The SRG/eROSITA All-Sky Survey

View of the Fornax galaxy cluster

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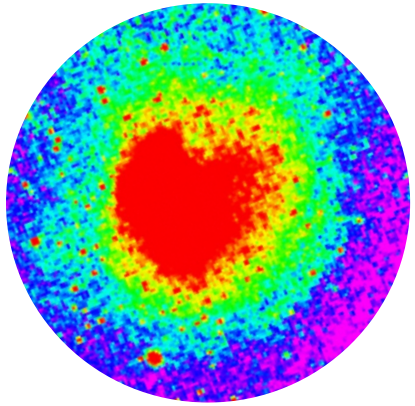

(Chandra)

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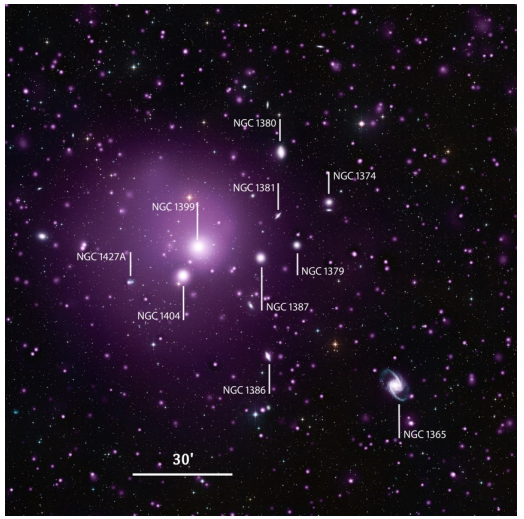
http://dark-energy.net



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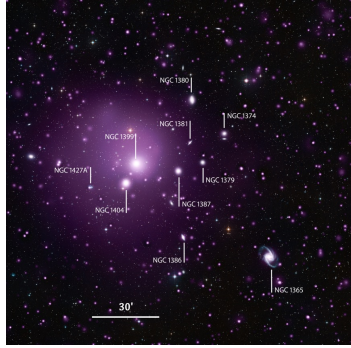
eROSITA

