ALSNews Vol. 294 January 28, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. DIRECTOR'S UPDATE: A NEW YEAR AND A NEW ERA

by Roger Falcone
(Contact: Roger Falcone, RWFalcone@lbl.gov)

This month, on January 20, we took a moment to watch the inauguration of President Obama on screens in several conference rooms. It was wonderful to share in the optimism of the event with other members of the ALS community and hear messages of change, hope, and new personal responsibility. It was also encouraging to hear, on the same day, that the Senate confirmed our (former) Lab Director, Steve Chu, as the new Secretary of Energy.

I looked for themes in the inauguration speech that will affect our work, and they were there: "We will restore science to its rightful place, and wield technology's wonders to raise health care's quality and lower its cost. We will harness the sun and the winds and the soil to fuel our cars and run our factories. And we will transform our schools and colleges and universities to meet the demands of a new age. All this we can do. All this we will do." I felt some pride in knowing that we will contribute in these areas.

Another theme in the speech, international cooperation and collaboration, we often take for granted in operating a "user facility." I also note that we are inherently democratic in our structure, in the open way we provide service to a broad range of users.

As President Obama noted, it was a wonderful moment, but we cannot be blind to the challenges we face, economically and technologically. In the last few weeks we have heard about potential new funding for science, under the American Recovery and Reinvestment Act, a part of the broader stimulus package being considered by Congress. What role we will play in the economic recovery, how we can best utilize existing and possible additional resources, and what the funding outlook is long-term, all are yet to be determined.

We have been working to clarify the role that the ALS does and can play in the future of science and technology, in a variety of ways. Specifically, we are developing a better understanding of the ways that ALS scientists contribute to energy research. We have worked with other labs (SLAC, ANL, and BNL) to develop a white paper on the science and technology of future light sources. Also, we completed a report on a recent workshop on science with coherent soft x-rays. Finally, we are bringing our Strategic Plan to the Department of Energy (DOE) and will work with it on the renewal of the ALS. In the next few months we hope to have a greater understanding of the overall budget situation for light sources, but at this moment, the situation is uncertain, and our immediate goal is to complete our planning processes.

As most of our users and all our staff know, over the last few weeks, we have been focusing our attention on the upcoming audit by the DOE of our safety practices and culture. The preparation for this audit has made us a better and safer facility, and I want to thank Jim Floyd, our users, and the entire ALS staff for all of their efforts in preparation for this review, which will occur in major part at the end of January.

Finally, on your way to lunch at the cafeteria, I encourage you to take a look at the new user guesthouse. Its construction has gone remarkably rapidly, it looks very impressive, and I look forward its opening later this year.

2. REACTION-DRIVEN RESTRUCTURING OF BIMETALLIC NANOPARTICLE CATALYSTS

(Contacts: Gabor Somorjai, somorjai@berkeley.edu; Miquel Salmeron, mbsalmeron@lbl.gov)

Catalytic systems based on bimetallic particles with controlled size, composition, and structure dispersed on a high-surface-area support are widely used for catalytic reforming, pollution control, alcohol oxidation, and electrocatalysis in fuel cells. Owing to the nanoscale size of the particles, the modification of the surface structure and composition that may occur when reaction conditions change can have dramatic effects on catalyst activity and selectivity. Working at the ALS, a University of California, Berkeley - Berkeley Lab group has used an ambient-pressure x-ray photoelectron spectroscopy (APXPS) apparatus to demonstrate that bimetallic nanoparticle catalysts can undergo profound structural and chemical changes in response to reactive environments at ambient pressures, thereby opening the way for engineering catalysts with enhanced activity and selectivity.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/179nanoparticle-catalyst.html

Publication about this research: F. Tao, M.E. Grass, Y. Zhang, D.R. Butcher, J.R. Renzas, Z. Liu, J.Y. Chung, B.S. Mun, M. Salmeron, and G.A. Somorjai, "Reaction-driven restructuring of Rh-Pd and Pt-Pd core-shell nanoparticles," Science 322, 932 (2008).

3. NANOSCALE CHEMICAL IMAGING OF A WORKING CATALYST

(Contacts: Frank de Groot, f.m.f.degroot@uu.nl; Bert Weckhuysen, b.m.weckhuysen@uu.nl)

The heterogeneous catalysts used in most chemical processes typically consist of nanoscale metal or metal oxide particles dispersed on high-surface-area supports. While these particles are the active elements of the catalyst, the overall performance depends not only on their size and composition but also on their multiple interactions with the support, reactants, and products. Probing this chemical soup in real time under realistic reaction conditions is such a tall order that in some cases even the catalytically active chemical species is not known. A Dutch team working at the ALS has combined scanning transmission x-ray microscopy with a reaction chamber adapted from electron microscopy to identify the chemical species present for an iron-based Fischer-Tropsch synthesis catalyst and to image their distribution on the nanoscale. When developed further, this new tool may give chemists the ability to design and tailor catalysts for maximum selectivity and efficiency in a wide range of chemical processes.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/180catalyst-imaging.html

Publication about this research: E. de Smit, I. Swart, J.F. Creemer, G.H. Hoveling, M.K. Gilles, T. Tyliszczak, P.J. Kooyman, H.W. Zandbergen, C. Morin, B.M. Weckhuysen, and F.M.F. de Groot, "Nanoscale chemical imaging of a working catalyst by scanning transmission x-ray microscopy," Nature 456, 222 (2008).

4. REMINDER: EXPERIMENTAL SAFETY SHEET PROCEDURE

(Contact: Sue Bailey, SBailey2@lbl.gov)

ALS users are reminded that safety at the ALS is of paramount importance. To ensure that all experiments are run safely, ALS staff members need details of the experiments that will be run, including any hazards, well before the experiment time. We then assess the hazards, ensure that proper controls are established, and provide inspections for the experiment setup as appropriate. The mechanism for collecting and documenting this procedure is the Experimental Safety Sheet (ESS), which is generated when a proposal is submitted to do work at the ALS and is reviewed annually.

It is critical that ALS users ensure that the ESS is an accurate description of the experiment, and all users on site at the ALS are required to sign the ESS before the start of their experiment. Beamline staff and the Experiment Coordination Group (ext. 7222) are available to help you through the process.

In addition, a one-page form (User Experiment Form) is required for each visit, detailing the dates of the experiment and which users are actually present for the visit and summarizing the hazards. Both the ESS and the User Experiment Form need to be posted at the sector board on the outer wall of the ALS and close to the beamline.

Health, Safety, and Security auditors will be visiting the ALS this week. Users of the ALS during this time may be asked by an auditor for an interview about their work at the ALS and their understanding of the ESS process. If you are interested in learning more about the ESS procedure, the online course ALS1001 (http://www.lbl.gov/ehs/training/courses_online/index.shtml) serves as a good introduction.

5. UEC CORNER: INTRODUCING THE 2009 COMMITTEE

by Kenneth Goldberg
(Contact: Kenneth Goldberg, KAGoldberg@lbl.gov)

I am very happy to introduce this year's ALS Users' Executive Committee (UEC) and to serve as your chairman in 2009. We represent you, the ALS user community, to the ALS management and funding agencies. With the support of the ALS staff, the UEC also runs the annual ALS Users' Meeting each fall. While this year's UEC spans a broad range of research interests, we rely on your input, concerns, and suggestions to give direction to our work. Please do not hesitate to contact any one of us with issues that concern our community or your work at the ALS. We will do our best to listen and to elevate your concerns to the ALS management.

At the same time as we welcome our new UEC members Chris Jacobsen, David Osborn, and Yayoi Takamura, I would like to thank our outgoing members for their service and their involvement: Elke Arenholz, Tony van Buuren (past chair), Alessandra Lanzara, and Simon Morton. Simon, however, will be continuing on in two roles: as user representative on the User Support Building and Guest House committees and as a representative/consultant for macromolecular crystallography users. A special thank you is also due to our outgoing UEC chair, Hendrik Ohldag, whose involvement continues through 2009.

I have been working at the ALS since 1993, serving as a beamline scientist for over 10 years. I am especially sensitive to quality-of-life issues at the ALS and am aware of the essential roles that beamline scientists play in every experiment. Among other issues, I'd like to help make beamline scientists' lives easier, by working with the ALS to simplify and improve how we report new publications and beamline usage.

The UEC will be active in a number of issues this year. Safety is front and center, and finding ways to live and work within the new requirements is paramount for each of us. UEC members are also helping to improve the proposal process at the ALS and providing users' perspectives to a division management faced with a difficult budget climate.

You can usually find me at Beamline 11.3.2, so please don't hesitate to introduce yourselves and to let me know if I or the broader UEC group can be of service. We are looking forward to working with you and for you in 2009. For more info about the UEC, go to http://www.als.lbl.gov/als/uec/index.html .

2009 ALS UEC Members:

Kenneth Goldberg (chair), LBNL (2007-09)
Yves Acremann, SLAC (2008-10)
Peter Fischer, LBNL (2007-09)
Phil Heimann, ALS (2008-10)
Franz Himpsel, Univ. of Wisconsin, Madison (2007-09)
Chris Jacobsen, Stony Brook University (2009-11)
Hendrik Ohldag (past chair), SSRL (2006-08)
David Osborn, Sandia National Laboratories (2009-11)
Anne Sakdinawat (student), UC Berkeley, UC San Francisco, LBNL (2008-10)
Wayne Stolte, Univ. of Nevada, Las Vegas (2008-10)
Yayoi Takamura, UC Davis (2009-11)
Simon Morton, LBNL (2006-08, 2009 special assignee)

6. HONORS AND AWARDS: ELI ROTENBERG AND RICHARD SAYKALLY

Eli Rotenberg, Deputy Leader of the ALS Scientific Support Group, has been elected a Fellow of the American Physical Society (APS). His citation reads: "For outstanding contributions to the understanding of quantum electronic properties of nanophase and reduced dimensionality systems by creative applications of angle-resolved photoemission spectroscopy." Election to Fellowship in the APS is limited to no more than one half of one percent of the membership, and is recognition by peers of outstanding contributions to physics.

Long-time ALS user and Berkeley Lab chemical scientist Richard Saykally has received the Peter Debye Award in Physical Chemistry, bestowed by the American Chemical Society. Laser spectroscopy of liquids, surfaces, and clusters, synchrotron x-ray spectroscopy of liquids and liquid surfaces, and femtosecond nonlinear optical spectroscopy of liquid surfaces are among the areas in which Saykally conducts research. Peter Debye, the award's namesake, was a Dutch physicist and physical chemist, and Nobel laureate who died in 1966.

7. A SUCCESSFUL SES IV IN SAN FRANCISCO

(Contact: Peter Nico, PSNico@lbl.gov)

The Fourth Synchrotron Environmental Science conference (SES IV), held December 11-13, 2008, in San Francisco was co-hosted by ALS/Berkeley Lab and SSRL/SLAC and included over 80 registered attendees. The two hands-on sessions, one at ALS and one at SSRL, were both filled to capacity and introduced nearly 30 new users to some of the amazing capabilities synchrotrons have to offer for environmental science. At the ALS, four beamlines participated in the hands-on session, 1.4.3, 8.3.2, 10.3.2, and 11.0.2. The main session in San Francisco included introductory talks on EXAFS, microprobes, x-ray scattering, APPES, and STXM, while the keynote speakers presented their vision for how synchrotron science can contribute to some of the most pressing questions in environmental science including CO2 sequestration, environmental remediation, climate change, marine science, and atmospheric science. The

conference also highlighted new synchrotron methods and facility developments at all the North American synchrotron sources. Thanks to all who contributed to making the SES IV such a success!

8. ALS-RELATED WEB NEWS AND LINKS

Interview with Paul Adams in PDB Newsletter
http://www.rcsb.org/pdb/general_information/news_publications/newsletters/2008q3/pdb-focus.html

Finding better materials for solar cells
http://www.physorg.com/news148138993.html

Obama picks Berkeley Lab Director Steve Chu for Energy Secretary
http://www.lightsources.org/cms/?pid=1003186

Structural study backs new model for the nuclear pore complex
http://newswire.rockefeller.edu/?page=engine&id=869

Senate Energy & Natural Resources Cmte. Hearing on Energy Secretary Nomination (video)
http://www.c-span.org/Watch/watch.aspx?MediaId=HP-A-14255

Iowa State University researchers discover structure of key Ebola protein
http://www.public.iastate.edu/~nscentral/news/2009/jan/ebola.shtml

E. coli persists against antibiotics through HipA-induced dormancy
http://www.mdanderson.org/departments/newsroom/display.cfm?id=4d917264-2dce-4eb8-a51fd1ae19a30f5f&method=displayfull&pn=00c8a30f-c468-11d4-80fb00508b603a14

University of California appoints Paul Alivisatos Interim Director of Berkeley Lab
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/january/01-22-09/SE.html

9. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

The ALS was shut down at 12:00 A.M. on Wednesday, December 24, 2008, for the winter holidays. Operations resumed at 8:00 A.M. on January 2, 2009, for planned maintenance and installations--mainly of modified top-off apertures in the storage ring. Also, permanent-magnet assemblies were added to the front ends of Beamlines 12.3.1 and 8.3.1. User operations resumed at 8:00 A.M. on Tuesday, January 13, 2009.

For the user runs from November 19 to December 23, 2008, and January 13 to 18, 2009, the beam reliability (time delivered/time scheduled) was 94.3%. Of the scheduled beam, 88.5% was delivered to completion.

On December 6, 2008, an ALS-wide ac-power variation resulted in the loss of over 16 hours of scheduled beam time.

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

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LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

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Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. TOP-OFF UPGRADE COMPLETED SUCCESSFULLY

(Contact: Christoph Steier, CSteier@lbl.gov)

The largest upgrade of the Advanced Light Source since it was originally commissioned in 1993 culminated with the successful transition to top-off user operations on Wednesday, February 11. The top-off operational mode allows frequent injection of electron beam into the storage ring, resulting in a nearly constant current while keeping user-beam shutters open at all times. This mode presents several large advantages for users. Instead of having multiple injections of a large number of electrons in a short time period followed by uninterrupted beam decay over the course of eight hours, a small number of electrons is added to the storage ring at approximately every 30-60 seconds. The constant beam current enhances the flux and brightness of the radiation while simultaneously improving the thermal stability of the machine and its beamlines.

The new average current level is about 450 mA, but plans are to ultimately increase that to 500 mA in the next few weeks. In terms of flux, this translates into a 50% increase now and 100% increase at full current. Also, the process of slowly decreasing the vertical emittance has begun. So far there has been about a 10-15% reduction of the vertical beamsize, with a resultant increase in brightness of twice that amount. The goal is to cut the beamsize by 50% over the next six months, increasing brightness by up to a factor of four. So, overall, the upgrade should increase the flux by a factor of two and the brightness by a factor of up to eight. The installation of newer insertion devices with smaller gaps will provide additional gains.

In terms of stability, it's estimated that by eliminating the current dependence of beam-position monitors and by reducing the thermal motion of magnets, girders, etc., the medium-term orbit drift has been reduced by a factor of two to three. On top of that, user beamlines might profit by the steady heat load no longer introducing thermal drifts in beamline components. Finally, it is of advantage to many users that they do not need to normalize their measurement data to their incoming photon flux anymore. This makes measurements easier and reduces noise and

systematic errors. Responses from users, who have anxiously anticipated top-off operation for several years, have been uniformly positive.

