

50th IAA SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) –
 The Next Steps (A4)
 SETI 1: SETI Science and Technology (1)

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Abstract

The search for extraterrestrial intelligence (SETI) is a field that benefits from scale to increase the chance of detecting a signal. Scaling is expensive though, as radio telescopes are immense and occupy a large land area. Moreover, Earth's environment is just not ideal for SETI. Various layers of the atmosphere distort and block potentially useful wavelengths like the Ultra-Long Wavelengths (ULW), and the noise of human civilization obscures and confuses possible extraterrestrial signals on desirable frequencies. So too does the inability to perform an all-sky survey, with the exception of the upcoming completion of the SKA, make catching SETI signals as they occur unfeasible at best. A solution often stated to solve this issue is to situate all SETI efforts in space, well beyond the Earth's interference. A posterchild would be a lunar farside radio telescope array (Eric J. Michaud, 2002 Saptarshi Bandyopadhyay, 2020). However, this operation would be challenging to set up, and ultimately does not represent the pinnacle of our abilities. The author here proposes to build up a cube-satellite constellation at the Earth-Sun 4th Lagrange point (L4), launched via modern launch systems like the Falcon 9, and delivered via gravitational assistance. Each of the cube satellites carries on their own an individual radio receiver. Alone, they would be ineffective, but many cube satellites stationed in a coordinated fashion can act as a composite radio telescope over an area of the entire L4 orbital space. This offers stupendous interferometry opportunities the likes of which cannot be paralleled on Earth due to the atmospheric and anthropogenic disturbance, confined spaces and cost. The modular nature of this design enables replacement of defective satellites and most importantly, vast expansion potential, constituting the largest human-made radio telescope arrays in the history of astronomy. With another array at the Earth-Sun 5th Lagrange point working in tandem, the telescope aperture, or resolution capacity increases by a factor of a thousand. Similar arrays can be stationed at the other Lagrange points of Earth and other planets in the solar-system. By these economical and expedient means, we can make a robust solar-system-wide radio telescope to monitor the cosmos around us at all times – instead of today's piecemeal approach. The Nephilim of old were sons of "The Watchers", and giant men of renown. This array will be truly giant, and is the offspring of the watchers of the cosmos – Humanity.