Motivation



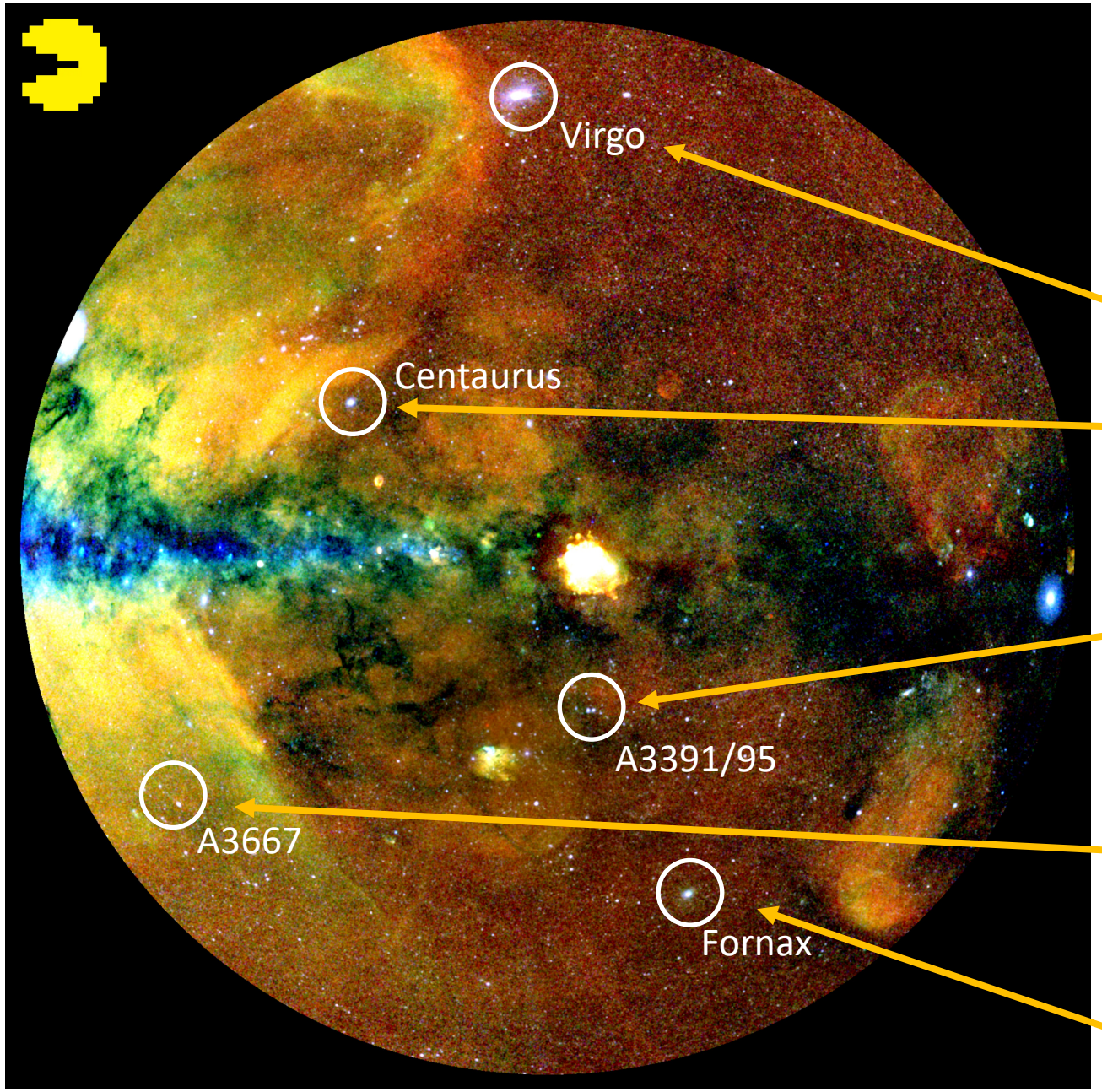
- Fornax cluster (M<10^{14} $M_{\odot}$, central galaxy NGC 1399) is nearby and bright. → Resolve details.
- Dynamically active system; e.g., from infall/merger of NGC 1404 shock front is predicted at outskirts (Sheardown+18).
  → Search for this and other features with eROSITA's unlimited field-of-view.
- Fornax A group is bound to the main cluster (Drinkwater+01) but no gaseous emission bridge has been found in the past.
  → Revisit this, taking advantage of eROSITA's excellent low surface brightness sensitivity in the soft band.

