Summary of experiment 94121, Exotic Meson Spectroscopy with CLAS:

A great deal is known about the spectrum of low lying mesons, as one can easily see from an inspection of the PDG compilation. Numerous mass multiplets have been mapped out and coupling strengths to many final states are known. However surprisingly little order emerges from ones examination of mesons above about 1.5 Gev in mass. It is likely that our poor understanding of the known spectra is due at least in part to a lack of knowledge about gluonic configurations.

Photoproduction reactions have provided little spectroscopic information in the past, primarily due to the low intensity of the available beams. The CLAS spectrometer will allow us to make a detailed study of multi-meson final states, which is expected to identify mesons with exotic structure (e.g. $q\bar{q}g$ hybrids). According to theoretical expectations these channels will offer important new opportunities to isolate hybrid mesons.

Photoproduction of mesons decaying to final states with up to five particles will be measured. These measurements will sample the $b_1\,\pi$, $a_1\,\pi$ and $a_2\,\pi$ meson decay channels, among others. The data will be used to identify new mesons with masses up to 2 GeV. Spectroscopic information on exotic mesons will be extracted from a partial-wave analysis of the data.