

## Astrophysics &gt; Cosmology and Extragalactic Astrophysics

# Spectroscopic Confirmation of Three Red-Sequence Selected Galaxy Clusters at $z=0.87$ , 1.16 and 1.21 from the SpARCS Survey

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The Spitzer Adaptation of the Red-sequence Cluster Survey (SpARCS) is a  $z'$ -passband imaging survey of the 50 deg<sup>2</sup> Spitzer SWIRE Legacy fields, designed with the primary aim of creating the first large, homogeneously selected sample of massive clusters at  $z>1$ . SpARCS uses an infrared adaptation of the two-filter cluster red-sequence technique. In this paper we report Keck/LRIS spectroscopic confirmation of two new exceptionally rich galaxy clusters, SpARCS J161315+564930 at  $z=0.871\pm 0.002$ , with 14 high-confidence members and a rest-frame velocity dispersion of  $\sigma_v=1230\pm 320$  km s<sup>-1</sup>, and SpARCS J161641+554513 at  $z=1.161\pm 0.003$ , with seven high-confidence members (including one AGN) and a rest-frame velocity dispersion of  $\sigma_v=950\pm 330$  km s<sup>-1</sup>. We also report confirmation of a third new system, SpARCS J161037+552417 at  $z=1.210\pm 0.002$ , with seven high-confidence members and a rest-frame velocity dispersion of  $\sigma_v=410\pm 300$  km s<sup>-1</sup>. These three new spectroscopically confirmed clusters further demonstrate the efficiency and effectiveness of two-filter imaging for detecting bona fide galaxy clusters at high redshift. We conclude by demonstrating that prospects are good for the current generation of surveys aiming to estimate cluster redshifts and masses at  $z\sim 1$  directly from optical-infrared imaging.

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