What the WIYN-ODI Survey Can Learn From (and Teach) LSST

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PDF

is **platform**

independent

PDF

is (***supposedly***) **platform**

independent

Large Synoptic Survey Telescope (LSST):

Tony Tyson (Director)

Zeljko Ivezic (System Scientist)

Don Sweeney (Project Manager)

Michael Strauss (Science Collaborations Chair)

~300 scientists have produced a 576 page Science Book

Large Synoptic Survey Telescope (LSST):

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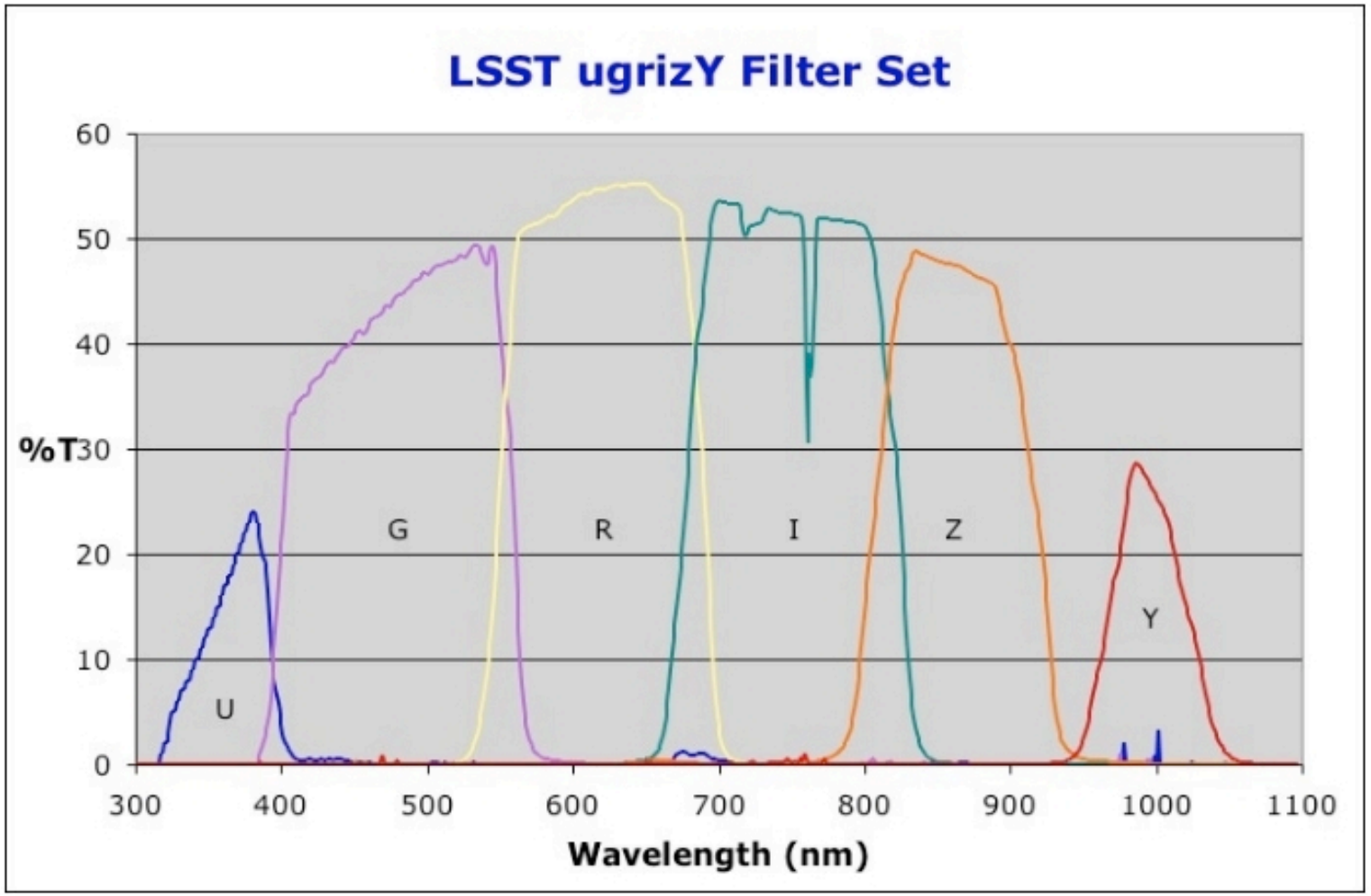
The Revolution is in the Time Domain

- LSST uses 2x15s exposures without dither for CR rejection
- LSST returns in a few hours and then in ~3 days
- LSST still undecided about repeating pointing centers (modulo small dither) or half-stepping them
- also unsure of constant instrument rotator angle vs. NSEW vs. random

LSST chose to include U-band despite initial reluctance due to design tradeoffs



Depth (5σ) reached by LSST over 20,000 square degrees :

filter	u	g	r	i	z	y
Single visit:	23.9	25.0	24.7	24.0	23.3	22.1
%time	6%	9%	21%	22%	23%	19%
10 years:	26.3	27.5	27.7	27.0	26.2	24.9
Uniform depth could be achieved (except y):						
%time	9%	1%	2%	9%	40%	39%
10 years:	26.5	26.5	26.5	26.5	26.5	25.3

For ODI, uniform depth seems undesirable but should include u as part of main survey with equal exposure time at cost of only 0.1 mag depth (or 20% of area)

LSST Deep ("Drilling") Fields

~4-10 deep fields around the sky, observed every night (always one at airmass<2)

Will go ~2 mags deeper than full-sky survey, can optimize cadence differently (e.g. Supernovae)

Single LSST pointing (10 square degrees) beats "cosmic variance" at z>~0.2 (30 Mpc across)

Field Locations: Considerations

Multiwavelength coverage is critical, but no deep* ~10 square degree fields exist (or are even planned!)

Are existing ~10 square degree multiwavelength fields deep enough?
e.g. NDWFS-Cetus/XMM-LSS, HI surveys

Are existing deepest (0.2-2 square degree) multiwavelength fields wide enough?
e.g. ECDF-S, COSMOS/Ultravista, other VISTA-VIDEO

*"deep" means deep enough to reasonably complement the impressive LSST optical depths

Multiwavelength Coverage for Yale ODI Deep Areas (YODA?) & LSST

If equatorial, can be joint effort for proposal writing and data reduction

We need a World-Access Wiki for Astronomy (WAWA) to coordinate the next generation of deep-wide multiwavelength surveys – who wants to host it?

A Language Lesson from LSST

Étendue is Collecting Area x FOV, means "extent"

A Language Lesson from LSST

Étendue is Collecting Area x FOV, means "extent"

Éntendue means "heard"

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