

S19A-Q1060 report

Subaru Near-Field Cosmology Survey

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Subaru Near-Field Cosmology Survey (SNFC; S19A-QI060)

Cover 7 nearby disk galaxies with HSC 2 or 4 pointings each with g,i-bands

S19A-S21B 13.1 nights HSC Queue

Elucidate the dependence of stellar halos and thick disk properties in late-type galaxies based on the homogeneous observations/reductions/analyses

For individual galaxies:

- Verify stellar halo and thick disk existence and reveal their stellar populations
- Search new satellites, (sub-)structures, GCs, outlying young stellar systems
- Radial metallicity distributions of old population by RGB colors

Using all target galaxies + existing samples:

- Clarify the dependence of stellar halos and thick disk properties in late-type galaxies on the luminosity/morphology/environment.
 - Compare halo radial profiles (power-law like MW, M31, M81?)
 - Thick disks of edge-on targets (N247, N253, N4244, N4236)
- Address the missing satellite problem with LFs/MDFs of satellites
- halo-to-halo scatter of the satellite abundance?

SNFC: target selection

Selection:

- Nearby galaxies $D < 5$ Mpc
- Not “dwarf” $M_B < -18.0$
- Visible from MK more than 3hours/night
- Galactic latitude $|b| > 30$ degree
- Variety of Morphological type, Mass, etc.

Target magnitude:

- 1.5mag below TRGB_i, $(g-i) < 2.0$

Target area

- $> \frac{1}{2} R_{\text{vir}}$

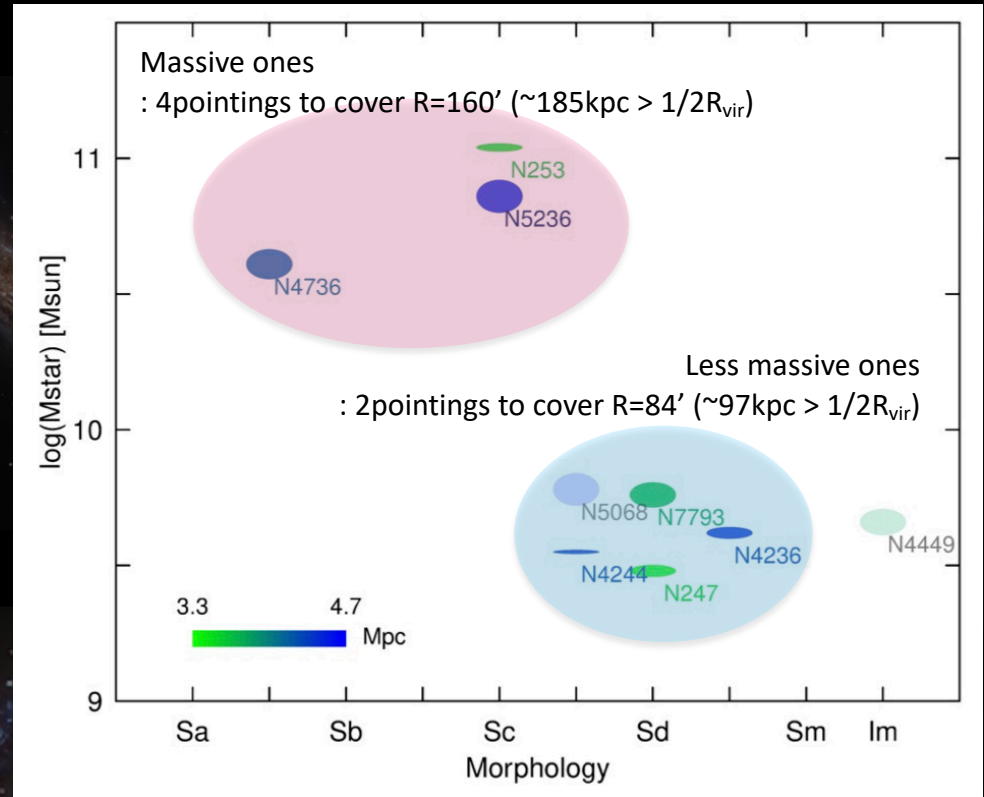


Table 1: The target galaxies

Name	# ^a	term ^b	D (Mpc) ^c	group ^d	M_B	class ^e	b/a	$M_*(M_\odot)$ ^f	image	comments
NGC0247	2	B	$3.4 \pm 0.06^{(1)}$	ScI	-18.5	Sd	0.32	3×10^9	HSC ^g	
NGC0253	5	B	$3.5 \pm 0.1^{(2)}$	ScI	-21.3	Sc	0.22	1×10^{11}	CFHT	two satellites ^h
NGC7793	2	B	$3.7 \pm 0.1^{(2)}$	ScI	-18.5	Sd	0.68	5.8×10^9	Gemini	
NGC4736	5	A	$4.2 \pm 0.3^{(2)}$	M94	-19.9	Sab	0.81	4.1×10^{10}	n/a	
NGC4244	2	A	$4.4 \pm 0.2^{(2)}$	M94	-18.2	Scd	0.11	3.6×10^9	HSC ^g	no stellar halo?
NGC4236	5	A	$4.5 \pm 0.3^{(4)}$	M81	-18.6	Sdm	0.32	4.2×10^9	n/a	extended UV disk
NGC5236	5	A	$4.5 \pm 0.3^{(5)}$	M83	-20.6	Sc	0.89	7.2×10^{10}	HSC ^g	HI, satellite ^h

SNFC: Final Status

Overall, 59% completion of the original plan

S19A (2n)=50%, S19B (3n)=35%, S20A (3n)=36%, S20B (2n)=47%, S21A (2n)=22%, S21B (2.1n)=66%

target	Fields	visibility	filter	exp/F [s]	Field1	Field2	Field3	Field4
NGC0247	2	mid7-end12	i	2500	100 %	100 %		
			g	5500	100 %	100 %		
NGC0253	4	mid7-end12	i	2750	100 %	100 %	100 %	80 %
			g	7650	100 %	100 %	78 %	0 %
NGC7793	2	mid7-end11	i	3825	0 %	0 %		
			g	8400	0 %	0 %		
NGC4736	4	early12-end7	i	6250	100 %	100 %	100 %	100 %
			g	16800	100 %	0 %	0 %	0 %
NGC4244	2	end11-end7	i	7200	100 %	100 %		
			g	15600	100 %	100 %		
NGC4236	2	early12-end6	i	7500	100 %	100 %		
			g	8225	70 %	0 %		
NGC5236	4	early1-end6	i	7700	0 %	0 %	0 %	0 %
			g	21000	0 %	0 %	0 %	0 %

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If you are interested in SNFC data and results, please contact the following address.
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SNFC: follow-up and synergy observations

[Spectroscopy]

Subaru/PFS, 4MOST :

dynamics and metallicity gradient of old population (by GCs), and young populations (by super-giants) throughout galaxies

[more resolved photometry]

Euclid (JEC consortium) :

Utilise the VIS image to reduce the contaminations, NIR images for TP-AGBs, carbon stars, and GCs of SNFC galaxies (all galaxies are located within the Euclid footprint)

Roman (GO program), Subaru/ULTIMATE-WFI :

resolving the inner-side and interesting area of galaxies

