

HOMESTAKE DUSEL AND SANFORD LABORATORY NEWSLETTER

Dear Homestake Collaboration,

Welcome to the November edition of our monthly newsletter for Homestake DUSEL and South Dakota's Sanford Laboratory (under new editorship).



Thanks to Dianna Jacobs for all her energetic, hard work in the past. She is moving on to increased involvement in Risk Management, Documentation and Information Management and pursuing her MBA so Melissa Barclay will be taking over. The newsletters will still

provide the same interesting and timely updates on the progress of re-entry into the mine, information concerning the Collaboration, links to news articles, and scientific updates from those who are in the planning or executing stages of experiments at Homestake. We welcome your input in future editions for news, workshops, conference notices and other highlights.

PROGRESS AT SANFORD UNDERGROUND LABORATORY AT HOMESTAKE

The South Dakota Science and Technology Authority (SDSTA) is making preparations for early science at the Sanford Underground Laboratory. However, the biggest news in Lead, SD is the dropping water level at Homestake—more than 80 feet since late August.

Water-level milestones

Heavy spring snow and an unexpectedly high iron content in the mine water slowed dewatering in late spring and summer. The SDSTA installed clarifiers to remove the iron, and the water-treatment plant has been able to sustain pumping rates of 1,000 gallons per minute and more. As a result, the water level at Homestake was lowered to 4,600 feet underground by October 28—a milestone that made news throughout South Dakota. By November 5, the water had dropped to just below 4,611 feet underground. That was down from a high-water mark of 4,530 feet underground on August 21. The water level continues to drop, and plans are in the works to increase pumping and treatment capacity.



This view down Six Winze, a shaft that connects the 4550 Level to the 8000 Level at Homestake, shows the water level just below 4,600 feet underground.

IMPORTANT DATES

DUSEL Annual Review: January 28-30, 2009 - Berkeley, California. Committee will be chaired by Ed Temple.

S-4 Solicitation is out: Deadline – January 9, 2009.

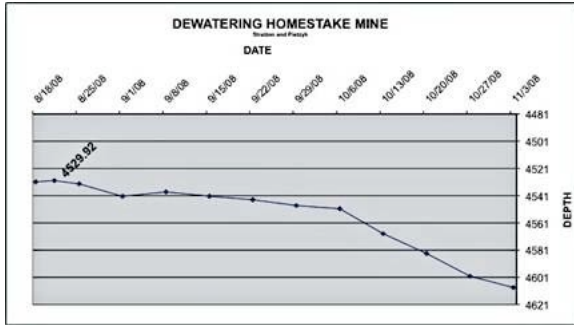
<http://www.nsf.gov/pubs/2009/nsf09500/nsf09500.htm>

AGU meeting in San Francisco 15-19 December 2008

<http://www.agu.org/meetings/fm08/>

Variables such as precipitation and an increasing capacity to treat and pump water make it difficult to predict the exact rate of dewatering. However, SDSTA Executive Director Ron Wheeler wagered DUSEL Principal Investigator Dr. Kevin Lesko a case of champagne/Zinfandel that the 4850 Level will be dry by May 1 (The newsletter promises to keep you posted on this important development!) ("Levels" at Homestake are traditionally designated by their depth in feet.)

HOMESTAKE DUSEL AND SANFORD LABORATORY NEWSLETTER



This chart shows the declining water level at Homestake since August.

Yates Shaft re-entry

In September, the SDSTA awarded an \$8.9 million contract to RCS Construction of Rapid City to re-enter, refurbish and rehabilitate the Yates Shaft. RCS has hired deep-shaft experts, some with years of experience in the Yates Shaft itself. The company will inspect the shaft, replace shaft timber where necessary, and replace power, water, and telecommunications utilities to support early science at the 4850 level. RCS is expected to begin shaft inspections in late November 2008.

The Yates Shaft will support early science at Sanford Lab and it will provide a secondary access and egress route. The Yates Shaft will serve as the primary science access portal at the underground laboratory. The Ross Shaft, which also gives access to the 4850 Level, will be the construction portal to the Sanford Lab.

