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# Caught in the act: Cluster 'k+a' galaxies as a link between spirals and S0s.

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## Abstract

We use integral field spectroscopy of 13 disk galaxies in the cluster AC114 at $z \sim 0.31$ in an attempt to disentangle the physical processes responsible for the transformation of spiral galaxies in clusters. Our sample is selected to display a dominant young stellar population, as indicated by strong H$\delta$ absorption lines in their integrated spectra. Most of our galaxies lack the [OII]$\lambda$3727 emission line, and hence ongoing star formation. They therefore possess 'k+a' spectra, indicative of a recent truncation of star formation, possibly preceded by a starburst. Disky 'k+a' galaxies are a promising candidate for the intermediate stage of the transformation from star-forming spiral galaxies to passive S0s.

Our observations allow us to study the spatial distributions and the kinematics of the different stellar populations within the galaxies. We used three different indicators to evaluate the presence of a young population: the equivalent width of H$\delta$, the luminosity-weighted fraction of A stars, and the fraction of the galaxy light attributable to simple stellar populations with ages between 0.5 and 1.5 Gyr. We find a mixture of behaviours, but are able to show that in most of galaxies the last episode of star-formation occurred in an extended disk, similar to preceding generations of stars, though somewhat more centrally concentrated. We thus exclude nuclear starbursts and violent gravitational interactions as causes of the star formation truncation. Gentler mechanisms, such as ram-pressure stripping or weak galaxy-galaxy interactions, appear to be responsible for ending star-formation in these intermediate-redshift cluster disk galaxies.