July 2000

ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

Training office works

to make EH&S and specialized training more accessible, save money

Lab earns Lifetime

Achievement Award for participation in career exploration program

In helping community,

Lab earns recognition as a training ground for marketable job skills

Improving cancer imaging

JLab medical diagnostic equipment excelling in clinical trials

by James Schultz

Technology derived from Jefferson Laboratory's sophisticated subatomic particle detectors is proving its mettle in a quartet of trials designed to evaluate the effectiveness of a new generation of medical sensing equipment. Three related but separate devices developed at JLab — a mini breast-core-biopsy "gamma camera," a dedicated breast-imaging gamma camera and a positron-emission mammography camera — are being or are about to be tested at breast-imaging facilities in Newport News, and at university medical centers at George Washington (with Dilon Technologies), and Duke and West Virginia Universities, respectively.

Key to their operation is an enhanced sensitivity to injected radioisotopes that, combined with conventional imaging techniques, allows for the detection of otherwise hard-to-see cancers of the breast and other tissues. In at least one case, reports Stan Majewski, head of the Lab's detector group and leader of the overall medical imaging effort, the gamma camera has pinpointed abnormal growth even when X-rays showed no apparent mass.

"We have four instruments out in hospitals and four active clinical protocols," he says. "There's hard evidence coming in that validates our approach. The overall goal is to improve biopsy procedures. We're not replacing the biopsy, only helping to make it better."

Riverside Diagnostic and Breast Imaging Center is playing host to the longest running of the clinical evaluations.

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Telly Green (left), Hampton University graduate student, helps Drew Weisenberger, staff scientist, prepare the mini gamma camera for a patient study at Riverside Diagnostic and Breast Imaging Center, just a few blocks from the Lab.

Improving cancer imaging. . .

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There, Riverside doctors and medical technicians are putting to use a digital X-ray, guided-core biopsy system outfitted with a mini gamma camera — developed jointly by the Lab and Hampton University — in order to gather clinical data on the camera's usefulness as a means of early detection of breast cancer. The core-biopsy system is commonly used to localize and sample breast lesions, discovered on mammograms, that are considered potentially malignant. The addition of the JLab/Hampton camera provides a way to test the effectiveness of injected radioisotopes in identifying probable cancers, a method known as scintimammography.

Up to 70 percent of the time, conventional mammographic techniques may indicate malignancy where there is none. Should the study prove successful, the new technique may substantially reduce the number of false positives, allowing patients to bypass unnecessary and traumatic surgical extractions of suspect breast tissue.

Thus far, the mini gamma camera has produced breast-tissue digital images of more than 20 patients, all volunteers. In every case, where close examination of the camera's images prior to biopsy indicated a probability of malignancy — roughly 30 percent of all cases — malignancy was confirmed in medical-laboratory tissue tests. In the remaining 70 percent, where negative results were expected after viewing the gamma camera's output, negative results were also confirmed in the laboratory assays.

"Standard mammography has some limitations," Majewski points out. "X-rays don't go through so-called radiodense breast tissue in younger women. With the gamma camera, we've not yet missed a cancerous lesion."

More accurate diagnostic imaging

To indicate malignancy, the gamma and positron-emission cameras rely on the uptake by cancer cells of protein-like or sugar-like radiotracer substances, which are more readily metabolized by cancers than by healthy tissue. As the radiotracer solution migrates to diseased sites, it accumulates within abnormal cells and emits gamma rays. The cameras sense the gamma rays, converting them into electrical signals and, in turn, transforming the signals into real-time, computer-generated images of the breast area under investigation.

Majewski's Detector Group has produced two positron-emission cameras. Both employ a technique and radiotracer different from those found in other scintimammographic methods. One, at West Virginia University, is being used prior to breast tissue biopsy, while the other, under construction by the Detector Group for Duke University, will be used initially for diagnostic breast imaging only.

Cynthia Keppel, a JLab staff scientist and director of Hampton University's Nuclear and High-Energy Physics Research Center, says that a more accurate and noninvasive means of cancer detection would not only aid in the early detection and treatment of breast cancer, but prevent the sometimes unnecessary physical trauma of tissue biopsy. "It's scary and painful when a piece of you is cut out. Our hope is that our cameras will greatly reduce the need to confirm the 60 to 70 percent of the negative results," she says.

"Most of what I do is accelerator-based nuclear physics, finding out about quarks and gluons and the fundamental nature of matter. This kind of technology is real-time. You build it. It has a human payoff. It's a great experience."

