

# ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

## **Electronic Media**

*facilitates Lab communication*

## **SciDAC to boost**

*Lab's computing capabilities  
to terascale*

## **Lab seeks volunteers to**

*help with Science Bowl*

## **Lab plans first blood drive of new year**

*Vicki Barnett, Medical Services, is looking for people interested in helping with the Thursday, Jan. 24 blood drive. She needs volunteers to help with donor signup and registration, and she hopes to fill all of the donor appointments. The blood drive will be held in the ARC from 10 a.m.- 4 p.m. Contact Barnett or Sharon Mortimer to volunteer or for additional information.*

Logo printed with permission of the  
American Physical Society

## **Congratulations!**

### *Five JLab staff recognized as 2001 American Physical Society Fellows*

Five members of Jefferson Lab's staff recently received one of the highest peer honors in the world of physics. Kees de Jager, Physics Division; Fred Dylla, Accelerator Division; Geoff Krafft, Accelerator; Bernhard Mecking, Physics; and George Neil, Accelerator, learned early this month that they had been elected 2001 Fellows of the American Physical Society.

In an announcement sent to all Lab staff, Lab Director Christoph Leemann said, "The American Physical Society has honored five Lab staff members by appointing them Fellows of the Society. I am very proud of this fact, and ask you to join me in congratulating our colleagues on their election as American Physical Society Fellows! This is a great honor for our scientists — recognizing them for their major contributions to the field of nuclear physics and the physics of beams."

Kees de Jager was nominated by the Division of Nuclear Physics, citing his contributions to experimental medium-energy nuclear physics, in particular for his lead role in the development of and measurements with an internal target facility using polarized electrons.

Fred Dylla was nominated by the Forum on Industrial and Applied Physics, for sustained contributions to the surface science of materials and the design of ultra-high vacuum systems that have enabled a new generation of particle accelerators, plasma devices and materials processing systems.

Geoff Krafft was nominated by the Division of Physics of Beams, for his pioneering contributions in establishing the stability and operational foundation of superconducting and recirculating electron accelerators.

Bernhard Mecking, nominated by the

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# JLab congratulates new APS Fellows...

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Division of Nuclear Physics, was cited for his contributions to electromagnetic nuclear physics, including leadership in the design and construction of the CEBAF Large Acceptance Spectrometer (CLAS).

George Neil, nominated by the Division of Physics of Beams, was cited for his contributions to the development of physics and technology of Free-Electron Lasers and for his leadership in demonstrating a high average power FEL.

This is a meaningful distinction, Leemann pointed out, because the APS council selects no more than one-half of one percent of the total APS membership for Fellowship each year. This year 190 new Fellows were elected.

In the coming months, the 2001 Fellows will receive their certificates from the APS unit recognizing their achievements, according to Alan Chodos, associate executive officer of the APS.

The APS Fellowship program was created to recognize members who have made advances in knowledge through original research and publication or made significant and innovative contributions in the application of physics to science and technology, or made significant contributions to the teaching of physics. Each year, no more than one-half of one percent of the current membership of the Society is recognized by their peers for election to the status of Fellow in the American Physical Society. Each new Fellow is elected after competitive review and recommendation by a Fellowship committee on the unit level, additional review by the APS Fellowship committee and final approval by the full APS council.

APS Fellows have been around since the beginning of the APS in 1899, according to Chodos. "In the early days, being a Fellow was more common than being a regular member," the APS official explained. "But now of course it is the other way around: 5247 Fellows out of a membership of about 42,000."



