NEXT GENERATION SPACE TELESCOPES FOR TERRESTRIAL EXOPLANET CHARACTERIZATION AND THE SEARCH FOR BIOSIGNATURES. J. Grunsfeld[1], M. Clampin[1], M. Mountain[2] and C. Stark[3], [1]NASA Goddard Space Flight Center, Greenbelt, MD, [2]Association of Universities for Research in Astronomy, Washington, DC, [3]Space Telescope Science Institute, Baltimore, MD.

Introduction: The coming decade of the 2020s will present an amazing array of capabilities to observe the Universe across the electromagnetic spectrum, and in particular to discover and characterize exoplanets in the neighborhood of our solar system. These include the Transiting Exoplanet Survey Satellite and the remarkable James Webb Space Telescope (JWST) in space, and a suite of large observatories on the ground, including the Atacama Large Millimeter Array, and several 30m class optical/IR telescopes.

The study of earth-size exoplanets, and in particular the detailed spectroscopic analysis of their atmospheres, will require new capabilities beyond those currently in development. A number of studies have been performed over the past decade, including ATLAST, LUVOIR, and now multiple studies sponsored by NASA in preparation for the National Academies 2020 Decadal Survey in Astrophysics, that specifically address the capabilities that will be required to make progress in exoplanet characterization.

Based on the results from the NASA Kepler mission and other exoplanet observations, the known distribution of stars in the solar neighborhood and the expected capabilities of future telescopes, we present a parametric analysis of the capabilities of future large aperture space telescopes to assess the yield for discovery of terrestrial exoplanets, characterize their atmospheres, including the search for potential biosignatures.