

LCLS UEC Meeting, October 7th 2022

Present:

Matteo Mitrano, Mike Dunne, Nick Hartley, Daniel Rolles, Elisa Biasin, Emma McBride, Uwe Bergmann, Tais Gorkhover, Yue Cao, Chitra Rajendran, Marius Schmidt, Margaret Doyle, Dominik Oberthur, Paul Jones, Mariano Trigo, Leilani Conradson, Blaine Mooers, Natalia Powers-Riggs, Samuel Teitelbaum

Absent:

G. Jackson Williams, Agostino Marinelli, Gilles Doumy

Welcome by UEC Chair, Matteo Mitrano

1. Introduction of UEC members specifying name, affiliation, representation of user area.
2. Scope of meeting. Thanking the previous Chair, stating the role of UEC in improving the LCLS experience, and addressing DEI issues.

LCLS Updates, Mike Dunne

1. Welcome and introduction. Introduction to role and scope of UEC, formal charge of UEC and charter. UEC as an advocacy group, representatives of broader scientific efforts (i.e. scientific areas), communication to LCLS leadership, and advice to LCLS director. Monthly meetings.
2. Discussion of user engagement with LCLS: broadening the user community, new labs and capabilities for LCLS-II, new data workflows. There is a growing need for new data workflows and new data policies.
3. LCLS-II and LCLS-II-HE updates. **Q&A with UEC**
 - a. LCLS-II linac commissioning started 12 hours ago, superconducting RF modules starting to come up. There will be some impact on run 21 due to the commissioning of 2nd linac. The schedule of user experiments in November might be affected.
 - b. Looking to the future, there will be some more downtime due to the LCLS-II-HE upgrade. The superconducting (SCRF) linac will be down for some time, but user ops slated to continue all year. At the moment, we anticipate downtime for the full FY26, with the SCRF linac expected back FY27.
 - c. **Q&A with Mike Dunne, LCLS Director:**
 - d. **Question: going deeper into run 21 disruptions due to LCLS-II commissioning.** Beam back at the end of October, and through end of winter break. During this time there are a few periods where only the SC linac is on. There will likely be a 10-day period “somewhere in December” when LCLS will run for user operation during the night shift, as commissioning is done during the day. Similar disruption expected in January due to SXR undulator train.
 - e. **Question: Plans for detectors and detector development.** Detector suite and development plan, ePix development path to 5 kHz version of the epix-10K, then 100 kHz detectors, and sparse MHz readouts. The goal is to achieve a full-frame readout at MHz rates by LCLS-II-HE time. Of course, one has to strike a balance

of technology development among detector, DAQ and linac. Near-term, the version of the 5 kHz system will be deployed in QRIXS.

- f. **Question: Science campaign discussion. Defining the competitive edge of LCLS.** Attosecond capabilities, two-color mode ($\omega, 2\omega$). How do we take full advantage of our capabilities. How do we interface with the PRP in terms of what is scheduled from a community point of view? Regarding high rep. rate experiments? We need to engage users from other facilities for high rep. rate experiments. There is strong communication between LCLS and other facilities on detectors and data rates. Plans for integration to exaflop supercomputers for advanced data processing. Advice on how we can better engage the user community on this.
- g. **Question Need for high data rates vs. increasing stability for integrating-mode experiments rather than single-shot.** Can we not take data every shot and not have to worry about exaflop-scale computing if we can improve XFEL timing/stability? Answer: LCLS bins after the fact because the timing system is older. SCRF should be very stable, and staged synchronization technologies that should have stability in 20-25 fs stability, perhaps sub-10 fs. This is a major goal of ChemRIXS. A big instability in the Cu linac is represented by the bunch compressors, so we could feed SCRF into Cu linac to enhance stability.
- h. **Question: Is there the possibility to establish a meeting between the SAC and UEC?** The UEC and SAC have different ideas of the scientific priorities and there is the need for better coordination. It is on the agenda for the next meeting as to who/what the schedule will be so as to not overburden LCLS leadership/UEC.

General Discussion

1. **Vice-chair elections.** Encouraged UEC members to put forward nominations, which should be sent to the chair and Leilani by **next Friday 10/14**.
2. **LCLS Young investigator award:** We should extend the LCLS Young Investigator Award eligibility by one year for extenuating circumstances. The committee approves unanimously.
3. **SSRL/LCLS user meeting:** Feedback from UEC about the organization of the user meeting. Caveat: unclear if 2023 user meeting is in-person or virtual. Feedback from the MEC session: not recorded. Can we record every session? Keep young investigator talks. We should work on promoting virtual poster session. Fundamentals of LCLS session was positively received. Scope of poster session awards should be clearer.
4. **Staff awards and staff quality of life.** The introduction of a staff recognition award is making a positive difference among staff and the choice of Silke Nelson was a great start. Moving forward, send a google form to collect feedback from user's meeting.
5. **Plan for next UEC meeting, feedback for DOE.** After meeting with Linda Horton (BES) and Dava Keavney (lightsources) DOE leadership, we need to provide science highlights to better communicate the scientific impact of the LCLS to the general public and other stakeholders (legislators, executive branch, etc).

6. **Formalizing the next meeting:** Discussing priorities for UEC tasks. We will introduce discussion topics and keep an open list for discussion topics of the UEC.
7. **Reminder of UEC vice chair nominations.**