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The Next Steps (A4)
SETI 1: SETI Science and Technology (1)

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BREAKTHROUGH LISTEN SEARCH FOR SIGNS OF INTELLIGENT LIFE NEAR THE GALACTIC
CENTER AT X-BAND

Abstract

The discovery of numerous Earth-type exoplanets over the last decade have extended the possibility of other life-bearing worlds. However, the question of the existence of intelligent life might remain elusive unless a dedicated attempt is made to extensively Search for Extra-Terrestrial Intelligence (SETI). Breakthrough Listen (BL) is a 10-year effort to conduct the most sensitive, comprehensive, and intensive search for advanced intelligent life on other worlds ever performed. The Galactic Center (GC) is a key observational target for the radio component of the BL program. The line of sight toward the GC offers the largest integrated galactic star count of any direction in the sky, is a widely cited possible location for a beacon built by an advanced intelligence, and is the most energetic region in the Milky Way. Given the potential for discovery in the GC region, the BL survey will cover the entire frequency range from 700 MHz to 100 GHz using the Green Bank Telescope (GBT) and Parkes Telescope. We will conduct deep observations of around 350 hours from the GBT and 280 hours from the Parkes telescope, making it the most significant SETI survey to date of any region of the sky. The GC region is also an exciting observational target for a host of natural astrophysical phenomena, prominently including pulsars in close orbits around the central super-massive black hole, Sgr A, or in new exotic systems such as a millisecond pulsar in a binary system with a black hole. Following our 1-8 GHz results (Gajjar et al. 2021), here I discuss updates from our GC survey so far, specifically, the GBT X-band (8-12 GHz) observation strategy and narrowband searches.