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EDITORIAL COMMENT

On the Search for Extraterrestrial Intelligence (SETI)

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"Meeting an advanced civilization could be like Native Americans encountering Columbus. That didn't turn out so well for the Native Americans."[1]

In recent years, international lawyers have helped nations establish cooperative arrangements regarding a variety of nontraditional challenges, such as human activities in Antarctica and outer space, the proliferation of nuclear weapons, climate change, and regulation of the internet. Scientific and technological advances—including developments in artificial intelligence, genetic engineering, and nanotechnology—have raised new concerns potentially calling for collective international approaches and responses. This Comment calls attention to another emerging issue that deserves the involvement of international lawyers—the possibility that humanity might make contact with intelligent and technologically advanced life elsewhere in the galaxy and universe. This Comment also considers whether we need a UN treaty or other international measures establishing protocols and international oversight regarding current efforts to search for, contact, and communicate with intelligent extraterrestrial beings and civilizations.

I. Some Background

In 1960, Cornell astronomer Frank Drake trained the radio telescope at the National Radio Observatory at Greenbank, West Virginia, on several nearby stars, hoping to detect interstellar radio transmissions indicating the presence of intelligent life and civilizations ("ETs" or "aliens") on other planets in our "Milky Way" galaxy.[2] While Drake's "Project Ozma" failed to detect any such transmissions, it pioneered what has since become a multinational and broad-based Search for Extraterrestrial Intelligence (SETI)[3] involving not only astronomers

* Of the Board of Editors

[1] Stephen Hawking on the 2016 TV documentary "Steven Hawking's Favorite Places," streamed by the British CuriosityStream video service, and see also the 2010 documentary "Into the Universe with Stephen Hawking," at https://www.youtube.com/watch?v=Oc9Jw8MqhiM.

[2] *See* F.D. Drake, *Project Ozma*, 14 Physics Today 40 (1961).

[3] The writings and other resources concerning the possibility of extraterrestrial intelligent life and humanity's contact with alien civilizations are very extensive. Among many useful discussions, see, for example: Michael A.G. Michaud, Contact with Alien Civilizations: Our Hopes and Fears About Contacting Extraterrestrial Intelligence (2007); Searching for Extraterrestrial Intelligence: SETI Past, Present, and Future (The Frontiers Collection) (H. Paul Schuch ed., 2011); Aliens: The World's Leading Scientists on the Search for Extraterrestrial Life (Jim Al-Khalili ed., 2016); Michael A.G. Michaud, *Ten Decisions that Could Shake the World*, 19 Space Pol'y 131 (2003); Steven Johnson, *Greetings, E.T. (Please Don't Murder Us)*,

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and other space-interested scientists, scientific institutes, and associations, but also national governments, international organizations, and many private individuals.[4]

These SETI-related activities reflect the current surge of interest in the perennial question, "Are we alone in the universe?" Is life—in particular, intelligent and technologically advanced beings such as our human species—unique to planet Earth, or might intelligent and technologically advanced beings and civilizations exist on other planets in our galaxy or other galaxies in the universe? If so, might we contact such extraterrestrial beings and civilizations, what might they be like, and what might be the consequences of such a contact or encounter? Might humanity's contact with an alien civilization offer us enormous benefits from acquiring its advanced knowledge and technology? Or instead, might our attempts to discover, contact, and possibly encounter extraterrestrial civilizations pose grave risks—perhaps existential dangers—for our human species and, if so, should we seek or facilitate such contacts? Finally, in view of the risks and probable global impact of humanity's contact with any extraterrestrial beings and their civilization, should there be greater collective international oversight and regulation of SETI and SETI-related activities and decisions and, indeed, more involvement in such matters by international lawyers?