*It is important that Jefferson Lab is recognized for the high quality of its scientific staff. I am very happy that my APS Fellowship will contribute to that goal.*

*Kees de Jager*



*I was nominated by several jolly good fellows and I'm honored to be joining their ranks.*

*Fred Dylla*

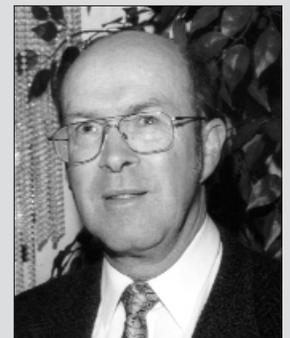


*I feel quite excited and very honored in being selected a Fellow of the American Physical Society. To me, it is confirmation that many of the problems that we as an institution, and that I as an individual, have worked on, have value outside the confines of Jefferson Lab. Our recirculating accelerators are being emulated the world over for many and more diverse applications. This Fellowship, and that of George Neil's clearly indicate the importance attached to work on recirculating accelerators among members of the accelerator physics community. It is easy for me to imagine that in 30 to 50 years, superconducting recirculating accelerators of many types will exist and that there will be three classes of accelerators discussed in textbooks: linacs, rings, and recirculating accelerators.*

*Geoffrey Krafft*

*Since there is no APS Fellowship for groups, I am sure that I have been selected for this honor in order to recognize the work done by the Hall B staff and the CLAS Collaboration in getting the CEBAF Large Acceptance Spectrometer detector designed, built, commissioned, and into routine data taking for physics. I am proud to have been part of that effort.*

*Bernhard A. Mecking*



*This is not only an exciting honor for me but recognition of the outstanding work done by the Free-Electron Laser team in breaking new ground in FEL performance and understanding the physics of such recirculating beam devices. We now have a long list of institutions that want to collaborate with us because of the efforts of the entire group; and this will have a substantial legacy for Jefferson Lab. Thanks to everyone who supported this effort!*

*George R. Neil*



## *Reorganized section facilitates Lab's internal, external communications*

Need a new graphic for a poster presentation or bulletin board, how about a more professional look for your PowerPoint briefing, or a revamped design to replace your department's aging, dysfunctional dinosaur of a web page? These and a host of other creative design services are available to the Lab community through Electronic Media.

Earlier this year, User Liaison evolved into two separate sections: the User/International Liaison office and Electronic Media. The office of Electronic Media (EM) serves as a key component facilitating the Lab's communication strategy for both internal and external users. It encompasses a variety of jobs such as consulting; web site creation; multimedia enhancements; graphic development; event promotion; maintenance; training; and the design, preparation, production and distribution of promotional and informational media.

Shannan Kyte, located in ARC room 525, heads the eight-person team. Members include Greg Adams, multimedia specialist; Zo Brown, application developer; Jessica Ledbetter, web developer; Lori Powell, graphic design-

er; and student programmers Collin Cusce, Matt Maravillas and Chris Schiel. Their diverse backgrounds have led to the development of a team dedicated as the Lab's primary multimedia and communication resource.

The creative services staff can design brochures, posters/flyers, presentation templates, publications, report covers, logo designs, wall panels, banners, and signs. They can also help individuals having problems between graphic file creation and sending the completed project to the printer.

EM provides a variety of photography, video and video-conferencing services to Lab staff and the user community. Video services include video production and duplication (videotaping, editing, copying, etc.), and streaming Internet video (broadcast events). Photography services include archival photography, high-resolution scanning, on-site photographic prints and posters.

"The success of a web site is often determined by the quality and skill of the people who built it," Shannan Kyte comments. "Web site design requires a variety of skills — ranging from innovative

design ideas to solution-oriented programming."

Past and current projects include the JLab Picture Exchange (JPIX), the JLab employee recognition and awards database, intralab At-A-Glance calendar, multiple conference registrations and departmental web site designs. "I enjoy the variety of work and the daily challenges," says Jessica Ledbetter. "Not only am I involved in the design of the project, but also the programming, testing and training elements."

After the recent JLab website redesign, EM received numerous compliments, and a steady stream of work requests. "We are implementing more ways to ensure the highest quality of work possible while maintaining quick turnaround on projects," says Zo Brown.

