Hubble Space Telescope

Cycle 15 AR Proposal

Are Classical QSO Host Galaxies Bona Fide Elliptical Galaxies?

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Abstract

Recent studies of QSO host galaxies have renewed old claims that most, if not all, classical QSOs reside in seemingly undisturbed elliptical hosts with ancient stellar populations. However, our deep ACS images of a sample of these objects (GO-10421) show dramatic shell structure indicative of past major merger events, and our deep Keck spectroscopy indicates that they were involved in major starburst episodes within the last 2 Gyr. Are these host galaxies truly distinct from bona fide ellipticals? There are now enough archival ACS data that we are able to find a large sample of elliptical galaxies in fields with observations approximately as deep (5 orbits) as those of our QSO host galaxies. Here we propose to carry out a matching study of a control sample of early type galaxies from the archive. We will perform the same analysis on the images and will obtain ground based spectroscopy that will enable us to study their interaction and star formation histories and thus make a meaningful comparison with the QSO host galaxies. We will then determine whether the latter are truly a distinct population. This project can also significantly contribute to our knowledge and understanding of the origin and evolution of early type galaxies.

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