While as yet we have no evidence of the existence of life—more particularly, intelligent life—elsewhere in the universe, a number of astronomers and other scientists and commentators believe that we are but one among many intelligent and technologically advanced species in the cosmos.[5] Scientists estimate that there are hundreds of billions of stars in our galaxy, as well as

N.Y. TIMES MAG. (June 28, 2017); STEVEN J. DICK, ASTROBIOLOGY, DISCOVERY, AND SOCIETAL IMPACT (2018); DONALD GOLDSMITH, EXOPLANETS: HIDDEN WORLDS AND THE QUEST FOR EXTRATERRESTRIAL LIFE (2018); CARL SAGAN, CONTACT (1985) (the novel and the movie made from it). This subject has also, of course, been extensively and thoughtfully explored in a substantial body of science fiction writings, movies, and television programs. For a well-regarded recent example, see LIU CIXIN, THE THREE-BODY PROBLEM (English translation, 2014). For excellent recent discussions of many of the legal and other developments and issues discussed in this Comment, see particularly: FRANCIS LYALL AND PAUL B. LARSEN, SPACE LAW: A TREATISE, at ch. 17 (2d ed. 2018); and John Gertz, *Post-detection SETI Protocols & METI: The Time Has Come to Regulate Them Both*, 69 J. BRIT. INTERPLANETARY SOC'Y 263 (2016). Wikipedia offers online and informative articles—usually periodically updated and footnoted with references to primary resources—on many SETI-related matters mentioned in this Comment. I have drawn on a number of them, particularly for my "Background" discussion and, as will be indicated in footnotes, certain other topics. *See, e.g.*, Wikipedia, *Search for Extraterrestrial Intelligence*, *at* https://en.wikipedia.org/wiki/Search_for_extraterrestrial_intelligence; Wikipedia, *Potential Cultural Impact of Extraterrestrial Contact*, *at* https://en.wikipedia.org/wiki/Potential_cultural_impact_of_extraterrestrial_contact); Wikipedia, *Active SETI*, *at* https://en.wikipedia.org/wiki/Active_SETI; Wikipedia, *METI (Messaging Extraterrestrial Intelligence)*, *at* https://en.wikipedia.org/wiki/METI_(Messaging_Extraterrestrial_Intelligence); Wikipedia, *Post-detection Policy*, *at* https://en.wikipedia.org/wiki/Post-detection_policy; Wikipedia, *Extraterrestrial Life*, *at* https://en.wikipedia.org/wiki/Extraterrestrial_life.

[4] Some scientific institutions and programs involved in SETI-related research or activities include: SETI Institute; University of California, Berkeley, SETI Research Center; SETI League Inc.; METI International; International Academy of Astronautics and its Permanent Committee on SETI; Harvard University SETI program; International Institute of Space Law; International Astronomical Union; International Union of Radio; British Interplanetary Society; UK SETI Research Network; and Committee on Space Research. The leading U.S. government agency likely to be concerned with SETI-related activity is the National Aeronautics and Space Agency (NASA). The most important international organization likely to be involved in SETI-related concerns is the United Nations Office of Outer Space Affairs (UNOOSA) and its Committee on the Peaceful Uses of Outer Space (COPUOS).

[5] The so-called "Drake equation," proposed by Frank Drake in 1961, is a widely accepted tool used by the scientific community to estimate the probable number of technologically advanced and communicative extraterrestrial civilizations in our galaxy. The "equation" summarizes the factors likely to play a role in the emergence of intelligent extraterrestrial life, development of an alien civilization, and the possibility of detecting it, such as the average rate of planet formation in the galaxy, the fraction of planets that can potentially support life and on which intelligent life develops, the fraction of such planets that develop technology capable of broadcasting messages into space, and the length of time it takes such civilizations do so. The "equation" suggests that, as a matter of probability, even if the fraction of planets meeting all of these requirements is very small, the existence of billions of

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billions of other galaxies in the universe; that, as NASA's Kepler space telescope and new Transiting Exoplanet Survey Satellite have established, many, if not most, stars host one or more planets, suggesting many billions of planets in our own galaxy alone; and that some of these exoplanets are similar to Earth—rocky and in so-called "Goldilocks" orbits relative to their host star, possibly having liquid water, and with other conditions favorable to the emergence and evolution of life.[6] While we are not yet sure how life emerged on Earth, SETI proponents argue it is unlikely that life, including intelligent life, would have appeared only on Earth but not on some of these Earth-like exoplanets as well. Moreover, the Earth is only about four billion years old and our human species, civilizations, and technology have emerged only within the last 200,000 years or so—very recently as compared with the formation of the universe some fourteen billion years ago. Consequently, intelligent alien life and civilizations may have appeared on at least some of these Earth-like exoplanets thousands or even millions of years before us and to have developed knowledge, cultures, and technology now far in advance of our own.