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Sharing their EM expertise with the Lab are front row (left to right) Greg Adams, Collin Cusce and Zo Brown, and back row (l. to r.) Lori Powell, Shannan Kyte and Jessica Ledbetter.

# Turbocharging to Terascale

## SciDAC looks to boost Lab's computing capabilities

by James Schultz

Jefferson Lab is a participant in a new initiative announced recently by the Department of Energy. The Scientific Discovery through Advanced Computing (SciDAC) program will enable computing on the terascale level: creating systems capable of conducting trillions of calculations per second. Such an ability should allow researchers to tackle a variety of complex and otherwise intractable mathematical problems, including far more accurate models of climate, nuclear-energy and chemical processes, fusion power and astrophysics, among others.

The project also aims to produce the next generation in scientific simulation codes, harnessing terascale hardware to put parallel computational techniques more effectively and efficiently to use. (Calculating in parallel allows for the simultaneous solution of many different parts of a given computational task.) Fifty-one SciDAC projects will receive a total of \$57 million in fiscal year 2002 to advance fundamental research in several areas related to the Energy Department's missions.

At JLab, the program will involve applying the power of the new hardware and software configurations to address theoretical calculations related to quantum chromodynamics, the theory that describes the strong-force interactions in the atomic nucleus between the basic particles known as quarks. The Lab will also participate in the SciDAC-related Particle Physics Data Grid, a high-speed, high-capacity infrastructure 1,000 times faster than current systems that is expected to be deployed within the next three years. Planners intend that the Grid will give researchers across the globe instant access to large amounts of data that can be shared routinely among far-flung groups of scientific collaborators.

"The SciDAC program is more evolutionary than revolutionary," says Chip Watson, JLab's head of high-performance computing. "Conceptually it's similar to what we have today — only a lot more of it. It will improve the exist-



Chip Watson, head of the Lab's High-Performance Computing Group, watches as group members Walt Akers and Jie Chen (left to right) check out a new dual-processor Pentium 4 server.

ing collaborations between institutions, help us to set up new ones and generally help us work together much more efficiently."

### Available Anytime, Anywhere

SciDAC implementation at JLab may eventually entail hooking together as many as 1,000 two-to-four-processor machines in clusters that could fill a good-size room. Because of increased need for electricity — up to a megawatt of power for operation and cooling — Watson expects expansion of the current Computer Center will be required.

Beyond the hardware, however, the most important SciDAC impact should come with innovative software that will be written specifically to take advantage of the multiprocessor arrangements. Ease of use is another major goal. Ultimately, Watson says, SciDAC-derived software should be available anytime, anywhere, on any machine.

"We'll be attempting to develop a software library in which the software

won't 'care' what machine it's running on," he explains. "Different machines have different advantages. Portability and scalability are major advantages of this project."

The Lab hopes to purchase off-the-shelf computer components over three years, beginning in calendar year 2003. SciDAC and JLab funds have been committed to acquire a one teraflop system by the end of 2003. Beyond that, provided funding is available, the plan calls for continuing growth to 10 teraflops over the next several years. The aggregate cost of growing from one to 10 teraflops would be several million dollars. As hardware costs per unit of computing power continue to decrease, the Lab will replace outmoded processors with newer versions, yielding continual improvement as the program proceeds.

"On the commodity side, Moore's Law pushes down the price of these things," Watson says. "Three or four years from now I think we'll make the list of the world's 50 fastest computers."

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# Science bowl

## *JLab needs your help to conduct academic tournament*

When the Virginia Regional Science Bowl comes to JLab on Feb. 9, the time and effort of nearly 60 volunteers will be needed to run the day-long academic event, says Jan Tyler, Science Education program manager.

"We'll need a team of four — including a moderator, rules judge, timekeeper and scorekeeper — for each of the rooms we'll be using for tournament rounds," Tyler explains. "And it looks like we'll start the day with 10 of these teams handling the morning round-robin session. We'll also need a small group of volunteers to be available on site as the scientific team. They will be called on to handle any student challenges to questions or answers that might crop up during the competition."

