

# AuxTel Calibration Illumination System



U.S. DEPARTMENT OF  
**ENERGY**

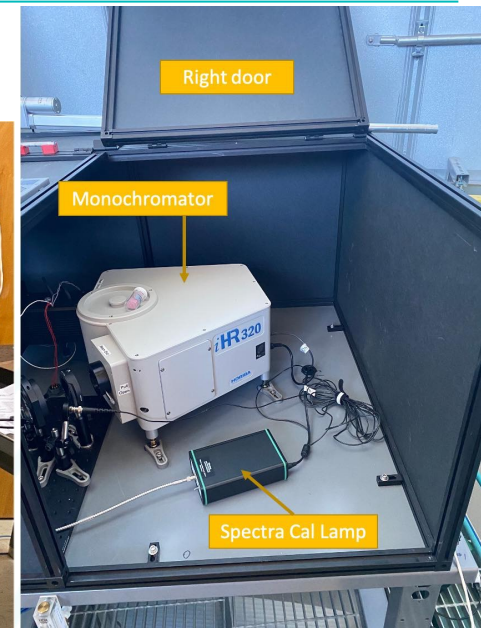
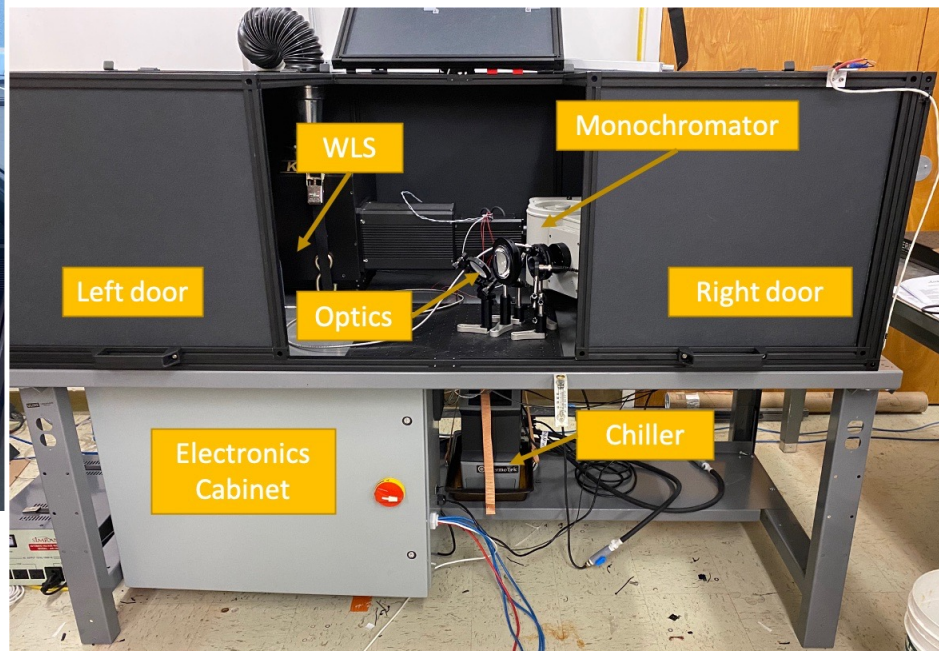
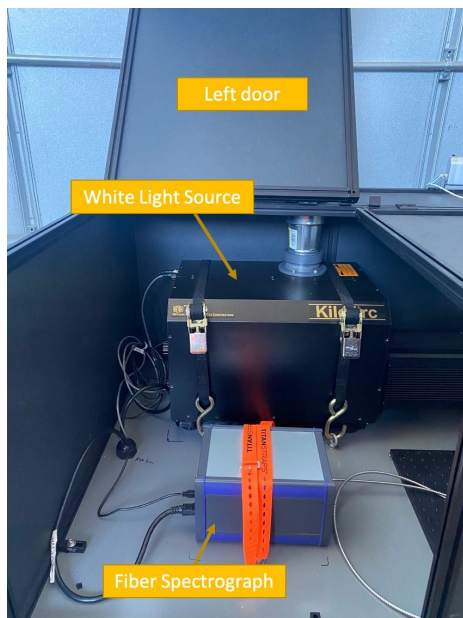
**SLAC**