Most SETI-related activities have been essentially "passive," using powerful radio telescopes in a number of countries to try to detect radio or other electromagnetic signals from distant stars indicating the presence of technologically advanced ET civilizations.[7] The likelihood of more such SETI radio telescope searches has recently received several boosts. In 2015, Russian billionaire Yuri Milner, together with astrophysicist Stephen Hawking, established a $100 million "Breakthrough Listen" program which will fund a major expansion of such efforts.[8] And in 2019, the Chinese government completed and began operating its new "FAST" radio telescope, one of the world's largest, which has a scientific mission specifically including searching for interstellar messages and perhaps making China the first nation to contact an interstellar alien civilization.[9]

planets in the galaxy makes it likely that, nevertheless, there are many technologically advanced alien civilizations in our galaxy. *See, e.g.*, Elizabeth Howell, *Drake Equation: Estimating the Odds of Finding E.T.*, SPACE.COM (Apr. 6, 2018), *at* https://www.space.com/25219-drake-equation.html; Wikipedia, *Drake Equation*, *at* https://en.wikipedia.org/wiki/Drake_equation. Some scientists and others are skeptical, however. In 1950, Enrico Fermi, the Italian physicist instrumental in the development of the atomic bomb, is reported to have asked "Where is everybody?," expressing what has become known as the "Fermi paradox"—the apparent contradiction between estimates for the existence of many alien civilizations and the fact that as yet we have had no contact or other evidence of them. *See, e.g.*, Elizabeth Howell, *Fermi Paradox: Where Are the Aliens?*, SPACE.COM (Apr. 27, 2018), *at* https://www.space.com/25325-fermi-paradox.html; Wikipedia, *Fermi Paradox*, *at* https://en.wikipedia.org/wiki/Fermi_paradox. While the lack of such contact—the so-called "great silence"—may be explained by the nonexistence of intelligent ETs and alien civilizations, SETI proponents suggest alternative explanations. These include that: alien civilizations are sparse; have not developed communications technology we could detect; are not interested in, have an ethic of not interfering with, or fear contacting us; are too distant to contact us; or they have already destroyed themselves. *See, e.g.*, STEPHEN WEBB, IF THE UNIVERSE IS TEEMING WITH ALIENS . . . WHERE IS EVERYBODY? SEVENTY-FIVE SOLUTIONS TO THE FERMI PARADOX AND THE PROBLEM OF EXTRATERRESTRIAL LIFE (SCIENCE AND FICTION) (2d ed. 2015); Sarah Kaplan, *Scientists Believe There's Other Life in the Universe. Why Haven't We Found It Yet?*, WASH. POST (July 21, 2015), *at* https://www.washingtonpost.com/news/morning-mix/wp/2015/07/21/scientists-believe-theres-other-life-in-the-universe-why-havent-we-found-it-yet.

[6] *See, e.g.*, Amina Khan, *Astronomers Find a Planet Where Life Might Thrive and Just 31 Light Years Away*, L.A. TIMES (July 31, 2019), *at* www.latimes.com/science/story/2019-07-31-superearth); Michael Greshko, *Water Found on a Potentially Life-Friendly Alien Planet*, NAT'L GEOGRAPHIC (Sept. 11, 2019), *at* https://www.nationalgeographic.com/science/2019/09/first-water-found-in-habitable-exoplanets-atmosphere-hubble-kepler-k2-18b.

[7] *See, e.g.*, Andrew J. LePage & Alan M. MacRobert, *SETI Searches Today*, SKY & TELESCOPE, at 44–48 (Dec. 1998). Some important U.S. radio telescopes involved in SETI searches include the Green Bank radio telescope in West Virginia, the Allen Array at the University of California in Berkeley, California, and the Arecibo telescope in Puerto Rico.