"The moderators, rules judges, timekeepers and scorekeepers each have specific roles and responsibilities during the competition," Tyler continues. "We've posted detailed descriptions of each of the positions on the Education web page at <http://education.jlab.org/sciencebowl>. We'll also conduct practice matches for our volunteers during the week of Feb. 4."

"Volunteers from past JLab hosted Science Bowls had a great time," Tyler recalls. "They enjoyed the excitement of the tournament and meeting people from the Lab and across the state." Brief descriptions of volunteer positions follow.

The **moderator** is responsible for starting and controlling each match. He or she reads all questions aloud and identifies the first student to activate the response buzzer, and announces whether responses are correct or incorrect. If there is a question about a student's response, the moderator requests assistance from the rules judge. The moderator must be able to keep the match moving, speak clearly, listen closely and maintain control of the match.

The **rules judge** ensures that all match rules are followed, including ensuring that audience members don't signal or communicate with competitors during rounds. The rules judge ensures quiet during a match, makes judgment calls as required, and makes sure that the timekeeper stops the clock during official discussions between officials and students. The rules judge also monitors scorekeeping.

The **timekeeper** operates the official clock for each match. He or she must stay focused on the clock, which is used to track the time of each match from beginning to end, including response times for bonus questions and toss-up questions.

The **scorekeeper** tracks the points for correct answers to all questions, provides the halftime scores, and the cumulative tally for both teams. The person must be able to award points and record scores and keep running totals throughout each match.

The **scientific team** needs to have a combined knowledge of the following fields: chemistry, biology, physics, mathematics, astronomy, and the general, earth and computer sciences. Ten conference rooms in CEBAF Center, the VARC and the ARC will be used for the event.

The Science Bowl is an academic competition among teams of high school students who answer questions on a variety of scientific topics. Each team is made up of five students, and a teacher who serves as an advisor and coach. The tournament will consist of a round robin followed by a double-elimination final, according to Tyler. Questions, posed to the students include multiple choice and short answer on a wide variety of science and math topics. The winning team will receive a trip to Washington, D.C. for the national finals May 2 – 5, 2002. Runner-up teams will earn science equipment for their schools.

All participants, including volunteers, will receive a "Dive into Science" T-shirt. Lab employees, contractors, users, as well as their spouses and family members age 13 and older may volunteer. "This is strictly a volunteer activity," Tyler reminds potential helpers. Anyone interested in more information or in volunteering may contact Tyler, e-mail [tyler@jlab.org](mailto:tyler@jlab.org) or call ext. 7164, or Sarah Ingels, Director's office, e-mail [ingels@jlab.org](mailto:ingels@jlab.org) or call ext. 7444.

## Turbocharging to Terascale...

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The FY 2002 allocations have not yet been made, but Jefferson Lab anticipates receiving approximately \$760,000.

Overall, the SciDAC-funded list includes 23 large projects that will each receive \$500,000 to \$4 million per year for three to five years, and 27 smaller projects, each with funding of up to \$500,000 per year for three years. The projects involve collaborations among 13 DOE laboratories, and more than 50 colleges and universities.

Thirty-three projects are in the biological, chemical and physical sciences. Specifically, 14 university projects will advance the science of climate simulation and prediction. These projects

involve both novel methods and computationally efficient approaches for simulating components of the climate system and work on the integrated climate models.

Ten projects will address the areas of quantum chemistry and fluid dynamics, which are critical for modeling energy-related chemical transformations such as combustion, catalysis and photochemical energy conversion. The scientists involved in these activities will develop new theoretical methods and efficient computational algorithms to predict complex molecular structures and reaction rates.