Majewski and the Detector Group will be seeking additional funding and partners, in the health care and business communities, to underwrite development of next-generation versions of the cameras. Majewski hopes that the Lab will obtain monies from the Department of Energy for fiscal year 2001, a follow-on to a $260,000 DOE award made last fiscal year. Assuming continued progress, the Lab has decided to hire a medical physicist to assist with additional deployment of the cameras.

Studies at the Riverside imaging clinic will continue through the summer. As many as 250 patients may eventually participate in the project.

Telly Green (foreground) checks connections to the mini gamma camera at Riverside while Gail Geer (left), Riverside Radiology Technician, reviews procedure protocol with JLab's Drew Weisenberger.

Working to meet Lab's needs

Training office aims to make programs more accessible, save money

Work is well underway to make Environmental, Health & Safety (EH&S) and specialized training at JLab more accessible and in the process save money, according to Bruce Ullman, the Lab's training manager.

"Two goals of the training office include taking nearly all JLab EH&S training out of the classroom, and designing a system for coordinating specialized, job-specific training so some of it can be offered on-site," Ullman said.

The benefits of these two initiatives are four-fold: 1) Staff get the training they need when they need it; 2) Training delivery is more convenient for the individual; 3) Training time for instructor and student is reduced; and 4) Tuition and travel expenses are cut.

"The EH&S training initiative is to change as many of our heavily used courses over to self-study as possible," Ullman explains. "The initial effort will focus on SAF100 (EH&S Orientation), SAF800 (GERT: General Employee Radiation Training), SAF801 (Rad Worker I), and SAF802 (Rad Worker II)."

In 1999, the Lab put 1,255 people through these four programs. That comes to roughly 3,416 hours away from the job for the participants and another 755 hours for the instructors. Using the standard cost of an employee hour for 1999 (from the Lab's Budget office), that totals more than $158k in time away from the job site for that year, according to Ullman.

"We'll save a little of that during 2000 with the current practice of allowing recertifying employees to test out of GERT. However, the big savings will come when these courses leave the classroom completely," he commented.

"The time spent on these courses either online or using a CD or video will be, according to the experts, about half that which is currently spent in the classroom. Since instructors will have a much smaller part in the process (i.e. proctoring the test), those hours will be cut way back, too," Ullman adds. He estimates that putting the same number of people as in 1999 through self-study versions of these courses would cost the Lab just under $68k in time away from the job — a $90k savings. In fiscal year 2000, the savings will be partially offset by the cost of developing and fielding the new programs; however, he calculates that the Lab will still save about $23k in the first year.

The second initiative is to help groups of employees interested in specialized, job-specific training avoid the costs of traveling to a training site or paying higher tuition because of off-site overhead. "Using 1999 as a baseline again, the training office helped organize eight specialized courses on-site last year to meet customer requests (there were six in 1998 and 10 so far this year)," he says. The 1999 programs were:

Effective Business Writing
Programming in Visual Basic
Programming in Java
Fundamentals of Electrical Industrial Machine Control
Digital Signal Processors
Introduction to Unix/Linux
Introduction to Windows and the Internet
Effective Customer Service

A total of 123 employees received this training at a cost of $32.3k in tuition and another $72k in lost student and instructor time. Ullman points out that if these students had taken these programs off-site, the tuition would have totaled close to $37.5k. And even more significant, the time away from the job would have been worth almost $160k due to longer course length for "canned" courses and travel to and from the training site. These numbers equate to a savings in 1999 of about $92.6k. It's also worth mentioning that the off-site equivalents of these 1999 courses used in these calculations were all offered locally. "Training travel costs would have been much higher if employees had to travel outside Hampton Roads as they sometimes do," Ullman explains.

"Once these two training initiatives are fully implemented, the Lab can reallocate almost $183k a year back to the primary mission by the end of 2001."

Public Affairs Office offers employee tours during August

The Continuous Electron Beam Accelerator will be down during August for scheduled maintenance and upgrade work. A couple of times during the month, Public Affairs will have access to the accelerator and experimental halls for the purpose of giving Lab staff orientation tours of these facilities.

"The tunnel and halls are off limits to many people on site," points out PA Manager Linda Ware. "Shutdown month gives us the chance to take new Lab employees into the tunnel and experimental halls, and it gives folks that have been here awhile the chance to see the latest accelerator improvements." Lab employees interested in a tour may e-mail ware@jlab.org to sign up. Anyone going on an accelerator site tour must be at least 18-years-old, carry a picture ID (Lab ID badge is fine), and wear solid shoes (no sandals).