2. PROBING CORE-HOLE LOCALIZATION IN MOLECULAR NITROGEN

(Contact: Markus Schoeffler, schoeffler@atom.uni-frankfurt.de)

The behavior of the core hole created in molecular x-ray photoemission experiments has provided molecular scientists with a valuable window through which to probe the electronic structure and dynamics of molecules. But the answer to one fundamental quantum question--whether the core hole is localized or delocalized--has remained elusive for diatomic molecules in which both atoms are the same element. An international team of scientists from the University of Frankfurt in Germany, Berkeley Lab, Kansas State University, and Auburn University has now resolved the issue with an appropriate twist of quantum fuzziness. By means of coincident detection of the photoelectron ejected from molecular nitrogen and the Auger electron emitted femtoseconds later, the team found that how the measurements are done determines which description--localized or delocalized--is valid.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/177core-hole-nitrogen.html

Publication about this research: M.S. Schoeffler, J. Titze, N. Petridis, T. Jahnke, K. Cole, L. Ph.H. Schmidt, A. Czasch, D. Akoury, O. Jagutzki, J.B. Williams, N.A. Cherepkov, S.K. Semenov, C.W. McCurdy, T.N. Rescigno, C.L. Cocke, T. Osipov, S. Lee, M.H. Prior, A. Belkacem, A.L. Landers, H. Schmidt-Boecking, Th. Weber, and R. Doerner, "Ultrafast probing of core hole localization in N2," Science 320, 920 (2008).

3. ENZYME STRUCTURE PROVIDES INSIGHTS INTO CANCER AND AGING

(Contact: Jill Fuss, JFuss@lbl.gov)

XPD helicase is an enzyme that unwinds the DNA double helix; it is one component of an essential repair mechanism that maintains the integrity of DNA. XPD is unique, however, in that pinpoint mutations of this single protein are responsible for three different human diseases: in xeroderma pigmentosum (XP), extreme sensitivity to sunlight promotes cancer; Cockayne syndrome (CS) involves stunted growth and premature aging; trichothiodystrophy (TTD), characterized by brittle hair and scaly skin, is another form of greatly accelerated aging. At the ALS, researchers from Berkeley Lab and The Scripps Research Institute recently solved the structure of XPD. The structure gives novel insight into the processes of aging and cancer by revealing how discrete flaws--as seemingly insignificant as a change in either of two adjacent amino acid residues--can lead to diseases with completely different physical manifestations.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/178xpd.html

Publication about this research: L. Fan, J.O. Fuss, Q.J. Cheng, A.S. Arvai, M. Hammel, V.A. Roberts, P.K. Cooper, and J.A. Tainer, "XPD helicase structures and activities: Insights into the cancer and aging phenotypes from XPD mutations," Cell 133, 789 (2008).

4. GUEST HOUSE SURVEY: ROOM LAYOUTS AND FURNISHINGS

(Contact: Sue Bailey, SBailey2@lbl.gov)

The Berkeley Lab Guest House is on schedule for a July completion and opening. The Guest House building is now watertight, and electrical installation has started. The Guest House will have 57 guest rooms with an additional lounge/kitchenette. It is expected that tentative bookings might be taken as early as April or May, to be confirmed in June.

Sited near the ALS building, the Guest House is expected to be popular with ALS users. Room furniture will be ordered within the next few weeks and we would like your input to help us choose the appropriate room layouts and furnishings to meet your needs (see possible room layouts at http://www.als.lbl.gov/als/quickguide/housing.html). Your input is valuable and will be used to help the contractors make decisions. If you're an ALS user who plans to utilize the Guest House, please complete the short survey at the link below so that we know what will work for you (the survey also includes a few short questions about light-source safety practices and the general-user proposal process).

http://www.zoomerang.com/Survey/?p=WEB228V2ARFUXW

5. TWO IMPORTANT STRATEGIC DOCUMENTS NOW AVAILABLE ONLINE

A white paper titled "Science and Technology of Future Light Sources," a collaboration between scientists from Argonne National Laboratory, Brookhaven National Laboratory, Lawrence Berkeley National Laboratory, and SLAC National Accelerator Laboratory, is now available in PDF format. This 87-page document envisions the scientific challenges that can be met by future x-ray sources and instrumentation and summarizes the research and development required to achieve that vision. Scientific challenges, or "drivers," such as understanding and controlling dynamic phenomena, chemical reactivity, complex materials, novel materials design and behavior under extreme conditions, and life science and soft condensed matter are covered, with a discussion of "What Is Needed?" for each of these areas. Closing chapters discuss types of x-ray sources, their capabilities and trade-offs, and other considerations.

http://www.als.lbl.gov/als/publications/4LabWhitePaper.pdf

Working closely with our U.S. Department of Energy (DOE) sponsors, advisory committees, user community, and beamline scientists, the ALS has developed a new strategic plan titled "The Advanced Light Source Strategic Plan: 2009-2016." Subtitled "Addressing the Scientific Grand Challenges and Our Energy Future," the plan not only aims to keep the ALS at the forefront among its peers, but also responds to the challenge of establishing unique scientific programs capable of achieving the breakthroughs in fundamental research needed to put advanced energy

technologies within reach. Four key focus areas provide the foundation for the new plan: New and upgraded beamlines, accelerator renewal, enabling technical capabilities, and user scientific support and future scientist pipeline. A chapter devoted to each focus area describes specific elements of the plan, including what funding will be needed, roughly in priority order.

http://www.als.lbl.gov/als/publications/StrategicPlanFeb09.pdf

6. WANTED: ENERGY-RELATED HIGHLIGHTS

(Contact: Lori Tamura, LSTamura@lbl.gov)

The ALS is always on the lookout for science highlights to publish in ALSNews, post on our Web site, and send to our funding agency, DOE. In the past, our focus has been on research published in the so-called "high-profile" journals: Nature, Science, Physical Review Letters, and Cell (for structural biology). It has not escaped our attention, however, that many interesting and worthwhile experiments by ALS users get overlooked using this tight screen. Therefore, we would like to encourage users to submit their work for consideration as science highlights--particularly on energy-related topics--as long as it has been either published or accepted for publication in a peer-reviewed journal. "Energy-related" is of course a broad category, covering topics from catalysis and combustion to batteries and solar cells. If you would like to help "energize" our science highlights, please submit your research paper(s) to Lori Tamura (LSTamura@lbl.gov) or Liz Moxon (EJMoxon@lbl.gov).

7. ALS-RELATED WEB NEWS AND LINKS

Next–Generation Lithography: EUVL readiness for pilot line insertion
http://www.solid-state.com/display_article/352195/5/none/none/Feat/Next%E2%80%93Generation-Lithography:-EUVL-readiness-for-pilot-line-insertio

Iron on its Route to the Sea-Floor: A New Path
http://www.nsf.gov/news/news_summ.jsp?cntn_id=114136&org=NSF&from=news

A Zen discovery: Unrusted iron in ocean
http://www.eurekalert.org/pub_releases/2009-02/uosc-azd020409.php

Carbon Acts Like Rustoleum Around Hydrothermal Vents
http://insciences.org/article.php?article_id=2133

"Science": Novel Quantum Effect Directly Observed and Explained
http://www.fz-juelich.de/portal/index.php?cmd=show&index=163&mid=671

Science Headed for Big Stimulus Boost
http://blogs.sciencemag.org/scienceinsider/2009/02/science-headed.html

Quantum dance: Discovery led by Princeton researchers could revolutionize computing
http://www.princeton.edu/main/news/archive/S23/49/78A93/index.xml?section=topstories

How Ten Trillion Bits Per Square Inch Assemble Themselves Perfectly
http://insciences.org/article.php?article_id=2583

'Transformative' Method Developed by UMass for Generating the Smallest, Most Perfect, Ultradense Polymer Films Ever
http://www.umass.edu/newsoffice/newsreleases/articles/84323.php

8. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

The beam reliability and completion numbers for the user runs from January 21 to February 15, 2009, were not available at the time of publication. Please check the online version of ALSNews, where the information will be posted later this week.

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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1. EXPERIMENTAL TEST OF SELF-SHIELDING IN VUV PHOTODISSOCIATION OF CO

(Contact: Mark H. Thiemens, mthiemens@ucsd.edu)

One way to test models of the solar system's formation is to compare the isotopic abundances of the elements found in its constituent bodies. A case in point is oxygen with three stable isotopes dominated by oxygen-16, with minute fractions of oxygen-17 and oxygen-18. Primitive objects whose formation predates the Earth's, such as the calcium-aluminum-rich inclusions in the Allende meteorite, have relatively higher fractions of the two heavier isotopes than does the Earth’s crust. Among the numerous explanations that have been proposed is the notion that chemical processes within the early solar nebula gave rise to the oxygen ratios, a leading candidate being a process called isotope self-shielding. But researchers from the University of California, San Diego, and Berkeley Lab have now shown that photodissociation of carbon monoxide (CO) caused by vacuum-ultraviolet (VUV) light from the early sun could generate reservoirs of the heavier isotopes in the solar nebula without the help of self-shielding.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/181isotope.html

Publication about this research: S. Chakraborty, M. Ahmed, T.L. Jackson, and M.H. Thiemens, "Experimental test of self-shielding in vacuum ultraviolet photodissociation of CO," Science 321, 1328 (2008).

2. SELF-ASSEMBLY OF POLYMER NANO-ELEMENTS ON SAPPHIRE

(Contacts: Thomas Russell, russell@mail.pse.umass.edu; Ting Xu, tingxu@berkeley.edu)

Self-assembly of polymers promises to vastly improve the properties and manufacturing processes of nanostructured materials, since self-assembly is highly parallel, quite versatile, and easy to implement. Especially promising are novel compounds known as block copolymers,

formed by two chemically different polymers that are linked together. Guided patterned arrays have been produced using electron-beam lithographic techniques or nano-imprint lithography, but these methods are painstaking, and they have not yet been able to produce perfect surfaces over large areas. Recently, a group of researchers used faceted surfaces of commercially available sapphire wafers to guide the self-assembly of block copolymer microdomains. Grazing-incidence small-angle x-ray scattering (GISAXS) at ALS Beamline 7.3.3 verified the arrays' quasi long-range crystalline order over arbitrarily large wafer surfaces. It's expected that this new method of producing highly ordered macroscopic arrays of nanoscopic elements will revolutionize the microelectronic and storage industries and perhaps others, such as photovoltaics.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/182copolymers.html

Publication about this research: S. Park, D.H. Lee, J. Xu, B. Kim, S.W. Hong, U. Jeong, T. Xu, and T.P. Russell, "Macroscopic 10-terabit-per-square-inch arrays from block copolymers with lateral order," Science 323, 1030 (2009).

3. NEW RESPONSIBILITIES FOR FALCONE, SCHOENLEIN, ODDONE

ALS Division Director Roger Falcone has been appointed by Berkeley Lab's Interim Director Paul Alivisatos to serve as Associate Laboratory Director for Photon Sciences. In this position, Roger will continue to serve as ALS director, leading efforts to renew the ALS while working to secure the Next Generation Light Source at Berkeley Lab. The Next Generation Light Source has the potential to revolutionize energy science research and is a critical project for the future of Berkeley Lab. Alivisatos also appointed Environmental Energy Technology Division Director Arun Majumdar to serve as Associate Laboratory Director for Energy and Environment. In a videotaped announcement, Alivisatos said: "These are exciting times for Berkeley Lab. Together, we are pursuing new large-scale science and technology initiatives for energy and environment, topics that are more relevant than ever to the health and prosperity of our nation and the planet... Please join me in thanking Roger and Arun for assuming these additional responsibilities, which are effective immediately. Both are outstanding scientists and have served this Lab with distinction. The Lab will be stronger for their strength and vision."

Also this month, Roger announced that Bob Schoenlein is joining the ALS as Deputy Director for Science. Bob is a scientist with the Materials Sciences Division at Berkeley Lab and is well known to many at the ALS as the developer of Beamline 6, our ultrafast x-ray facility, and an expert in condensed-phase physics. He has worked on projects ranging from the dynamics of biomolecules to the understanding of complex oxides and with photons ranging from the infrared to x rays. He is an internationally recognized leader in optical sciences, was educated at MIT, and has been at Berkeley Lab for 20 years. In a transitional period over the next year, Bob will be working together with ALS Science Advisor Janos Kirz.

Finally, Paul Alivisatos has asked ALS Special Assistant for Strategic Initiatives, Pat Oddone, to assist him and his staff as he makes the transition to Interim Laboratory Director. Pat is now

stationed in Building 50A, and it is expected that Pat's stay will last a minimum of six to nine months. You might still see her around the ALS from time to time as she continues to be involved in ALS initiatives and Next Generation Light Source planning.

4. POSITIVE REPORT FROM DOE HEALTH, SAFETY, AND SECURITY AUDIT

(Contacts: Roger Falcone, RWFalcone@lbl.gov; Jim Floyd, JGFloyd@lbl.gov)

As you all know, ALS was one of the divisions selected for the recently concluded Department of Energy (DOE) Health, Safety, and Security (HSS) audit. This was the most comprehensive safety inspection Berkeley Lab has undergone in more than a decade. At the ALS alone, more than 40 people were observed performing work, auditors sat in on several of our safety meetings, and dozens of documents were reviewed during the three weeks that they were here.

We are very happy to report that HSS found all of our Integrated Safety Management (ISM) Core Functions to be "effectively performed," the top rating. This is an extremely positive result for our division and we should be very proud of this accomplishment. We think we've all come to realize the importance of safety, both as an ethical and legal imperative, and for its impact to our scientific mission. Safety is now an important part of generating confidence on the part of our funders so reports such as this play a big role in our ability to continue to succeed.

One comment in the report is especially meaningful: "Division management and staff displayed their commitment to teamwork and safety in the development and implementation of hazard controls...." We know how hard all of you have worked this last year and we have seen your dedication and teamwork, so it is very gratifying to see that this was also recognized by HSS. Your openness and willingness to learn from this review went a long way towards achieving this measure of recognition.

However, we should recognize that we still have many areas that we can and need to improve upon. The appendices to the report list many items that they found during their time here and we all identified many more as a result of this process. This report, however, clearly shows that we've accomplished much and are on the right track. Many thanks again to all of you.

5. UEC CORNER: SAVE THE DATES FOR 2009 ALS USERS' MEETING

From meeting co-chairs David Osborn and Yayoi Takamura:

Make plans to attend the 2009 ALS Users' Meeting, Thursday, October 15, through Saturday, October 17, 2009. This year's meeting will be hosted jointly with the Molecular Foundry and will have a primary focus on research to further the United States' and the world's energy agenda. The meeting will have plenary talks, workshops, a joint poster session, and vendor exhibits. If you would like to organize a workshop for the 2009 Users' Meeting, please contact Yayoi Takamura (ytakamura@ucdavis.edu) or David Osborn (dlosbor@sandia.gov), this year's meeting co-chairs. Check the meeting Web site (http://www-als.lbl.gov/als/usermtg) periodically for the latest information, as it becomes available.