Ross Shaft Transitions

About the same time, Dynatec Corp. completed its contract to rehabilitate the Ross Shaft, about a kilometer from the Yates Shaft. The SDSTA hired additional personnel—again, many with Homestake experience—to operate the pumping system in the Ross Shaft and install new infrastructure, including new transformers on the 4550 Level for additional pumps.

New Personnel

As of mid-November, 55 people work for the SDSTA. In addition, RCS Construction will bring its own crews, and other contractors continue to refurbish and refit offices, shops and other buildings.

Ultra-high speed Internet

In December, the Sanford Laboratory will be connected to the South Dakota Research Education and Economic Development Network, a high-speed fiber-optic data network that will provide data access

at speeds approaching 50 gigabits per second. The Great Plains Education Foundation and the South Dakota Board of Regents are funding the \$11.8 million statewide system.

Early Science

Two large physics experiments are slated for the 4850 Level. A review is being planned for December 3-5 on the Sanford Lab campus in Lead in order to assess the readiness of the LUX dark matter experiment as well as Sanford Lab's readiness to support early science. The LUX collaboration intends to begin testing their scientific equipment on the surface in a refurbished Homestake building. The Majorana collaboration, looking for neutrinoless double-beta decay, is considering the 800 Level as a site for electroforming ultra-pure copper that the experiment will use to construct shielding for the main detector.

Researchers already at work at the Sanford Lab at Homestake include:

- A hydrometry group, led by Dr. Larry Stetler of the South Dakota School of Mines and Technology, has scouted sites for new instruments on the 4550 Level.
- Geomicrobiologists Dr. Cynthia Anderson of Black Hills State University and Sookie Bang of South Dakota School of Mines & Technology have been sampling underground, sponsored by a grant from the South Dakota Board of Regents.



Dr. Cynthia Anderson of Black Hills State University takes a biological sample at the 2000 Level of Homestake.

- Dr. Riccardo DeSalvo of CalTech and Dr. Vuk Mandic of the University of Minnesota have installed instruments on the 300 Level and the 2000 Level to determine whether the noise level at Sanford Lab is low enough for a gravity-wave detector.
- Dr. Bill Roggenthen of the South Dakota School of Mines and Technology continues to deploy instruments underground as part of a three-dimensional seismic array.

HOMESTAKE DUSEL AND SANFORD LABORATORY NEWSLETTER



Dr. Larry Stetler and graduate student Jason VanBeek of the South Dakota School of Mines and Technology check instruments at the 4550 Level.

Education and Outreach

The Sanford Lab continues its “Deep Science for Everyone” lecture series, with events at the Sanford campus in Lead and in Spearfish, where 320 people attending an evening lecture on gravity waves by Dr. Riccardo DeSalvo of CalTech. (Spearfish High School science students received extra credit for attending.)

In November, the “Deep Science for Everyone” lecture series will make its debut east of the Missouri River in South Dakota. Sanford Lab Director Dr. Jose Alonso will present “Neutrinos and Dark Matter in the Black Hills” in public lectures in Brookings, Sioux Falls, Madison and Vermillion. South Dakota Public Television is taping one of the lectures. (This newsletter will give you more info on these events in the next issue.)

NEW HIRE for Education and Outreach

Black Hills State University recently hired Peggy McMahon Norris of Lawrence Berkeley National Laboratory as deputy director of education and outreach for the Sanford Underground Laboratory. Peggy will start work in January. Additional information about Peggy will appear in next month’s newsletter.

July News from SDSTA

The Board of Directors of the SDSTA named Mr. Ron Wheeler as its Executive Director. He succeeded Mr. Dave Snyder who retired June 30. Mr. Wheeler’s previous experience includes 28 successful years in executive and management positions, first as President and CEO of Simon Telelect in Watertown, and then as President of the Access Division of Simon Engineering Plc, London, England. Most recently he served as President and CEO of BHL Capital Corp. in Rapid City since 2002.

