utilizing new developments in theory, we hope to make a major contribution toward a fundamental understanding of the nucleon structure from the smallest to the largest distance scale. This is exactly the kind of science Jefferson Lab was built to do."


Experiment co-leaders Gail Dodge and Sebastian Kuhn, Old Dominion University physics professors, prepare to start taking data during the EG1 run.

# Thesis Prize winner

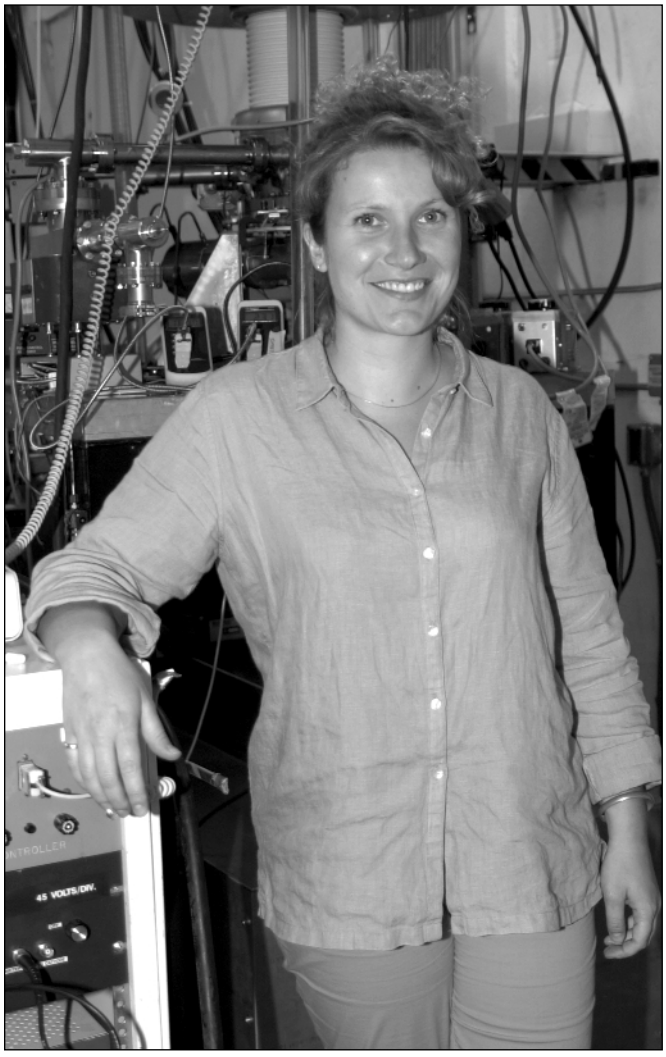
## *Baylac receives award during User Group meeting*

*by Katherine C. Showalter*
*Public Affairs Intern*

Maud Baylac, who worked as a doctoral candidate research assistant at Jefferson Lab since 1998 and joined the staff early this year, has been awarded the 2000 SURA Thesis Prize.

The award was presented during the June 20-22 Users Group meeting. Baylac's thesis (English translation) "Measurement of the polarization of the Jefferson Laboratory electron beam via Compton effect for the HAPPEX experiment using violation in elastic electron-proton scattering", was based on data collected during that experiment's run in Hall A during 1999.

A reading committee determined by the JLab Users Group Board of Directors selected Baylac's work from nine submissions. The award, established in 1999 by the Southeastern Universities Research Association (SURA), recognizes the vital role graduate students play in the scientific mission of Jefferson Lab. The prize, which is awarded annually to the outstanding Ph.D. thesis based on work done at JLab, includes a $1,000 prize and a plaque commemorating the achievement.



Maud Baylac pauses for a moment from her work in the injector test cave in the Test Lab.

Baylac's name will also join the two previous winners — Ioana Niculescu, of Hampton University, and Bart Terburg of the University of Illinois, who jointly won in 1999 — on the Lab's permanent plaque.

The SURA Thesis Prize is awarded, based upon the quality of the papers written on JLab technology, the candidate's contribution to the article and the overall impact of the student's work. According to Alan M. Nathan, chairman of the User Group Board of Directors, "Throughout its short history, JLab has been very fortunate to attract some of the best Ph.D. students in the world. These students contribute immeasurably to the success of the Lab. The selection committee received nine nominations for the 2000 prize, and all were uniformly excellent.

"This year's prize goes to Dr. Maud Baylac of Saclay. The selection committee was especially impressed with the clarity of her writing," Nathan continued, "the depth of her understanding of the important issues, and the lasting legacy of her work for polarization experiments in Hall A."

