UEC Meeting Minutes – 2025-03-27

Attendance: R. Boll, M. Centurion, M. Dunne, A. Follmer, N. Hartley, P. Jones, C. Laasch, J.-S. Lee, S.-C. Lin, L. Moreau, M. Mitrano, S. Pandolfi, N. Powers-Riggs, D. Oberthuer, B. Ofori-Okai, A. Rudenko, B. Tan, S. Teitelbaum, V. Tiwari, A. Zong, C. Rajendran, Leilani Conradson

Mike's Updates:

- Excellent progress with the new LCLS-SC beam:
  - Now delivering at ~33 kHz repetition rate to users! Currently serving TMO, ChemRIXS and qRIXS instruments.
  - Demonstrated the delivery of SC beams simultaneoulsly for hard and soft x-ray beamlines (by kicking the e-beam to both undulators), enabling dual operation for the start of the HE era. Initial demonstration at 8.3 kHz (soft) and 1 kHz (hard), with ramp-up tests in July.
  - A new cathode design has reduced dark current by 1000x, allowing greater flexibility in beam tuning.
  - The first paper from LCLS-SC beamtime has been published, focusing on coherent shaping (amplitude, phase) of XFEL pulses to alter spectrum and pulse duration to allow phase-locked pulse pairs, ultrashort pulses, etc, with applications in non-Born-Oppenheimer molecular dynamics.
- XPP is being completely rebuilt in readiness for LCLS-II-HE. It will be available for use with the Cu Linac in Spring 2026, and with the SC linac once available (winter 2027).
- The FEH (Far experimental hall) is being reshaped in readiness for LCLS II HE …
  - Control rooms will be built on the mezzanine in summer 2025 to allow more space on the experimental floor for the new systems.
  - A new laser hall and wet labs will be built in 2026-2027 in the space currently occupied by the XCS/MFX/CXI control rooms.
  - Various systems will be moved outside to create more space in the experimental area (PCW, an air handling unit, and new cooling systems for high-rate detectors)

Biosciences Topic discussion - Alec Follmer presentation

- An overview of Bioscience at LCLS was presented, highlighting the reasons to use and XFEL, example science objectives, and current techniques, with a focus on opportunities and challenges in the transition to the LCLS-II-HE era.
- Challenges include sample delivery and experiment complexity, as well as a drop in the number of bioscience proposals in recent years.
- Ideas for how to expand the user base were discussed to reduce the barriers to entry and to enable remote operations. This highlighted the need for (i) longer beamtimes for prototyping and optimizing new platforms into "standard configurations", (ii) shorter beamtimes for high throughput "measurements" to exploit existing configurations, and to host novice users
- The need for real-time data reduction and analysis was highlighed, as was the benefit of stronger and better defined collaborations with experienced user groups.

- This topic will also be discussed with the LCLS Scientific Advisory Committee (SAC) in April.

User meeting (UM) updates

- Deadline for workshop submission is March 28
- UEC members should propose new workshops, plenary speaker options, and help rationalize the submitted ideas.
- The duration and structure of the UM was discussed. There was strong support for a continuation of the "tutorial" sessions – previously held on the first day (Sunday). Consolidation into Monday-Friday was discussed, as was the need to avoid splitting key topics with multiple days between, and avoiding parallel sessions from the same community
- Next steps:
    - Finalizing workshops (first week in April)
    - Determine meeting duration (specifically 6 days or 5)

- **Young Investigator award**: The UEC need to define and communicate clear eligibility criteria for this Award, including date of PhD defense and employment status.