RESOLVED STELLAR STREAMS AROUND NGC 4631 FROM A SUBARU/HYPER SUPRIME-CAM SURVEY

arXiv:1704.03146

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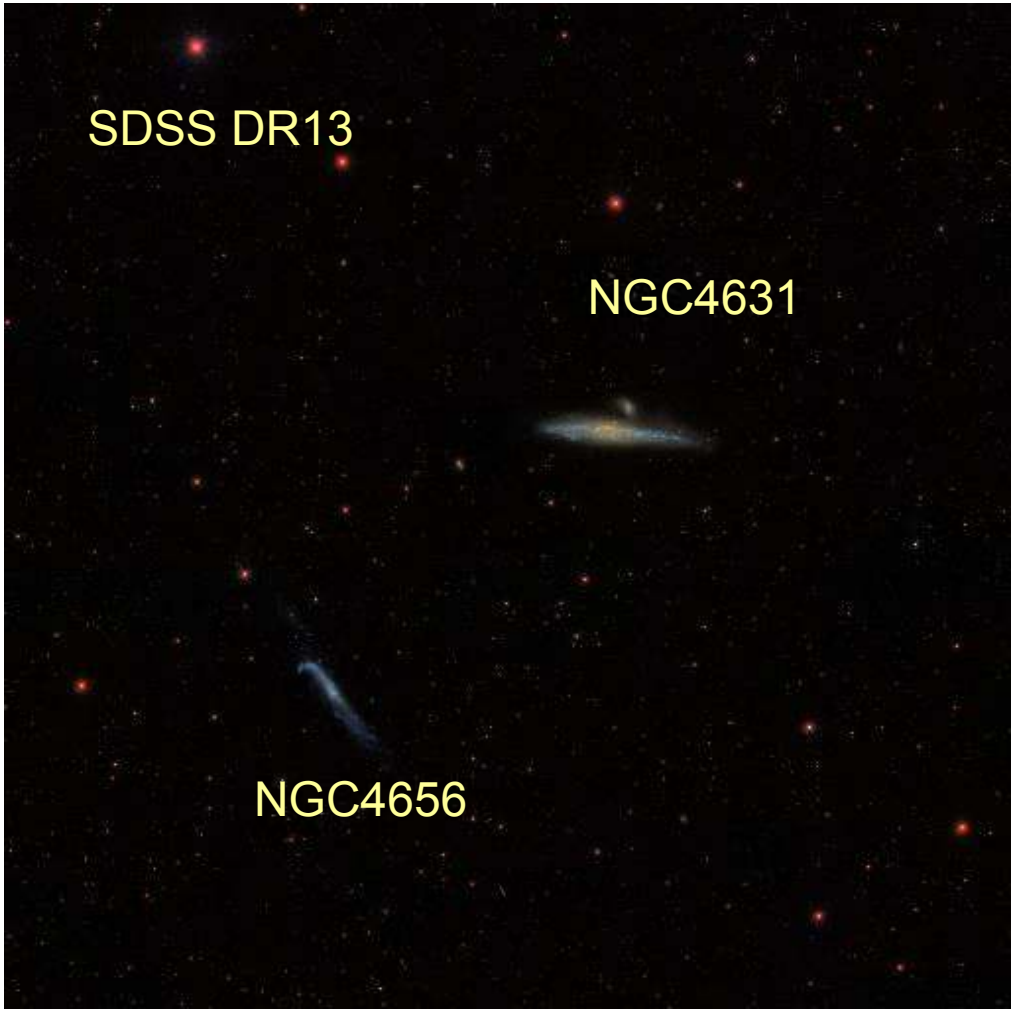


Subaru/Hyper Suprime-Cam (HSC):
104 CCD 2048 × 4096, 0.17"/px
F.O.V. 1.5 deg
(190 kpc at the distance of N4631/56)

