

# **Tracing filaments through the cosmic time**

MiniGrant 2022, RSN1

# The request:

Goal: Characterise the properties of the galaxies that are falling onto clusters, either through filaments or from isotropic infall, to understand the mechanisms acting on them at different cosmic epochs.

Participants: B. Vulcani (OaPd), D. Zakharova (UniPD, PhD student)

Request: 20000 Eur to support the expenses (both hardware and travel) of the PhD student whose thesis is focused on characterizing the properties of galaxies in filaments from a theoretical point of view and of Vulcani (travel), who is also leading a new initiative aimed at studying high redshift clusters.

Duration: 2 years

Awarded: 18500 Eur

# Status after 1 year:

## Papers published:

- Zakharova, Vulcani, De Lucia, Xie, Hirschmann, Fontanot, *The filament determination depends on the tracer: comparing filaments based on dark matter particles and galaxies in the GAEA semi-analytical model*, 2023, MNRAS 525, 4079
- Baxter, Cooper, Balogh, Rudnick, De Lucia, Demarco, Finoguenov, Forrest, Muzzin, Reeves, Sarron, Vulcani, Wilson, Zaritsky, *When the well runs dry: modelling environmental quenching of high-mass satellites in massive clusters at  $z \gtrsim 1$* , 2023, MNRAS, 526, 3716
- Zaritsky, Crossett, Jaffé, Donnerstein, Karunakaran, Khim, Lourenço, Spekkens, Sun, Vulcani, *An enigmatic 380 kpc long linear collimated galactic tail*, 2023, MNRAS, 524, 1432

## Papers submitted/in preparation:

- Edward, Balogh, Bahé, Cooper, Hatch, Marchioni, Muzzin, Noble, Rudnick, Vulcani, Wilson, De Lucia, Demarco, Forrest, Hirschmann, Castignani, Cerulo, Finn, Hewitt, Jablonka, Kodama, Maurogordato, Nantais, Xie, *The stellar mass function of quiescent galaxies in  $2 < z < 2.5$  protoclusters*, MNRAS submitted
- Gully, Hatch, Bahé, Balogh, Bolzonella, Cooper, Muzzin, Pozzetti, Rudnick, Vulcani, Wilson, *Spitzer-selected  $z > 1.3$  protocluster candidates in the LSST Deep-Drilling Fields*, MNRAS submitted
- Zakharova, Vulcani, De Lucia, Xie, Hirschmann, Fontanot, Rudnick, Finn, Jablonka, Castignani, Combes, *H I and H<sub>2</sub> content of galaxy in filaments in the GAEA semi-analytical model*, MNRAS in prep
- Cooper, Rudnick, Vulcani, Balogh, Jablonka Finn, *The dependence of quiescent fraction on environment and stellar mass at  $z \sim 0.5$* , MNRAS in prep.

# Status after 1 year:

- All the analysis proceeds as expected, both participants have attended a few international collaboration meetings where they discussed the progress of the different projects.
- No significant criticalities.