Five projects are focused on developing and improving the physics models

needed for everything from integrated simulations of plasma systems to advanced fusion energy science. Those studies will focus on such fundamental phenomena as electromagnetic wave-plasma interactions, plasma turbulence and macroscopic stability of magnetically confined plasmas.

Four projects in high energy and nuclear physics will significantly extend the exploration of the fundamental processes of nature. The projects include the search for the explosion mechanism of core-collapse supernovae, development of a new generation of accelerator simulation codes and, at JLab, simulations of quantum chromodynamics.

## Toys for Tots

The Dec. 15 Children's Holiday Party was a great success, says Jessica Ledbetter, JLab Activities Group member. "A special thanks to the volunteers who made it such a special event for the kids. Brett Lewis, Accelerator Division, made liquid nitrogen ice cream, which was a real hit. The children also enjoyed a visit from Santa Claus, watching videos and eating snacks. They really demolished the chocolate chip cookies brought in by several parents," Ledbetter noted. JLab children and adults donated four large boxes of toys for Toys for Tots, including four bikes complete with helmets, donated by Test Lab staff. Here a marine accepts a toy from Gregory N. Adams, son of Greg Adams, Electronic Media.



## Milestones for November 2001

### Hello

Dana M. Cochran, Database Programmer/Analyst, Physics Division

Anthony M. Dela Cruz, Diagnostic Systems Technician, Accelerator Division

Hovanes Egiyan, Post Doctoral Fellow, Physics Division

Vladimir Sapunenko, Computer Scientist, Physics Division

### Goodbye

Kenneth Garrow, Post Doctoral Associate, Physics Division

### Congratulations

Brooks H. Pate, University of Virginia chemistry professor and FEL user, was recently named as one of the 23 recipients of this year's MacArthur Fellowships. He was one of nine scientists, and the only Virginia resident in the group. Pate's research at JLab, over the past two years, involved using the Free-Electron Laser to accelerate chemical reactions. Using the

FEL, he is discovering more about the combustion process of hydrocarbons, a family of molecules much like the fuel in a vehicle's gas tank. He wants to learn how combustion creates carcinogenic byproducts called polyaromatic hydrocarbons, and find ways to neutralize them. He plans to use his award to develop more specialized equipment for his studies.

*"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 employees, guests compete in golf tourney

The JLab fall golf tournament was played Oct. 9 at Cypress Creek in Smithfield. "The weather was beautiful that day, and everyone had a lot of fun," says event co-organizer, Julie Oyer. Forty-eight Lab employees and their guests participated in the event.

The tourney was planned by Danny Machie, Accelerator Division; Mike Zarecky, Accelerator; and Oyer, Office of Technical Performance. The Lab's spring tourney will be organized by Ed Daly, Accelerator; Tom Hiatt, Accelerator; and Oyer. More information will be available early in 2002.

Finishing in first place at 7 under par were:

- Dave Waldman, Accelerator
- Ed Daly, Accelerator
- Kelly Dixon, Accelerator
- Stephanie Sun

The second and third place teams both finished at 5 under par. The second place team broke the tie by scoring better on the hardest handicap hole. In second place were:

- John Horne
- Kelly Tremblay, Accelerator
- Mark Davis -

Mark Wissman, Accelerator

And finishing in third place were:

- Brad Cumbia, Accelerator
- Mike Spata, Accelerator
- Omar Garza, Accelerator
- Scott Higgins, Accelerator

The JLab Sportsman Award went to the team of Kelly Hanifan, Accelerator; Dale Webster, Sharon Parkinson, Director's Office; and Ed Stitts, Accelerator (+18).

Individual Awards were won by the following people:

- Closest to the Pin on Hole 16: Kelly Dixon at 10 ft 11 in. beat out Tom Hiatt, Accelerator, at 14 ft 0 in.
- Closest to the Pin on Hole 7: Mark Davis at 3 ft 4.5 in. beat out Mike Spata at 30 ft 8 in.

