

Reference Targeting Strategy

Quick Requirements Overview

- BigBOSS-North targeting needs to cover $\sim 12\text{k sq. deg}$ of the North Galactic Cap
- LRGs: $0.6 < z < 1.0$, $n_{\text{bar}} \sim 3.4\text{E-}4 \text{ (h/Mpc)}^{-3}$
- ELGs: $0.7 < z < 1.6$, $n_{\text{bar}} \sim 3.4\text{E-}4 \text{ (h/Mpc)}^{-3}$
- QSOs: $2 < z < 3.5$, 80/sq. deg goal, 60/sq. deg min.
 - o Optional QSOs targeting at $z < 2$, but can't measure LyA

Galaxy Sample Requirements

LRGs (Newman, Blanton, Padmanabhan)

- Baseline for BB-North is $0.6 < z < 1.0$, $n \sim 3.4\text{E-}4 \text{ (h/Mpc)}^{-3}$
- What is the S/N requirement for redshift measurement?
- What density do we want?
 - o For BigBOSS-N, if we assume constant number density and extend BOSS from $0.6 < z < 1$, should have $\sim 300/\text{deg}^2$
 - o BigBOSS-S would need to cover $0 < z < 1$, so $\sim 450/\text{deg}^2$
 - o BOSS gets $\sim 180/\text{deg}^2$ with $i < 20$
- Select with *gri* possible with deep enough *i*-band, *riz* probably ideal for targeting the 4000Ang break to $z < 1$
- Selection with WISE *gr*+2.5micron looks very promising (Newman)

QSOs (Ross, Yèche, Worseck, Ho)

- Schlegel goal: Target all QSOs in the known universe! (really??)
 - o Should be $\sim 100 \text{ sq/deg}$ for $g < 23$, not much gain going fainter (that we know)
- BOSS requirements are $g < 22$ with S/N=1 per 1 Angstrom in the LyA forest
- Contamination mitigation is the main problem
 - o BOSS delivers about $20/\text{deg}^2$ with $\sim 50\%$ efficiency
 - o Can BigBOSS get to $60/\text{deg}^2$? $80/\text{deg}^2$?
 - o Want to look at *gr* time-variable data (PTF or Strip 82 co-add) or inclusion of *u*-band data (CFHT)

ELGs (Newman, Mostek, Kneib)

- Baseline is $0.7 < z < 1.7$, $n = 3.4\text{E-}4 \text{ (h/Mpc)}^{-3}$
- Can select blue galaxies in *gri* with $> 70\%$ efficiency (DEEP2)
- If looking at 1.7, S/N=8 at [OII] total line flux limit of $8\text{E-}17 \text{ ergs/s/cm}^2$
- n_{bar} requirement after *gri* selection produces a minimum of 3500 targets/sq. deg (depends on color cut)
- We need $r \sim 23.5$ (5σ) with equivalent AB mag depths in *g* and *i*.

Current Photometric Surveys

PTF (Peter Nugent)

- what's the depths and error function?

- Peter reported S/N=7 at R=23.5, g=23.5 in 4 hours (point source)
- Nick has been assuming S/N=5 at R=23.3 and g=24 in 3 hours (1.8" extraction)
- How do depths scale with multiple exposures (depth of co-added time-series data required for QSO targeting?)
- Can we look at data in COSMOS field or DEEP fields to confirm proper targeting depths?

PS1 (?)

- 5σ depths of PS1 (full survey – 360s) in *i* and *z* with 1" extraction. m_1 is the point source magnitude that produce $1e^-/\text{sec}$ and μ is the sky brightness.

Band	m_1	μ (mag/sq. arcsec)	5σ mag
<i>i</i>	25.0	22.37	23.4
<i>z</i>	24.63	19.26	22.7

- Contingent on them coming close to projected PSF
- Contingent on them running the full PS1 360s expT
- See PASAG Target document for analytic form of mag. errors
- Data must be made public....could come for free
- Need to follow up to see how well the newest photometry is performing
- **Goal is to be PS1 independent if possible (!!!)**

WISE (Newman)

- Can IR space telescope help us in LRG targeting, g+r+Ch. 1 (2.5 micron) band?
- WISE hits the confusion limit at 63 mJy, which should be Ch.1 < 19.4 mag_AB
- All sky survey!

Possible Photometric Surveys

CFHT u-band survey (JP)

- Pilot program proposal going in for 800k sq deg u-band survey
- Targeting RCS2 fields (existing grz)
- Depths? Extensions?

La Silla i+z band survey (?)

- Put JDEM CCDs on 1m Schmidt telescope (f3)
- 4x4 SNAP CCDs would cover ~2.7 degrees on a side (7.5 sq deg)
- Cover equator to +30 deg
- With Yale's help, would need to start running in the next 2-3 years

Palomar i-band Survey (Shri?)

- Extend PTF by adding i-band filter to Palomar camera
- Current 12k x 8k Mosaic (from CFHT) has marginal red response (might need new chips)

- Must start after PTF, worse site than La-silla, but access to Northern Gal. Cap

ODI i-band Survey (Mostek, Padmanabhan)

- One Degree Imager is starting up at WIYN in 2011
- Yale is leading an i-band survey focused on smaller area with larger depths. We would have to either buy in or help (say in software reductions)
- Can get $i \sim 24$ in 5 minutes, read time is 2s. Would need ~ 12 nights a year to cover 5000 sq. deg in 4 years. (At least to get BigBOSS started!)

Need to down-select on 3rd band survey source for clarity in the proposal