Baylac presented her paper during the User Group meeting. "She spoke with enthusiasm," Nathan added, "creating a delicate balance between teaching us the experimental issues and giving us a flavor for the kinds of technical problems she had to overcome along the way. The Users Group is proud of the achievements represented by all the theses, and we particularly want to congratulate Maud Baylac for her outstanding accomplishments."

About her part in HAPPEX, Baylac said " We had to build everything from scratch, which was both exciting and stressful at the time. We started the first run in 1998, but had some problems. It wasn't until May 1999 that we actually got the results we were looking for." Baylac defended her thesis in France in October 2000.

She joined the Lab staff in January when she started working as an Injector physicist in the Accelerator Division.

# ‘Trip of a lifetime’

## *Tireman meets physics Nobel Laureates at convention*

*by Katherine C. Showalter*
*Public Affairs Intern*

It was the trip of a lifetime. It was the opportunity of a lifetime,” says William Tireman, reflecting upon his recent trip to Germany to meet and visit with Nobel Laureates. Tireman, a research assistant at Jefferson Lab, was one of 31 participants chosen by the Department of Energy, to attend the 51st international convention of Nobel Laureates in Lindau, Germany, June 25–29.

The meeting of Nobel Laureates in Lindau, is part of a continuing tradition established in 1951 by Swedish patron, Count Linnart Bernadotte. Nobel Laureates in chemistry, physics, or physiology and medicine convene annually in Lindau, to have open and informal meetings with more than 200 students and young researchers from around the world. The meetings rotate by discipline each year, with this year’s focus on physics.

Tireman, an applied physics Ph.D. candidate from Barron, Wisconsin, made his first trip outside the U.S. for this event. He is a third-year doctoral student at Kent State University, in Kent, Ohio.

Upon his return to Jefferson Lab the week after his international sojourn, Tireman spoke of the personal interaction between students from the United States and Europe, and of the availability of many of the Nobel Laureates and of the congenial atmosphere at the convention. “The whole experience was a very interesting one, and I am thankful I was selected to be a part of it,” Tireman said.

“I have so many great memories from the trip. But one part I will always remember was a DOE-sponsored lunch for the American students. A few of the Nobel Laureates stayed afterward and spoke with the students at the table. It was so casual. It was really cool,” he reminisced. “The speeches covered past research but also highlighted current research work. The entire conference was a very interesting and positive experience. It was great to brush elbows with Nobel Laureates, and it was a great opportunity to network with other physics students and research colleagues.”

William Tireman, after his return from Germany, poses for a photo in front of CEBAF Center.

Most of the DOE participants attended an orientation on June 22 in Washington, D.C., then departed for the overnight flight to Zurich, Switzerland, where they transferred to buses for the 75-mile trip to Lindau. The participants had Sunday to get settled and to tour the historic medieval city, which is located at the common border of Austria, Germany and Switzerland. During the rest of the week, mornings were spent in meetings with the Laureates, who lectured on topics of their choosing. The afternoon’s agenda scheduled informal table talks, where participants were able to approach individual Laureates. After hours, the Laureates and participants met at local restaurants and hotels for additional informal discussions.

The capstone of the week took place on June 29: the end-of-conference meeting at Mainau Castle, a short ferry ride from Lindau. Mainau Castle is the family home of Count Bernadotte and his family. There the participants visited the botanical gardens. After the closing ceremonies, they departed for home or continued their travels.

The newspaper, *Demographics Daily* (September 2000) has designated River Falls, Wisconsin, as one of its “Dream Towns.” Tireman, who attended undergraduate school there, hopes to fulfill his educational “dreams” when he completes his doctoral dissertation later this year. Under the mentorship of Kent States’ Bryon Anderson and Hampton University’s’ Richard Madey, Tireman worked on Hall C experiment E93-038 and is currently assisting with data analysis.

For more information and photos from the participants’ trip, visit www.orau.gov/orise/edu/lindau on the Internet.