SRG/eROSITA X-ray All-Sky Survey

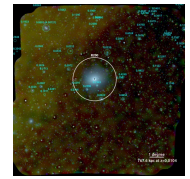
eRASS1 Western Galactic half

0.3-0.63 keV
0.63-1.04 keV
1.04-2.3 keV

~52" Healpix

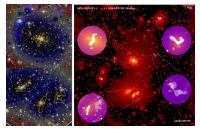


McCall+24

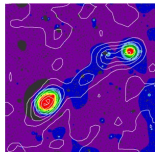


Veronica+24

Reiprich+21,
Brüggen+21
Veronica+22,
Biffi+22,
Veronica+24



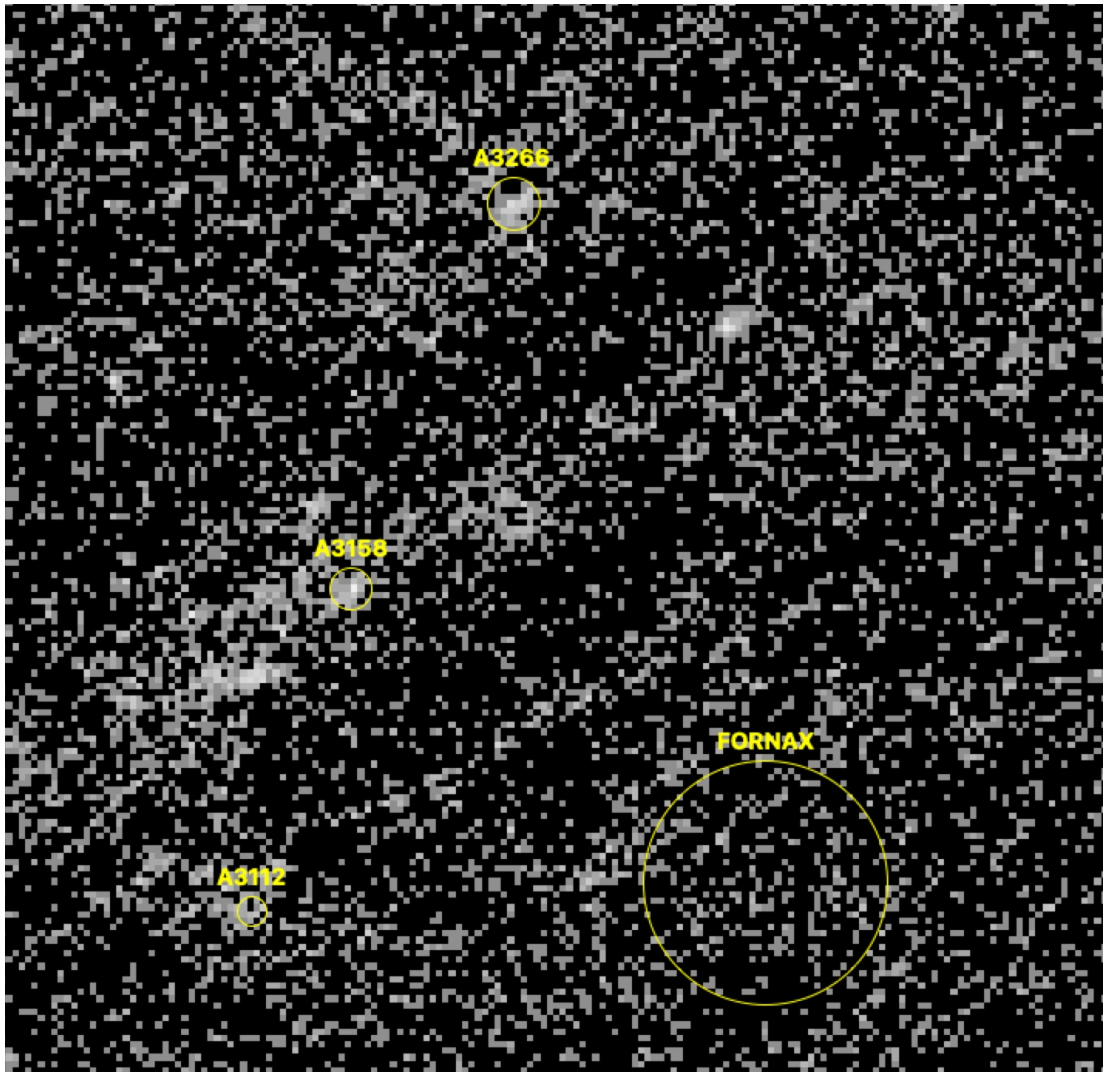
Dietl+24



Reiprich+TBS,
"easy" foreground

Credit: MPE, J. Sanders for the eROSITA consortium

Fornax is very close (z = 0.005) and huge (D_{100} ~ 4.4 deg)!



