

# Galaxy cluster detection on LSST simulated images using convolutional neural networks

*mardi 29 novembre 2022 09:40 (20 minutes)*

The distribution of galaxy clusters, the largest gravitationally bound structures in the Universe, helps us to estimate fundamental constants and constrain different cosmological models. With the expected development and commissioning of astronomical instruments, such as LSST, in the next decade, the depth of imaging data for a significant area of the sky will allow us to select nearly complete samples of galaxy clusters at redshifts up to  $z \sim 1$ . To test the cluster detection technique that works directly with the reduced images, we have applied the convolutional neural network Yolo v3, trained on SDSS color images for redMaPPer clusters, to precomputed color images for LSST DC2 simulation. In order to reach performance similar to that one for SDSS images we used the same filter set and color scheme for DC2 cutouts. Our results demonstrate that Yolo is well transferable and can give reliable results even applied to datasets different from those it was trained on.

**Auteurs principaux:** GRISHIN, Kirill (Universite de Paris); MEI, Simona

**Orateur:** GRISHIN, Kirill (Universite de Paris)

**Classification de Session:** Science talks