6. ALS-RELATED WEB NEWS AND LINKS

Berkeley Lab to Receive $115.8 Million in American Recovery and Reinvestment Act Funding
http://newscenter.lbl.gov/press-releases/2009/03/23/arra-funding/

7. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from January 21 to February 15, 2009, the beam reliability (time delivered/time scheduled) was 95.9%. Of the scheduled beam, 88.7% was delivered to completion. This includes the first week of user operations in top-off mode. There were no significant interruptions.

For the user runs from February 18 to March 15, 2009, the beam reliability was 96.0%. Of the scheduled beam, 89.7% was delivered to completion. This includes two weeks of two-bunch operation from March 4-15. There were no significant interruptions.

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

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ALSNews Vol. 297 April 29, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. PRESERVATION OF FE(II) BY CARBON-RICH MATRICES IN HYDROTHERMAL PLUMES

(Contact: Brandy M. Toner, toner@umn.edu)

Despite the significant quantity of the considerable amount of iron that enters the oceans from the continents and from hydrothermal vents at mid-ocean ridges on the seafloor, there are large regions of the global ocean where iron availability is so low that it limits life. Oceanographers have long explained this anomaly by assuming that the iron in the sea is primarily incorporated as Fe(III) into inorganic minerals that lack both the mobility to circulate over long distance and bioavailability to sea life as an essential nutrient. Now, a collaboration led by researchers from the Woods Hole Oceanographic Institution has reported that the hydrothermal plumes emerging from the vents actually contain iron in both Fe(II) and Fe(III) oxidation states associated with organic material from nearby flora and fauna. The collaboration suggests that the organic matrices prevent oxidation and precipitation of the Fe(II), perhaps increasing both its circulation through the world's oceans and its bioavailability as a deep-sea nutrient.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/183ocean-iron.html

Publication about this research: B.M. Toner, S.C. Fakra, S.J. Manganini, C.M. Santelli, M.A. Marcus, J.W. Moffett, O. Rouxel, C.R. German, and K.J. Edwards, "Preservation of iron(II) by carbon-rich matrices in a hydrothermal plume," Nature Geoscience 2, 197 (2009).

2. HOW DYNEIN BINDS TO MICROTUBULES

(Contact: Andrew Carter, cartera@cmp.ucsf.edu)

Cytoplasmic dynein is a protein complex responsible for the transport of a large variety of cargoes, from specific RNAs and proteins to whole organelles, in a directional fashion along microtubules that serve as cellular conveyor belts. Consistent with this central role, cytoplasmic dynein is associated with a number of disease-related processes, including the transport of viruses, neurodegeneration, and the mitotic checkpoint malfunctions that lead to cancer. A team of researchers from the University of California's San Francisco and Berkeley campuses has recently solved the structure of dynein's microtubule-binding domain (MTBD) and part of the stalk structure that connects MTBD to the rest of the dynein complex. This first look at any part of the dynein motor domain identifies how it binds to microtubules and gives some hints into the fascinating question of how communication passes along the stalk from the MTBD to the rest of the motor.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/185dynein.html

Publication about this research: A.P. Carter, J.E. Garbarino, E.M. Wilson-Kubalek, W.E. Shipley, C. Cho, R.A. Milligan, R.D. Vale, and I.R. Gibbons, "Structure and functional role of dynein's microtubule-binding domain," Science 322, 1691 (2009).

3. TOP-OFF MODE NOW AT FULL CURRENT; CONGRATULATIONS TEAM!

This month, the ALS ramped up to its target of 500 mA of average storage-ring current in top-off mode. According to David Robin, ALS Division Deputy for Operations and Accelerator Development, top-off is exceeding expectations, with less of a "teething period" than anticipated. As expected, he said, we have improved thermal stability, we increased the flux, and we've increased the usable beam time. Furthermore, reliability [(time scheduled - time lost)/time scheduled)] has actually improved: we're getting close to our best operation since the ALS was commissioned.

The top-off project has been the largest upgrade to the accelerator since the ALS was commissioned in 1993. Similar to the superbend upgrade in 2001, it was major surgery, with a lot of risks and breaking new ground in many areas. For example, bunch cleaning for two-bunch mode was a requirement for which there wasn't a solution when the project began. The method ultimately devised by the team proved to work extremely well, resulting in greater bunch purity than before and an increase in average two-bunch current by nearly a factor of three.

"It was a terrific feeling to be able to pull up the ALS ring status on my laptop computer, at any hour of the day, even when I was back at DOE in Washington, and see the high and flat beam current," said ALS Director Roger Falcone. "And then the emails started coming in from the users, highly laudatory and very grateful... We told people at DOE we were capable of doing it; we did it. We told our users we could do it; and we did it."

Many thanks and congratulations to Christoph Steier, top-off project manager, and all ALS, engineering, accelerator operations, and EH&S staff for all your help in making this project a success.

4. MEET OUR NEW DEPUTY DIRECTOR FOR SCIENCE: BOB SCHOENLEIN

Last month we briefly announced that Robert (Bob) Schoenlein (pronounced "Shane-line") would join the ALS as Deputy Director for Science. Here is a more detailed account of Bob's past involvement with the ALS and his goals for the future.

Bob's research is in the area of ultrafast science, with programs in Berkeley Lab's Materials Sciences and Chemical Sciences Divisions (MSD and CSD, respectively). His involvement with the ALS dates back more than 15 years, beginning as a somewhat unconventional "ALS user"--first joining with an interdisciplinary team of colleagues from the Lab's Accelerator and Fusion Research Division (AFRD) and the ALS to develop laser-based techniques for manipulating electron beams to generate ultrafast x-rays, and then applying these unique sources to studies of structural dynamics in matter.

In the mid 1990s, Schoenlein, W. Leemans, and colleagues used Thomson scattering with the ALS linac injector to generate femtosecond hard x-ray pulses for some of the earliest subpicosecond diffraction studies. Even newer ideas from AFRD colleagues A. Zholents and M. Zolotorev, based on injecting femtosecond laser pulses into the storage ring, were demonstrated on Beamline 6.3.2 and further developed at the prototype femtosecond x-ray Beamline 5.3.1 with ALS Scientists P. Heimann and E. Glover. This approach is the basis for the new Ultrafast Slicing Beamlines 6.0.1 and 6.0.2, which support Bob's current research (on dynamics in complex materials and condensed-phase molecular dynamics) as well as that of many other ALS users in the growing field of ultrafast x-ray science.

In addition to his new role as Deputy Director for Science, Bob plans to remain active as a researcher within MSD, CSD, and at the ALS. Of course his first priority will be to support the world-class science program of the ALS, which he believes is a testament to the outstanding scientific staff, technical staff, and user community of the ALS. His major goals are to maintain and build on this record of excellence--fostering the development of new research directions and exploiting new scientific opportunities. He is looking forward to working closely with ALS scientific staff, users, and advisory committees to meet these challenges and to helping Roger and his team implement the ALS Strategic Plan that will serve as a roadmap for the facility into the next decade and beyond. Bob is fortunate to have the opportunity to work with ALS Science Advisor and former Director Janos Kirz during a transition period. This leaves only one grand challenge standing between Janos and retirement from management responsibilities--passing along his extensive knowledge, expertise, and scientific judgment that has served the ALS so well.

5. FUNDING AND USER SUPPORT BUILDING UPDATES

(Contacts: Ben Feinberg, BFeinberg@lbl.gov; Steve Rossi, SLRossi@lbl.gov)

After a series of ups and downs, we have excellent news about the ALS budget for fiscal year 2009 (October 2008 - September 2009). In brief, the ALS will receive an increase of about 10% over the continuing resolution funding under which we've been operating. In addition, we will receive a supplement to allow us to complete both the seismic work on Building 6 and the klystron replacement project.

The four Department of Energy (DOE) light sources have also been asked to submit a substantial number of additional projects under the stimulus legislation. The ALS and DOE intend to use this funding to jump start the ALS Strategic Plan (http://www.als.lbl.gov/als/ourorg/strategicplan.html). Stay tuned for results of this exciting submittal.

The User Support Building (USB) project has faced many funding challenges to date, but it appears that those days are now behind us. The anticipated FY09 funding of $11.5M is in the recently signed omnibus spending bill. Additionally, the FY10 funding of $14.5M has been forward funded to the project as a part of the stimulus bill. Construction activities can now proceed uninterrupted and be completed in the most efficient way possible.

On April 22, the USB project underwent an extremely successful and positive DOE Lehman review led by Steve Tkaczyk of the DOE's Office of Engineering and Construction Management, with Pedro Montano, Director of the Scientific User Facilities Division of the DOE's Office of Basic Energy Sciences (BES), and Tom Brown, Program Manager in BES for the USB project, observing. Lehman reviews are independent technical, cost, schedule, and management peer reviews of DOE Office of Science construction projects.

Structural steel erection began on Monday, April 27. The structural steel activity will be one of the most challenging phases of the project due to crane needs, the large quantity of material to be delivered and staged, and the constricted construction site. Each time construction begins on the site it takes weeks for personnel to adjust and respect the new boundaries. This time we do not have that luxury so we ask for your immediate cooperation and assistance.

The current forecast construction completion date is in June 2010. We anticipate taking occupancy of the building in August or September 2010.

6. GUEST HOUSE TAKES SHAPE ON HILLSIDE

(Contacts: Susan Bailey, SBailey2@lbl.gov; Steve Rossi, SLRossi@lbl.gov)

Construction of the Berkeley Lab Guest House is proceeding nicely, and we are on schedule for an August 2009 completion date. Located within a short walk of the ALS and the cafeteria, the 57-room Guest House will provide 70 beds in single- and double-occupancy rooms, and will include a main lobby, lounge/kitchenette area, laundry facilities, vending areas, and an outdoor patio. All rooms will have a refrigerator and free wireless Internet access. As finish work on the

exterior progresses in earnest, and with the removal of the scaffolding that was cloaking the building's facades, the structure is now recognizable as the guest house depicted in the architectural drawings. Interior rough-in work is nearly complete and finish sheet-rock work is getting underway. Although we had hoped to have set rates available at this point in time, various challenges have arisen, precluding this for now. As soon as we are confident of an opening date and operations plan, reservations will be accepted and rates will be announced.

7. ALS-RELATED WEB NEWS AND LINKS

Scripps Research Scientists Model 3-D Structures of Proteins that Control Human Clock
http://www.scripps.edu/news/press/041009.html

A Research Center for Understanding How to Store CO2 Underground
http://newscenter.lbl.gov/feature-stories/2009/04/28/efrc-co2/

8. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from March 18 to April 12, 2009, the beam reliability [(time scheduled - time lost)/time scheduled)] was 95.4%. For this period, the mean time between failures (MTBF) was 22.2 hours, and the mean time to recovery (MTTR) was 64 minutes. There were no significant interruptions.

Note that the previously reported metric, "percent of scheduled beam delivered to completion," depended on the practice of periodically refilling the storage ring. With the advent of top-off mode, there is only one storage ring refill--at the beginning of each week. Therefore, we are reporting instead MTBF and MTTR, two standard reliability metrics often requested by users that will provide something like the "delivered to completion" number of the previous mode of operation.

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

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ALSNews Vol. 298 May 27, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. OBSERVATION OF A MACROSCOPICALLY QUANTUM-ENTANGLED INSULATOR

(Contact: M. Zahid Hasan, mzhasan@princeton.edu)

It has recently been proposed that insulators with large band gaps and strong spin-orbit coupling can host a new phase of quantum matter called a topological insulator that is characterized by entangled wavefunctions. The proposal has now been realized by an international collaboration led by researchers from Princeton University who studied the electronic structure of insulating alloys of bismuth and antimony by means of angle-resolved photoemission spectroscopy (ARPES) and spin-resolved ARPES. Their results constitute the first direct experimental evidence of a topological insulator in nature that is fully quantum entangled. In the future, a detailed study of topological order and quantum entanglement using their method can potentially pave the way for fault-tolerant (topological) quantum computing.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/184insulators.html

Publication about this research: D. Hsieh, Y. Xia, L. Wray, D. Qian, A. Pal, J.H. Dil, J. Osterwalder, F. Meier, G. Bihlmayer, C.L. Kane, Y.S. Hor, R.J. Cava, and M.Z. Hasan, "Observation of unconventional quantum spin textures in topological insulators," Science 323, 919 (2009).

2. P-GLYCOPROTEIN STRUCTURE AND CHEMOTHERAPY RESISTANCE

(Contact: Geoffrey Chang, gchang@scripps.edu)

A research team from the Scripps Research Institute and the Texas Tech University Health Sciences Center has obtained the first glimpse of a protein that keeps certain substances,

including many drugs, out of cells. The protein, called P-glycoprotein, or P-gp for short, is one of the main reasons cancer cells are resistant to chemotherapy drugs. Understanding its structure may help scientists design more effective drugs. The structure is a nice tool for understanding how drugs are transported out of cells by P-gp and for designing drugs to evade P-gp, preventing drug resistance.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/186Pgp.html

Publication about this research: S.G. Aller, J. Yu, A. Ward, Y. Weng, S. Chittaboina, R. Zhuo, P.M. Harrell, Y.T. Trinh, Q. Zhang, I.L. Urbatsch, and G. Chang, "Structure of P-glycoprotein reveals a molecular basis for poly-specific drug binding," Science 323, 1718 (2009).

3. MOLECULAR-FRAME ANGULAR DISTRIBUTIONS OF RESONANT AUGER ELECTRONS

(Contact: Nora Berrah, nora.berrah@wmich.edu)

Molecular-frame electron angular distribution (MFAD) measurements provide access to an unprecedented level of detailed information about phenomena involving quantum coherence, such as phases of photoelectron waves, symmetry breaking in molecular dissociation, core-hole localization in molecules, and molecular double-slit interference, all of which are hidden in conventional gas-phase electron spectroscopy, owing to the random orientation of the molecules. While most MFAD studies to date have focused on photoelectrons, an international team of scientists from Western Michigan University, the ALS, and Tohoku University in Japan has successfully used a novel approach to determine for the first time the molecular-frame angular distributions of resonantly excited Auger electrons in carbon monoxide.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/187molecular-frame.html

Publication about this research: D. Rolles, G. Prumper, H. Fukuzawa, X.-J. Liu, Z.D. Pesic, R.F. Fink, A.N. Grum-Grzhimailo, I. Dumitriu, N. Berrah, and K. Ueda, "Molecular-frame angular distributions of resonant CO:C(1s) Auger electrons," Phys. Rev. Lett. 101, 263002 (2008).

4. ALS TO PARTICIPATE IN ENERGY FRONTIER RESEARCH CENTERS

On April 27, the Department of Energy's Office of Science announced 46 Energy Frontier Research Centers (EFRCs) that will share $777 million to bring groups of leading scientists together to confront the energy challenges of the 21st century (http://www.sc.doe.gov/bes/EFRC.html). The EFRCs will be funded for five years with grants of between $2 and 5 million that will support research with the aim of accelerating scientific breakthroughs in the fields of solar energy, electricity storage, materials sciences, advanced nuclear systems, and carbon capture and sequestration.

