

# Searching for Hybrid Mesons with GlueX

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Hybrid mesons consist of a quark-antiquark pair bound together by a gluonic field that is in an excited state. A rich spectrum of hybrid meson states has been predicted, but only a few experiments have reported evidence of their existence. Measuring the spectrum of these states will provide valuable information on the gluonic degrees of freedom of QCD in the quark-confinement regime.

The GlueX experiment at Jefferson Lab is designed to search for and measure the spectrum of light-mass hybrid mesons, and began its physics run in Spring 2017. For the experiment, a 12 GeV electron beam incident on a diamond radiator is used to produce a linearly-polarized, coherent bremsstrahlung tagged-photon beam with a coherent peak at 9 GeV. The linearly-polarized photon beam is incident on a proton target located within the hermetic GlueX detector, which can detect many different final states to which the hybrid mesons are predicted to decay. Early GlueX physics will be shown, including several beam asymmetry measurements and near-threshold charm production.

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