

The Bright Future with Big Eyes: Reionization and Early Galaxy Formation in High Definition (Rychard Bouwens) (I)

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Current astronomers clearly live in a golden area of astronomy, with an almost incessant march towards viewing the early universe in ever greater clarity and sensitivity, new observational facilities coming online ever 18 months that astound and amaze, and new scientific insights becoming available almost every few days. One of these areas where astronomers have been granted a completely new outlook on the early universe has been through the use of strong gravitational lensing clusters and as a result of vision and investment of the community in the ambitious Hubble Frontier Fields (HFF) program. With that program, we have been able to study significantly lower luminosity sources than thought possible before and small star-forming systems at very high spatial resolution, even allowing the community to identify proto-globular cluster candidates in the deep data. In my presentation, I present some lessons the community has gained from the use of those data, recent work from my own team on that front, new WFC3/UVIS data soon to be collected over the HFF clusters to enable future science, and the capabilities future telescopes should have to optimize such science going forward. In closing my presentation, I provide a prospective on what can be in searches for massive ISM reservoirs in the early universe with current technology, using the newly approved cycle-7 ALMA large program REBELS I am leading as an example and then remarking about how such science can be made better with future facilities.