UPDATE FROM THE DUSEL EXPERIMENT DEVELOPMENT COMMITTEE (DEDC)

On the heels of a successful workshop in Lead, SD, in April 2008, the DEDC has been involved in a major project review for the DUSEL-Homestake project, coordinating initial activities related to S4 and beyond, and is looking ahead to a full-on project review by NSF in late January 2009.

With the DUSEL-Homestake S3 award not even one year old, the project team arranged an internal review, in late July 2008, to provide feedback on progress to date, and to supply suggestions to change the trajectory, if necessary. The DEDC participated in this review, and presented an evolving science plan for the facility. Many from the community contributed by submitting updated materials from working groups and updated white papers. The committee drew freely from these materials for their presentation with the summary presentation available online. http://www.lbl.gov/nsd/Homestake/dedc_papers.html

For the Physics groups, among other areas, activities related to the long baseline experiment and nuclear astrophysics have been very active.

Brookhaven meeting

The Long Baseline Experiment held a collaboration meeting at Brookhaven National Laboratory on October 14-15. Collaboration organization issues were discussed along with plans for the S-4 submission. Current plans call for S-4 submissions on geotechnical investigations, Water Cherenkov and Liquid Argon detectors. Immediately following this meeting, a workshop was held on “Underground Detectors Investigating Grand Unification.” The talks from this workshop can be seen at: <http://www.bnl.gov/udig/>.

Astrophysics

The Astrophysics Underground Accelerator Collaboration met on Friday, October 24th during the DNP meeting (Annual Fall meeting of the Division of

HOMESTAKE DUSEL AND SANFORD LABORATORY NEWSLETTER

Nuclear Physics of the American Physical Society) in Oakland, CA. The three-hour meeting was structured in an update from the facility and the ongoing design effort of the DUSEL laboratory. (Kevin Lesko, Jose Alonso and Steve Marks made short presentations.) There was a productive discussion of how to proceed with the S-4 proposal by mid-December.

The collaboration agreed to pursue a two-accelerator concept covering a wide range of energies using singly charged high intensity ion sources as well as multi-charged ECR ion sources. The combination of the accelerators and those versatile ion sources will enable a unique experimental accelerator. This will allow us to conduct two experiments at the same time or set up a new experiment independent from the other. The presentations of this collaboration meeting can be seen at: http://ecrgroup.lbl.gov/Astro_DUSEL.htm

For the non-Physics Groups

A series of conference calls have refined the form of individual experiments which will be submitted for the initial suite of experiments for S4. Since no specific resources in the S4 opportunity have been allocated for Biology, Geosciences, Engineering and other cross-cutting areas, the proposals will have to compete within the existing grant submission structure of NSF. Consequently, working groups have been busy determining the most appropriate programs within NSF as receptors for their proposals. The coordination activities will culminate with sessions on Geoneutrinos and Underground Science at the Fall meeting of the American Geophysical Union (San Francisco, December 2008).

* DEDC will participate in the DUSEL project review by NSF in January, and will be contacting people for their input on the review.

New Employees at LBNL

Sydney (Syd) De Vries is a Professional Mining Engineer from Canada who has been living in the Central Valley of California for the past four years. He has over 25 years of engineering and operations experience in the mining industry with the majority of his experience in underground mining and construction. He has been married to his wife Shelli for 17 years and has three children: Tara – 15, Rachel – 13, and Lauren – 10. He looks forward to applying his knowledge and experience to the construction of Science Laboratories at DUSEL.

Syd's favorite quote: *All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.*
- Arthur Schopenhauer

Sarah Morgan has been at LBNL for 7.5 years and is coming to DUSEL from Facilities. She has supported the following projects: Building 51 and Bevatron Demolition, ALS User Support Building, The Molecular Foundry as well as a variety of other conventional facilities work.

Sarah's favorite quote: *Nobody can make you feel inferior without your permission – Eleanor Roosevelt*



Sarah and her dog

Focus on Safety

In October, Lawrence Berkeley National Lab mandated several all day training sessions to make employees and guests more aware of safety issues. If you are an offsite guest, please check your Lab email regularly and comply with Lab safety requirements. For most of those in offices, the main issues concern Ergo and seismic safety.