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- Longest Drive for the Women on Hole 4: Julie Oyer beat out Sharon Parkinson.
- Longest Drive for the Men on Hole 4: Ed Daly beat out John Horne who beat out Brad Cumbia.
- Longest Drive for the Men on Hole 18: Steve Singleton, Accelerator, beat out Kelly Dixon who beat out Steve Oyer who beat out Mark Stapleton, Accelerator, who beat out Scott Higgins.

## Greeting cards; don't toss, donate to St. Jude's

Holiday greeting cards: chances are nearly everyone has at least a few taped to the office door or stacked on the dining room table at home. "Don't throw them away," begs Betty Beeler, EH&S Reporting office. "Those pretty holiday cards don't have to wind up in the trash. They can be recycled by St. Jude's Ranch for Children." For the past three years JLab volunteers have collected used greeting cards of all types and sent them to St. Jude's Ranch for Children, Beeler explains.

St. Jude's is a nationally recognized nonprofit organization that focuses on the needs of abused, abandoned and neglected youths of all faiths and races. The children trim the cards and glue them onto pre-printed card backs, which are then sold to the public. Each child earns 15 cents for each card he or she makes. The money the children make is divided among their education funds, savings, spending money and group outings.

Beeler encourages everyone at the Lab to bring in their used holiday and greeting cards and put them in the marked drop boxes located around the site.

Be sure to remove personal letters and photos before donating the cards, Beeler reminds. The ranch only uses the fronts of the cards. The backs will be removed before mailing. Marked collection boxes are located in the CEBAF Center second-floor recycling area, VARC recycling center, Machine Control Center, and the Applied Research Center seventh-floor copy room.

The program is a delightful approach to reducing landfill waste

while contributing to the needs of a very special charity, points out Beeler. For more information e-mail Beeler (beeler@jlab.org) or call ext. 7491. To date the Lab has gathered more than 30,000 cards to benefit St. Jude's youth.

For more information about St. Jude's and its greeting card fundraising project, visit [www.stjudesranch.org/](http://www.stjudesranch.org/).

## Electronic Media...

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"Our specialists understand the creative and production process, from concept to completion," Kyte says. "If you need a new approach or help managing a creative project, EM can assist you. We can give your print and web projects the professional look you desire." Projects and work orders are prioritized according to importance to Lab mission, EM workload and deadline. The JLab web committee reviews and prioritizes all significant EM projects.

For more information on EM, visit [www.jlab.org/em/](http://www.jlab.org/em/), or contact Kyte, ext. 7337 or e-mail [shannan@jlab.org](mailto:shannan@jlab.org).

# Update



## NC A&T

Phillip Carey, Dean of the College of Arts and Sciences at North Carolina A&T State University recently visited the Lab for the first time. He was here to see the work being done by a team from NC A&T; they are part of the experimental collaboration called PRIMEX for Hall B. He received briefings and was shown the PRIMEX experiment as well as the three experimental halls. After departing, he was heard to say that Jefferson Lab "has a great place in the future of the university." Pictured is (left to right) Ashot Gasparian, Hampton University professor and contact for the PRIMEX detector; John Domingo, JLab representative; Sam Danagoulian, NC A&T, spokesman for PRIMEX; Dr. Carey; and Abdellah Akmidouch, NC A&T, professor of physics.

# Community leaders, DOE welcome new JLab director

Southeastern Universities Research Association President Jerry Draayer hosted a reception on Dec. 11 for local community leaders to congratulate Christoph Leemann as Jefferson Lab's new director. Here Leemann and Newport News Mayor Joe Frank smile for a photo. ▶



◀ The SURA-hosted reception, held at the Omni in Newport News, also allowed Department of Energy officials to recognize Leemann as JLab's new director. Here Christoph talks with Dennis Kovar, director of the Department of Energy's Nuclear Physics Division, and Kovar's wife, Mary.

**ON TARGET**

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