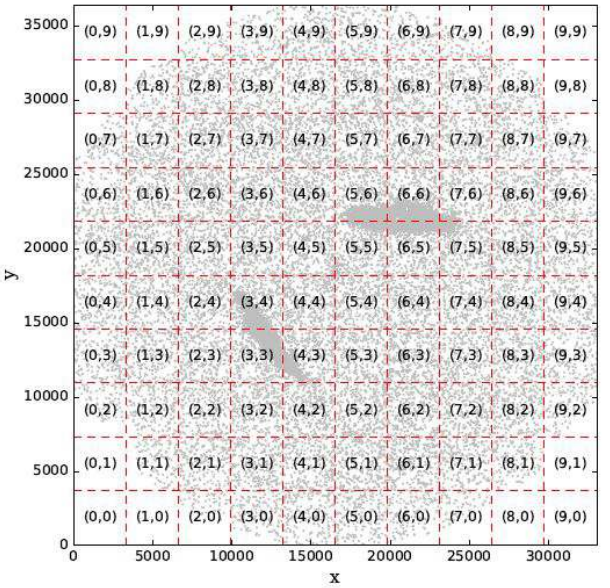
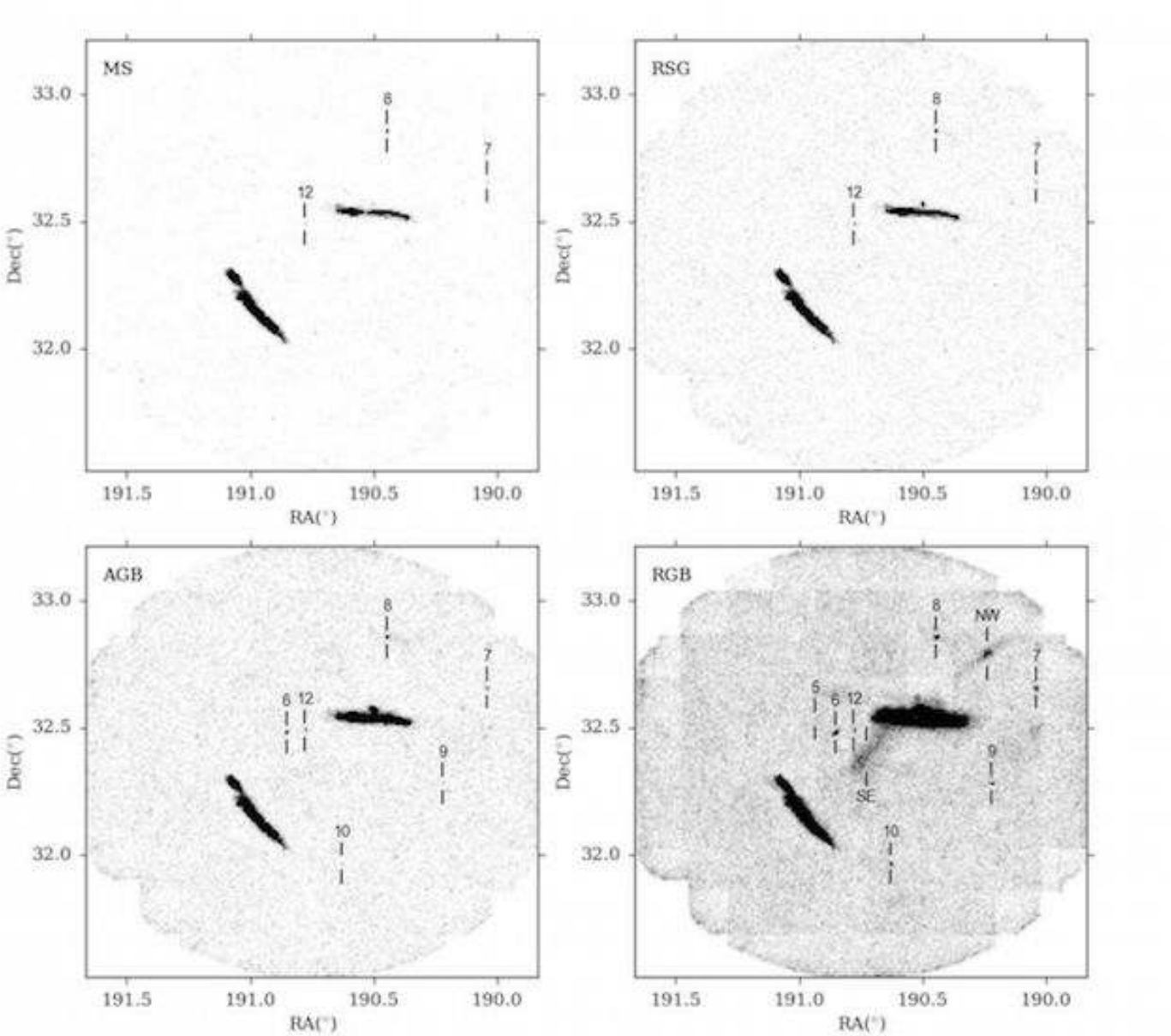


