SPECTROPHOTOMETRY OF SHELL GALAXIES

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Low dispersion spectra of two shell galaxies, NGC 3923 and NGC 3051, have been obtained covering the 5300Å to 10000Å spectral range. These long-slit spectra go through the nucleus of each galaxy and also through 12 shells in NGC 3923 and through 3 shells in NGC 3051. The main results are:

1) In NGC 3051 the surface brightness of the 2 inner shells is nearly constant with radius. These plateaus of luminosity have very abrupt outer cutoffs but have no detectable inner limits.

2) In NGC 3923 all the shells have similar contrast relative to the underlying galaxy which implies that the shells roughly follow the same luminosity distribution as the galaxy itself.

3) Both galaxies contain some gas and dust. In NGC 3923 this is confined to the nucleus and a single large dust spot. The interstellar emission in NGC 3051 is much stronger and spread throughout the galaxy.

4) Both galaxies show a reddening towards the nucleus caused by a metallicity abundance gradient.

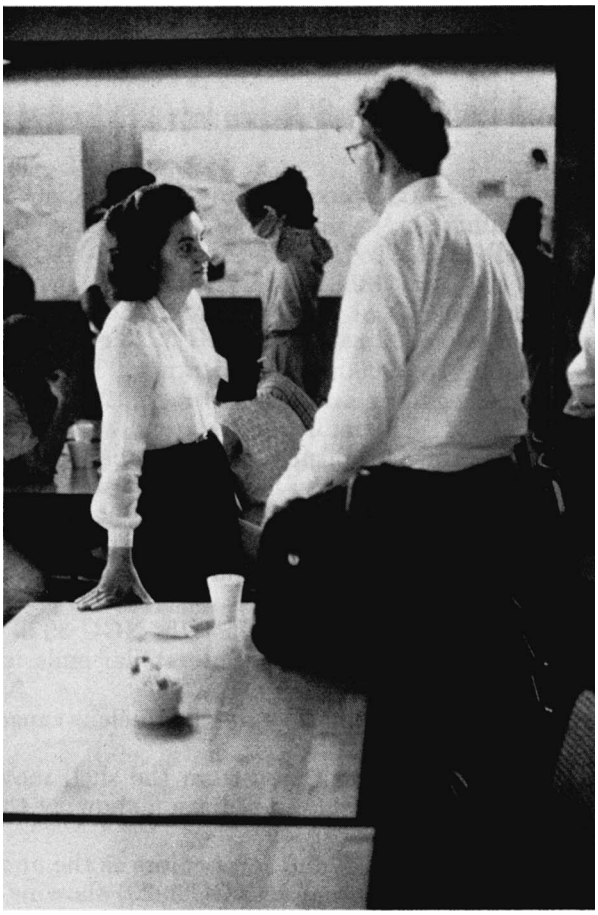
5) There is no significant line emission from the shell material; most of the the shell luminosity comes from continuum radiation showing that the shells have a stellar, rather than a gaseous composition.

6) The shells have the same $V-R$ and $R-I$ colors as the underlying galaxy (to within 0.05 mag in NGC 3051 and 0.1 mag in NGC 3923) showing that they must be composed of an old stellar population very similar to that of the underlying galaxy. If the shells were formed by a recent galaxy merger then the infalling material probably came from an elliptical or S0 galaxy. On the other hand, if the merger was with a spiral galaxy, then it must have taken place more than about 10^9 years ago to provide time for the blue population to evolve.

7) The shells only contribute about 0.5% and 5% of the total flux in NGC 3923 and in NGC 3051, respectively. This is in apparent contradiction to the prediction of the merger shell formation theory since a companion galaxy of at least 10% of the primary mass is required to produce the inner shells seen in both galaxies.

The full report on this research has appeared in *Astroph. J.*, **310**, 597.

T. de Zeeuw (ed.), Structure and Dynamics of Elliptical Galaxies, 463.



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