HOMESTAKE IN THE NEWS

South Dakota CBS affiliate's story about dewatering Homestake:

<http://www.keloland.com/NewsDetail6162.cfm?Id=25.75772>

HOMESTAKE DUSEL AND SANFORD LABORATORY NEWSLETTER

JOBS IN PHYSICS

Tenure Track Position in Experimental Particle Astrophysics: Assistant or Associate Professor in Department of Physics, Engineering Physics and Astronomy. Applications review begins 11/15/08. Dept of Physics, Engineering Physics & Astronomy, Queen's University, Kingston, Ontario, Canada K7L

Professor/Assistant Professor – Columbia University (Non-Collider Particle or Astroparticle Physics) Applications review begins 12/1/08.
<https://academicjobs.columbia.edu/applicants/jsp/shared/frameset/frameset.jsp?time=1225146102733>

Tenure Track Faculty Position in Experimental Particle Physics, Department of Physics & Astronomy, University of Rochester. Applications review: November 2008. Send applications and arrange for 4 letters of recommendation to be sent to: HEP Faculty Search Committee, c/o Ms. Shirley Brignall, shirl@pas.rochester.edu Department of Physics and Astronomy, University of Rochester, Rochester, NY 14627

Experimental Nuclear Physics, Full Professor Indiana University. Submit applications and arrange for a minimum of 6 letters of recommendation to: Joni Beatrice, jbeatrice@indiana.edu Ground Mail: Professor Mike Snow, Faculty Search, Department of Physics, 727 E 3rd St., Bloomington, IN 47405-7105. wsnow@indiana.edu Review begins 12/1/08. For further info: <http://www.indiana.edu/~deanfac/baalist.html>

THREE Postdoctoral Positions at the University of Alabama: EXO and Double Chooz. Two to work on a search for the double beta decay of ^{136}Xe (EXO), and one to search for the theta-13 mixing angle (Double Chooz). Application should include a cover letter addressing how you meet job requirements, a current CV, with the following categories preferred: educational background, degree dates, GPA with scale, experience, invited presentations and publications. Indicate which position you prefer. Include at least 2 letters of reference sent directly to: Michelle Kijeski, Dept of Physics & Astronomy, 206 Gallalee Hall, Box 870324, Tuscaloosa, AL, 35487. mykijeski@as.ua.edu. Positions open till filled.

RockEng09 Organizing Committee notice:

Rock Engineering in Difficult Conditions - "3rd Canada-US Rock Mechanics Symposium" & "20th Canadian Rock Mechanics Symposium" / A Joint Meeting of the Canadian Rock Mechanics Association & the American Rock Mechanics Association, in conjunction with the 2009 CIM Annual Conference and Exhibition. Deadline Extended to November 15. If you have not already done so, please consider submitting an abstract. The meeting will be held in Toronto May 9-14, 2009. If you are interested in organizing a workshop/short-course, or contributing to the conference as sponsor or exhibitor, please contact info@rockent09.com. Further info at <http://www.RockEng09.com>

This newsletter is edited by Melissa Barclay. A special thanks for input from Kevin Lesko, Bill Harlan, Jaret Heise, Derek Elsworth, Hank Sobel, and Daniela Leitner.

HOMESTAKE DUSEL CONTACT INFORMATION Lawrence Berkeley National Laboratory

Richard DiGennaro PH: 510-486-5516
Email: RSDigennaro@lbl.gov
Project Office – Dianna Jacobs PH: 510- 486-7191
Email: DJacobs@lbl.gov

South Dakota Science and Technology Authority

Ron Wheeler, Executive Director
Laurie Gehner, Executive Assistant
PH: 605-722-8650

South Dakota School of Mines and Technology

William Roggenthen PH: 605-394-2460
William.Roggenthen@sdsmt.edu

University of California at Berkeley

Kevin T. Lesko PH: 510-486-7731
Email: KTLesko@lbl.gov
Melissa Barclay PH: 510-486-5237
MWBarclay@lbl.gov