[8] *See, e.g.*, Breakthrough Initiatives, *at* https://breakthroughinitiatives.org/news.

[9] *See, e.g.*, Katie Hunt, *China's Giant Space Telescope Starts Search for Alien Life*, SPACE + SCI. (Sept. 21, 2016), *at* https://www.cnn.com/2016/09/21/health/china-fast-telescope-search-for-aliens/index.html; Wikipedia, *Five-*

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However, some SETI-related programs—so-called "Active SETI" or Messaging Extraterrestrial Intelligence (METI)—involve not simply passively listening for interstellar messages, but deliberately trying to announce to possible ET civilizations humanity's presence on Earth and inform them about Earth and our civilization. Since Drake's 1960 "Ozma" project, a number of such messages have been sent from radio telescopes in various countries to distant stars, in hopes that an alien civilization may detect and decipher them.[10] The "Arecibo Message," composed by Frank Drake and Cornell physicist Carl Sagan and sent from the Arecibo radio telescope in Puerto Rico toward the star M13 some 25,000 light years from Earth, is a widely reported example.[11] In addition, the U.S. National Aeronautics and Space Agency (NASA) placed plaques on its 1972 Pioneer 10 and 1973 Pioneer 11 space probes as well as a "golden record" on its 1977 Voyager I and II space probes similarly describing humanity's existence on Earth to any ET civilization that might intercept them.[12] More recently, in 2015 a group of prominent scientists formed a new association, METI International, to advocate and support additional METI efforts and programs.[13]

These efforts have their critics. Some question SETI's broad justification—whether the costs of "Passive SETI"—including the diversion of scientific resources such as radio telescopes or space probes to SETI rather than more traditional scientific purposes—are worthwhile, considering the remote chance of detecting any interstellar communications or making contact with an ET civilization. However, the major controversy concerns METI.

METI critics, who include well-respected scientists and other prominent individuals, argue that, in view of what they believe are the significant, perhaps existential, risks involved, we should not do anything—such as either sending or replying to any interstellar messages—that might alert or reveal humanity's existence on Earth to any extraterrestrial civilizations.[14] They warn that, while we may hope an advanced alien civilization will be benign and altruistic, it

Hundred-Meter Aperture Spherical Telescope, *at* https://en.wikipedia.org/wiki/Five_hundred_meter_Aperture_Spherical_Telescope; Ross Anderson, *What Happens if China Makes First Contact?*," ATLANTIC (Dec. 2017), *at* https://www.theatlantic.com/magazine/archive/2017/12/what-happens-if-china-makes-first-contact/544131.

[10] To date, at least twelve such messages have been sent. *See, e.g.*, Meilan Solly, *New Catalogue Describes Everything We've Sent into Space*, SMITHSONIAN.COM (Nov. 20, 2019), *at* https://www.smithsonianmag.com/smart-news/new-catalogue-offers-comprehensive-account-artifacts-messages-weve-sent-space-180970861; Wikipedia, *Active SETI*, *supra* note 3, "Realized Projects"; Wikipedia, *List of Interstellar Radio Messages*, *at* https://en.wikipedia.org/wiki/List_of_interstellar_radio_messages.

[11] *See* SETI Institute, *Arecibo Message*, *at* https://www.seti.org/seti-institute/project/details/arecibo-message; Wikipedia, *Arecibo Message*, *at* https://en.wikipedia.org/wiki/Arecibo_message.

[12] *See, e.g.*, Joss Fong, *The 116 Photos NASA Picked to Explain Our World to Aliens*, VOX (Nov. 11, 2015), *at* https://www.vox.com/2015/11/11/9702090/voyager-golden-record-pictures.

