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AFRD newsletter *July/August 2014*

ALS Finished Shutdown

In early July, the ALS finished a two month shutdown and is now up and running again for users. Most installations during the shutdown were geared towards improving reliability and general operation of the facility.

The big-ticket project that set the timing and duration of the shutdown was the replacement of the old ALS storage ring radio frequency (SRRF) crowbar system with a new high-voltage switch. The new switch will provide the same overvoltage protection for the SRRF system, but with increased reliability. It is part of a larger project to upgrade the whole RF system of the storage ring (the klystron and the high-voltage power supply had been replaced in past shutdowns, and the waveguide switch matrix will be replaced next year).

Other shutdown projects were focussed on the low-conductivity water (LCW) system, something the ALS has been working on for years. Necessary, but corrosive by nature, LCW can cause maintenance problems like water leaks and blockages. An anti-corrosive agent, benzotriazole, was recently added to the ALS low-conductivity water supply and the effects are being closely monitored. This shutdown included the replacement of a number of low-conductivity water flow meters in the storage ring with vortex-based meters that have no mechanical or moving parts, which should reduce corrosion issues that can cause the beam to trip, costing users valuable time. The water system also got two new tower fans in the cooling towers at Building 37.

This shutdown also included surveying and aligning the storage ring and replacing beam position monitor (BPM) buttons (part of the $7.6 million, multi-year controls upgrade project). The new BPM buttons are connected to a new electronics system, which will give the ALS accelerator physics group a much better tool for monitoring the beam.

The linear accelerator klystron modulator was replaced and tested, which is dramatically increasing the injection efficiency. The damaged QFA magnet power supply that caused an unexpected outage just prior to this shutdown was fully repaired and tested.

Advanced Accelerator Concepts Workshop

Every two years, the American research groups funded by DOE Office of High Energy Physics to pursue advances in novel accelerator technology come together for a workshop called Advanced Accelerator Concepts (AAC). The pool of "invitation-only" participants is complemented by select international representation. From July 13 to 18 the meeting took place at the Dolce Hayes Mansion in San Jose. Since the term "advanced concepts" is rather broad, the various research topics were divided into eight working groups, with joint sessions for overlapping topics.

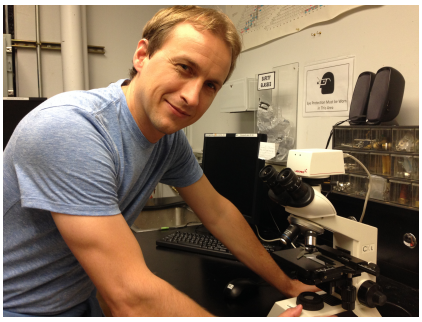
A dense agenda made it very challenging to follow several working groups in parallel throughout the week. Below are some highlights, mostly from the working group on laser-plasma acceleration:

- Scientists from FACET at SLAC were able to boost electron energies from 20 GeV to 47 GeV through acceleration by an e-beam-driven wake in a meter-scale plasma.
- Several groups are addressing collider considerations for plasma acceleration of electrons and positrons.
- New simulation techniques are being developed to speed up computation and address very high beam qualities.
- The BELLA facility at LBNL reported on record-breaking production of 4.25 GeV electrons through laser-plasma acceleration in a 9-cm-long plasma guiding channel.
- Through laser-produced fields in dielectric microstructures, accelerating field gradients of 80 kV over a few hundred micrometer were demonstrated in a single structure, enabling the vision of stacking multiple structures on a single chip.
- The Jena group from Germany presented their latest diagnostic data on laser-driven wakefields, combing excellent few-fs temporal and few-micron spatial resolution to provide a unique perspective on the wakefield dynamics.

- Researchers from Osaka, Japan, demonstrated that two independent laser pulses can be focused on a longitudinally-varying plasma density profile to boost the post-acceleration performance and control of their laser-plasma accelerator.

For a better overview of the highlights, the working group summary slides can be found online, under section 7 at `http://aac2014.stanford.edu/plenary-slides` . Workshop proceedings will be published later in the year.

Get to Know Your Colleague: Jeroen van Tilborg



What's your name? How do you pronounce it (unless it's obvious)? Do you usually go by a nickname or an anglicized version of your name?

My name is "Jeroen", last name "van Tilborg". "Jeroen" is a very common Dutch name, but not at all easy to pronounce for the rest of the world. It is pronounced as "Ye-roon". Although it's a pain for people, I never took on a different nickname since most people get some sort of acceptable version of my name going eventually.

What is your current position and what are you working on right now?

My current job title is career-track scientist. As an experimentalist, I work on several aspects of the Laser Plasma Accelerator program. For example, I am currently part of a team pursuing staged acceleration (integrating multiple independent LPA modules), and are developing novel plasma channel diagnostics.

Have you done other things at the Lab prior to your current activites?

Yes, In the period 2001-2006 I was a graduate student in the same group as where I am now, and in 2006-2009 I worked as a post-doc in the Chemical Sciences Division. There I pursued ultra-fast non-linear X-ray science in model molecules with a high-power High Harmonic Generation setup. Since 2009 I am back in LOASIS/BELLA: returned to the LPA business.

What is your professional background? Where did you work before coming to the Lab?

I received my Bachelor's and Master's Degree in Applied Science from the Eindhoven University of Technology in the Netherlands, and came straight to LBNL after that. Never left LBNL since. My PhD program was set up as a joint Eindhoven University/LBNL collaboration.

Have you had a teacher, mentor or co-worker that truly inspired you? Who was it? Why was the person so inspiring?

In general I am inspired by people that can obtain a balanced life. Be motivated at work, but make time for family, friends, travel, hobbies, etc. Right now with a 1-year old at home, I feel there are simply not enough hours in the day, but for inspiration I look at people around me that are (or have been) in the same situation.

Is there something interesting about you that most people at the Lab don't know that you would like to share with the Division?

I have a weird fascination with original old maps. Maps from the 16th-18th century, where entire continents were still blank or misrepresented. I only own two such maps myself (it is an expensive hobby), but whenever I see an antique store or a museum exhibit I always check out the cartographer's section. There is something special in knowing that an individual in 1650 held a map in their hands, which he/she thought was based on the latest up-to-date high-tech knowledge, but that person would have had no idea yet that Australia was an island while California was not.

Link of the Month: New Parking Policy to Aid Expectant Mothers

Berkeley Lab aims to promote a family-friendly work environment. Thanks to a new program expectant mothers (employees, contract workers, and affiliates) can receive a Temporary Blue Triangle parking pass. This program is designed to ensure that expectant mothers are provided safe access to their work buildings and vehicles, and to aid them in accessing parking at the Laboratory during their pregnancy.

The policy is detailed at `https://commons.lbl.gov/display/rpm2/Parking+at+Berkeley+Lab`

To arrange for this temporary accomodation, fill out this form: `https://commons.lbl.gov/download/attachments/77332671/Expectant.Mother.Parking.ProgramDraft2.04.03.14.docx?api=v2`

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