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## A linear relation between outer galaxy radius and virial mass for galaxies 7 billion years ago from LEGA-C

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The relation between half-light radius and galaxy stellar mass has in recent years been studied extensively using large photometric surveys. This scaling relation has been found to be different for early types and late types, with different logarithmic slopes and zero points, and to evolve with time. While it provides important clues as to the assembly history of galaxies, the interpretation is limited without direct observations of the surrounding dark matter halo. And while the stellar mass of a galaxy is expected to be related to the total mass of its halo, the exact relationship is unclear due to the effect of local processes affecting star formation. A more direct link to the halo can be found from the observed virial mass derived from the dispersion of the motions of stellar bodies. I will present for 3000 galaxies the relation between the radius encapsulating 80% of a galaxy's light, and the virial mass, obtained from the LEGA-C survey. LEGA-C is the first spectroscopic survey combining sufficient depth and area to allow such a study for large numbers of galaxies looking back 7 billion years into the history of the universe. I will show that unlike for the well known half-light - stellar mass relation, both early types and late types lie on the same linear relationship.

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