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The most massive galaxy clusters

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Extreme bound objects are important probes of the large-scale Universe. The abundance and certain parameters of the most massive (super-) clusters of galaxies put constraints on the cosmological parameters and the background evolution. In my talk I will present two approaches, one [1] based on the exact solution to Einstein's equations and a complementary one [2], based on the relativistic, Lagrangian perturbation theory. Both allow to derive an observationally-verifiable predictions regarding the biggest, gravitationally bounded structures. Comparison with observations will be summarized and put into perspective.

References

[1] Bolejko K., Ostrowski J. J., The environment-dependence of the growth of the most massive objects in the Universe, Phys. Rev. D 99, 124036 (2019) [arXiv:1805.11047]

[2] Ostrowski J.J., Delgado Gaspar I., On the maximum volume of collapsing structures, JCAP, 4, 59 (2022) [arXiv:2112.05245]

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