ATOMS of another kind

Lab earns achievement award for part in career exploration program

Jefferson Lab recently earned special recognition for it's decade of participation in the Peninsula ATOMS program. ATOMS, or Adventures in Technology = Options in Math & Science, offers middle school students a link between their formal education and the world of work through the use of hands-on activities in local high-technology industries and institutions of higher education.

Jefferson Lab was singled out for a Lifetime Industry Achievement Award during the ATOMS recognition luncheon held in June at Thomas Nelson Community College.

The Lab has been an integral part of ATOMS since it's inception in 1990. Former Lab Project Manager Beverly Hartline was a strong proponent of the program and initiated the Lab's partnership with ATOMS.

The award praised Jefferson Lab for continually providing "dynamic science, math, and technological career exploration activities for students, with a level of quality that surpasses industry standards."

"The people at Jefferson Lab are to be commended for their commitment, innovation and overall excellence," says Tanya Cohen-Caldwell, ATOMS Program Director. "Jefferson Lab participants are always willing to take one more group, or spend the extra few minutes talking with a curious student. When a group couldn't make their field trip to the Lab last fall, the Lab's ATOMS volunteers packed up their equipment and brought the field trip to the students."

After a decade of growth and development, ATOMS has become a thriving part of the career exploration activities that thousands of middle school students participate in each year, according to the ATOMS program director.

"It's an honor being part of the program," remarks Jan Tyler, JLab Education Program Manager.

"Participating in ATOMS is rewarding in itself, but receiving this award is a special touch. It's nice to be recognized for making a positive impact on our community's youth."

Nearly 600 eighth-grade students from three participating schools visited the Lab early in the 1999-2000 school year. While here they met with Lab technicians and Education staff. The program is geared toward exposing students to the variety of technical jobs available in the working world. The students delve into what these specialists do, how they do their job and use math and science at work, and what kind of training is needed for various technical careers.

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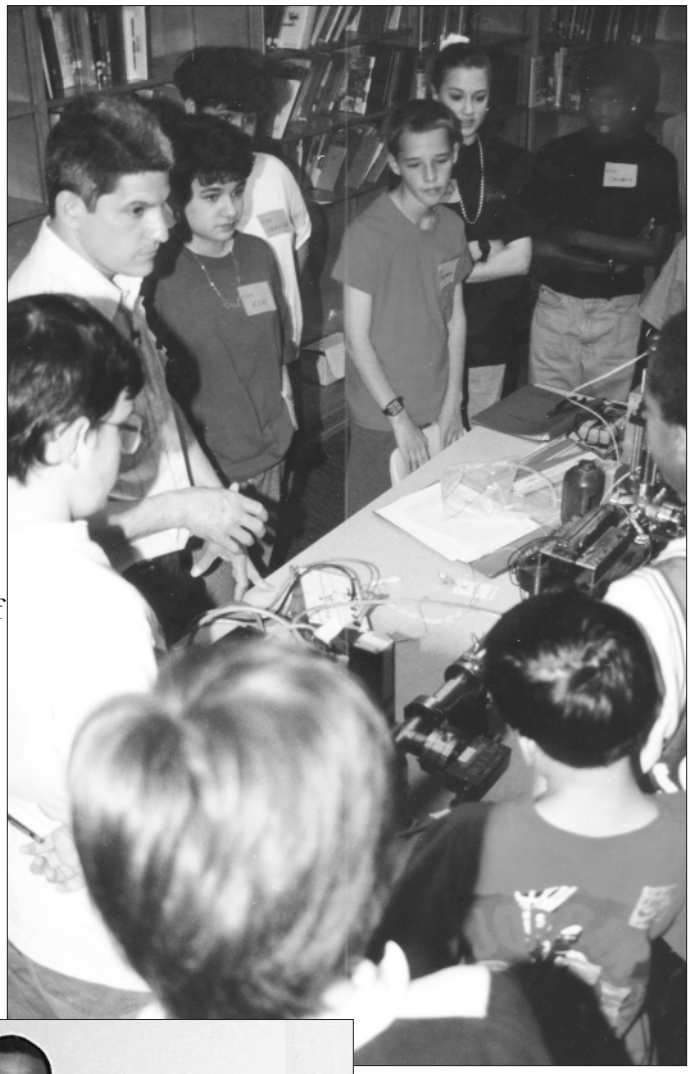