# Milestones

## *for June 2001*

### Hello

Mary K. Eaton, Employment Assistant, Administration Division

Mary L. Fox, Theory Group Secretary, Physics Division

Ginny L. Gettys, PC System Administrator, Accelerator Division

Michael T. Lawing, Mechanical Technician, Physics Division

Elizabeth L. Lear, Staff Secretary, Administration Division

Leonard F. Page, Maintenance Worker, Administration Division

Stella T. Parker, Payroll/Fixed Asset Supervisor, Administration Division

Nikolai Sinkine, Staff Engineer, Physics Division

David W. Waldman, Design Engineer, Accelerator Division

Yuhong Zhang, Information Manager/Scientist, Accelerator Division

### Goodbye

Kim M. Haddock, Hall B Electronics Coordinator, Physics Division

Jeffery S. Karn, Magnet/Analysis Engineer, Accelerator Division

George B. Link, Electronics Diagnostic Technician, Accelerator Division

Joseph H. Mitchell, Hall C Physicist, Physics Division

Karen L. Sullivan, Electrical Technician-Cryogenics, Accelerator Division

## *for July 2001*

### Hello

Kevin A. Banks, Accelerator Technician, Accelerator Division

Colleen Bartlett, Program Specialist III, Administration Division

James B. Breeding, Machinist, Accelerator Division

Samuel T. Hicks, Jr., Mechanical Technician, Physics Division

Yi-Mei Howell, Program Specialist III, Administration Division

### Goodbye

Yvonne B. Casalino, Chief of Staff, Accelerator Division

James E. Jones, FEL Electronics Technician, Accelerator Division

Douglas A. Kieper, Detector Specialist, Physics Division

Richard Kirkpatrick, Mechanical CAD Designer, Accelerator Division

William J. Schneider, Injector Senior Engineer, Accelerator Division

### Congratulations

Paul Souder, professor of physic at Syracuse University and JLab user, has received the 2001 Senior Award for Research Excellence from the Syracuse chapter of Sigma Xi. This is the highest honor Sigma Xi, a scientific research society, bestows to recognize scientists for a particularly elegant piece of research or for an outstanding research program or career. Souder has supervised and participated in experiments designed to explore the structure and behavior of protons at several institutions, including JLab.

## *Come to BEAMS volunteer fair Sept. 14*

Science Education staff members are preparing to kick off a new school year. BEAMS, or Becoming Enthusiastic About Math and Science, starts in October.

"We're holding a Volunteer Thank-You and Recruitment Fair on Sept. 14 from 11:30 a.m.–1:30 p.m. in the CEBAF Center atrium," notes Lisa Surles-Law, Science Education specialist. "We want to thank our wonderful volunteers and recruit new volunteers to help with this year's program. We're always looking for Lab employees and users who are interested in making classroom visits, mentoring or leading BEAMS activities; and we provide instruction on the BEAMS activities.

"We hope everyone will take a few minutes to stop by and visit with us," Surles-Law continues. "We'll be demonstrating and explaining several of the BEAMS activities and have ice cream for our volunteers." Area 6th, 7th and 8th grade classes participate in BEAMS.

For more information about this event or the Lab's Science Education program, contact Surles-Law, ext. 5002 or e-mail surles@jlab.org.

## *Fall Science Series begins with Sept. 13 event*

The Science Education program is hosting two Fall Science Series events.

On Sept. 13 at 7 p.m., internationally known physicist and author Lawrence Krauss will discuss his recent book "Atom: An Odyssey from the Big Bang to Life on Earth…and Beyond." Barnes and Noble will be selling Krauss's book and the author will be available for book signing afterward. Krauss is author of the bestseller "The Physics of Star Trek." He visited JLab in the fall of 1998 to give a Science Series presentation on that book.

Then on Oct. 2, Mr. Magnet comes to Jefferson Lab to demonstrate the forces of ferromagnetism and magnetoelectricity.

Science Series events begin at 7 p.m. in the CEBAF Center auditorium. Presentations last about 1 hour and a question & answer period ends the evening. The events are free and open to the public.

## *Sign up now for United Way Day of Caring*

The United Way's annual Day of Caring is Friday, Sept. 14, says JLab's Day of Caring coordinator Pat Morton. "Eight Lab members have signed up so far, and we can accept up to 12 more volunteers," she notes. "It's a great way to support volunteerism and to give back to the community."

This is a day set aside each September when area businesses and

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organizations allow their employees to take part in volunteer projects helping community nonprofit organizations during normal work hours. JLab has participated in this program since 1994.

Taking part in Day of Caring is easy, according to Morton. "First, get your supervisor's 'ok'," she explains, "then forward the signup form, call or e-mail me so I can send your information to United Way for matching you with an assignment. The tasks are varied and can run from performing clerical duties to serving meals to manual labor like weeding flowerbeds or putting up shelves. Some of our volunteers have teamed up with a co-worker or buddy to take part in this activity."

Last year 11 Lab members participated in Day of Caring and 12 in 1999. "We hope to have at least that much Lab participation this year," Morton says. The day kicks off with breakfast at the Hampton Coliseum. Volunteer work runs from 9 a.m. – 4 p.m. and lunch is provided. Volunteers are asked to wear clothing appropriate for their tasks.

Call Morton at ext. 7232 or e-mail her at pmorton@jlab.org for more information or to sign up. United Way will work to place volunteers up through Sept. 12.

