ASTROPHYSICS SEMINAR SERIES

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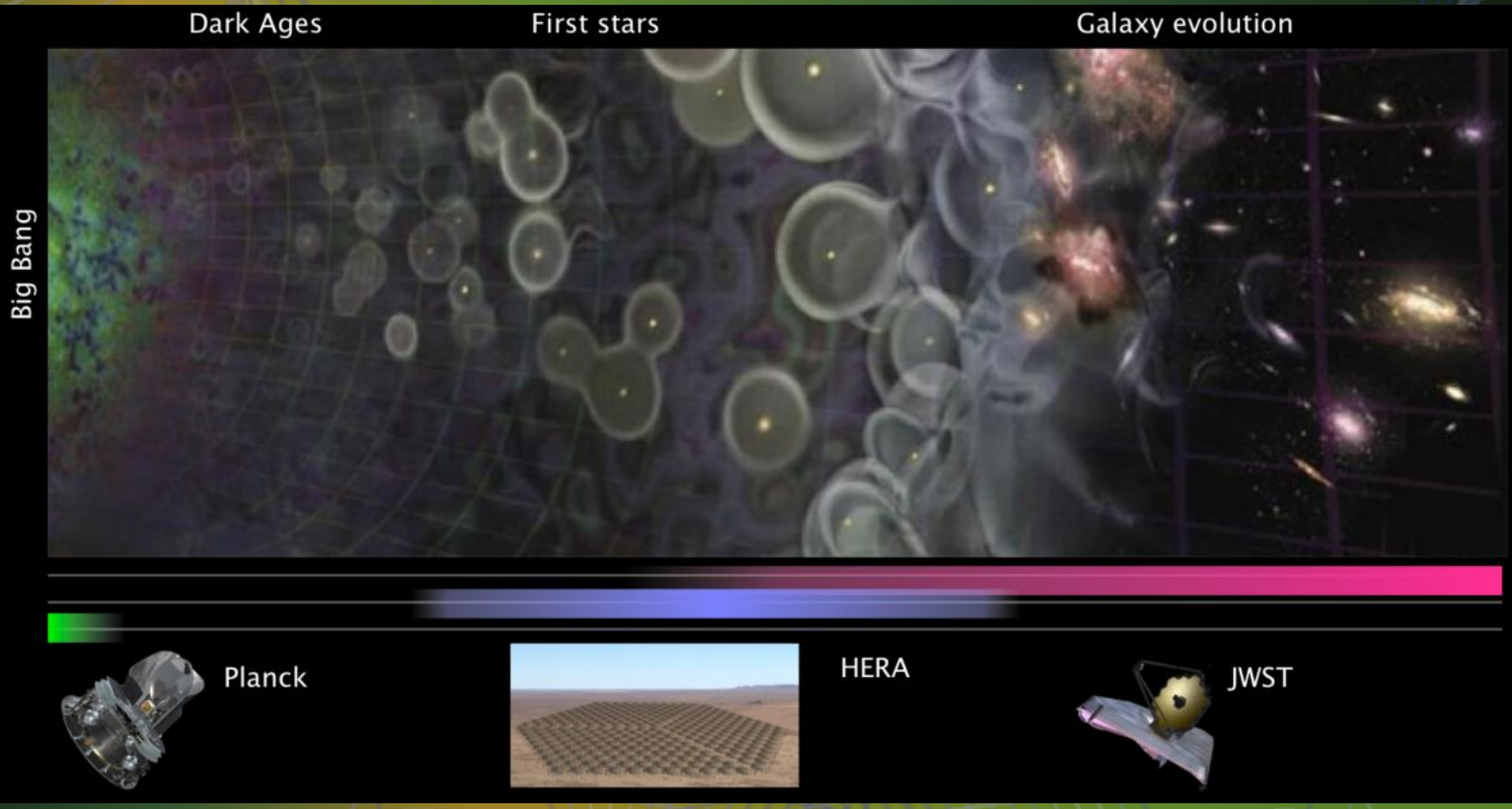

Recent developments in instruments for high redshift 21cm and exoplanets

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Observation of 21cm radio emission from neutral hydrogen from before reionization is a promising window on the early universe and has received considerable experimental attention. The Hydrogen Epoch of Reionization Array (HERA) has reported limits which constrain galaxy formation models and is now observing after an upgrade. An essential 21cm experiment is its location; almost nowhere on Earth is suitable. Longer wavelengths can only be observed from space. The same is true in the ultraviolet. Recent advances have encouraged a new generation of UV instruments. Stellar flares, which are extremely bright in the UV, have a strong impact on the atmospheres of exoplanets. The Star Planet Activity Research CubeSat (SPARCS) will monitor flare M-Dwarf stars, one of the most common planet host. This cubesat is currently under construction aiming for a launch in early 2024. I will describe the design and some interesting particulars of this miniature space telescope. The lessons and technical capability we are building with SPARCS are training us for a future of space-based radio observations. The first such experiment will be the DORA cubesat which carries a prototype 21-cm receiver set to launch Dec 2023.

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