

## NO ALIEN SIGNAL, SAY SETI ASTRONOMERS

A strong signal from a sunlike star sparked speculation recently that we might – at last – have heard from an alien civilization. Now astronomers say ... no.

You might have read the stories about Russian astronomers detecting a possible “signal” from a star 94 light-years from Earth. **The signal from sunlike star HD 164595 – said to be a very strong signal – spawned a flurry of speculation that, maybe, perhaps, at last, we’ve heard a signal from an alien civilization.** Like many other stars in our Milky Way galaxy, the star HD 164595 looked promising as an abode for alien life. Italian astronomer **Claudio Maccone** and others had described it as a strong candidate for SETI. But the SETI Institute says the signal has now been identified as having been from a Russian military satellite

**Subsequent processing and analysis of the signal revealed its most probable terrestrial origin. It can be said with confidence that no sought-for signal has been detected yet.**

What did SETI astronomers think the signal might be? If the signal had been artificial, its strength suggested that it came from an advanced civilization, at least a Type II on the Kardashev scale, which astronomers have been talking about and speculating about for decades. The Kardashev scale – originally designed in 1964 by the Russian astrophysicist **Nikolai Kardashev** – is a way of imagining a civilization’s level of technological advancement, based on the amount of energy it’s able to harness.

**Kardashev graduated from Moscow State University in 1955, following up at Sternberg Astronomical Institute. He studied under Shklovskii and finished his PhD in 1962.**

In 1963 Kardashev examined quasar CTA-102, the first Soviet effort in the search for extraterrestrial intelligence (SETI). In this work he came up with the idea that some galactic civilizations would be perhaps millions or billions of years ahead of us, and created the Kardashev classification scheme to rank such civilizations.

In 1964, Kardashev defined three levels of civilizations, based on the order of magnitude of power available to them:

**Type I** Technological level close to that presently attained on Earth, with energy consumption at  $4 \times 10^{12}$  watts). We humans on Earth represent a Type I civilization – sometimes called planetary civilization. We have the technology to use and store energy from our sun that strikes our world’s surface, or nearby space

**Type II** A civilization capable of harnessing **all the energy** radiated by its own star (a Dyson sphere?) with energy consumption at  $4 \times 10^{26}$  watts.

**Type III** A civilization in possession of energy on the scale of its own galaxy (such as our own Milky Way), with energy consumption  $4 \times 10^{37}$  watts.

**So, back to the mysterious signal.**

Because the receivers used were making broad band measurements, there’s really nothing about this “signal” that would distinguish it from a natural radio transient (stellar flare, active galactic nucleus, microlensing of a background source, etc.)

**There’s also nothing that could distinguish it from a satellite passing through the telescope field of view.** SETI@home has seen millions of potential signals with similar characteristics, but it takes more than that to make a good candidate:

**Multiple detections are a minimum criterion.**

**And so it was a military satellite. To all SETI astronomers: keep searching!**



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