

ASTROPHYSICS SEMINAR SERIES

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A search for high-redshift galaxies and an accidental galactic survey of dwarf stars with Hubble

Current searches for high-redshift galaxies use a combination of near-infrared filters with one or more optical filters to check for contaminants. One of these contaminants are faint dwarf stars in the disk and halo of our own Milky Way Galaxy. Thus in the search for the galaxies that caused the Reionization of the Universe, an accidental census of Dwarf stars in the Milky Way was conducted as well. I report on one observational approach with the Hubble Space Telescope; the Brightest Origin of Reionizing Galaxies (BORG) survey.

I will discuss the identification of the distant high-redshift galaxies, their unique properties, the faint brown and red dwarf stars (M-dwarfs) and our results on characterizing the shape of the Milky Way from their number. We identified stellar objects in the BoRG survey and mapped their distribution onto the Milky Way. Results are a thin disk (300pc), the rediscovery of the Sagittarius stream, a total count of 58 billion M-dwarfs in the Milky Way of which 7% reside in the halo. We also found a population of very bright, redshift eight galaxies (“Super-Eights”) that show evidence for strong nebular emission lines and direct observations of Lyman-alpha.

These M-dwarfs may be useful to register the on-sky position of NASA/ESA’s new flagship telescope, the James Webb Space Telescope and as a science byproduct of ESA’s EUCLID telescope. The Super-Eights appear to reveal a very specific mode of star-formation that may have played a critical role in the Reionization of the Universe. I will discuss future prospects.



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