

SETI IS COMING OF AGE

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If asked to assess the evolution of SETI in the quarter of a century which has elapsed since its proposal, I would say that it parallels that of most novel and challenging human endeavours; a mixture of technical and cultural progresses and set-backs.

Culturally SETI had, and still has, some peculiar difficulties in being accepted by the public opinion. The initial opposition was similar to that met by the pioneers of aviation: "why disturb the Angels?" Skepticism mixed with fear that success would jeopardize something in our lives. It thus became very significant that in 1983, SETI gained a place (albeit the last) in the official list of the astronomical research priorities.

As for technical problems, SETI has to face the fact that numerous searches have so far been unsuccessful. This must be viewed in contrast to the great achievements, in the same period, of optical and X-ray astronomy. However, it must be realized that optical and X-ray telescopes take advantage, in the same apparatus, of four essential capabilities:

- i) good angular resolution within a large solid angle, i.e., a two-dimensional sensitivity in the focal plane of the telescope;
- ii) intensity measurement within a narrow frequency band;
- iii) time resolution capable of sensing rapid intensity variations;
- iv) simultaneous measurements in various frequency bands.

Though the detectors used for SETI have met the last three conditions, sometimes even more egregiously than in the optical and X-ray searches, they have been incapable, so far, of coping with condition i). In the focal plane of the radio telescopes still sits a one-point detector. How many peculiar galaxies would have been discovered in astronomical searches if in the focal plane of the telescope were placed a single photo-cell instead of a photographic plate?

For an effective SETI search, now, when the "easy" sources have already been exhausted, the focal plane of the radio telescope should be covered by a myriad of point detectors, over a solid angle, if not as large as that of a Schmidt, at least as large as that of an Einstein. A feat still at the limit of present technology, but not hopeless for the future.

To illustrate the difficulties always met by a novel program, let me quote a case that, though on a more modest scale, has similarities with SETI.

About 25 years ago it was proposed to use the already existing detectors of Cosmic-ray Extensive Air Showers as “telescopes” capable of sensing possible point-sources of energetic γ -rays¹. To reach the necessary angular resolution a more accurate timing of the apparatus was needed, a technical complication small in comparison to those required for SETI. Still, only last year the first source (Cygnus X-3) emitting 10^{16} eV γ -rays was discovered with a detector sufficiently improved and a subtle analysis of data collected in two years².

If it took 23 years for such a simple idea to give fruit in a field where there are no Angels, should half a century be considered too much for SETI?

REFERENCES

1. G. Cocconi, Proc. Moscow Cosmic Ray Conf. (1960) Vol. II, 309.
2. M. Samorski and W. Stamm, Astrophysical J. **268** (1983) L 17.