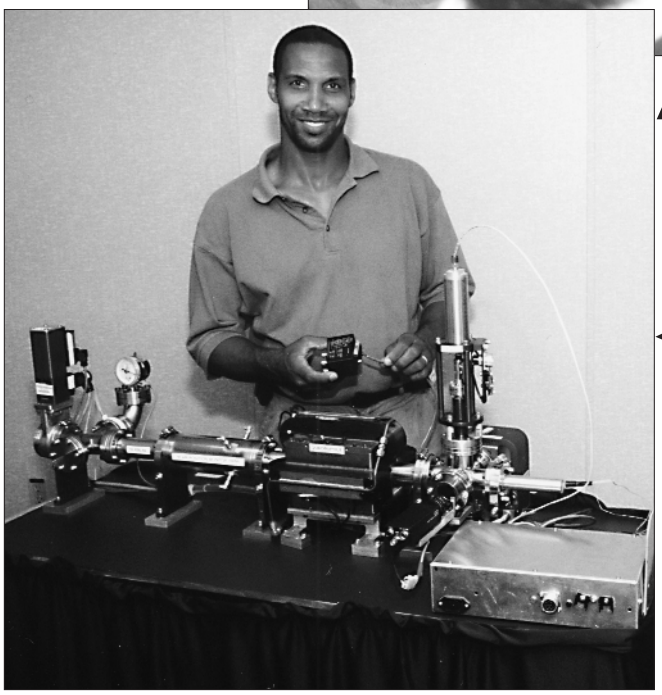

▲ Rick Gonzales (upper left), Accelerator, works with a group of ATOMS students as they prepare to run Adderley's Diagnostic Beam Line.

◀ Phil Adderley, Accelerator Div. High Vacuum Associate, and an ATOMS student created this demo Diagnostic Beam Line. The component has given many students the chance to interact with high-tech equipment.

ATOMS . . .

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"The program makes students aware of technical career alternatives available to them. Many of these interesting, challenging, good paying jobs only require a two-year degree or graduation from a specialized job-training program," Tyler points out.

ATOMS students visit the Lab with their guidance counselors and classroom teachers. The visits take place in the months leading up to the students selecting their high school freshman classes. "This is an important time for students making education decisions; class choices can really impact their career options a few years down the road," Tyler explains.

In ATOMS' first year, JLab was one of only a handful of participants. Now the list includes tens of area businesses, industries, and academic and government entities. Seven new industry partners joined the program during the 1999-2000 school year.

Jefferson Lab's Education Program staff (from left): Education Technicians Stacy Ring and María Niland, Program Manager Jan Tyler, Administrative Assistant Leigh Ann Garza, and Education Technicians Lisa Surles-Law and Steve Gagnon pose for a group photo after receiving the ATOMS Award for Jefferson Lab.

Special thanks to JLab ATOMS volunteers

Name	Division	David Hamlette	Accelerator
Phil Adderley	Accelerator	Joyce Miller	Physics
Herb Ashlock	Accelerator	Ed Stitts	Accelerator
Susan Esp	Physics	Keith Welch	Accelerator
Rick Gonzales	Accelerator	Scott Williams	Accelerator

Hermann Grunder holding the lifetime achievement award.

Lifetime of work rewarded

The University of Frankfurt recently conferred a lifetime achievement award to Hermann Grunder in a ceremony in Frankfurt, Germany. The award recognized his distinguished efforts in the construction of the BEVALAC at Lawrence Berkeley National Lab (LBNL) making heavy nuclei available to the research community. The science from the BEVALAC is the foundation of the science of relativistic heavy ions, currently the focus of research at Brookhaven National Lab. The award also recognized the construction of "an accelerator of a new concept to investigate the structure of hadrons" – CEBAF.

What does Hermann think of such a distinguished honor? "It's wonderful to have played a role during the modest beginning of the field of relativistic heavy ions. Evidence of the quark-gluon plasma was already a holy grail in the early beginning of the BEVALAC in the early '70's and continues to show promise. To also have the development and construction of CEBAF acknowledged so early in its life is a great acknowledgement of all the hard work the entire team at Jefferson Lab has accomplished".

Helping our community

Lab earns recognition as a training ground for marketable job skills

by Judi Tull

Tamika Boyd knew the drill: every time she applied for a decent-paying job, she was turned away because she had no experience. At 24, she was supporting two kids on public assistance and couldn't see how her situation was going to change any time soon.

