Galaxy Morphology in Large Surveys

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Abstract

The morphology of a galaxy provides information on the orbits of stars within it. As such, important clues to the formation history of galaxies is revealed by their morphologies, and this information is complimentary, but not identical to, their star formation history and chemical composition as revealed by photometry and spectra.

Obtaining reliable morphologies for large samples of galaxies is challenging, but useful. In allows for statistical studies of the galaxy population, finding rare objects, and placing unusual classes of galaxies in context. The Galaxy Zoo project (www.galaxyzoo.org) has provided quantitative visual morphologies for over a million galaxies (including the entire Sloan Digital Sky Surveys, or SDSS Main Galaxy Sample as well as all public HST surveys, UKIDSS and most recently DECaLS). The most recent version of Galaxy Zoo combines machine learning techniques with crowdsourcing to leverage the best of both techniques.

The quantitative morphological information collected by Galaxy Zoo has shown itself to be a powerful database for studying galaxy evolution, and Galaxy Zoo continues to collect classifications - currently serving imaging from DECaLS in its main site, and running a variety of related projects hosted by the Zooniverse (www.zooniverse.org). I will review how to make best use of the morphologies from Galaxy Zoo, and highlight some of the results from the last 10 years of the project.

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