Figure 1. The HSC FoV map of subfields divided by 10×10 red-dashed grids for detection and psf-fitting photometry. Grey points indicate objects from our final photometric catalog selected under the restrictions of PyRAF/DAOPHOT parameters ($merr < 0.5$,


MS
RSG
AGB
RGB
Dec(°)
RA(°)
33.0
32.5
32.0
191.5
191.0
190.5
190.0
6
7
8
9
10
12
NW
SE

Два прилиных хвоста и 8 новых карликовых галактик (всего -11)

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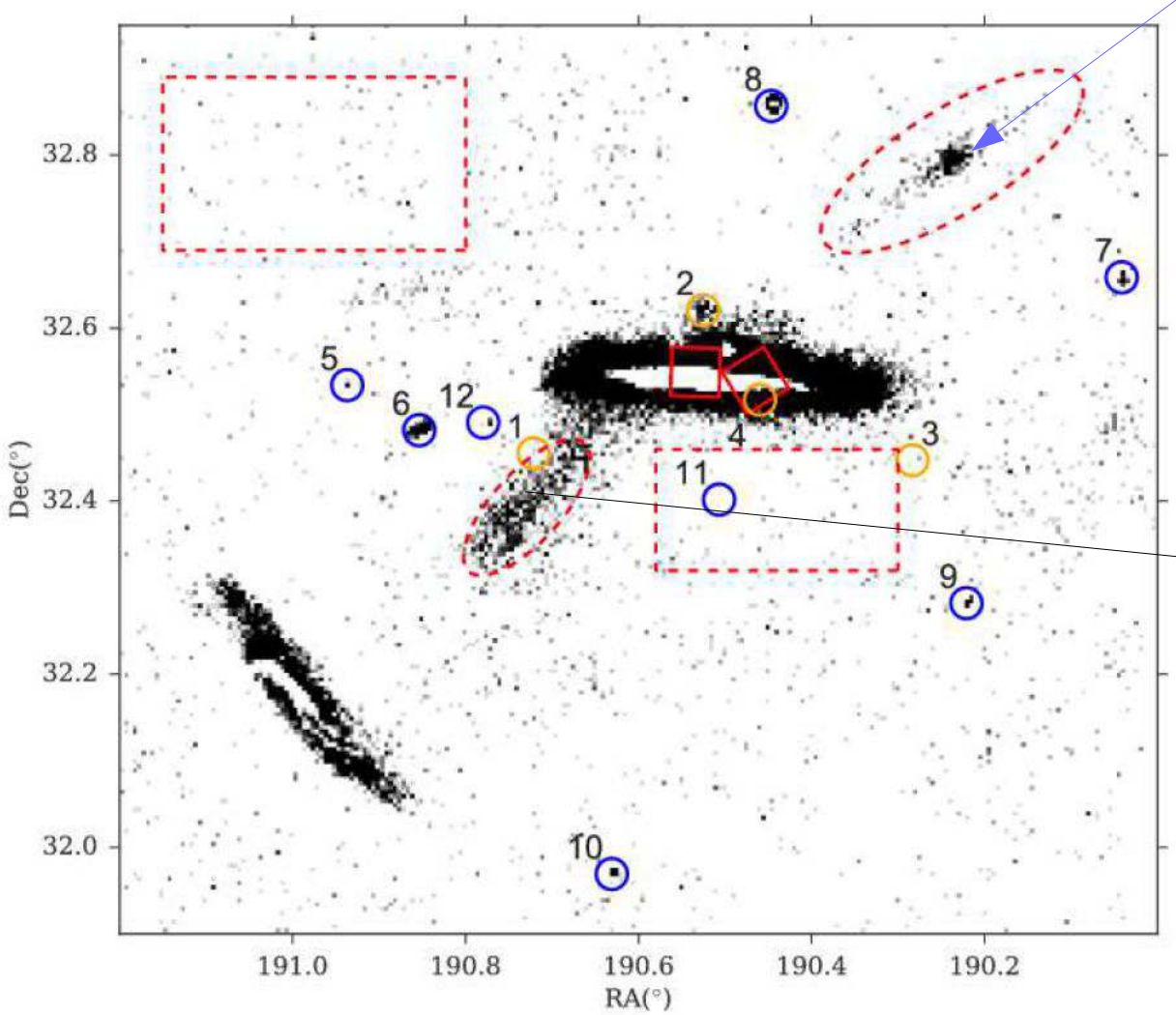
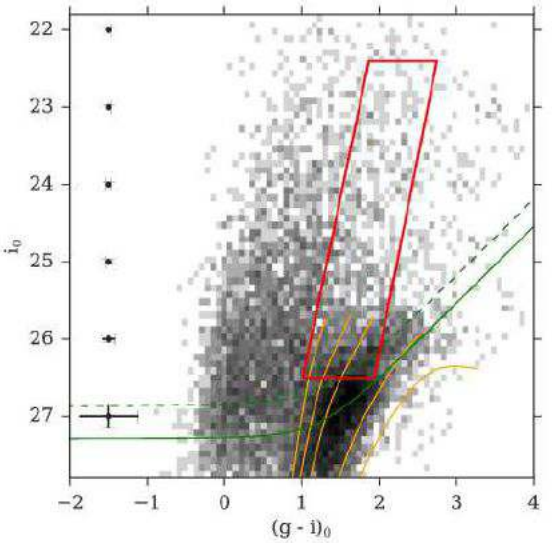
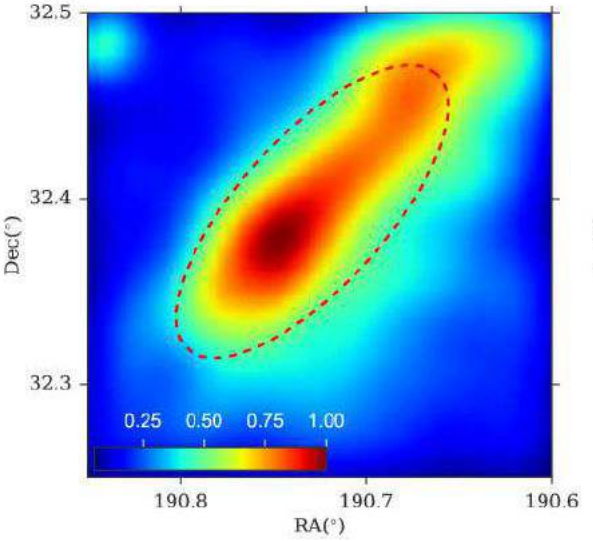
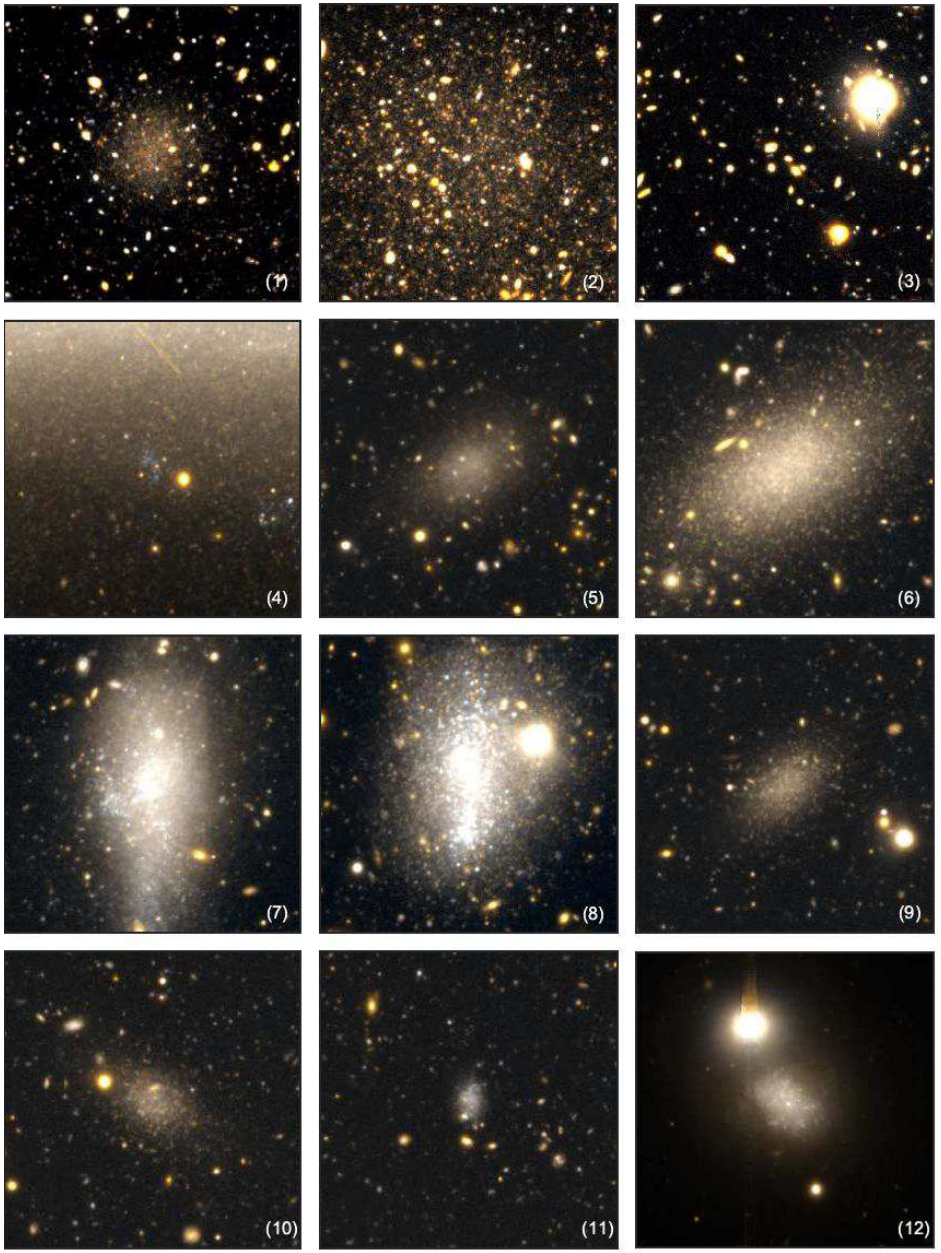
Ядро спутника ?







