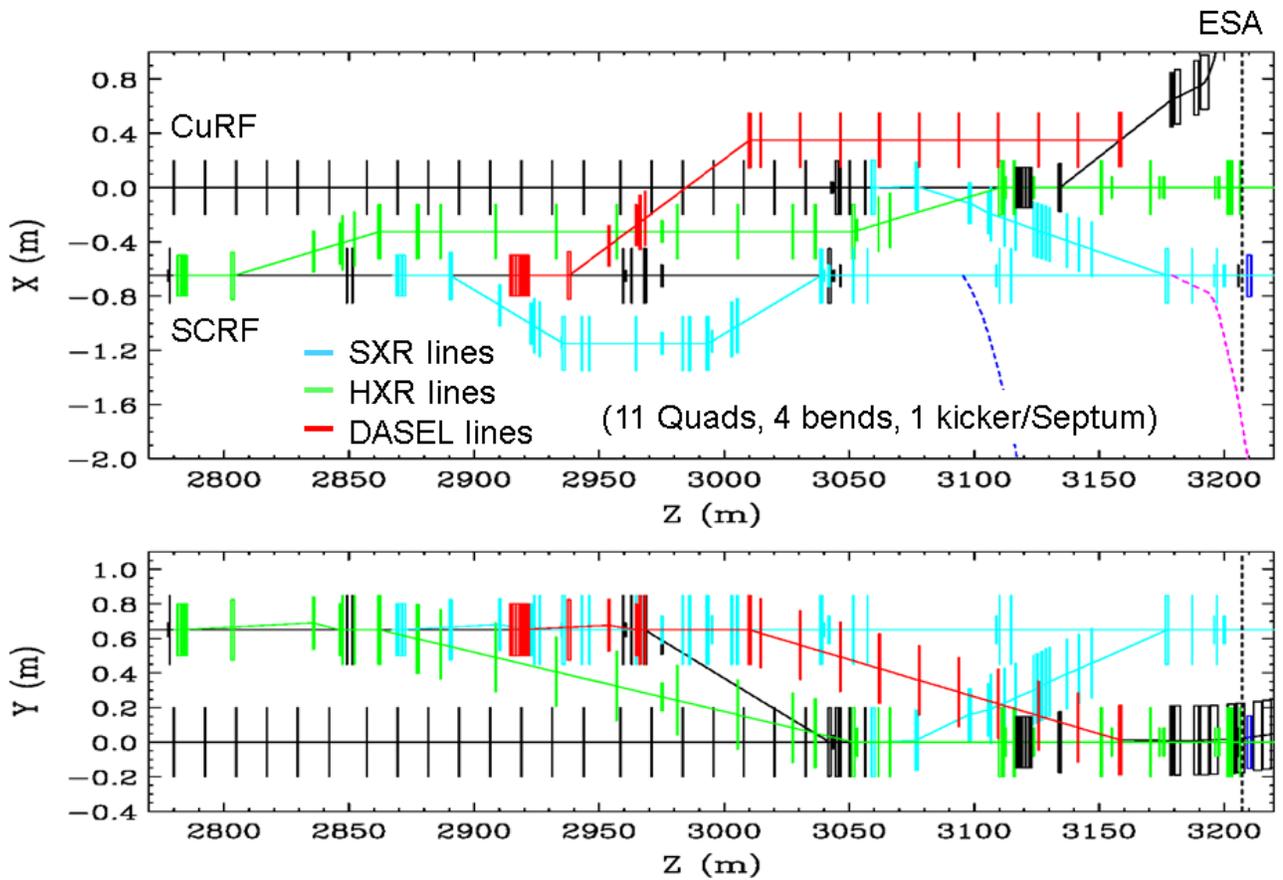


## **Sector 30 Transfer Line (S30XL) and Linac to End Station A (LESA)**

The LCLSII superconducting linac accelerates 250kW of electrons to 4 GeV in bunches spaced 1.08usec (929kHz) apart and extracts them to either of two undulators or passes them to a beam dump. The LCLSII RF gun operates at 186MHz. Each of the 200 bunches in between those destined for the undulators will carry electrons from the gun HV “dark current” or can be seeded with a very low charge by an independent source laser operating at low power at the gun frequency.

The Sector 30 Transfer Line AIP (S30XL), currently under construction, will provide a new, long-pulse kicker to divert ~60% of the dark current from the gun to a dump ~90m downstream in the linac tunnel for beam studies, test beam, and precision QED measurements. S30XL will extract these bunches after they pass the second of the two LCLSII kickers and before the beam is bent down to the 250kW dump.

Linac to End Station A (LESA) is a proposal to add an additional ~160m of beamline, connecting the S30XL beamline to the existing A-Line to deliver a CW electron beam to End Station A — a capability unique within the HEP complex. The addition of a seed laser, used in conjunction with the existing spoiler-collimator system in the A-Line, offer substantial flexibility in beam conditions. The time structure and energy of LESA's electron beam will enable a multi-pronged science program, including (1) electron-scattering measurements supporting the accelerator-based neutrino program, (2) high-impact searches for low-mass dark matter (Missing momentum experiments such as LDMX were highlighted in the 2018 Dark Matter BRN report), and (3) a broad test beam program that leverages the time structure and short pulses delivered by LCLS-II.



### Recent space activity

### Space contributors



[Natalia Toro](#)  
[Laser References](#) updated Jun 28, 2024 [view change](#)  
[Reviews](#) updated Mar 28, 2024 [view change](#)



[Thomas Markiewicz](#)  
[Reviews](#) updated Mar 12, 2024 [view change](#)  
[S30XL/LESA Public Documents](#) updated Mar 12, 2024 [view change](#)  
[Documents in Preparation](#) updated Sep 21, 2023 [view change](#)

- [Natalia Toro](#) (29 days ago)
- [Thomas Markiewicz](#) (136 days ago)