Dark Energy & Cosmology

Studying the fundamental constituents of the Universe

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- ✦ Large-Scale Structure (Galaxy Clustering) Weak Lensing (Cosmic Shear)
  - ➡ high-precision cross-correlation calibration of photo-z
  - ➡ photometric redshift training
- ✦ Strong Lensing
  - ➡ Kinematic host mass. Map out the potential space
- ✦ Clusters
  - ➡ Lensing for mass calibration $z<1.2$. Modified gravity tests.
- ✦ Type Ia Supernova Distances
  - ➡ photometric training, host galaxy properties, gold sample

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Spectroscopic Desires

- ✦ Weak Lensing and Large-Scale Structure
  - ➡ A) 100,000 bright (i<23) over >100 sq. deg.; R~4000, 0.4-1.0um. 1000/sd
  - ➡ B) 100,000 faint (22 < i < 25) 1000 sq deg, R~4000, 0.4-2.0um. 100/sd
    - ❖ Supplemental i~25 AB failures: JWST NIRSPEC or WFIRST IFU
    - ❖ OH suppression could potentially yield significant benefits
- ✦ Cluster cosmology
  - ➡ 100-500 objects per 5' diam for several clusters; R~4000, 0.4-1.5um,
- ✦ Strong lensing cosmology
  - ➡ AO IFU ~1000 systems using 20/30m class telescopes; R~2000, 1-2 um
- ✦ SNIa Cosmology
  - ➡ 10,000 SN spectra 0.4-1.0um R~1000 Time-sensitive (days). 5/sd (2020)
  - ➡ 200,000 SN host galaxy spectra 0.4-1.0um R~4000 Static. 500/sd (2025)