

Russians, Japanese search for life in space

By JON LOMBERG

Soviet and Japanese scientists have plans for several new instruments to search for intelligent life in outer space. In fact, the Russians are looking into the feasibility of a billion-dollar orbiting radio-telescope with a receiving dish 3 kilometres (1.9 miles) in diameter.

These and other plans to seek out intelligent life in outer space were discussed recently at a conference held in Tallinn, Estonia, which was organized by the Soviet Academy of Sciences.

Two hundred participants from the Soviet Union, the United States, and several other countries reaffirmed that a continued search for alien signals is "an activity of great philosophical, scientific, and social significance."

The SETI (Search for Extra-Terrestrial Intelligence) concept, first articulated by physicists Giuseppe Cocconi and Philip Morrison in 1959, says that the most reasonable way for civilizations to contact each other across the great gulfs between the stars is to use radio techniques.

Stars are so far apart that even light takes years to pass between them: four years from the sun to the nearest star, and 30,000 years from the sun to the centre of the galaxy. Radio travels at the speed of light (about 300,000 kilometres, 186,000 miles, a second), is cheaper to make than spacecrafts, can carry large quantities of information, and probably would be discovered fairly early in the scientific lifetime of a technical civilization.

In fact, a spherical wavefront of television programs, FM radio broadcasts, and military radar has been propagating from Earth since the 1940s. So if there is any other sophisticated civilization within 40 light years of the sun, its radio astronomers could detect these signals. Similarly, radio astronomers on Earth could try to detect

the signals coming from some other star.

The first SETI was conducted by astronomer Frank Drake, who in 1960 listened to two nearby stars similar to the sun for signals, with negative results. Since then, a score of searches have been conducted, including a search by Canadian astronomers Alan Bridle and Paul Feldman in the 1970s, using the Algonquin Park Radio Telescope.

No aliens have been detected, but that could be because no one has looked at the right place and at the right frequency.

Dr. Drake, former director of the giant radio-telescope in Arecibo, Puerto Rico, led the delegation of U. S. scientists to the SETI conference in Estonia.

Signals hidden like needles in haystack

The 10 U. S. delegates were, for the most part, astronomers who have done SETI research and engineers who have designed equipment intended to scan the vast radio spectrum for sharp, narrow-band signals that might be hidden "like needles in the cosmic haystack" in Dr. Drake's words.

Some scientists have suggested recently that life may in fact be unique to Earth. But for the most part, scientists still accord SETI scientific respectability, involving as it does some very basic questions about the origin of planets and life.

However, U. S. SETI projects are in financial difficulty. Sen. William Proxmire of Wisconsin has given SETI proposals his "Golden Fleece" Award as examples of wasting money, and he was recently responsible for attaching an amendment to a Congressional Appropriations Bill making it illegal for the U. S. National Aeronautics and Space Administration to spend even one penny on SETI.

NASA had proposed spending about \$2-million to design and build a signal-processing device called a multi-channel spectrum analyzer.

This digital computer would have allowed astronomers to simultaneously monitor eight million radio channels at one time when listening to any particular star. If an unusual signal — say a series of modulated beeps — was present on any one of these millions of channels, the computer would record it and alert astronomers to its presence.

The cancellation of this project means that there is now no government-supported SETI in the United States and no North American or Western European country is actively involved.

However, the conference certainly seemed to indicate that Soviet SETI is well-financed, well-respected, and well-publicized. Soviet participants included some of their leading scientists and four cosmonauts attended the sessions.

And the Soviets demonstrated that their SETI efforts have substance as well as show.

In Russia, many of the most advanced astronomical instruments have a clear SETI orientation. N. S. Kardashev, of the Space Research Institute in Moscow, described a new radio telescope being constructed near the city of Samarkand.

The telescope has a steerable collecting dish 70 metres (230 feet) in diameter and is sensitive to millimetre wavelength radiation. (Few large Western telescopes are sensitive to shorter radio wavelengths, which might be ideal for SETI).

Dr. Kardashev says that a significant portion of the observatory's work will involve the search for alien signals.

He also described plans for a new satellite

which the Soviets will launch in the next few years designed to make observations at infra-red wavelengths, which are blocked by Earth's atmosphere from reaching the ground.

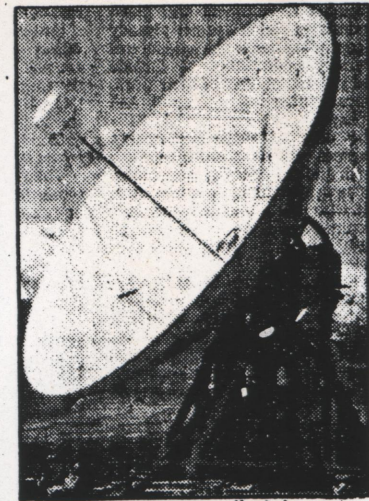
In particular, Dr. Kardashev wants to use that satellite to search the centre of the Milky Way for evidence of very advanced civilizations, whose "astro-engineering" projects might be leaking infra-red radiation. Dr. Kardashev is a spokesman for a common Soviet viewpoint that says that SETI should concentrate on very strange objects such as quasars or the centres of galaxies rather than target individual stars, even though these quasars and galaxies are millions of light years away.

Network of receivers to listen to sky

V. S. Troitsky, another leading Soviet astronomer, outlined plans for a network of receivers capable of listening to the whole sky at once for omni-directional (as opposed to tightly beamed) signals. His team is committed to a 20-year survey of the whole sky by that method. Two years of this survey have been completed with existing equipment. And G. S. Sarevsky described the study for the billion-dollar orbital radio telescope, which could be "infinitely expandable" by the addition of new panels to the dish.

In space, the dish would be immune to the effects of gravity, wind, dirt, and local interference which plague ground-based instruments. The large collecting surface would provide sensitivity 10,000 times greater than any existing radio telescope.

Japanese interest in SETI was expressed by Prof. Jun Jagaku of the Tokyo Observatory who described a new 45 m (150-foot)



New Japanese radio-telescope.

radio-telescope sensitive to millimetre wavelengths nearing completion in Japan. That instrument will be used to study the huge dark clouds of dust, rich in organic molecules, that line the spiral arms of the Milky Way.

Meanwhile, the Soviets seem prepared to commit themselves to decades of patient observation. In Dr. Sarevsky's words, "We must search, search, and search." He and his colleagues are spurred by the staggering implications of a successful SETI program. The Soviet Government realizes, perhaps, the enormous prestige that would accrue to any country which first detected life "out there."