Full-sky / X-ray – optical / Future

An eROSITA mock catalog of Active Galactic Nuclei and their large-scale structure

The low redshift survey at calar alto

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Johan Comparat

J. Comparat (MPE/MPG)
Cosmological puzzles

- Dark matter
- Dark energy

Galaxy evolution puzzles

- role of AGN
- formation of clusters
Low Redshift survey at Calar Alto (LoRCA)

Mapping completely the low redshift Universe.
Comparat et al. 2015 MNRAS. arXiv 1510.00147
Photometry and targets

? Use digitized archival astro-plates to enhance/improve target selection?

2MASS

SDSS

K=11.5
z=0.046

K=12.8
z=0.044

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BAO prediction

We generated 1,024 EZmocks light cones to compute the 2-pt function covariance matrix.
Predicted measurement

$LTs = LoRCA + TAIPAN$

![Graph showing redshift $z$ versus $\sigma(\ln D_r / r_d)$ and $W_0$ versus $W_a$.]
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Submitted to MNRAS. ArXiv: 1901.10866
EROSITA in a nutshell

- **eROSITA**: Next Generation all-sky X-ray survey
  - 0.5-2 keV: 30× deeper than ROSAT
  - 2-10 keV: 100× deeper than HEAO-1; 10× XMM Slew
- Image quality comparable to XMM-Newton, better spectral resolution
- detect 100,000 clusters (LSS, cosmology)
- 3Million AGN, including obscured objects
- Built by consortium led by MPE
End to end simulations for cosmology
Exploring the halo occupation of AGN using dark-matter cosmological simulations


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Redshift distribution

eRASS8: 2.6e6 AGN (Merloni 12, Kolozdig 2013,14: ~3e6 AGNs)
eRASS3: 1.3e6
SNR3: 3.6e6
Clustering amplitude

Discrepancy between the clustering of obscured vs. un-obscured AGNs?

Current uncertainties on the bias >10-20% level

eROSITA: Redshift 0-1: sub-percent level sensitivity to the bias.
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! Multi-wavelength synergy with astro-plates !

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