48th IAA SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps (A4)
SETI 1: SETI Science and Technology (1)

Author: Dr. Vishal Gajjar
University of California, Berkeley, United States

Dr. Andrew Siemion
Univerisity of California, United States
Dr. David DeBoer
UC Berkeley, United States
Dr. Daniel Price
U.C. Berkeley, United States
Mr. J. Emilio Enriquez
UC Berkeley / Radboud University Nijmegen, United States
Dr. Dan Werthimer
University of California, United States
Dr. Steve Croft
University California Berkeley, United States
Mr. Jamie Drew
NASA, United States
Dr. Pete Worden
United States
Ms. Karen Perez
Columbia University, United States

ON THE BREAKTHROUGH LISTEN SEARCH FOR SIGNS OF INTELLIGENT LIFE NEAR THE GALACTIC CENTER

Abstract

Over the last decade, discoveries of numerous earth type exoplanets 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). The 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 beacon builtby 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 plan to 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. Other astrophysics of interest include accelerated masers, spectral line surveys, and studies of the detailed structure of the dense ionized Interstellar Medium (ISM)

in the GC. I will review these observation strategies and novel data analysis techniques we plan to deploy to investigate a range of signal types using state-of-the-art machine learning tools.