The ALS will be used by three of the EFRCs. The Center for Nanoscale Control of Geologic CO2, run out of Berkeley Lab, with collaborators from Lawrence Livermore National Laboratory, Massachusetts Institute of Technology, and the University of California, Davis, will look at scientific foundations for the geological storage of carbon dioxide and how they are related to reducing greenhouse gases released to the atmosphere from stationary power sources. Developing computational tools to accurately model catalytic reactions and thereby provide the basis for the design of new catalysts will be the focus of a second EFRC to be established at Louisiana State University. Finally, the EFRC for Combustion Science will focus on the science underlying the development of non-petroleum-based fuels, including carbon-neutral biofuels, and their optimal use in transportation. This collaboration comprises 15 members from seven universities, and Sandia and Argonne National Laboratories. This group will address the goal to develop a "validated, predictive, multi-scale, combustion modeling capability to optimize the design and operation of evolving fuels in advanced engines for transportation applications." As part of this Center, Nils Hansen of Sandia National Laboratories will perform experiments at the "Flame-Sampling Endstation" of the Chemical Dynamics Beamline (Beamline 9.0.2). The Center will take full advantage of the unique capabilities of the ALS to provide an unprecedented detailed data set to test combustion chemistry models and to determine key reaction pathways in real combustion environments. Synopses of all the EFRCs are available in PDF format: http://www.sc.doe.gov/bes/EFRC_Synopses.pdf .

5. UEC CORNER: MARK YOUR CALENDARS FOR THE 2009 USERS' MEETING

by Kenneth Goldberg
(Contact: Kenneth Goldberg, KAGoldberg@lbl.gov)

Please save the date for the 2009 ALS/Molecular Foundry Users' Meeting, Thursday, October 15 through Saturday, October 17, 2009. This year's meeting will be hosted jointly with The Molecular Foundry (TMF) and will have a primary focus on basic research to further the United States' and the world's energy agenda. The conference program includes plenary talks, talks given by selected attendees and award recipients, a joint poster session with TMF, and twelve workshops. See the Users' Meeting Web page at http://www.als.lbl.gov/als/usermtg/ for titles and organizers, updated as the information becomes available.

Please keep in mind the following deadlines:

Poster Abstract Submission: Monday, 8/31/2009
Award Nominations: Monday, 8/31/2009
Early Registration: Friday, 9/5/2009
Vendor Registration: Monday, 9/28/2009
Student Poster Award Sponsorship: Monday, 9/28/2009

We look forward to seeing you at the 2009 ALS/TMF Users' Meeting.

2009 Users' Meeting co-chairs
Yayoi Takamura, ALS (ytakamura@ucdavis.edu)
David Osborn, ALS (dlosbor@sandia.gov)
Oscar Dubon, TMF (oddubon@berkeley.edu)

6. REMINDER: ALS FELLOWSHIP PROGRAMS AVAILABLE
(Contact: Adriana Reza, AReza@lbl.gov)

The ALS offers two types of research fellowships: the Doctoral Fellowship in Residence (applications due July 31, 2009) and the Postdoctoral Fellowship (applications reviewed quarterly).

ALS Doctoral Fellowship in Residence enable students who have passed their Ph.D. qualifying or comprehensive verbal and written exams to acquire hands-on scientific training and develop professional maturity for independent research. Applicants must be full-time, currently enrolled students in a Ph.D. program in the physical or biological sciences pursuing thesis research based on the use of synchrotron radiation. The fellowships are offered as one-year appointments with the possibility of renewal. Successful applicants will be compensated with an $18,000 annual stipend. Additionally, fellows will be matched with an on-site mentor and have access to ALS resources, including beam time. Fellows are expected to present their results at a meeting or as a seminar at the end of the fellowship year. Applications for the 2009-10 academic year are due by July 31, 2009. For more information, go to the ALS Doctoral Fellowships Web page at http://www-als.lbl.gov/als/fellowships/ .

The purpose of the ALS Postdoctoral Fellowship Program is to identify outstanding individuals in new and emerging scientific and engineering research fields and provide advanced training in synchrotron radiation science. It also provides the opportunity to identify outstanding scientists in historically underrepresented groups. Fellows become integral members of ALS research teams. Applicants must have received a doctoral research degree from an accredited academic institution in an appropriate scientific or engineering discipline within three years of the appointment start date. Applications are reviewed on a quarterly basis. Awards are initially for one year with the possibility of renewal for a second or third year, contingent on satisfactory annual performance reviews and funding availability. A monthly salary will be paid at a rate competitive with current ALS/LBNL postdoctoral fellows. Postdoctoral fellows are also eligible for midlevel career benefits. For more information on the fellowship and application requirements, go to the ALS Postdoctoral Fellowships Web page at http://www-als.lbl.gov/als/fellowships/postdoc.html .

7. BESAC PHOTON WORKSHOP REPORT POSTED ONLINE

The U.S. Department of Energy's Basic Energy Sciences Advisory Committee (BESAC) sponsored a series of workshops about "Basic Research Needs" to help identify research directions for a decades-to-century energy strategy. A newly published report from this series, titled "Next Generation Photon Sources for Grand Challenges in Science and Energy," summarizes the results of the Photon Workshop held in October 2008, co-chaired by Wolfgang Eberhardt and Franz Himpsel. The "Photon Report" identifies connections between major new research opportunities and the capabilities of the next generation of light sources. Particular

emphasis was on energy-related research. Please feel free to download the report and distribute it to colleagues in the scientific community.

Download the report: http://www.sc.doe.gov/bes/reports/abstracts.html#NGPS

8. ALS-RELATED WEB NEWS AND LINKS

Researchers Show Electric Fields Can Be Used as ON/OFF Switches in Doped Multiferroic Films
http://www.azonano.com/news.asp?newsID=11635

Multiferroics - Making a Switch the Electric Way
http://newscenter.lbl.gov/press-releases/2009/05/21/multiferroics/

9. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from April 15 to May 11, the beam reliability [(time scheduled - time lost)/time scheduled)] was 96.1%. For this period, the mean time between failures (MTBF) was 23.8 hours, and the mean time to recovery (MTTR) was 44 minutes. There were no significant interruptions.

More detailed information on reliability is available on the ALS reliability bulletin board, which is located in the hallway between the ALS and the control room in Building 80. Questions about beam reliability should be sent to David Richardson.

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

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ALSNews Vol. 299 June 24, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. PROTEIN STRUCTURE SUGGESTS ROLE AS MOLECULAR ADAPTER

(Contact: Melissa Mott, melissalynnm@berkeley.edu)

To split and copy DNA during replication, all cellular organisms use a multicomponent molecular machine known as the replisome. An essential step in replisome assembly is the loading of ring-shaped helicases (motor proteins) onto the separated strands of DNA. Dedicated ATP-fueled proteins regulate the loading; however, the mechanism by which these proteins recruit and deposit helicases has remained unclear. To better understand this process, researchers at the University of California, Berkeley, recently determined the structure of the ATPase region of DnaC, a bacterial helicase loader. The structure revealed that DnaC is a close cousin of DnaA, the protein thought to be responsible for unwinding DNA. Unexpectedly, the team further found that DnaC forms a right-handed helix similar to the state adopted by ATP-bound DnaA. These findings, together with biochemical studies, implicate DnaC as a molecular adapter that uses ATP-activated DnaA as a docking site for ensuring that DnaB (the ring-shaped helicase) is correctly deposited at the onset of replication.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/188DnaC.html

Publication about this research: M.L. Mott, J.P. Erzberger, M.M. Coons, and J.M. Berger, "Structural synergy and molecular crosstalk between bacterial helicase loaders and replication initiators," Cell 124, 623 (2009).

2. ANOTHER LANDMARK DEVELOPMENT IN BIOLOGICAL MICROSCOPY AT THE ALS

(Contact: Gerry McDermott, GMcDermott@lbl.gov)

The biotech, pharmaceutical, and biofuels industries all grew out of our ability to understand and then predict how cells respond to changes in their environment. For example, the quest to make biofuel production more efficient begins with understanding how the cells that carry out fermentation deal with increasingly toxic concentrations of alcohol or butanol, taking advantage of this knowledge to guide the development of organisms with increased tolerance toward these molecules. Microscopy is a key technology in such work, in particular, high-resolution three-dimensional methods such as soft x-ray tomography. The establishment of the National Center for X-Ray Tomography (NCXT) and the construction of XM-2 firmly put the ALS on the map as a premier facility for imaging cells. Recently, the ALS became home to a completely new bio-imaging method: cryogenic, high-numerical-aperture light microscopy.

Developed by Mark Le Gros and Carolyn Larabell of the NCXT, this new microscope satisfies a long-standing need in cellular imaging. Now, for the first time, it is possible to image a whole, hydrated cell at high spatial resolution using both light and soft x rays. Correlation of the two data sets allows visualization of detailed cellular structure (x rays) together with the location of molecules tagged with a fluorescent label (light). The combination of these two pieces of knowledge is the "Holy Grail" of cell biology and answers the fundamental questions of who, what, where, and when. In other words, which molecules are interacting, and where and when do these interactions occur in the cell. This is a very exciting development in the world of cellular imaging, with the ALS being the only facility in the world with this capability. This new multimodal imaging resource has already begun to be used to address a wide range of highly topical questions, ranging from the design of new drugs to fight malaria and fungal infections to understanding where biodiesel is stored in algae. The possible applications of this new technique are virtually limitless, and it opens up a new chapter in biological research at the ALS.

The new cryo-light microscope used in this work is described in detail in the paper, "High aperture cryogenic light microscopy," by M.A. Le Gros, G. McDermott, M. Uchida, C.G. Knoechel, and C.A. Larabell, to be published in the July 2009 issue of the Journal of Microscopy.

3. CALL FOR GENERAL USER PROPOSALS: UPCOMING DEADLINES

(Contact: alsproposals@lbl.gov)

The User Services Office is accepting general user proposals from scientists who wish to conduct research at the ALS in the next cycle.

PROPOSAL SUBMISSION DEADLINE (physical sciences beamlines):
Cycle: January 2010 - June 2010
Deadline: July 15, 2009

PROPOSAL SUBMISSION DEADLINE (structural biology/biological SAXS):
Cycle: October 2009 - December 2009
Deadline: August 15, 2009.

NEW PROPOSALS: To submit a new proposal, please complete the appropriate online form:
http://alsusweb.lbl.gov/

ACTIVE PROPOSALS: Proposals for physical sciences beamlines are considered active and may be renewed for up to three, six-month cycles after the initial submission. After a total of four cycles, a new proposal must be submitted. If you have an active proposal for which you would like to request beam time during the January 2010 - June 2010 cycle, please submit a Proposal Renewal Form:
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/RolloverPassword.shtml/Initialize

The following resources have been recently updated and are available for further information:

General information on the proposal process:
http://www.als.lbl.gov/als/quickguide/becomealsuser.html

Advice on what to include in the scientific case:
http://www.als.lbl.gov/als/quickguide/proposal_guidelines.html

Beamline information:
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal scores for the current cycle
http://www-als.lbl.gov/als/quickguide/pspscores.html

The proposal form now includes a section on publications from previous ALS work. The publications will be pre-filled automatically from the ALS publication database by searching for the principal investigator's name. Please make sure your publications are entered into our database: http://www-als.lbl.gov/als/publications

4. UEC CORNER: ALS USERS' MEETING IMPORTANT DATES

by Kenneth Goldberg
(Contact: Kenneth Goldberg, KAGoldberg@lbl.gov)

The 16th annual ALS Users' Meeting is just a few months away: October 15-17, 2009. As in 2007, this year's meeting will be held jointly with The Molecular Foundry, with joint plenary and poster sessions, workshops, and a banquet. Information will be posted on this site as it becomes available: http://www.als.lbl.gov/als/usermtg/

WORKSHOPS: This year's meeting will have a primary focus on research to further the United States' and the world's energy agenda. Workshops cover that theme and a broad spectrum of other issues, including detectors; x-ray diffraction; graphene; influenza; nanomagnetism; next-

generation light sources; numerical modeling; quantum systems, clusters, and assembled materials; spectroscopy; tailored materials; and polymers.

AWARDS: Nominations for the Shirley (Science), Halbach (Instrumentation), and Renner (Service) Awards will accepted until Monday, August 31, 2009. This year's nomination process will be a bit different than in previous years. Please check the Users' Meeting Web site in July for details.

POSTERS: The deadline for poster abstract submissions is Monday, August 31, 2009. Students submitting posters have the opportunity to compete for three poster awards, with the winner being given an opportunity to speak at the Friday morning session.

LODGING: The Berkeley Lab Guest House is nearing completion, and we expect that it will be ready to accept guests by the time of the meeting. However, reservations are not being accepted just yet. Check the above link frequently if you'd like to be one of the first guests. A block of rooms has also been reserved at the Hotel Durant.

UEC ELECTIONS: Finally, the ALS Users' Executive Committee will be electing three new members and one student representative this fall. Nominations will be accepted until October 15, 2009, and voting will begin on October 16, 2009, on the second day of the meeting. Nomination instructions will be provided on the ALS Users' Meeting Web site in July.

Ken Goldberg (UEC Chair)
Yayoi Takamura (Users' Meeting Co-Chair)
David Osborn (Users' Meeting Co-Chair)

5. UPDATE ON THE GUEST HOUSE AT BERKELEY LAB

(Contact: Sue Bailey, SBailey2@lbl.gov)

Located within a short walk of the ALS and the cafeteria, the 57-room guest house will provide 70 beds in single- and double-occupancy rooms, and will include a main lobby, lounge/kitchenette area, laundry facilities, vending areas, and an outdoor patio. All rooms will have a refrigerator and free wireless Internet access.

Construction of the guest house is nearing completion, with electrical and air-conditioning commissioning starting this week. Furniture has been ordered and will be fitted in August, to be followed by further commissioning and staff training. An interim general manager is in place and work on the Web site is progressing. The opening date is currently being negotiated with the operating contractor and is likely to be the first week of October. The rates for staying at the guest house will be set within the next couple of weeks and will depend on the size and occupancy of the room with a slight premium for a bay view. The operator can now take reservations for groups of 10 rooms or more. Starting September 1, 2009, the operator will take reservations for individuals or groups booking fewer than 10 rooms. Reservations can be made by contacting Megan Troup (mtroup@berkeley.edu / 510-643-2454).

6. JOB OPPORTUNITY: ALS WRITER-EDITOR

The Advanced Light Source seeks a dynamic, creative writer to create and edit printed documents and electronic media to communicate the mission and achievements of the ALS. The writer will support the scientific and user programs of the ALS through the production of publications by working with scientists and technical staff to create visual displays, presentation materials, and grant proposals.

A primary role is to plan, edit, produce, and distribute a monthly email newsletter designed to keep ALS researchers and other interested parties informed about developments at the ALS. It will require the incumbent to apply broad knowledge of ALS research programs, scientific and engineering concepts, and Berkeley Lab's publication processes to communicate technical and nontechnical information for publication or verbal presentation. Will use Web 2.0 and social networking technologies to expand readership and to develop new audiences.

