MULTI-BAND PHOTOMETRY AND REDSHIFT ESTIMATION FROM GALAXY IMAGES WITH NORMALIZING FLOWS

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Cosmological analysis demands precise 3D mapping of the Universe

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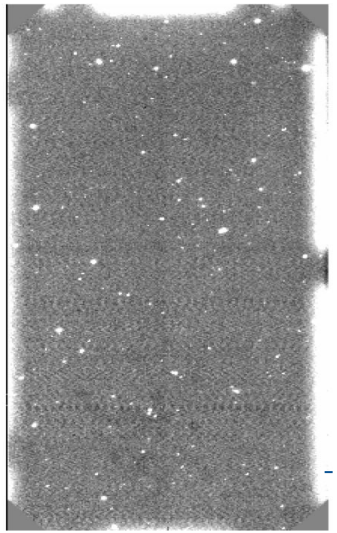
Measuring distance to galaxies (redshift)



Photometry

Several steps:
- Background subtraction
- Flux measurement
- Calibration
- ...

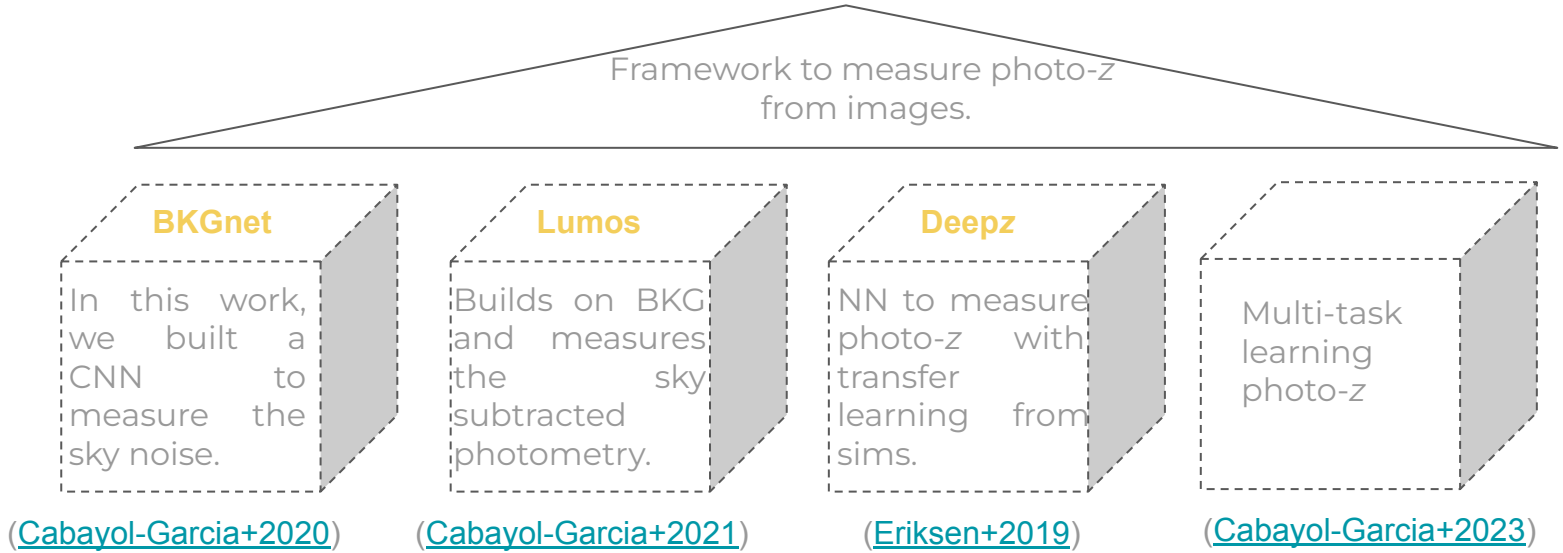
Photo-*z*

+photometry

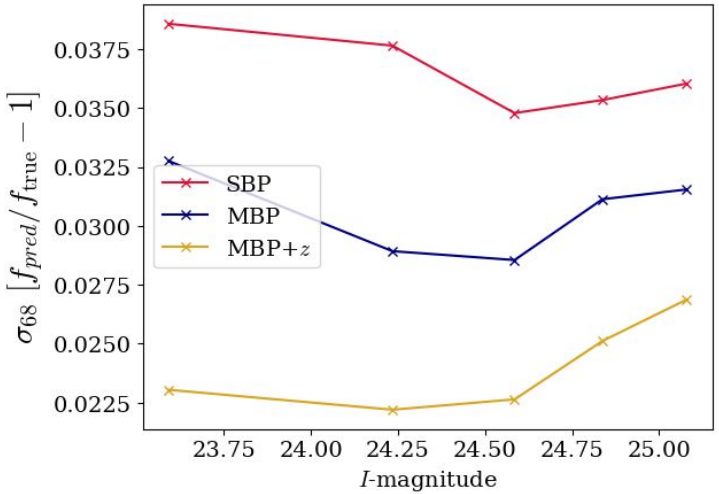
This work!

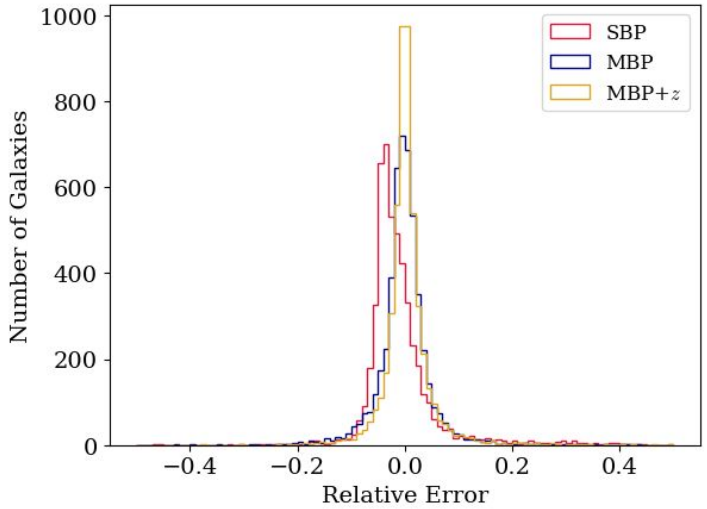
Bypassing the need for sequential measurements!!

Currently there are efforts on measuring photo-*z* directly from images with AI. **We are developing a normalizing flow model to concurrently measure photometry and photometric redshifts directly from the astronomical images.**



By simultaneously **measuring photometry across multiple spectral bands and photometric redshifts**, our model harnesses the full energy distribution of galaxies, which **enables cross-band constraints maximizing the use of information in the data.**





SBP: Single-band photometry. Each band is independent, the network does not learn from other bands to predict the flux of one band

MBP: Multi-band photometry. The network has information from all bands when making a prediction.

MBP+z: Multi-band photometry and redshift. The network has information from all bands when making a prediction. Predicts the photometry and the redshift simultaneously

The network benefits from knowing the full SED when making a prediction. It also benefits from predicting the photo-z simultaneously (MTL)

Check poster 36 tomorrow!