

Euclid vs. WFIRST

	Euclid				WFIRST-AFTA			
Aperture	1.2m				2.4m			
Imaging FoV	$\sim 0.789 \times 0.709 = 0.56 \text{deg}^2$				0.281deg ²			
Area (deg ²)	15,000				~ 2000			
Instrument	Optical	NIR			NIR			
Wavelength range (nm)	VIS (550-900)	Y(920-146)	J(1146-1372)	H(1372-2000)	Y(927-1192)	J(1131-1452)	H(1380-774)	F(1683-2000)
Depth	24.5	24	24	24	26.7	26.9	26.7	26.2
Pixel scale('')	0.1	0.3			0.12	0.12	0.14	0.14
Survey regions	All-sky				Mostly southern hemisphere			
Duration	~ 5 yrs				1.3 yrs			
Ground-based partners	South: DES+LSST North: not yet determined (Pan-Starrs not preferred, CFHT seems difficult)				Mostly LSST			
Collaboration with the Subaru community	HSC: Proposed to Subaru community to carry out "gri" imaging with HSC for Northern hemisphere (give ~ 40 scientists to Euclid data)				The Subaru community showed strong interest in participation, especially after WISH (Yamada san is leading the coordination)			

Note:

Euclid and WFIRST both have spectroscopy capability for BAO (R ~ 150 for Euclid, R $\sim 550-800$ for WFIRST)

Euclid has deep survey regions (40 deg², Y,J,H ~ 26 mag)

WFIRST has IFU capability (3.00 \times 3.15arcsec, 600-2000nm, R ~ 100)

Ultra-Wide, shallow HSC survey for Euclid

- FYI the DES depth is ~ 1000 sec. for each of griz
- If the HSC data (g:125sec, r:125sec, i:250sec) is deep enough for Euclid (thanks to 8.2m aperture and much better seeing), how many Subaru nights are needed to cover ~ 5000 sq. degrees?

$$\frac{5000 \text{ sq. degs.}}{\frac{9 \text{ hr/night} \times 60 \text{ min/hr} \times 60 \text{ sec/min}}{2 \times 250 \text{ sec} + 12 \times 30 \text{ sec}} \times [\pi \times (1.5 \text{ deg./2})^2]} \simeq \boxed{75 \text{ nights}} \text{ w/o weather fac.}$$

- This number ~ 75 nights is much smaller than what we were requested a few years ago (~ 200 nights)
- What are benefits?
 - ~ 40 Japanese scientists can join the Euclid consortium
 - Subaru community should have the full access, at least, to HSC data
 - Cosmology (clusters, WL, large-scale structure, ...)
 - Galactic Archaeology (MW structure up to the halo edge)
 - Time domain astronomy (e.g., a follow up of GW candidates, RR-Lyrae star search in MW halo region)

Synergy of Ultrawide HSC survey with eROSITA

SRG/eROSITA and HSC surveys

2017 Sep launch scheduled