CHARLES AND LISA SIMONYI FUND  
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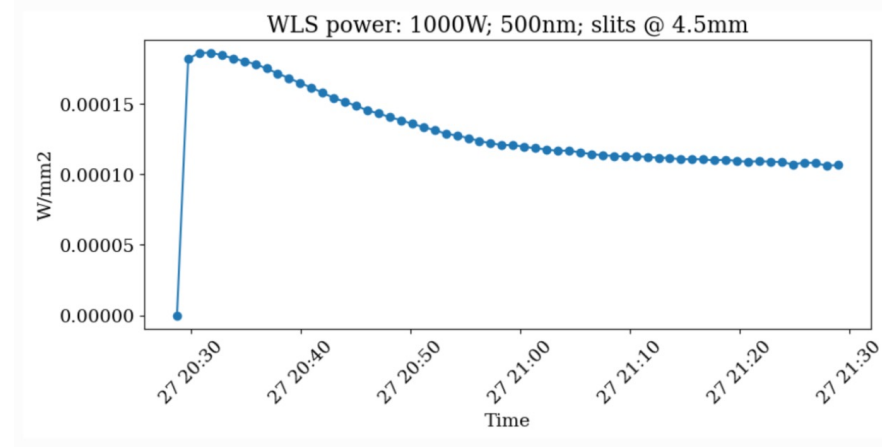
- In December, 2022, we installed a calibration illumination system that projects light onto a calibration screen on the AuxTel dome
- Tunable light source, ranging in wavelength from 300-1200 nm
- Complete system sits on a table on the dome floor
- Meant to calibrate LATISS and test the dm-calibration-products pipeline
- Main components include:
  - Bright white light lamp
  - Monochromator
  - Fiber Spectrograph
  - Photodiode/Electrometer
- Thanks to Craig Lage for getting this into a useful state.
- See the Handbook: <https://tstn-032.lsst.io/v/SITCOM-578/index.html>

# Calibration Illumination System



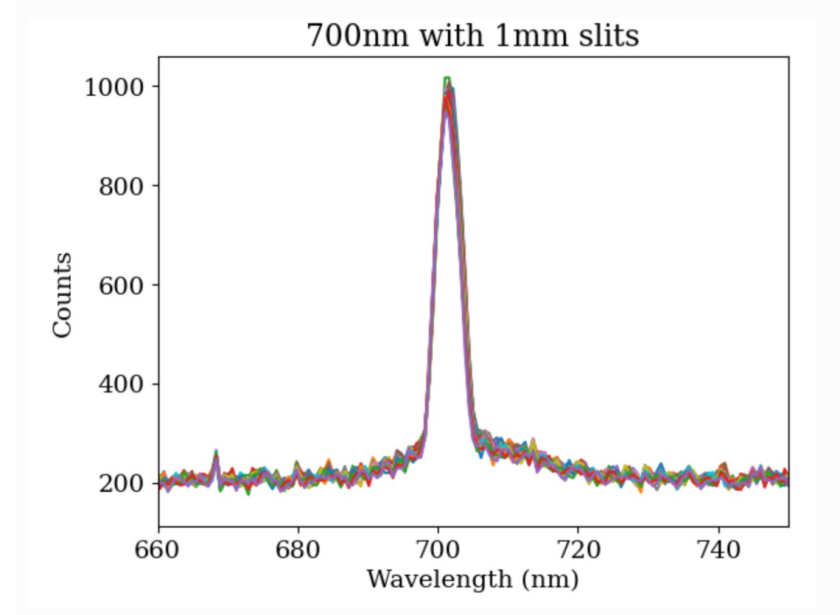
# White Light Source

- KiloArc Lamp built by Optical Building Blocks.
  - Mercury-Xenon bulb
- Power: 800 - 1200 W
- To remove heat, beam travels through a cell of water which is chilled
  - Fuse to avoid heat run-aways
  - Heaters on the water cell to avoid freezing during winter
- From the water cell, beam travels directly into the monochromator
- Brightness changes over time, tracked by photodiode



# Monochromator

- Modes: Red & Blue gratings; Mirror (white light)
- Output tunable to 300 – 1200 nm in 1 nm steps
- Entrance and Exit slits adjustable from 0 – 7mm in width
  - Line width ~10mm with 1mm slits
- Optimization required for slit widths vs. exposure time at each wavelength
- Fiber spectrograph tracks spectral output
  - Calibrated light source available



# Issues

- Distribution of light on screen far from flat
- Brightness of illumination less than expected
- Monochromator runs via LabView on a Windows machine
  - Connectivity is not reliable
  - Was running on Windows 7 device, which is vulnerable and has been taken offline
  - Working on a solution

