

Abstract Submitted
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Design and Construction of a Radio Telescope for Undergraduate Research¹ CHRISTOPHER STATHIS, Ithaca College — Radio telescopes provide a practical and economical alternative to optical observatories for astrophysics research and education at primarily undergraduate physics and astronomy institutions. Ithaca College is in the testing phase of development for a low cost, flexible frequency band radio telescope which I have developed as the research component of my undergraduate thesis. I have constructed a three-stage low noise superheterodyne radiometer on custom printed circuit boards for signal detection, which is mounted on a 3 meter parabolic antenna. Data collection and signal processing is achieved using custom software written in MATLAB. We are currently performing preliminary drift continuum observations of the Sun and Milky Way at Ku band frequencies. We expect that the receiver can also be easily adapted to measure spectral emission of neutral hydrogen and OH masers at L band. I present my design methods for the radiometer and printed circuit boards, including measured noise characteristics and SPICE simulations, as well as an overview of applied signal processing methods and a discussion of observable celestial sources.

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