Read more at the official job posting:
http://jobs.lbl.gov/LBNLCareers/details.asp?jid=23181&p=1

7. ALS-RELATED WEB NEWS AND LINKS

Bilayer graphene gets a bandgap
http://newscenter.lbl.gov/press-releases/2009/06/10/graphene-bandgap/

Graphene opens door to tunable transistors, LEDs
http://www.berkeley.edu/news/media/releases/2009/06/10_graphene.shtml

Tuning the gap in graphene
http://physicsworld.com/cws/article/news/39458

Yeast 'DNA damage sensor' provides chemotherapy resistance clue
http://info.cancerresearchuk.org/news/archive/pressreleases/2009/june/yeast-dna

New exotic material could revolutionize electronics
http://www.cellular-news.com/story/38004.php

Stanford scientists discover a possible successor to silicon
http://www.mercurynews.com/breakingnews/ci_12596666?nclick_check=1

Keasling steps down as Physical Biosciences director
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/june/06-19-09/index.html

8. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from May 13 to June 15, the beam reliability [(time scheduled - time lost)/time scheduled)] was 96.0%. For this period, the mean time between failures (MTBF) was 38.9 hours, and the mean time to recovery (MTTR) was 96 minutes. There were no significant interruptions.

During this period we set a new record for continuous hours of light provided to users in top-off mode: 95 continuous hours of light were provided to users from June 4 to June 7.

More detailed information on reliability is available on the ALS reliability bulletin board, which is located in the hallway between the ALS and the control room in Building 80. Questions about beam reliability should be directed to David Richardson (DBRichardson@lbl.gov , x4376).

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

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ALSNews Vol. 300 July 29, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. TOWARDS HEAVY FERMIONS IN EUROPIUM INTERMETALLIC COMPOUNDS

(Contact: Serguei Molodtsov, molodtso@physik.phy.tu-dresden.de)

For decades, intermetallic compounds of rare-earth metals have been favorite systems of the research community studying strong electron correlations in solids. Nowadays rare-earth intermetallics are often treated as model systems for studies of zero-temperature quantum critical phase transitions, since heavy-fermion rare-earth compounds (in which the electron effective mass is orders of magnitude larger than the bare electron mass) have provided the clearest evidence for these continuous phase transitions, which are controlled by such parameters as chemical composition, magnetic field, and pressure, rather than temperature. A new study of a europium-based compound by an international team led by researchers from the Technische Universitat Dresden in Germany hints that this compound could join well-known compounds of cerium, ytterbium, and uranium as a new material suitable for research on quantum critical transitions. This finding is exciting, since physicists hope that the use of a new material will give an additional degree of freedom for researching quantum critical behavior.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/189fermions.html

Publication about this research: S. Danzenbacher, D.V. Vyalikh, Y. Kucherenko, A. Kade, C. Laubschat, N. Caroca-Canales, C. Krellner, C. Geibel, A.V. Fedorov, D.S. Dessau, R. Follath, W. Eberhardt, and S.L. Molodtsov, "Hybridization phenomena in nearly half-filled f-shell electron systems: Photoemission study of EuNi2P2," Phys. Rev. Lett. 102, 026403 (2009).

2. STOCHASTIC DOMAIN-WALL DEPINNING IN MAGNETIC NANOWIRES

(Contacts: Peter Fischer, PJFischer@lbl.gov; Mi-Young Im, MIm@lbl.gov)

Reliably controlling the motion of magnetic domain walls along magnetic nanowires is a key requirement for current technological development of novel classes of logic and storage devices, but understanding the nature of non-deterministic domain-wall motion remains a scientific challenge. A statistical analysis of high-resolution magnetic soft x-ray microscopy images by a Berkeley Lab - University of Hamburg group has now revealed that the stochastic behavior of the domain-wall depinning field in notch-patterned Ni80Fe20 (permalloy) nanowires depends strongly on the wire width and the notch depth. This result both provides valuable insight into the motion of magnetic-domain walls and opens a path to further technological developments in spintronics applications.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/190domain-walls.html

Publication about this research: M.-Y. Im, L. Bocklage, P. Fischer, and G. Meier, "Direct observation of stochastic domain-wall depinning in magnetic nanowires," Phys. Rev. Lett. 102, 147204 (2009).

3. ALS GETS $11.3 M IN STIMULUS FUNDS FOR FACILITY IMPROVEMENTS

(Contact: Steve Rossi, SLRosssi@lbl.gov)

The ALS is receiving $11.3 million to help it maintain its position as one of the world's premier soft x-ray light sources. Four items from the ALS strategic plan have been approved for funding though the American Recovery and Reinvestment Act (ARRA).

First, the ALS will receive $5.8 million to increase brightness by replacing existing corrector magnets with hybrid multifunction sextupole magnets. This lattice upgrade would increase brightness by a factor of three in the center-bend-magnet beamlines and up to a factor of two in the insertion-device straights. Second, the ALS will receive $2 million to construct and install an elliptically polarizing undulator for the femtosecond soft x-ray Beamline 6.0.2, effectively doubling its capacity by enabling soft and hard x-ray branchlines to operate simultaneously. Third, the ALS will receive $2 million to equip beamlines with advanced CCD-based detectors developed at Berkeley Lab. These detectors, which are well beyond the commercially available state of the art, will dramatically increase the reach and scientific productivity of each of the beamlines where they are deployed. Fourth, the ALS will receive $1.5 million to develop a superconducting vector magnetometer with a magnetic field of over 5 Tesla in any orientation relative to the sample and photon polarization. The high magnetic field will allow experiments leading to novel insights into the magnetic structure of engineered magnetic nanostructures and materials not accessible by any other technique. It is estimated that the funding will create the equivalent of more than 19 jobs at the Lab and 65 jobs externally.

Beyond the items described above, several ALS-related infrastructure projects will also receive ARRA funds. The ALS User Support Building, currently under construction, has been forwarded $14.6 million for FY10 funding. The project, which has had funding challenges in the past, can now proceed uninterrupted and be completed in the most efficient way possible. Building 6, which houses the ALS experiment floor as well as offices, labs, and conference rooms, will receive $1.5 million to replace three aging air handling units that had some vibration issues, negatively impacting scientific studies, with higher-capacity and higher-efficiency units. Building 2, which provides office, laboratory, and conference-room space adjacent to the ALS, will receive $2.9 million for upgrades to its cooling system.

Visit http://recovery.lbl.gov for more details on all Berkeley Lab's ARRA projects.

4. UEC CORNER: USERS' MEETING WORKSHOPS, DEADLINES, AND ELECTIONS

by Ken Goldberg
(Ken Goldberg, KAGoldberg@lbl.gov)

The 16th annual ALS Users' Meeting is just a few weeks away: October 15-17, 2009. As in 2007, this year's meeting will be held jointly with The Molecular Foundry with a joint plenary, workshops, poster session, and banquet. Information will be posted on this site as it becomes available: http://www.als.lbl.gov/als/usermtg/ .

WORKSHOPS: This year's meeting will have a primary focus on research to further the United States' and the world's energy agenda. Workshops cover that theme and a broad spectrum of other issues, including detectors; x-ray diffraction; graphene; influenza; nanomagnetism; next generation light sources; numerical modeling; quantum systems, clusters, and assembled materials; spectroscopy; tailored materials; and polymers. The complete list can be found at http://www.als.lbl.gov/als/usermtg/workshops.html .

AWARDS: Nominations for the Shirley (Science), Halbach (Instrumentation), and Renner (Service) Awards will be accepted until Monday, August 31, 2009. This year's nomination process is different than in previous years. Nominators fill out a simple form, available at http://www.als.lbl.gov/als/usermtg/awards.html .

POSTERS: The deadline for poster abstract submissions is also Monday, August 31, 2009. Students submitting posters have the opportunity to compete for three poster awards, with the winner being given an opportunity to speak at the Friday morning session.

LODGING: The Berkeley Lab Guest House is nearing completion, and we expect that it will be ready to accept guests by the time of the meeting. However, reservations are not being accepted just yet. Check http://www.als.lbl.gov/als/usermtg/lodging.html frequently if you would like to be one of the first guests. A block of rooms has also been reserved at the Hotel Durant.

UEC ELECTIONS: Finally, the ALS Users' Executive Committee will be electing three new members and one student representative this Fall. Nominations will be accepted until October

15, 2009, and voting will begin on October 16, 2009, on the second day of the meeting. Nomination instructions will be provided on the ALS Users' Meeting Web site in August.

Ken Goldberg (UEC Chair)
Yayoi Takamura and David Osborn (Users' Meeting Co-Chairs)

5. DOE, UC BERKELEY, AND CITY OF BERKELEY OFFICIALS VISIT

It's been a busy month for the ALS and Berkeley Lab, with several high-profile visits from federal, state, and local government representatives. Department of Energy (DOE) Secretary Stephen Chu visited both the SLAC National Accelerator Laboratory and Berkeley Lab on a West Coast trip in late June. At SLAC, Chu spoke to a crowd of 700 about the energy challenges facing our country and how science can contribute solutions. Across the bay, at Berkeley Lab where he served as Director from 2004 through 2008, Chu attended a small reception and heard presentations on a variety of research projects underway at the Lab, from carbon dioxide fixation to hydrogen storage to graphene breakthroughs, the latter given by the ALS's own Eli Rotenberg. Also in attendance were Berkeley Lab Director Paul Alivisatos, Lab Chief Operating Officer Jim Krupnick, ALS Division Director Roger Falcone, and Physical Biosciences Acting Division Director Paul Adams.

On July 15, members of the University of California (UC) President's Associates visited Berkeley Lab for briefings on biosciences work at the Lab. The President's Associates include the spouses of UC Chancellors and Mrs. Judy Yudof, wife of UC President Mark Yudof. Roger Falcone welcomed the group and gave them an overview of the diverse research capabilities of the ALS. Beamline scientist Corie Ralston followed with a short presentation on structural biology research at the ALS with implications for diseases such as Alzheimer's and autism. Also, as part of a regular meeting with Lab leadership, Berkeley Mayor Tom Bates toured the ALS and the Old Town area just up the hill. He also met with Berkeley High teachers and students who are participating in internships at the Lab this summer. Discussion topics also included Lab construction and truck traffic, the East Bay Green Corridor program, and possible collaboration on projects funded by the American Recovery and Reinvestment Act.

6. DEADLINE FOR ALS DOCTORAL FELLOWSHIPS EXTENDED TO AUG. 14

(Contact: Adriana Reza, AReza@lbl.gov)

The application deadline for ALS Doctoral Fellowships for the 2009-10 academic year has been extended to August 14, 2009.

ALS Doctoral Fellowships enable students who have passed their Ph.D. qualifying or comprehensive verbal and written exams to acquire hands-on scientific training and develop professional maturity for independent research. Applicants must be full-time, currently enrolled students in a Ph.D. program in the physical or biological sciences pursuing thesis research based on the use of synchrotron radiation. The fellowships are offered as one-year appointments with the possibility of renewal. Successful applicants will be compensated with an $18,000 annual

stipend. Additionally, fellows will be matched with an on-site mentor and have access to ALS resources, including beam time. Fellows are expected to present their results at a meeting or as a seminar at the end of the fellowship year. For more information, go to the ALS Doctoral Fellowships Web page at http://www-als.lbl.gov/als/fellowships/ .

7. NEW FACES: ANGEL HERNANDEZ JOINS THE USER SERVICES OFFICE
by Emma Floyd

The ALS User Services Office has a new member of the team. Administrator Angel Hernandez moved to the ALS last month from the Berkeley Lab Badge Office and is here to help new users settle in. He works on everything from guest processing to travel, and will also be dealing with parking, stipends, and other miscellaneous administrative needs. Angel is excited to be here, saying, "I have always admired what goes on at ALS and it makes me proud to support the world-class science here."

Angel graduated from University of California, Berkeley, with a degree in philosophy and has since worked for two security companies contracted by the Lab. At the ALS, Angel explains, "I'll be working with a combination of a lot of different departments, but [I'll see] mostly ALS users." He goes on to say, "I really enjoy working with people, and welcoming new guests to their new home, in a manner of speaking, is a delight."

His coworkers are happy to have him, and as Sharon Fujimura notes, "He's very soft spoken, but behind that, he's a firecracker." Inside sources also say Angel loves all kinds of food, enjoys cooking, and is getting married this winter. So if you have a question about parking, guest processing, or a great dessert recipe, contact Angel Hernandez at (510) 486-5268, or drop by his office, Building 6, Room 2212H.

[Editorial note: Emma Floyd is a journalism major working at the ALS this summer.]

8. INTRODUCING: ALS SCIENCE BRIEFS
(Contact: Liz Moxon, EJMoxon@lbl.gov)

Members of the ALS Communications Section promote the scientific research going on around the ring by producing two or three science highlights per month. In order to keep up with the increasing number of scientific and technical accomplishments that we would like to present to our audiences, we are creating a new Web page called "Science Briefs," which will feature scientist-submitted highlights that contain a short description (200 words maximum) of recently published ALS-related work. These scientist-submitted "brief" highlights will also include one image, a caption, and the publication citation. All ALS users and beamline scientists are invited to download the template, which includes submission instructions, and submit at will!

http://www.als.lbl.gov/als/science/science-briefs/

9. ALS-RELATED WEB NEWS AND LINKS

UC Davis Physicist Earns Swedish Honor
http://www.news.ucdavis.edu/search/news_detail.lasso?id=9165

Computer simulations shed light on nanosized minerals
http://newscenter.lbl.gov/feature-stories/2009/07/06/nanosized-minerals/

Scientists track chemical changes in cells as they endure extreme conditions
http://newscenter.lbl.gov/feature-stories/2009/07/07/cells-endure-extremes/

Are iron pnictides new cuprates?
http://physics.aps.org/articles/v2/60

Protein structures revealed at record pace
http://newscenter.lbl.gov/press-releases/2009/07/20/fast-protein-structures/

10. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from June 16 to July 13, the beam reliability [(time scheduled - time lost)/time scheduled)] was 98.9%. For this period, the mean time between failures (MTBF) was 86.8 hours, and the mean time to recovery (MTTR) was 60 minutes. There were no significant interruptions.

More detailed information on reliability is available on the ALS reliability bulletin board, which is located in the hallway between the ALS and the control room in Building 80. Questions about beam reliability should be directed to Dave Richardson (DBRichardson@lbl.gov , x4376).

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

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ALSNews Vol. 301 August 26, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. SAFETY FIRST: NEW PERSONAL PROTECTIVE EQUIPMENT POLICIES

(Contact: Jim Floyd, JGFloyd@lbl.gov)

The ALS has been working to adapt Berkeley Lab-wide policies regarding the use of personal protective equipment (PPE) in laboratory areas for application to the ALS's unique experimental areas. The result is a three-part approach that designates certain technical areas and/or activities for which various forms of PPE are required.

Red Floor. The first technical area consists of all parts of the ALS experiment hall where the floor is painted red. This encompasses essentially all space under the dome in the facility, including the beamlines, accelerator tunnels, and pit areas. The PPE requirements for this area are closed-toe shoes and long pants or equivalent. Note that the nonpainted perimeter walkway and the designated pedestrian walkway used for tours are not covered by this requirement.

Yellow Border. In addition to the above requirement, within the experiment hall, certain smaller, limited areas exist where chemical and/or biological materials are used or stored. This also includes areas where open containers of liquid nitrogen may be found. These areas are identified by floor mats with a yellow border. All individuals who enter these areas (i.e., step on the floor mats) must wear proper eye protection (typically safety glasses) in addition to the closed-toe shoes and long pants.