R_{200}s on 2MASS galaxy distribution

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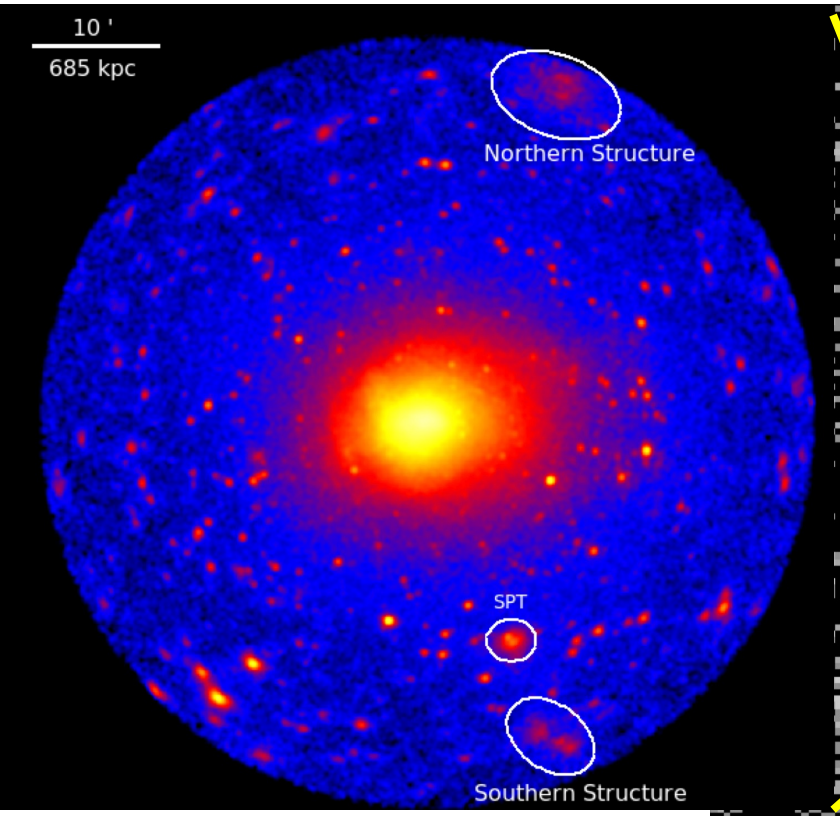
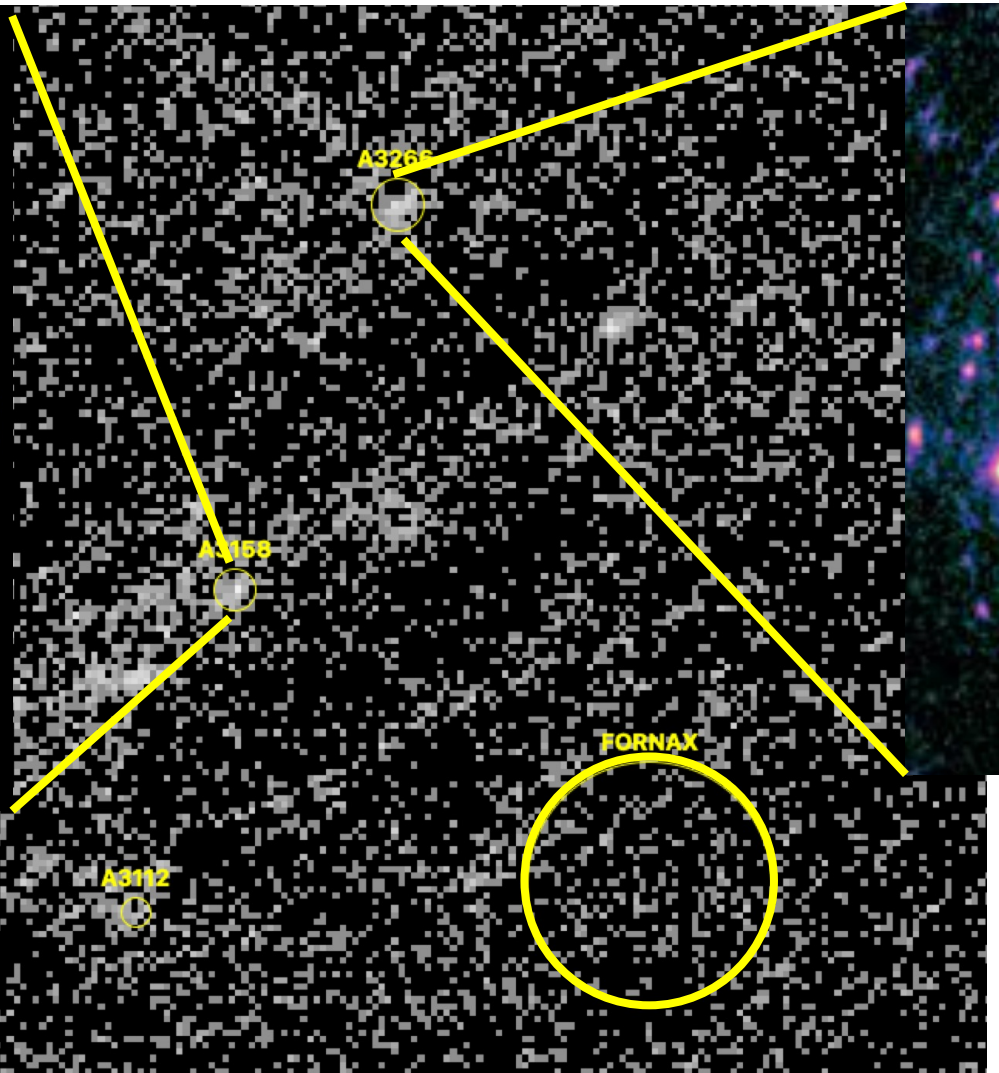
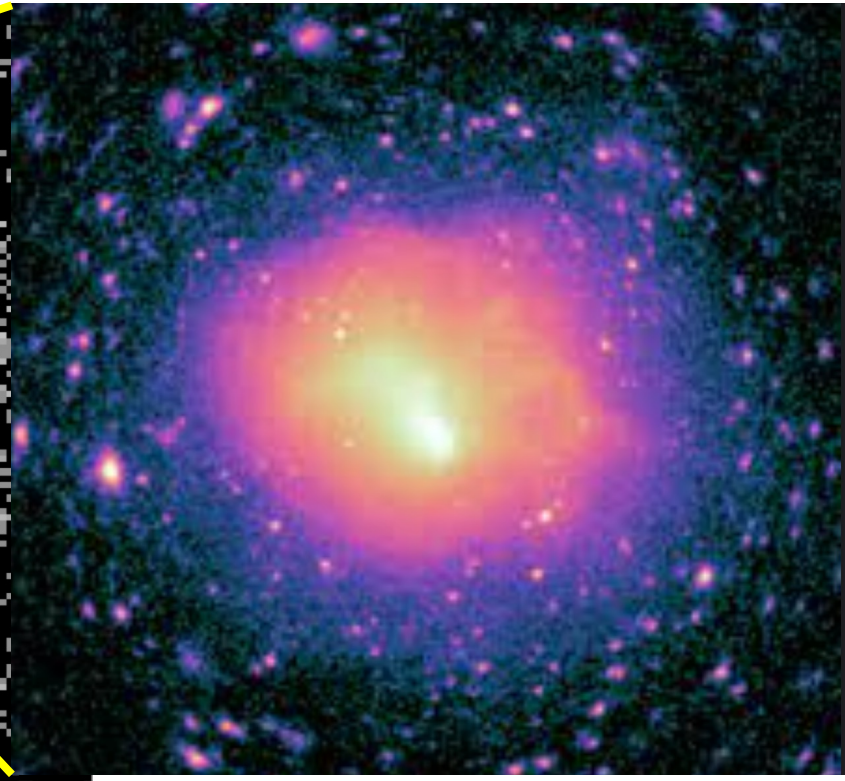


eROSITA, Whelan+22



R_{200}s on 2MASS galaxy distribution



eROSITA, Sanders+22

- Several slides removed here, sorry. ☹ But the paper will soon be submitted, and appear on arXiv. ☺

Summary

- Essentially all the extended structures seen in the wavelet-filtered image are due to real emission variations (as expected).
- Much (but not all) of it is due to structure in the outskirts of the Fornax cluster.
- No obvious large scale bow shock, as predicted from NGC 1404 merger scenario (Sheardown+18), is seen (TBC); instead, emission “fingers” beyond R_{500} that fade out into enhanced emission regions well beyond R_{100} are discovered.
- Galaxy and GC populations roughly trace the outer X-ray emission regions.
- Indications for an apparent bridge of emission connecting the Fornax A group with the Fornax cluster are found.
- Overall structure, including bridge to Fornax A, is very similar to that of the Fornax digital twin in constrained local volume simulation (SLOW, Dolag+23).