

Fornax Galaxy Cluster

Broad goal: understand the causal link between galaxy properties and their location in the cosmic web



Image credit: Springel et al. (2005); SDSS archive.

Fornax Galaxy Cluster

$M_{\text{vir}} \sim 5 \times 10^{13} M_{\odot}$
 $R_{\text{vir}} \sim 700 \text{ kpc}$
distance $\sim 20 \text{ Mpc}$
 $1'' \sim 100 \text{ pc}$

Fornax Galaxy Cluster . observations

Fornax Deep Survey

ESO/VST optical imaging

30 mag/arcsec²

bands: u,g,r,i

26 deg²

Fornax Galaxy Cluster

observations

MeerKAT Fornax Survey

MeerKAT radio spectro/
polarimetric imaging

~ 1 GHz, HI and radio
continuum, some $\mu\text{Jy}/\text{beam}$

12 deg²

Fornax Galaxy Cluster . observations

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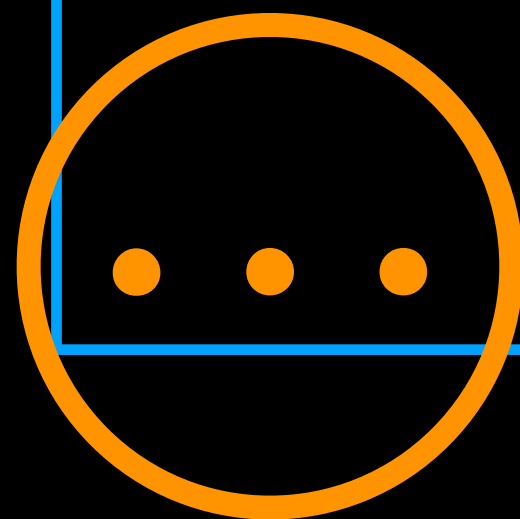
In combination with ancillary multi-wavelength observations, we are characterizing the distribution and evolution of all visible phases of matter in the intracluster medium and in all galaxies in Fornax from the centre to the outskirts of the cluster.

Fornax Galaxy Cluster . timeline

MeerKAT Fornax Survey

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12 deg²

observations in 2020 - 2024
3 articles so far

Fornax Deep Survey

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26 deg²



observations in 2013 - 2017
~20 articles since 2015

Fornax Galaxy Cluster . teams & leadership

MeerKAT Fornax Survey

1000h @ MeerKAT (key project)

Cagliari: *Serra (PI)*, *Govoni*,
Loi, Loni, Kleiner, Maccagni,
Murgia, Molnar, Ramatsoku

1.5+0.2M€ ERC+MIUR

Fornax Deep Survey

250h @ ESO VST

Capodimonte: *Iodice (PI)*,
Spavone

Abruzzo: *Cantiello*

+ *international FDS and MFS teams, each with
~20 researchers spread over ~10 institutes*

Fornax Galaxy Cluster . critical issues

MeerKAT Fornax Survey

Cagliari: *Serra (PI)*, Govoni, Loi, Loni, Kleiner,
Maccagni, Murgia, Molnar, Ramatsoku

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Money & FTE running out in 2022, observations
continuing until 2024, analysis continuing for
several more years. Will need to find resources.

Fornax Galaxy Cluster . critical issues

MeerKAT Fornax Survey

Automated detection of
sources in large radio
images and HI cubes
SoFiA, Serra et al. (2015)

Pipeline for 1 PB dataset
CARACal (Cagliari + SARA0)

Magnetic field simulations

Fornax Deep Survey

Automated detection of low-
surface-brightness sources
in large images

Fornax Galaxy Cluster . future

One of the first examples of wide-area optical imaging down to low surface brightnesses on the way to LSST, Euclid

Fornax Galaxy Cluster . future

A first glimpse of science and challenges of MeerKAT+ -> SKA
within INAF lines of research on clusters, magnetic fields, galaxy ISM
(e.g., Hunt, Poggianti, Brunetti, ...)