Liquid Nitrogen. Finally, when pressurized liquid nitrogen cylinders are being manipulated, an environmental hazard to the eyes exists. Regardless of where this work occurs, anyone within a radius of 3 ft must wear safety glasses. This is reinforced with signage at the cylinders. Note that this environmental hazard does not exist when the cylinders are not being manipulated, and safety glasses are not required just to walk past a stored gas cylinder (such as exists at many loading docks, etc.).

2. BILAYER GRAPHENE GETS A BANDGAP
(Contact: Feng Wang, fengwang76@berkeley.edu)

Graphene is the two-dimensional crystalline form of carbon whose extraordinary electron mobility and other unique features hold great promise for nanoscale electronics and photonics. But without a bandgap, graphene's promise can't be realized. As with monolayer graphene, bilayer graphene also has a zero bandgap and thus behaves like a metal. But a bandgap can be introduced if an electric displacement field is applied to the two layers; the material then behaves like a semiconductor. A team of researchers from Berkeley has engineered a bandgap in bilayer graphene that can be precisely controlled from 0 to 250 meV. With precision control of its bandgap over a wide range, plus independent manipulation of its electronic states through electrical doping, dual-gated bilayer graphene becomes a remarkably flexible tool for nanoscale electronic devices.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/191graphene.html

Publication about this research: Y. Zhang, T.-T. Tang, C. Girit, Z. Hao, M.C. Martin, A. Zettl, M.F. Crommie, Y.R. Shen, and F. Wang, "Direct observation of a widely tunable bandgap in bilayer graphene," Nature 459, 820 (2009).

3. HYBRID ROTAXANES: INTERLOCKED STRUCTURES FOR QUANTUM COMPUTING?
(Contact: Richard Winpenny, Richard.Winpenny@manchester.ac.uk)

Rotaxanes are mechanically interlocked molecular architectures consisting of a dumbbell-shaped molecule, the "axle," that threads through a ring called a macrocycle. Because the rings can spin around and slide along the axle, rotaxanes are promising components of molecular machines. While most rotaxanes have been entirely organic, the physical properties desirable in molecular machines are mostly found in inorganic compounds. Working together, two British groups at the University of Edinburgh and the University of Manchester have bridged this gap with hybrid rotaxanes, in which inorganic rings encircle the organic axles. The hybrid architecture greatly increases their range of useful physical properties, such as the magnetism based on molecular magnets that may make them suitable as qubits for quantum computers.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/192rotaxanes.html

Publication about this research: C.-F. Lee, D.A. Leigh, R.G. Pritchard, D. Schultz, S.J. Teat, G.A. Timco, and R.E.P. Winpenny, "Hybrid organic-inorganic rotaxanes and molecular shuttles," Nature 458, 314 (2009).

4. UEC CORNER: USERS' MEETING, POSTER DEADLINE, AWARDS, AND ELECTIONS
by Ken Goldberg
(Ken Goldberg, KAGoldberg@lbl.gov)

**ALS USERS' MEETING -- http://www.als.lbl.gov/als/usermtg/
The 16th annual ALS Users' Meeting is October 15-17, 2009. This year's meeting will be held jointly with The Molecular Foundry with a joint plenary, workshops, poster session, and banquet.

9/25: Early-registration deadline
8/31: Poster abstract submission deadline
8/31: Award Nominations

**SPEAKERS -- http://www.als.lbl.gov/als/usermtg/agenda.html
With an energy focus, this year's plenary speakers are: Bill Brinkman, Harriet Kung, and Arun Majumdar. Scientific highlights speakers are Pupa Gilbert (nacre), Mark LeGros (bio-fuels), and two speakers from The Molecular Foundry (TBD).

**AWARDS -- http://www.als.lbl.gov/als/usermtg/awards.html
Nominations for the Shirley (Science), Halbach (Instrumentation), and Renner (Service) awards will be accepted until Monday, August 31, 2009. Nominators fill out a simple form, available at the URL above.

**POSTERS -- http://www.als.lbl.gov/als/usermtg/abstracts.html
The deadline for poster abstract submissions is also Monday, August 31, 2009. Students submitting posters will compete for three awards, with the winner being given an opportunity to speak at the Friday morning session.

**UEC ELECTIONS -- http://alsuec.org/
The ALS Users' Executive Committee will be electing three new members and one student representative this fall. Nominations will be accepted until October 15, 2009, and voting will begin on October 16, 2009, on the second day of the meeting. Nomination instructions are available at the ALS UEC Web site, above.

We're looking forward to seeing you at the meeting!

Ken Goldberg (UEC Chair)
Yayoi Takamura and David Osborn (Users' Meeting Co-Chairs)

5. GUEST HOUSE TO BEGIN TAKING RESERVATIONS SEPTEMBER 1
(Contact: Sue Bailey, SBailey2@lbl.gov)

The Guest House at Berkeley Lab plans to open its doors to users from October 1, 2009, and will be taking individual reservations from September 1. The Guest House can be contacted by email at berkeleylabguesthouse@gmail.com. Inquiries sent before September 1 will receive an

automatic response with information about booking, and the potential guest will be contacted after September 1. Requests for a booking should include the following information:

First/last name
Requested dates of stay
Number of guests
Room type: standard (1 queen or 2 twins), large (2 queens),
or studio (1 or 2 queens)
Address
Phone number

6. ENERGY RESEARCH SCIENCE CAFE ON THURSDAY, AUGUST 27
(Contact: Liz Moxon, EJMoxon@lbl.gov)

The ALS kicks off its Science Cafe series tomorrow in Room 2-100B at 12 noon. The Science Cafe, designed to give beamline scientists the opportunity to present recent work to the ALS community in an informal environment, will start with a focus on energy research and technology. Featured this month is current work by staff and users on bioenergy, CO2 sequestration, and advances in solar-cell research. All are invited to attend and participate.

7. ALS MULTIMEDIA STARS HELP EDUCATE THE PUBLIC

How do you explain the science at the ALS to those without a science background? Emma Floyd, an undergraduate journalism student, created two videos to try and answer that question. "What is the Advanced Light Source?" gives a brief look at what the ALS is, who uses it, and how it works. In "The Big, The Small, and The ALS," viewers get an idea of the scale of the science done at the ALS with a quick look at some of the incredible numbers and measurements scientists use daily. Both videos are posted on the ALS Web site at

http://www.als.lbl.gov/media/als_intro6.mov
http://www.als.lbl.gov/media/numbers.mov

Have you ever wanted to ask a scientist to define a term in lay language? The Berkeley Lab Public Affairs Department thought so, which is why--with the help of scientists all over Berkeley Lab, including the ALS community--they have put together a video glossary, prominently featured on the Lab's homepage. Among the terms defined are photons (Ben Feinberg), synchrotron radiation (Mike Martin), protein crystallography (Corie Ralston), surface science (Miquel Salmeron), and free-electron laser (John Corlett). Entries are added each week, some of which are prompted by viewer suggestions.

http://videoglossary.lbl.gov/2009/

8. ALS-RELATED WEB NEWS AND LINKS

Jet-propelled Imaging for an Ultrafast Light Source
http://newscenter.lbl.gov/feature-stories/2009/07/28/jet-propelled-imaging/

Lab receives an additional $40.3 million in American Recovery and Reinvestment act funding
http://newscenter.lbl.gov/press-releases/2009/08/04/arra-addition/

Princeton scientists discover, visualize exotic electrons on surfaces of unique insulators
http://insciences.org/article.php?article_id=6431

UBC Research Pokes Holes in Hubbard Model, Could Help Solve Enigma of High-Temperature Superconductors
http://science.ubc.ca/news/303

Berkeley Lab's Advanced Light Source Receives $11.3 Million To Enable New Types of Scientific Inquiry
http://newscenter.lbl.gov/press-releases/2009/08/19/als-arra-funding/

New images capture cell's ribosomes at work, could aid in molecular war against disease
http://www.berkeley.edu/news/media/releases/2009/08/20_ribosomes.shtml

9. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from July 14 to August 17, the beam reliability [(time scheduled - time lost)/time scheduled)] was 97.2%. For this period, the mean time between failures (MTBF) was 33.5 hours, and the mean time to recovery (MTTR) was 56 minutes. There were no significant interruptions. (This period includes two-bunch operations from August 5-16.)

During this period, a new record was set for continuous hours of light provided to users in a single week of operation. For the period from July 14-19, 120 continuous hours of light were provided to users in top-off mode without any interruptions.

More detailed information on reliability is available on the ALS reliability bulletin board, which is located in the hallway between the ALS and the control room in Building 80. Questions about beam reliability should be directed to Dave Richardson (DBRichardson@lbl.gov , x4376).

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

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ALSNews Vol. 302 September 30, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. BERKELEY LAB GUEST HOUSE OFFICIALLY OPENS

"Just looking at the view here, I'm feeling like we really should be able to make sure this place is sold out; it shouldn't be that hard to do," joked Berkeley Lab Interim Director Paul Alivisatos in introductory remarks before cutting the ribbon to open the Berkeley Lab Guest House on September 21. With the brilliant afternoon sun overhead and the fog-shrouded San Francisco skyline as a backdrop, the event's organizers couldn't have asked for a more beautiful day to showcase a project that's been over 15 years in the making. "It has been obvious from the beginning," observed Janos Kirz, that in a facility that serves 2000 users a year delivering beam 24/7, that "users will sometimes also need food and shelter." Janos, standing in for ALS Director Roger Falcone who was unable to attend, gave a great deal of credit for the Guest House to the continuous advocacy of Gary Krebs who, as head of user services for the ALS, fought for such a building over many years.

Jerry Ohearn of Berkeley Lab's Facilities Division also spoke at the ceremony, thanking the legion of people and organizations supporting the guest house, including the Department of Energy (DOE), the University of California (UC), the Howard Hughes Medical Institute, Donald MacDonald Architects, W.E. Lyons Construction, and Facilities Division. For the ALS, he recognized Roger Falcone, Janos Kirz, Gary Krebs, current user services leader Sue Bailey, Steve Rossi (the ALS user representative who attended every meeting to make sure that the facility would meet the needs of ALS users), and Users' Executive Committe (UEC) chair Ken Goldberg. At the ceremony, Ken spoke of seeing "exhausted users occupying the couches and alcoves of the ALS, with their bedrolls and empty microwave noodle containers." Now, thanks to a remarkable effort, he said, the quality of life here is about to change. ALS users will now have "a great, convenient, and comfortable place to sleep, to quietly analyze their data between shifts, to meet with colleagues in a room with a great view, and to have their own kitchenette, where

presumably they will make something a little bit more substantial and possibly more healthy than microwave noodles."

Management of the Guest House is provided by UC Berkeley Residential & Student Service Programs. For more information or to make reservations, go to the Guest House Web site at http://berkeleyscience.org/berkeleylabguesthouse/index.html . Photos of the ribbon-cutting ceremony and a Guest House room can be viewed at http://www.als.lbl.gov/als/als_news/news_archive/vol.302_093009.html#1

2. SAFETY FIRST: SHIELDING-CONTROL END POINTS ESTABLISHED

(Contact: Tony Warwick, warwick@lbl.gov)

The long task of establishing shielding-control end points for 15 soft x-ray beamlines is now complete. An end point defines a spot in a soft x-ray beamline downstream of which users can have the freedom to change their equipment around without introducing a radiation hazard. Users are encouraged to consult with the floor operations staff or the relevant beamline scientist to confirm what restrictions apply to their particular situation. An example of an end point tag is shown at
http://www.als.lbl.gov/als/als_news/news_archive/vol.302_093009.html#2

In the early days of ALS operation, the configuration of the hard x-ray beamlines--especially the superbend beamlines--was carefully controlled to avoid having scattered synchrotron radiation exit the pipe. In the soft x-ray beamlines, this hazard is minimal, because they operate under vacuum and the synchrotron beam is completely attenuated by any closed valve. However, the ALS facility is required to control the configuration of all beamlines to ensure that no modifications are made that could introduce a radiation hazard. So shielding control was extended to the entire vacuum envelope of every beamline, and our excellent floor operations staff administer this policy. At the same time, our scientists do need free access to their soft x-ray endstations to perform their experiments.

The end points resolve this difficulty by defining a place in a soft x-ray line downstream of which no conceivable change to the configuration could introduce a radiation hazard. When this idea was put forward in 2007, a great deal of discussion ensued: ALS staff members are safety conscious, diligent, and empowered. We arrived at a prescription that requires the angles of reflections in the beamline to be monitored, annually, by the survey crew. One by one we examined all the soft x-ray lines and established the end points. The process was completed last month. Many thanks to Rick Donahue (radiation physics), Davy Xu (floor ops), and Alex Gavidia (survey) for pursuing the task to the end, as well as to everybody else involved and to Jim Floyd (ES&H) and Rick Bloemhard (operations) for motivation.

3. SITE AND BUILDING ACCESS TIED TO GERT TRAINING STARTING OCTOBER 1

Berkeley Lab Interim Director Paul Alivisatos has announced that, on October 1, there will be a significant change in how the Lab controls access to the site. Starting that day, the Lab's safety

training database will be linked to the badge access system. When you swipe your badge at any badge reader, the system will determine if you have a valid badge and are current with General Employee Radiological Training (GERT). If both requirements are not met, the badge reader will deny access. This includes room, building, and site-level access. This means that Lab employees and users who do not meet these two conditions cannot enter any area that requires card access during business hours, and will not be allowed on site after hours or on weekends.

Everyone with a badge is required by DOE regulations to be aware of the potential hazards associated with radioactive materials and radiation-producing machines, such as x-ray machines, electron-beam devices, and accelerators. GERT fulfills this requirement, and retraining is required every two years. We have an outstanding record of protecting our staff from radiation exposure, and this training plays a key role in ensuring that everyone working here has a basic understanding of radiation, its hazards, and how we control exposure here at the Lab. GERT training is available online. For more information, see the ALS Required Safety Training Web page at http://www.als.lbl.gov/als/quickguide/safetytrain.html .

4. HARNESSING THE BACTERIAL PRODUCTION OF NANOMAGNETS

(Contact: Elke Arenholz, EArenholz@lbl.gov)

Nanometer-size magnets have wide-ranging uses, from directed cancer therapy and drug delivery systems to magnetic recording media and transducers. Such applications require the production of nanoparticles with well-controlled size and tunable magnetic properties. The synthesis of such nanomagnets, however, often requires elevated temperatures and toxic solvents, resulting in high environmental and energy costs. Metal-reducing microorganisms offer an untapped resource to produce these materials in an environmentally benign way. At the ALS, researchers from the University of Manchester have shown that Fe(III)-reducing bacteria can be used to synthesize magnetic iron oxide nanoparticles with high yields, narrow size distribution, and magnetic properties equal to the best chemically synthesized materials.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/193nanomagnets.html

Publication about this research: V.S. Coker, N.D. Telling, G. van der Laan, R.A.D. Pattrick, C.I. Pearce, E. Arenholz, F. Tuna, R. Winpenny, and J.R. Lloyd, "Harnessing the extracellular bacterial production of nanoscale cobalt ferrite with exploitable magnetic properties," ACS Nano 3, 1922 (2009).