Now, Boyd is learning marketable job skills as part of a two-year-old program at Jefferson Lab that forges a link between welfare recipients and jobs that pay a living wage.

The program, which is a partnership with the Newport News Redevelopment and Housing Authority, will be honored at the end of July with an award from the National Association of Housing and Redevelopment officials.

In 1998, Bill Kozma, Operations Support Manager, Accelerator Division, heard about a similar, but much larger, program at Los Alamos National Laboratory. "I believed that if it could work there, it could work here," Kozma said.

Over the next six months, Kozma designed the program along with Stockroom Manager Bill Brisiel, in whose warehouse trainees would work, and representatives from local housing and social services departments.

Unlike many large-scale on-the-job training programs, this one was designed to be effective because of its simplicity. "We're doing this one person at a time," Brisiel said.

Staffers at the Newport News Redevelopment and Housing Authority select residents who meet some minimum criteria, such as having a learner's driving permit and a GED, and invite them to interview. Trainees are required to complete a series of employment workshops at the Family Investment Center before starting work.

Trainees are chosen for their enthusiasm, desire and ability to use the six-month program as a launching pad into the marketplace. It was important from the beginning, Kozma said, that an aggressive screening program would raise the likelihood of success.

The program is paid for with federal funds, through the housing authority to the Laboratory. The trainees receive $7.50 an hour for 24 hours of the 40 they work, so they are giving 16 hours of their own time to the project. More important than the money they earn, perhaps, is that they become part of the Laboratory "family," with an opportunity to learn how to cope with the world of work. They interact with co-workers, and learn not only computer, customer service and warehousing skills but also how to deal successfully with real-life issues such as child care, transportation and family crises.

The program already boasts successes. Two of the first three trainees are employed full time, and a third has gone into the Army. One of the graduates was recruited by a research institute in Maryland for a data specialist position. The institute paid her moving expenses and offered a starting salary of $27,000 a year.

Kozma believes that one of the reasons many training programs fail is because they teach minimum-wage skills to people who need, instead, to learn how to rise above poverty level pay. Compared to other former local welfare recipients, who are earning an average of $5.69 per hour, the trainees at Jefferson Lab are earning an average of $10 per hour.

Being able to add the Jefferson Lab name to a resume is another important component of the program. "That's going to make a big difference," Boyd said. There are a lot of people looking for warehouse work, but not many who can claim experience at an internationally known facility, she said.

"We're members of the community," Kozma said. "This is an opportunity for Lab people to come into contact with people they might not usually interact with. Nothing is solved by money alone. We have to show our concern by giving of ourselves. It is the personal commitment of Bill Brisiel and his staff, to the individuals participating in this program, that has made it successful. I'm very proud of them and we are all proud of our graduates."

"As a society," Brisiel said, "it's the right thing to do."

Tamika Boyd joined JLab in April for the six-month job training program. As a stockroom clerk, one of her many tasks is receiving incoming orders.

Milestones
for June 2000

Hello

Sergey V. Boyarinov, CLAS On-Line System Physicist, Physics Division

Susan Brown, Staff Secretary, Accelerator Division

Kelly S. Caccetta, Human Resources & Services Director, Administration Division

Pearle E. Carstens, Staff Services Receptionist, Administration Division

Hai Thanh Dong, Digital Engineer, Accelerator Division

Betty Fulgham, Travel Services Supervisor, Administration Division

David G. Meekins, Cryogenic /Polarized Target Physicist, Physics Division

Philip Mutton, Technical Facilities Engineer, Accelerator Division

Joseph P. Ozelis, Accelerator Engineer-Test Coordinator, Accelerator Division

Casie J. Weaver, Benefits Representative, Administration Division

Goodbye

Randy Macleod, Data Acquisition Scientist, Physics Division

Shilda Williams, Employment Representative, Administration Division

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

Lab Web site highlighted on Encarta Learning Zone page

Encarta Learning Zone recently recognized Jefferson Lab's "All About Atoms" Web page as a Best Web Site. Go to www.jlab.org/services/pced/ and click on "All About Atoms" to visit the site. It was developed and is maintained by Steve Gagnon, Education Technician.

For more information about Encarta's encyclopedia, English dictionary and atlas, visit its Web page (encarta.msn.com).