from a tidal interaction between NGC 4631 and a single dwarf satellite. The expected progenitor has a positively skewed metallicity distribution function with $[M/H]_{EAP} = -0.92$ with the 90% credible intervals of $[-1.46, -0.51]$. The stellar mass of the progenitor is estimated as $3.7 \times 10^8 M_\odot$ with the 90% credible intervals of $[5.8 \times 10^6, 8.6 \times 10^9]$ $M_\odot$ based on the mass-metallicity relation for Local group dwarf galaxies. This is in good agreement with an initial stellar mass of the progenitor presumed in the previous N-body simulation.



Расстояния до приливных структур по точке перегиба ветви красных гигантов
Stream SE (7.10 Mpc, 90% - [6.22, 7.29] Mpc)
Stream NW (7.91 Mpc, 90% - [6.44, 7.97] Mpc)
- на переднем и заднем фоне, соответственно

Средняя пов. яркость (V):
31.0 и 32.1 mag/arcsec2
Слабее, чем у более массивных галактик:

> Currently, there is observational evidence that stellar halos may become less common at lower stellar masses than Milky Way mass spiral galaxies (e.g., Tanaka et al. 2011; Streich et al. 2016) although there is a variation in the masses of stellar halos of spiral galaxies with stellar masses similar to that of the Milky Way (Merritt et al. 2016; Harmsen et al. 2016). NGC 4631 is interpreted as a large Magellanic-type galaxy for many years, and it is classified as a relatively late-type spiral galaxy in the Local Volume (de Vaucouleurs & de Vaucouleurs 1963). Therefore, we can infer that NGC 4631 is less massive galaxy than the Milky Way. Notwithstanding, NGC 4631