5. ELI ROTENBERG AWARDED FIRST KAI SIEGBAHN PRIZE

The editors of the scientific journal, "Nuclear Instruments and Methods in Physics Research, Section A," have awarded to Eli Rotenberg (ALS Scientific Support Group Deputy Leader) the first Kai Siegbahn Prize, named in honor of the journal's founder. The award citation recognizes Eli for "the creation and development of the 'Electronic Structure Factory' end-station at the Advanced Light Source, which could legitimately be called the most useful ARPES end-station

in the World. This endstation has been used to tease out many first results in a wide variety of complex and exotic materials. Eli Rotenberg's artful application of ARPES has greatly contributed to the understanding of some of the quantum electronic properties of nano-phase and reduced dimensionality materials. His scientific achievements are reported in tens of publications on the most prestigious journals of physics and scientific magazines."

The Kai Siegbahn Prize was established to recognize and encourage outstanding experimental achievement in synchrotron radiation research with a significant component of instrument development, particularly of synchrotron radiation spectroscopies. The selection committee consisted of Fulvio Parmigiani, committee chair, Universita di Trieste, editor, NIMA; William Barletta, Massachusetts Institute of Technology, coordinating editor, NIMA; Erik Karlsson, Uppsala University; Friso van der Veen, ETH Zurich; and Ingolf Lindau, SLAC National Accelerator Laboratory.

6. UEC CORNER: IN HAIKU, BY KEN GOLDBERG

(Contact: Ken Goldberg, KAGoldberg@lbl.gov)

Autumn in Berkeley
ALS users converge
jointly with Foundry
  http://www.als.lbl.gov/als/usermtg/

Energy focus:
Talks, posters, Workshops
Or come for the food
  http://www.als.lbl.gov/als/usermtg/agenda.html

ALS User
with great ideas to share
Join the UEC!
  http://ALSUEC.org/elections.html

Three shifts in a row,
Now a great new place to sleep
Berkeley Lab Guest House
  http://www.als.lbl.gov/als/quickguide/housing.html

UEC Corner:
Chairman squints at LCD.
Do people read this?
  http://ALSUEC.org/

I'm looking forward to seeing you at the meeting!

7. ALS SCIENCE CAFE ATTRACTS OVERFLOW CROWD

(Contact: Liz Moxon, EJMoxon@lbl.gov)

The ALS kicked off its inaugural Science Cafe on Thursday, August 27, to a packed house of scientists and staff. The program, designed to showcase current research in an informal environment, included three scientists invited to present work on energy research and technology underway at their beamlines. Speakers included Alastair MacDowell, who discussed the challenges of CO2 sequestration and opportunities for user research in this area, Alejandro Cruz detailing Joint BioEnergy Institute (JBEI) collaborations in bioenergy research at Beamline 1.4, and Matthew Marcus presenting work on solar cells. Each ten-minute presentation was followed by an "energetic" discussion that engaged staff and users. The next Science Cafe will be held in early November (in a larger room!).

Photo of the first ALS Science Cafe:
http://www.als.lbl.gov/als/als_news/news_archive/vol.302_093009.html#7

8. ALS-RELATED WEB NEWS AND LINKS

Boron-based compounds trick a biomedical protein
http://uonews.uoregon.edu/archive/news-release/2009/9/boron-based-compounds-trick-biomedical-protein

Gunning for free electrons
http://newscenter.lbl.gov/feature-stories/2009/09/09/electron-gun/

Lab Visitor: Undersecretary of Science Steve Koonin
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/september/09-23-09/index.html

Stimulus Funding: PBD Gets $433,000 from NIH for Robotic Study of Molecules
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/september/09-24-09/index.html

9. SHUTDOWN FEATURES SEISMIC RETROFIT, AIR HANDLER REPLACEMENT

(Contact: Steve Rossi, SLRossi@lbl.gov)

Another safe and successful shutdown of the ALS is wrapping up. This month's shutdown was dominated by facility projects that included the final phase of the seismic retrofit of the ALS dome, replacement of two of the three air handlers that provide cooling to the experiment floor, a rebuild of the low-conductivity water towers that provide cooling to the accelerator, and utility connections for the User Support Building, currently under construction.

Technical work on the accelerator was reasonably limited, but a number of important items were accomplished, such as maintenance replacement of the superbend cold heads, testing of a new digital controller for the booster power supplies, and commissioning of new high-level accelerator controls.

As usual there were a myriad of smaller beamline projects completed as well, such as an inspection of the Beamline 5.0 carbon filter foils, a configuration change of PEEM3 at Beamline 11.0.1, and a survey and realignment of Beamline 8.2.2, to name a few.

10. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from August 18 to 31, the beam reliability [(time scheduled - time lost)/time scheduled)] was 98.6%. For this period, the mean time between failures (MTBF) was 61.5 hours, and the mean time to recovery (MTTR) was 53 minutes. There were no significant interruptions.

The ALS shut down on September 1 for scheduled installations and maintenance. User operation is scheduled to resume on October 6.

More detailed information on reliability is available on the ALS reliability bulletin board, which is located in the hallway between the ALS and the control room in Building 80. Questions about beam reliability should be directed to Dave Richardson (DBRichardson@lbl.gov, x4376).

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov

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ALSNews Vol. 303 October 28, 2009

Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. ALS USERS' MEETING 2009: HAIKU, TOP-OFF, NOBEL, OH MY!

The 2009 ALS Users' Meeting was another successful joint effort between the ALS and the Molecular Foundry. After the 2007 Joint Users' Meeting, this year's co-chairs David Osborn and Yayoi Takamura wanted to bring ALS and Foundry users together again to continue improving scientific collaboration. The Users' Executive Committee Chairs for the ALS and the Foundry, Ken Goldberg and Oscar Dubon, welcomed attendees to the opening session with some clever haikus: "Autumn in Berkeley; ALS users converge; jointly with Foundry."

ALS Division Director Roger Falcone gave an opening address covering stimulus project progress, new safety efforts, and Thomas Steitz's 2009 Nobel Prize for Chemistry. Falcone then introduced Robert Schoenlein, ALS's new Deputy Director for Science, and shared some details of the Lab's biggest upcoming initiative: the Next Generation Light Source. The NGLS will be "an array of soft x-ray lasers, for 3D imaging, with chemical selectivity, to measure structure at the nano-scale." Foundry Director Carolyn Bertozzi then gave an overview of the facility's science, progress, and future plans, followed by Basic Energy Sciences Associate Director Harriet Kung, who showed how a large portion of BES's stimulus funds will be invested in light sources and nanoscale science research centers.

Keynote addresses rounded out the morning. William Brinkman, the new Office of Science Director, opened by presenting energy research being done at synchrotron radiation facilities. "X-ray light sources are revolutionizing biology," Brinkman said. Synchrotrons have contributed to the discovery of 70% of the 50,000 protein structures in the Protein Data Bank, with the ALS alone contributing over 2700 entries. Berkeley Lab Interim Director Paul Alivisatos then gave his keynote speech on the Carbon Cycle Research Program, artificial photosynthesis, and energy

storage. He focused on nanoscale materials for solar fuel generation, and multi-component nanoparticle systems for light-induced hydrogen production from water.

Read the full article at
http://www.als.lbl.gov/als/als_news/news_archive/vol.303_102809.html#1

2. PROTEIN BRIDGES DNA BASE AND NUCLEOTIDE EXCISION REPAIR PATHWAYS

(Contact: Julie L. Tubbs, jtubbs@scripps.edu)

Alkyltransferase proteins (AGT) protect cells from the biological effects of DNA damage caused by the addition of alkyl groups (alkylation). Alkyltransferase-like proteins (ATLs) can do the same, but they lack the reactive cysteine residue that allows the alkyltransferase function, and the mechanism for cell protection has remained unknown. To address this mystery, a British-American team lead by researchers at the Scripps Research Institute recently applied a combination of x-ray structural, biochemical, and genetic studies to ATLs in the yeast Schizosaccharomyces pombe without and with damaged DNA. By showing how a process called non-enzymatic nucleotide flipping activates ATL-initiated DNA repair, their results may improve our understanding of genomic integrity and responses to DNA damage relevant to pathogens and cancer development.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/194nucleotide-repair.html

Publication about this research: J.L. Tubbs, V. Latypov, S. Kanugula, A. Butt, M. Melikishvili, R. Kraehenbuehl, O. Fleck, A. Marriott, A.J. Watson, B. Verbeek, G. McGown, M. Thorncroft, M.F. Santibanez-Koref, C. Millington, A.S. Arvai, M.D. Kroeger, L.A. Peterson, D.M. Williams, M.G. Fried, G.P. Margison, A.E. Pegg, and J.A. Tainer, "Flipping of alkylated DNA damage bridges base and nucleotide excision repair," Nature 459, 808 (2009).

3. ROBUST, HIGH-THROUGHPUT ANALYSIS OF PROTEIN STRUCTURES

(Contact: Greg Hura, GLHura@lbl.gov)

Scientists have developed a fast and efficient way to determine the structure of proteins, shortening a process that often takes years into a matter of days. The Structurally Integrated BiologY for Life Sciences (SIBYLS) beamline at the ALS has implemented the world's highest-throughput biological-solution x-ray scattering beamline enabling genomic-scale protein-structure characterization. Coupling brilliant x rays from one of the superconducting bend magnets at the ALS to liquid-handling robotics has enabled the collection of 96 samples in 4 hours. Importantly, the sample format and the amount of material required are practical for most biological problems. The beamline's high-throughput capability is set to have a large impact on many fields that require genomic-scale information, such as Berkeley Lab's bioenergy efforts and cancer biology studies.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/196saxs.html

Publication about this research: G.L. Hura, A.L. Menon, M. Hammel, R.P. Rambo, F.L. Poole II, S.E. Tsutakawa, F.E. Jenney Jr, S. Classen, K.A. Frankel, R.C. Hopkins, S.-J. Yang, J.W. Scott, B.D. Dillard, M.W.W. Adams, and J.A. Tainer, "Robust, high-throughput solution structural analyses by small angle x-ray scattering (SAXS)," Nat. Methods 6, 606 (2009).

4. THOMAS STEITZ TO SHARE 2009 CHEMISTRY NOBEL PRIZE

Thomas Steitz (Yale University and Howard Hughes Medical Institute), a regular user of structural biology Beamlines 8.2.1 and 8.2.2 at the ALS, received the 2009 Nobel Prize for Chemistry (with Venki Ramakrishnan and Ana Yonath) for studies of the structure and function of the ribosome. Ribosomes are RNA-based protein factories found in all living cells, responsible for translating the genetic information encoded in messenger RNA (mRNA) into proteins. Research in this area may lead to novel antibiotics targeting bacterial ribosomes that have developed resistance to current drugs. At the ALS, Steitz has performed crystallographic experiments at Beamline 8.2.2 to understand the mechanism of antibiotic resistance by eubacterial ribosomes, resulting in the publication of "Structures of MLSBK antibiotics bound to mutated large ribosomal subunits provide a structural explanation for resistance," D. Tu, G. Blaha, P.B. Moore, and T.A. Steitz, Cell 121, 257 (2005). In addition, each Nobel announcement includes supporting documentation outlining the case that the Nobel committee considered in coming to their conclusion. Two of our users, Jamie Cate (University of California, Berkeley) and Harry Noller (University of California, Santa Cruz) were widely cited for their pioneering structural work on the ribosome, including the first solution of the intact ribosome structure to atomic resolution.

5. MORE UEC CORNER HAIKU, BY KEN GOLDBERG

(Contact: Ken Goldberg, KAGoldberg@lbl.gov)

Great users' meeting!
Kudos to all who helped, and
thanks to The Foundry!

So many posters
the joint meeting overflowed.
Next time, elbow room.
(Mark your calendar: October 14-16, 2010)

A tiny Z stage,
A quieter roughing pump...
Vendors spring for drinks

UEC voting
and meeting opinion poll
open now! Please vote.
  http://alsuec.org/uec_nominees.php

More time for workshops?
B.B.Q. is not for you?
We care what you think.
  email: KAGoldberg@lbl.gov
  or any UEC member: http://alsuec.org

6. GUEST HOUSE WELCOMES FIRST USER GROUPS

Since officially opening last month, the Berkeley Lab Guest House has been quite busy with visitors coming in for the ALS Users' Meeting and other conferences being hosted by Berkeley Lab this fall. Even before that, however, one of the first ALS user groups to take advantage of the brand-new accommodations was a group of six geoscientists from Germany and Mexico who were working at Beamline 12.2.2 on chemical reactions in materials at high temperatures and pressures. The group's research and week-long stay at the Guest House were sponsored by COMPRES (Consortium for Materials Properties Research in Earth Sciences), which is in turn supported by the Division of Earth Sciences of the National Science Foundation. During previous visits, the group would stay at the "ALS apartments," a block of off-site rental apartments in downtown Berkeley that was reserved for ALS users. According to members the group, the Guest House is "much more comfortable and makes life very convenient." Others mentioned how nice it is to stumble out of bed and go work just a few steps away, especially when dealing with jet lag. The consensus was that it was about time that Berkeley Lab built a guest house, and they "absolutely recommend" it to other users.

Photo of the COMPRES group:
http://www.als.lbl.gov/als/als_news/news_archive/vol.303_102809.html#6
From left: Florian Schroeder, Jasmin Biehler, Bjoern Winkler, Alexandra Friedrich, Erick Juarez-Arellano, Lkhamsuren Bayarjagal.

7. NEW X-RAY DATA BOOKLET/SPECTRUM PUBLISHED

New editions of the CXRO/ALS X-Ray Data Booklet and ALS Spectrum newsletter were handed out to attendees of the ALS Users' Meeting earlier this month. Now in its third edition, the X-Ray Data Booklet contains a few minor revisions and has been reprinted to replenish the supply of this highly sought-after pocket reference. The ALS will be working with other light sources regarding further production and distribution of the booklet (the ALS will not be mailing them out at this time). ALS Spectrum is an annual publication that reviews the past year's major science highlights and facility developments in a short, readable, newsletter-like format. This year, featured on the front page are stories about the ALS's successful transition to top-off mode and high-profile science involving the study of working catalysts. Contents also include a round-

up of other science highlights, brief reports from ALS staff and user groups, articles about ALS people and events, and facility updates. A PDF version can be accessed from the General ALS Publications Web page at http://www.als.lbl.gov/als/publications/genpubs.html .

8. ALS SUPPLIER, BOYD TECHNOLOGIES, TO CLOSE

We recently learned the sad news that Peter Boyd, owner of Boyd Technologies, passed away last month. His friends and family will miss him greatly. Through his company, Peter supplied a diverse community of ALS users with equipment for synchrotron x-ray scattering experiments, especially protein crystallography. With Peter's passing, Boyd Technologies will close its doors, and his former clients will need to seek new vendors for products his company formerly supplied.

