

43rd SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The
Next Steps (A4)
SETI 1: SETI Science and Technology (1)

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RADIO SEARCHES FOR EXTRATERRESTRIAL INTELLIGENCE AS FACILITY OBSERVING
PROGRAMS

Abstract

The vast majority of radio searches for extraterrestrial intelligence (SETI) are conducted using specialized purpose-built hardware and software, largely due to their unique signal processing requirements. This differs markedly from radio astronomy in general, in which a small collection of digital instruments and software packages can be used to conduct a wide range of experiments with varied scientific goals. Because of the relatively high cost and steep learning curve associated with the use of dedicated hardware and software, it has historically been difficult for new SETI practitioners to conduct their own observational programs, and as a result most SETI experiments are conducted by only a few scientists.

In the last several years, the radio astronomy digital instrumentation landscape has changed significantly and custom integrated circuits are being replaced by commercial compute elements like field programmable gate arrays (FPGAs) and commodity CPUs/GPUs. In addition to being much more capable, these new instruments are also much more configurable than their predecessors. It has now become possible to conduct high sensitivity searches for extraterrestrial intelligence using only the digital instrumentation provided by observatory facilities, offering the prospect of SETI observing becoming as routine as continuum mapping or pulsar searching.

Here we will present the status of our group's facility-SETI observing efforts at several observatories, including the Green Bank Telescope, the Arecibo Observatory and the Low Frequency Array (LOFAR). We will describe targeted and survey SETI observations we are conducting at these facilities and also detailing an open-source SETI software pipeline, currently under development, that is capable of processing data in many formats and employing a range of search algorithms.