

# **A Decision Process for Examining the Possibility of Sending Communications to Extraterrestrial Civilizations**

## **FOREWORD**

This open document is a proposal to begin serious international consultation on the question of future attempts to deliberately transmit electromagnetic signals from Earth to extraterrestrial civilizations. It was prepared over a number of years in the SETI Committee of the International Academy of Astronautics by a special subcommittee under the leadership of Michael Michaud. It has been endorsed by the Board of Trustees of the Academy, which decided to make it a formal Academy Position Paper. It has also been endorsed by the Board of Directors of the International Institute of Space Law. Both organizations consider that the questions raised in the document are of sufficient import to warrant sending it to many nations with a request that they consider bringing it to the attention of the Committee of the Peaceful Uses of Outer Space of the United Nations, for further study, and possible action, on behalf of all humankind. In September of 1996, the document was sent by the Academy to the sixty-three nations which make up this UN Committee.

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## **Summary**

This position paper outlines an approach to an international process for deciding whether and how to send a communication to an extraterrestrial civilization.

For over thirty years, humans have used radio technology to conduct searches for evidence of extraterrestrial intelligence (ETI). Collectively, these efforts are known as the Search for Extraterrestrial Intelligence (SETI).

If SETI is successful in detecting an extraterrestrial civilization, it will raise the question of whether and how humanity should attempt to communicate with the other civilization. How should that decision be made? What should be the content of such a message? Who should decide? The same questions would apply to proposals that signals be sent in the absence of detection, in the hope that they might be detected by an extraterrestrial civilization.

The first section of this paper introduces the idea of extraterrestrial intelligent life, and describes our growing scientific and technological capabilities for SETI. The second section addresses the issue of humanity's sending a communication. The third section proposes the development of a Declaration of Principles concerning the sending of communications to extraterrestrial intelligence.

## **I. The Science of SETI**

Speculation about life on other worlds has a very long history, dating back at least as far as Classical Greece. The Copernican revolution, which displaced the Earth from the center of the universe, accelerated speculation about intelligent life elsewhere, as other worlds came to seem more equal to our own [1]. Subsequent advances in astronomy and the study of evolution have made it seem more probable that life, including intelligent life, may be

widespread in the universe. The central hypothesis of SETI is that we have the means to detect evidence of extraterrestrial civilizations, particularly the electromagnetic signals they may emit.

In 1959, Giuseppe Cocconi and Philip Morrison, noting the existence of powerful radio telescopes, proposed that a search be made at frequencies near the hydrogen line (21 centimeters) [2]. In 1960, the American radio astronomer Frank Drake independently carried out the first search using a radio telescope, aiming at two nearby stars [3]. Since then, about sixty other searches have been carried out by American, Russian, Canadian, French, and Argentine astronomers, though without detecting credible evidence of ETI [4].

Within the radio spectrum, there is a region known as the free space microwave window, between 1 gigahertz and 60 gigahertz. This is the quietest region of the radio spectrum; it is the region in which it is easiest to detect a faint radio signal emanating from another civilization against the noise of the natural background. The 21 centimeter line is at the low frequency end of this window. Most radio searches for ETI have concentrated on this region of the radio spectrum.

While the scientific and technological sophistication of these searches has grown in recent years, the central strategy of SETI remains to listen. However, proposals also have been made to send our own signals in the hope that they will be detected by another civilization and will generate a response. Whichever strategy we pursue, our improving capabilities are making detection more likely.

The signal we detect could range from a simple carrier wave conveying little information to a message rich in information. The signal could have been transmitted to attract the attention of other civilizations, or we might "overhear" internal communications of the other civilization. In either case, we would know for the first time that we are not alone. Our conception of the universe and our future as a species surely would change, as it did after the Copernican revolution. Information from the other civilization could have a significant impact on our science and our culture.

Ten years ago, the SETI Committee of the International Academy of Astronautics began discussing the question of what Humankind should do after a detection. One result of these exchanges was a series of papers in a Special Issue of *Acta Astronautica*, entitled "SETI Post Detection Protocol". [5] The discussions also led to the formulation of a "Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence" (see Annex I, page 6, for full text). This document, which is intended for voluntary agreement among researchers, has been endorsed by six international space and astronomy organizations. While most of the principles in the Declaration deal with the dissemination of knowledge of the discovery, one principle deals with the question of sending a communication in response to the discovery.

## **II. Sending a Communication from Earth**

Detecting a signal from an extraterrestrial civilization would raise an important question: should we humans send a message back to the civilization that we have detected, a "response from Earth"? This issue also has been examined by a number of interested persons during recent years, notably in the SETI Committee of the International Academy of Astronautics.

Proposals to send messages to attract the attention of other civilizations we have not yet detected (sometimes called "active SETI") raise essentially the same question [6].

