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# Studying Galaxy Mergers Using Domain Adaptation

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The ability to capture important features in imaging data through deep learning is of paramount importance in astronomy. Deep learning allows for the reduction of manual labor necessary in combing through thousands of astronomical images, however, small differences between astronomical datasets make the performance of deep learning models trained on one data set substantially different than on other datasets. The goal of this project is to use a technique called Domain Adaptation to train a deep learning model to learn the star formation rate (SFR) of galaxies in two separate datasets. Domain adaptation is a deep learning technique which involves training a model on a set of labeled source objects (in this case: simulated galaxy images from the Illustris TNG simulation with the values of SFR and stellar mass provided for each galaxy), as well as an unlabeled target dataset (real galaxy images of higher redshift from the CANDELS dataset) . Domain adaptation will allow the model to find features present in both datasets and potentially allow us to learn about high redshift galaxies and periods of enhanced star formation rates.

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