9. ALS-RELATED WEB NEWS AND LINKS

Scientists decipher missing piece of first-responder DNA repair machine
http://newscenter.lbl.gov/press-releases/2009/10/01/dna-repair-uncovered/

"Promiscuous" protein interactions found in the nuclear pore complex
http://newswire.rockefeller.edu/?page=engine&id=976

First direct information about the prion's molecular structure reported
http://sitemason.vanderbilt.edu/news/releases/2009/10/05/first-direct-information-about-the-prions-molecular-structure-reported.93044

Small (and Big) Talk at FiO
http://www.photonics.com/Content/ReadArticle.aspx?ArticleID=40000

Accelerators for America's future: An exercise in integration
http://newscenter.lbl.gov/feature-stories/2009/10/16/accelerators-for-future/

Researchers find new route to nanotechnology self-assembly
http://newscenter.lbl.gov/press-releases/2009/10/22/new-route-to-nano-self-assembly/

Team led by Scripps Research and UC San Diego scientists reveals secrets of drought resistance
http://www.eurekalert.org/pub_releases/2009-10/sri-tlb102209.php

The Energy Challenge (video of Secretary Chu's talk at Berkeley Lab, 10/26/09)
http://hosting.epresence.tv/LBL/1.aspx

10. OPERATIONS UPDATE
(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from October 6 to 18, the beam reliability [(time scheduled - time lost)/time scheduled)] was 93.5%. For this period, the mean time between failures (MTBF) was 22.4 hours, and the mean time to recovery (MTTR) was 94 minutes. There were no significant interruptions.

More detailed information on reliability is available on the ALS reliability bulletin board, which is located in the hallway between the ALS and the control room in Building 80. Questions about beam reliability should be directed to Dave Richardson (DBRichardson@lbl.gov, x4376).

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2009)
Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov, sbkanel@lbl.gov

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Contents of This Issue:

Current issue online at http://www-als.lbl.gov/als/als_news/

1. PROOFREADING RNA: STRUCTURE OF RNA POLYMERASE II'S BACKTRACKED STATE

(Contact: Dong Wang, dongwang@stanford.edu)

For genes to be expressed, a complementary strand of RNA must be produced from a DNA template. During this process of transcription, a special class of enzyme called RNA polymerase moves along the DNA template, reading the DNA and producing an RNA complement. This process operates with amazingly high fidelity--the error rate is as low as one mistake for every 100,000 DNA base pairs transcribed--thanks in part to error correction by an RNA polymerase known as pol II, which "backtracks," or reverses, along the transcript to remove misincorporated or damaged nucleotides. A group from the Stanford University School of Medicine has solved the structure of pol II in the backtracked state, providing structural insights about a key mechanism for ensuring accurate transcription.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/195polymeraseII.html

Publication about this research: D. Wang, D.A. Bushnell, X. Huang, K.D. Westover, M. Levitt, and R.D. Kornberg, "Structural basis of transcription: Backtracked RNA polymerase II at 3.4 angstrom resolution," Science 324, 5931 (2009).

2. X-RAY IMAGING OF THE DYNAMIC MAGNETIC VORTEX CORE DEFORMATION

(Contact: Arne Vansteenkiste, Arne.Vansteenkiste@ugent.be)

Magnetic thin-film nanostructures can exhibit a magnetic vortex state in which the magnetization vectors lie in the film plane and curl around in a closed loop. At the very center of the vortex, a small, stable core exists where the magnetization points either up or down out of the plane. Three years ago, the discovery of an easy core reversal mechanism (http://www.als.lbl.gov/als/science/sci_archive/145vortex.html) at the ALS not only made the possibility of using such systems as magnetic memories much more realistic, it also initiated investigation of the core switching mechanism itself. Now, a Belgian-German-ALS collaboration has used high-resolution, time-resolved, magnetic x-ray microscopy to experimentally reveal the first step of the reversal process: the dynamic deformation of the vortex core. The group also measured a critical vortex velocity above which reversal occurs. Both these observations provide the first experimental support for the postulated reversal mechanism.

Read the full story at
http://www.als.lbl.gov/als/science/sci_archive/197vortex.html

Publication about this research: A. Vansteenkiste, K.W. Chou, M. Weigand, M. Curcic, V. Sackmann, H. Stoll, T. Tyliszczak, G. Woltersdorf, C.H. Back, G. Schuetz, B. Van Waeyenberge, "X-ray imaging of the dynamic magnetic vortex core deformation," Nature Phys. 5, 332 (2009).

3. CALL FOR GENERAL USER PROPOSALS: DEADLINE JANUARY 15

(Contact: alsproposals@lbl.gov)

The User Services Office is accepting general user proposals from scientists who wish to conduct research at the ALS in the next cycle.

PROPOSAL SUBMISSION DEADLINE (physical sciences beamlines):
Cycle: July - December 2010
Deadline: January 15, 2010

PROPOSAL SUBMISSION DEADLINE (structural biology/biological SAXS):
Cycle: March - April 2010
Deadline: January 15, 2010

NEW PROPOSALS: To submit a new proposal, please complete the appropriate online form:
http://alsusweb.lbl.gov/

ACTIVE PROPOSALS: Proposals for physical sciences beamlines are considered active and may be renewed for up to three, six-month cycles after the initial submission. After a total of four cycles, a new proposal must be submitted. If you have an active proposal for which you would like to request beam time during the July - December 2010 cycle, please submit a

Proposal Renewal Form:
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/RolloverPassword.shtml/Initialize

The following resources have been recently updated and are available for further information:

General information on the proposal process:
http://www.als.lbl.gov/als/quickguide/becomealsuser.html

Advice on what to include in the scientific case:
http://www.als.lbl.gov/als/quickguide/proposal_guidelines.html

Beamline information:
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal scores for the current cycle
http://www-als.lbl.gov/als/quickguide/pspscores.html

The proposal form now includes a section on publications from previous ALS work. The publications will be pre-filled automatically from the ALS publication database by searching for the principal investigator's name. Please make sure your publications are entered into our database: http://www-als.lbl.gov/als/publications

4. ALS JOB POSTING: DEPUTY DIVISION DIRECTOR, OPERATIONS

The ALS is accepting applications for a Division Deputy for Operations to serve as the Chief Operating Officer for the ALS. This critical position offers the challenge and opportunity to be a part of a world-renowned center for scientific research. The deputy's primary role is to manage the overall operation of the ALS. High-impact responsibilities include handling business, project, and facility management and long-range planning related to Berkeley Lab's mission. The deputy will also assume the day-to-day responsibilities of the division director, as needed. Required qualifications include substantial experience managing a scientific program/project and knowledge of a national scientific user facility; demonstrated ability to work effectively with multidisciplinary teams; demonstrated ability to recruit, retain, and develop staff; and experience with financial and budget oversight and development. Substantial knowledge of the synchrotron radiation community is highly preferred.

Read the full job posting at
http://cjo.lbl.gov/LBNLCareers/details.asp?jid=23266&p=1

5. LIGHT-SOURCE SAFETY OFFICIALS MEET FOR TWO-DAY WORKSHOP

(Contact: Sue Bailey, SBailey2@lbl.gov)

Safety and User Services staff from the five Department of Energy light sources met at a workshop at the ALS on November 16-17. The purpose was to present each facility's user safety

program and to identify best practices and potential areas of collaboration. In all, eleven different issues were found for further work. The most significant of these was to work towards a more common experiment review process. The eventual goal, where practical, is to have a consistent web tool for users such that similar work would have a consistent review and authorization process across all of the light sources. The meeting paved the way for staff at the ALS to overhaul the current paper-based Experiment Safety Sheet (ESS), replacing it with an electronic system based on the Advanced Photon Source's Experiment Safety Approval Form (ESAF).

Attending the meeting were Ken Goldberg, Mike Martin (LBNL); Zoe Van Hoover, Matthew Padilla (SLAC); Nena Moonier (APS); Jim Floyd (LBNL); Cathy Knotts (SLAC); Sue Bailey (LBNL); Ian Evans (SLAC); Susan Strasser (APS); Deborah Smith, Liz Moxon (LBNL); Andrew Ackerman (NSLS); David Malone (LBNL); and Mohamed Benmerrouche(CLS). See the photo online at http://www.als.lbl.gov/als/als_news/news_archive/vol.304_112509.html#5 .

6. UEC CORNER: NEW MEMBERS FOR 2010, SURVEY RESULTS

by Ken Goldberg
(Contact: Ken Goldberg, KAGoldberg@lbl.gov)

I'm very pleased to announce the four new members of the ALS UEC, the next UEC chair, and the results of the user poll. 156 users voted. http://alsuec.org/uec_results.php

The new UEC members are Hendrik Bluhm, David Kilcoyne, and Brandy Toner.

75 Votes |========== Hendrik Bluhm, Chemical Sciences, LBNL
64 Votes |========== David Kilcoyne, Advanced Light Source, LBNL
55 Votes |========== Brandy Toner, Univ. of Minnesota, Twin Cities
(The first runner up was Norman Manella.)

The new student representative is Holly Barth.

51 Votes |========== Holly Barth, UC Berkeley
(Jodi Iwata and Helen He were in a virtual tie for second.)

Their terms begin January 1st, 2010.

David Osborn (Sandia National Laboratories) has been elected as the next UEC chair for 2010. Many thanks to Peter Fischer, Franz Himpsel, Anne Sakdinawat, and Hendrik Ohldag, who will all be rotating off the committee in 2010.

Thank you to everyone who participated in the Users' Meeting opinion poll and charter amendment vote. Here are the results.

Q1: Importance of the joint meeting?
10% |== against it
42% |======== not important
23% |===== somewhat important
16% |=== important but could be better
04% |= very important
05% |= so important that it should be every year

Q2: What month would you prefer?
11% |== May
04% |= June
02% | July
12% |== August
19% |==== September
53% |========== October

Q3: Beam ON or beam OFF during the meeting
19% |==== beam ON
38% |======== no preference
43% |========= beam OFF

Q4: Meeting science program preference
14% |=== fewer talks, 1 full day before workshops
63% |============ 1.5 days of talks before workshops (current)
23% |===== 2 days of talks before workshops

Charter amendment (passes)
94% |================== change Student Member Term to <= 2 years
06% |= No change

7. WELCOME: SHAUNA KANEL AND CLYDE LEWIS

Shauna Kanel is excited to be joining the ALS communications team. She comes to us from the Stanford School of Medicine, where she was the communications coordinator in charge of marketing, Web design, and news for the Biomedical Informatics Research division and the National Center for Biomedical Ontology. Shauna did her undergraduate and graduate studies in molecular biology at the University of California, San Diego. She will be writing and editing ALSNews and science highlights, helping redesign the ALS Web site, and improving the ALS's social marketing strategies. "If you have any exciting research coming down the pike, contact us and we'll get the news out," Shauna said. You can reach her at SBKanel@lbl.gov and 510-486-6376. Her office is in Building 4, Room 210.

The User Services Office would like to welcome Clyde Lewis to the ALS. Clyde will be working as the ALS's proposal administrator. He recently completed a term as a writing instructor with Berekely Lab's Center for Science and Engineering Education, assisting undergraduates with

internship writing requirements. Clyde's Masters Degree in Educational Administration and experience derived from creating a Center for Foreign Language Study at Keio University, Japan, will be an asset to the ALS. "I couldn't have asked for a better position; all the people I'm working with are phenomenal," Clyde said. His open and friendly personality will make him a great addition to the ALS support staff, where he hopes to build relationships and gain a better understanding of the Lab. You can contact Clyde at CHLewis@lbl.gov and 510-486-7692.

8. AROUND THE RING: SCIENCE CAFE, HIGH-PROFILE VISITORS

A second Science Cafe was held on Tuesday, November 10, again attracting an overflow crowd interested in hearing about energy-related research taking place on ALS beamlines. Speakers for this event included Simon Teat, who spoke about investigating molecular structures for gas sequestraion using small-molecule crystallography on Beamline 11.3.1; Martin Kunz, who presented recent lithium-ion battery research on Beamline 12.3.2, and who also proposed several ideas to develop new energy-research user communities at the ALS; and Jinghua Guo, who rounded out the program with his presentation about metal-oxide clusters as photocatalysts for water splitting. Division Director Roger Falcone moderated the discussions that followed each talk. The next Cafe will take place on Wednesday, January 20, 2010.

Representative Bill Foster, one of only three physicists in the U.S. Congress, spoke on "What It's Like to be a Scientist in the U.S. Congress" at Berkeley Lab on Monday, November 9. Foster, who represents the 14th District in Illinois, was a researcher at Fermilab for 22 years. While there, Foster helped discover the top quark, the heaviest known form of matter. Foster currently serves on the House Financial Services Committee. As part of his visit, Rep. Foster toured the ALS with Director Roger Falcone. The congressman was particularly interested in Alastair MacDowell's effort on measuring CO2 transport through rock on Beamline 8.3.2, in connection with the Lab's work on energy and climate change related to carbon sequestration. Foster was also interested in Berkeley Lab's proposed new x-ray free-electron laser source, and his knowledge of particle accelerators from his previous life's work at Fermilab led to some probing questions.

Members of the Australian Parliament also toured the ALS with Roger on Monday, September 28. The delegation was led by Senator John Hogg, President of the Australian Senate (equivalent to the U.S. Speaker of the House). In addition to visiting the ALS, the delegation toured the National Center for Electron Microscopy (Uli Dahmen) and heard presentations on advanced biofuels development (Jay Keasling) and energy-efficient buildings (Arun Majumdar/Steve Selkowitz).

9. RING STATUS NOTIFICATIONS TO CELL PHONE

You may now receive text message notifications to your cell phone of the ALS ring status. Send a text message from your phone to alsringstatus@gmail.com containing the letters "als" in the body of the text. You will get a response with the current status and, if the beam is down, it will send a follow-up text as soon as the beam is back. James Glossinger of the Berkeley Center for

Structural Biology (BCSB) developed the application, with help from Eric Berryman of Engineering Division. Thanks to Leif Steinhour (also BCSB) for suggesting the project.

10. ALS-RELATED WEB NEWS AND LINKS

Meet a Postdoc: Shuyun Zhou (a Berkeley Lab video series)
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/october/10-30-09/zhou.html

Engineering Division Upgrades the ALS without Downsizing Safety
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/november/11-03-09/safety-jump.html

X-ray diffraction microscopy peers into tiny cells
http://physicsworld.com/cws/article/news/40907

Research: Tuning Bilayer Graphene to Create New Quanta
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/november/11-17-09/index.html

Microscopy: Cell close-up (Nature Research Highlight)
http://www.nature.com/nature/journal/v462/n7271/full/462254d.html

Alivisatos Named Director of Berkeley Lab
http://www.lbl.gov/publicinfo/newscenter/tabl/2009/november/11-19-09SE/11-19-09SE.html

Atomic-level Snapshot Catches Protein Motor in Action
http://newscenter.lbl.gov/feature-stories/2009/11/19/rho-protein-motor/

11. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs from October 21 to November 15, the beam reliability [(time scheduled - time lost)/time scheduled)] was 92.6%. For this period, the mean time between failures (MTBF) was 29.6 hours, and the mean time to recovery (MTTR) was 143 minutes. A failure within the SR01C SD power supply November 3 - 4 resulted in a loss of over 14 hours of scheduled beam time (eight of those hours during a scheduled special operations shift.)

More detailed information on reliability is available on the ALS reliability bulletin board, which is located in the hallway between the ALS and the control room in Building 80. Questions about beam reliability should be directed to Dave Richardson (DBRichardson@lbl.gov, x4376).

Long-term and weekly operations schedules are available on the Web at http://www-als.lbl.gov/als/schedules/index.html . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at http://www-als.lbl.gov/als/status/ .

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Editors: lstamura@lbl.gov, ejmoxon@lbl.gov, alrobinson@lbl.gov, sbkanel@lbl.gov

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