One approach would be to make no effort to prepare for this eventuality, addressing the question at the time of a discovery. Another approach is to begin to address the question now, even in the absence of confirmed evidence of extraterrestrial intelligence. Such a discussion could lead to the development of an agreement or procedure on this issue.

Principle 8 of the *Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence* states that "No response to a signal or other evidence of extraterrestrial intelligence should be sent until appropriate international consultations have taken place. The procedures for such consultations will be the subject of a separate agreement, declaration, or arrangement."

The substance of such a response has been discussed by several authors in recent years. In the mid-1980s, Goodman and Ney proposed international agreements on this issue [7], and Goldsmith proposed that the International Astronautical Federation and the International Astronomical Union create a committee to attempt to reach a consensus on an international "reply from Earth." [8] More recently, Michaud et al. have proposed that an agreement be developed creating an international process by which the species would decide whether and how to reply if a detection is made [9].

However one chooses to address this issue, an array of questions emerges. One is whether it is worth the expenditure of any significant effort to address the question now. It could be years, decades, or even centuries before we detect a signal, if we ever do. Despite this uncertainty, the fact remains that we could detect a signal in the near future, particularly because of the increased scale and sensitivity of SETI searches.

If we decide that this question is worth addressing, how should we go about it? Should we make a decision in advance of a detection that humanity should or should not send a message? Should we attempt to design a generic response, or should we wait until we have a signal to analyze? If we decide to send a message, what should be its content? Should humanity respond as one, or with many different messages from separate nations or organizations? Who should decide on these questions?

The issues involved in sending messages to extraterrestrial civilizations raise profound philosophical and political questions. These questions are of such weight for the future of our own civilization as to merit extensive discussion, perhaps over a period of many years.

There also is the question of the institutional context for such discussions. Clearly, sending a message to another civilization is more than just a scientific research project; it is a policy question that should be addressed by policy bodies. The most universal of existing international policy bodies is the United Nations; ultimately, it would seem appropriate for the issue to be addressed there, beginning with the Committee on the Peaceful Uses of Outer Space (COPUOS). However, given their existing agendas of more politically pressing issues, United Nations bodies would be unlikely to give much attention to SETI issues in advance of a confirmed detection of a signal.

The initial work could begin outside the United Nations, perhaps in interested non-governmental bodies. As a starting point, the International Academy of Astronautics, in

consultation with the International Institute of Space Law, has developed, as part of this proposal (See III below), a draft agreement or declaration of principles for consideration by others. In the initial stages, this draft agreement or declaration could be a focal point for discussion rather than a finished, formal document. Many mechanisms can be used to stimulate discussion, including workshops, public debates, university seminars, and media coverage. This implies a long, complex process that is unlikely to produce a quick agreement. Given the magnitude of the questions involved, it will be important to allow time for the development of some degree of consensus.

International non-governmental organizations cannot themselves introduce matters for discussion by COPUOS; only member governments can do this. If a draft agreement or declaration were developed, one or more of the member governments would have to be persuaded to introduce it. This draft could then be considered by the United Nations, through the COPUOS, and might be endorsed by the COPUOS and the General Assembly as international policy.

Periodic reports or presentations by interested non-government bodies to the COPUOS would be useful to keep governments informed and to facilitate subsequent approval of a draft declaration. If a signal were received and confirmed, the COPUOS might be willing to devote more time and attention to the issue and to texts.

### **III. A Draft Declaration of Principles Concerning Sending Communications to Extraterrestrial Intelligence**

Rather than trying to decide the substance of our decisions in advance, it may be more fruitful to focus on the process by which the human species as a whole might decide whether and how to send a message. It probably is premature to try to develop the text of a formal international agreement on the subject. However, this is not the only option. A technique used with some success in the United Nations system is to first address issues through the development of non-binding declarations of principles. For example, the Outer Space Treaty of 1967 originated from such a declaration. A declaration of principles could establish consensus on procedures enabling all humans, through appropriate representatives, to participate in the making of decisions on the sending of communications to an extraterrestrial civilization.

As a starting point for discussion, the draft agreement or declaration might include the following basic principles:

1. The decision on whether or not to send a message to extraterrestrial intelligence should be made by an appropriate international body, broadly representative of Humankind.
2. If a decision is made to send a message to extraterrestrial intelligence, it should be sent on behalf of all Humankind, rather than from individual States or groups.
3. The content of such a message should be developed through an appropriate international process, reflecting a broad consensus.

Annex 2 presents a proposed text of a declaration of principles on the sending of a communication to extraterrestrial intelligence. This is simply a draft, to be revised as necessary in later discussions. However, it provides a starting point for an important and intellectually exciting debate with potentially profound consequences.

## Annexes

- [Annex 1](#): Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence
- [Annex 2](#): Draft Declaration of Principles Concerning Sending Communications with Extraterrestrial Intelligence

## References

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