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HIGH CONTRAST OBSERVATIONS THE ALPHA CENTAURI SYSTEM AND SEVERAL SHORTCUTS TO IMAGE ANOTHER PALE BLUE DOT

Abstract

This paper will be an opportunity to describe several projects aimed to image and characterize the surrounding of the Alpha Centauri Star System in the hope of collecting the first picture of another Pale Blue Dot, or an Earth-Like Exoplanet. We will describe several concept instruments capable of achieving this goal using ground-based telescopes and space-based telescopes, including - TIKI, a mid-infrared adaptive optics instrument optimized to deliver a contrast sufficient on 8-m class telescope to detect an Earth-like exoplanet after 100 hours of observations - ELF, a hybrid optical telescope for imaging exo-earths, and detecting alien life and civilizations proposed by the PLANET Foundation which could achieve the stability and SNR needed in direct imaging to detect biosignatures and technosignatures, as well as build a photometric map of the planet. - Project Blue, an off-axis space telescope with an aperture of only 40-50cm, equipped with a Phase Induced Amplitude Apodization coronograph and a starlight suppression system that will observe for several thousands of hours Rigil Kentaurus and Toliman , providing an image to directly image in the visible terrestrial planets around them.

We will also discuss the scientific importance of collecting an image of another Pale Blue Dot and its impact on our civilisation at large.