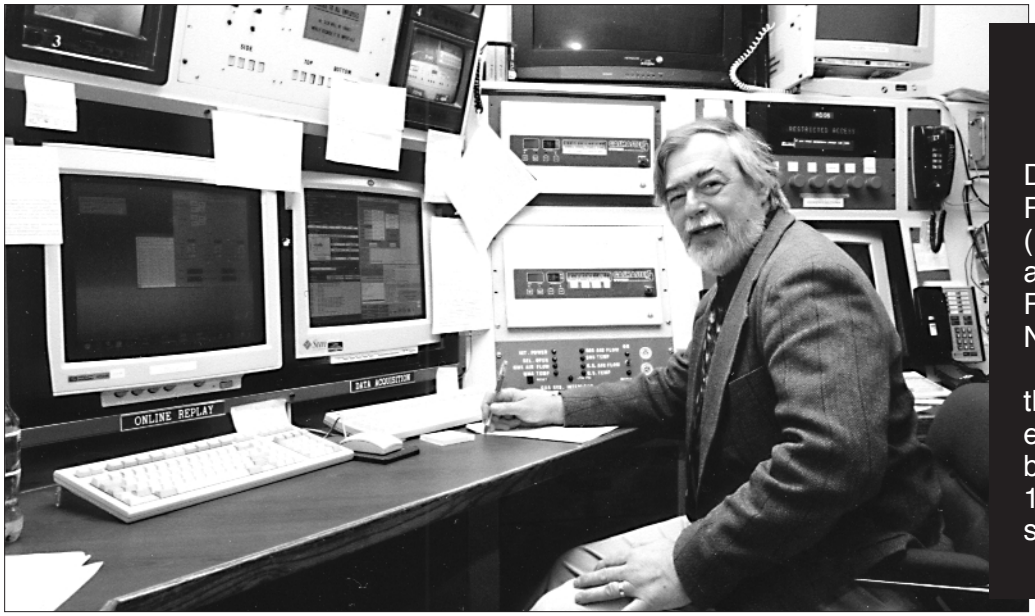
Caccetta becomes JLab's new HR&S Director

Jefferson Lab welcomes Kelly Caccetta as the Lab's new Human Resources & Services Director.

Caccetta brings to the Lab her experience as the Human Resources Manager at Gateway, Inc., where she was responsible for employee and labor relations, recruiting, compensation and benefits, and occupational health and safety.

She joined the Lab in mid-June. Watch for more information about Caccetta in an upcoming On Target.

Update



Congratulations!

Congratulations go out to Donald Geesaman, JLab's Program Advisory Committee (PAC) Chair. He was recently appointed Director of the Physics Division at Argonne National Lab.

Previously, Geesaman was the division's chief of medium-energy physics. Geesaman began his career at Argonne in 1976 and was promoted to senior scientist in 1991.

JLab spring golf tourney hits links with 12 teams

Jefferson Lab's Spring Golf Tournament took place at the Kiskiack Golf Club in Williamsburg, Va., during the latter half of May. Twelve teams kicked off the event with a noon-time shotgun start.

First place went to the team of Mark Davis, Physics; Gary Thomson, Kelly Trembley, Accelerator; and Jim Kuykendall with a score of 62.

Julie Oyer, Director's Office, won the two longest-drive holes and closest to the pin honors among the women competitors. Mark Davis and Gary Thomson each won for closest to the pin among the men. And Steve Singleton, Accelerator, and Bill Cash each won longest drive honors for the men.

"Players bought 'mulligans' at the outset of the tournament," said Event Chair Julie Oyer. "At the end of the day we drew tickets. Two new golfers won. Ed Daly, Accelerator, won $50 and Sam Stevens, Physics, took home the $100 prize. We hope to see them at the fall tourney. It was a fun event for everyone. Even the last place team of Bob Vignato, Greg Arnold, Frank Humphry, Sr. (retired), and Ed Stitts, all from the Accelerator Division, received gift certificates."

"It was a fantastic day for the tournament," she added. "We had beautiful, sunny weather with a little breeze, and the course was in great shape."

The Lab's next golf tournament will be this fall. Suggestions are welcome. Contact Oyer at ext. 7120 or e-mail her at oyer@jlab.org.

bright spot on the web

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

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

In honor of July being National Recreation and Parks Month, "Webspot" is highlighting the American Hiking Society's Web page at www.americanhiking.org. Check out the Hiker's Info Center featuring Trail Guides for hiking paths across the nation. The News & Resources section offers great fact sheets on hiking safety and how to treat insect bites. Or, start planning a special event for next year's National Trails Day with ideas and advice from the American Hiking Society. Happy wanderings!

ON TARGET

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