A FOBOS program to enable LSST and WFIRST cosmology

Choose 20 FOBOS “Deep” fields overlapping the LSST/WFIRST footprint, preferably in those surveys’ chosen deep fields, spanning a range in RA.

The survey could be i > 24 and drawn semi-randomly from the LSST/WFIRST color space, such that the full color space is sampled as with C3R2. Each deep region would have ~900 sources initially selected for follow-up spectroscopy. Dedicated fibers for sky? So ~18k sources over uncorrelated parts of the sky. It could also just be a survey matched to the LSST/WFIRST color space which will be dominated by faint sources anyway.

The goal would be to achieve high (>95%? >99%?) redshift success on this sample over a ~3 year survey. The program would use ~40 dark nights / year in tandem with other science goals including the galaxy program. Each field could receive a total of ~6 nights of total integration, ~50 hours.

Another possibility is to have different depths represented in each field and correspondingly adjust the integration times for each, ranging from ~10h to ~150h. This tiering could also be used to conduct an interesting galaxy science program in tandem. Note that sampling the full color space implies sampling the full galaxy evolution space.

Many of the sources would yield a redshift much more quickly than this, and the choice could be made to stop integrating on them and revise that deep field setup to include new sources, or just to go deeper to improve the galaxy science. As each field would be re-visited many times, other galaxy programs could happen in tandem with the cosmology survey.

I also spoke with Jim Bartlett at JPL and he believes an instrument like FOBOS could be interesting for cluster cosmology as well, specifically with detailed mass characterization that can be compared with weak lensing results.