Deepening the Hubble UDF - Constraining the High-z Galaxy Luminosity Function Faint End Slope and Reionization

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Legacy: Yes

Abstract

We propose to significantly improve the depth of the Hubble Ultra Deep Field (UDF) by ~0.4-0.5 magnitudes (equivalent to doubling the exposure time of the original UDF), through recalibrating and reprocessing the original UDF ACS data with improved reference files and new techniques to remove a variety of electronic instrumental signatures from the images. Since ACS has now been in operation for almost 5 years, this provides an opportunity to improve significantly upon the original calibration which had been performed using the best available information 18 months after the installation of ACS. Our team has the demonstrated expertise to carry out this recalibration and reprocessing, and we also have the demonstrated ability to release such products to the commmunity on a timely basis. We propose this as an Archival Legacy program because the resulting dataset, as well as the techniques that we are using, will be of great value to the community and should enable significant new science to be obtained from this unique dataset. In addition, the resulting improvements on the number counts of redshift ~6 dropout sources will significantly improve the current uncertainties in this field regarding the faint end slope and normalization of the luminosity function of the redshift ~6 population, and ultimately the role played by these sources in reionizing the universe.

Investigators:

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Number of investigators: 4

Dataset Summary:

Instrument	No. of Datasets	Retrieval Method	Retrieval Plan
ACS	400	FTP	All ACS/WFC data from Prop. 9978 (PI: Beckwith)