

The Experiment for Cryogenic Large-aperture Intensity Mapping (EXCLAIM)

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Abstract

Submillimeter and far-IR spectroscopy provides insight into galaxy evolution through atomic and molecular line emission. The EXperiment for Cryogenic Large-Aperture Intensity Mapping (EXCLAIM) is a cryogenic balloon-borne instrument designed to carry out an intensity mapping to measure the cumulative redshifted line emission from carbon monoxide and singly-ionized carbon to probe star formation in windows from the present to $z=3.5$. During this time, the rate of star formation dropped dramatically, while dark matter continued to cluster. Intensity mapping permits a blind and complete survey of emitting gas through statistics of cumulative brightness fluctuations. EXCLAIM achieves high sensitivity using a cryogenic telescope coupled to six integrated spectrometers with spectral resolving power $R = 512$ and employing kinetic inductance detectors. Here we summarize the status of the mission.