## JLab participates in School Tools Drive

JLab is also currently participating in the United Way's School Tools Drive. Donations of new school supplies (pencils, pens, notebooks, school paper, crayons, glue, rulers, etc.) will be collected by the United Way on Sept. 13 and delivered to students whose families lack the financial resources to purchase adequate school supplies.

Donation drop boxes are located in the lobby areas of CEBAF Center, the ARC and the VARC. For more information about this program, contact Pat Morton, HR&S, ext. 7232 or e-mail pmorton@jlab.org.

## Join Hampton Roads in Komen Race for the Cure

Hampton Roads will hold its second, 5 kilometer Komen Race for the Cure against cancer in conjunction with Phoebus Days on Saturday, Oct. 13 at Fort Monroe.

Last year the Susan G. Komen Breast Cancer Foundation established a local chapter in Hampton Roads. On October 21, 2000, nearly 3000 people registered in the foundation's first local race and raised $180,000. Seventy-five percent of the money raised was issued as grants to fund non-duplicating breast health education and breast cancer outreach programs for the medically underserved in eastern Virginia, according to Donna Gilchrist, Accelerator Division, who is one of this year's Komen Race for the Cure committee members.

"There are several ways we can help in the battle against cancer," points out Gilchrist. She encourages interested people to register and run as individuals or teams on race day; volunteer as individuals or teams to support race day activities; or donate funds, goods, or services for the race or the foundation.

For more information, visit the Komen Tidewater Race for the Cure Web site at www.hamptonroads.com/raceforthecure/, or contact Gilchrist, ext. 7063, e-mail gilchris@jlab.org or Tonya Evans, Accelerator Division, ext. 7682, e-mail tmevans@jlab.org.

## JLab plans booth at State Fair; needs you

The Virginia State Fair will be held at Strawberry Hill, Richmond from Sept. 27– Oct. 7. As in the past, JLab will staff a booth in the Technology Building. The booth will include informational displays about the Lab, our basic science mission and some technology transfer endeavors. We will also feature cryogenic demonstrations and science education activities.

For more information or to sign up to work at the Fair, contact Sarah Ingels, Public Affairs, ext. 7444, ingels@jlab.org.

**Thank you for all you do!**

Sixty-three interns hired through the Human Resources Dept. student intern program were recognized for their work during a ceremony and reception on July 27 in CEBAF Center. Interns work in nearly every area of Jefferson Lab and make important contributions to the success of the Lab.

# DOE opens assistance centers

## *Federal law provides compensation, medical benefits for workers*

The Departments of Energy and Labor have opened three Energy Employees Compensation Resource Centers to service workers from facilities managed by Oak Ridge Operations. These centers can provide assistance to current and former DOE federal and contractor employees in filing claims for compensation under the Energy Employees Occupational Illness Compensation Program Act of 2000.

The new law, which became effective July 31, provides $150,000 lump-sum compensation and related medical expenses to workers who became seriously ill from exposure to radiation, beryllium or silica while working at a DOE facility. Workers may also apply for benefits that may be available through state workers' compensation programs.

The centers are open 8:30 a.m.–5 p.m., Monday – Friday at:

• Oak Ridge, TN: 800 Oak Ridge Turnpike (Jackson Plaza), Suite C-103, Oak Ridge, ph. (865) 481-0411;

• Portsmouth, OH: 4320 Old Scioto Trail, Portsmouth, ph. (740) 353-6993; and

• Paducah, KY: 125 Memorial Drive (Barkley Centre), Paducah, ph. (270) 534-0599.

Additional resources available to workers include the Dept. of Labor's Energy Employees Occupational Illness Compensation Program hotline at 1-866-888-3322 or Web site www.dol.gov/dol/esa/public/regs/compliance/owcp/eeoicp/main.htm or DOE's Office of Advocacy hotline at 1-877-447-9756 or Web site www.eh.doe.gov/advocacy/.

# Employment team participates in NAACP job fair

As part of Jefferson Lab's continuing efforts to attract and hire qualified candidates from a diverse population, the Lab staffed an information booth at this year's NAACP Diversity & High-Tech Career Fair in Arlington, Va.

The JLab employment information team of Samantha Albright and Yvonne Scott, Employment office; and Leon Reynolds and Ken Surles-Law, Accelerator Division, represented the Lab at the mid-May event.

According to Employment Administrator Yvonne Scott, several thousand career-minded individuals attended the job fair and hundreds visited the JLab booth, not only to drop off a resume but also to learn more about the Lab. The team brought back more than 125 resumes from qualified candidates. The team targeted computer scientists and technologists and other hard-to-fill jobs.

This was the first time JLab participated in the job fair, which provides participants with access to dozens of high-technology employers. Lab involvement in future NAACP career fairs is anticipated.

ON TARGET

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