[13] See the "Strategic Plan 2015–2018" that was adopted by METI International's Board of Directors on August 19, 2015 and the version that was amended on February 3, 2016, at http://meti.org/en/strategic-plan-0. *See also Contacting Extraterrestrials: Nanoo Nanoo, Earth Invites the Inhabitants of a Distant Planet to Chat*, ECONOMIST (Nov. 18, 2017) (reporting METI's "Sonar calling GJ273b" message from Norway's Remsfjord radio antenna toward Luyten's star 12.4 light years from Earth).

[14] *See, e.g.*, David Brin, *The Search for Extra-Terrestrial Intelligence: Should We Message ET?*, 67 J. BRIT. INTERPLANETARY SOC'Y 8 (Jan. 2014); Marko Kovic, *Contacting Aliens Is a Horrible Idea: Actively Messaging Extraterrestrial Civilizations Would Be Humankind's Final Folly*, MEDIUM (Dec. 7, 2017), *at* https://medium.com/@marko_kovic/contacting-aliens-is-a-horrible-idea-d6f4e0ada22; Johnson, *supra* note 3. See also the July 2015 statement "Regarding Messaging to Extraterrestrial Intelligence (METI)/Active Searches for Extraterrestrial Intelligence (Active SETI)" signed by twenty-eight scientists, stating that "intentionally signaling other civilizations in the Milky Way Galaxy raises concerns for all the people of Earth about both the message and the consequences of contact. A worldwide scientific, political and humanitarian discussion must be held before any message is sent," at https://setiathome.berkeley.edu/meti_statement_0.html.

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may instead be malign, predatory, or indifferent, intent only on exploiting, colonizing, or even destroying our human species, and have advanced technologies and weapons we cannot resist. As the distinguished English theoretical physicist Stephen Hawking and other critics have stressed, human history and experience strongly suggest that, when a more-technologically advanced and less-technologically advanced civilization come into contact, the less technologically-advanced is usually the loser. Moreover, contact with an alien civilization could have profound—perhaps disruptive—religious, cultural, and other impacts on human societies. Consequently, they urge that our safest and wisest course is to "lie low," hoping that an advanced and possibly aggressive alien civilization will simply not notice or bother us.

METI proponents answer that these critics' concerns are overblown and, in any case, moot.[15] They point out that, for more than a century, we have been leaking radio, TV, and other electromagnetic signals from Earth out into space and that NASA's "New Horizon" and other deep-space probes have already left our solar system on journeys far into our galaxy. Consequently, advanced ET civilizations may already be aware of our existence, and it is now too late for us to hide. They also argue that, in view of the vast interstellar distances involved and inherent physical limits on the speed of interstellar communication and travel, it is unlikely that any alien civilization will be able to detect and receive any of our messages, much less travel to Earth and actually threaten us, if at all, for a very long time. The Arecibo message will not even reach M13 for almost 25,000 years!

II. Existing Legal Framework

At present, there are no legally binding international agreements specifically addressing SETI or METI activities and issues. The 1967 UN Outer Space Treaty at least makes clear that all human activities relating to outer space are of international concern, and expressly mandates freedom of scientific investigation and international cooperation in outer space investigations and activities.[16] But none of the other present UN space treaties applies or speaks directly to these issues.[17]

[15] *See, e.g.*, Seth Shostak, *Why Stephen Hawking Is Light Years from the Truth about "Dangerous Aliens,"* Guardian (Sept. 27, 2016), *at* https://www.theguardian.com/commentisfree/2016/sep/27/stephen-hawking-light-years-dangerous-aliens; Seth Shostak, *Should We Keep a Low Profile in Space?*, N.Y. Times (Mar. 27, 2015), *at* https://www.nytimes.com/2015/03/28/opinion/sunday/messaging-the-stars.html. *See also, e.g.*, METI International Special, International Space Society Development Conference (May 25, 2017), *at* http://isdc2017.nss.org/meti-international-special.

[16] UN Treaty on Principles Governing the Activity of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty), 18 UST 2410, 610 USTS 205 (1967), 61 ILM 386 (1968). Article I of the Treaty provides in part: "The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries . . . and shall be the province of all mankind." Article XI provides: "In order to promote international cooperation in the peaceful exploration and use of outer space, States Parties to the Treaty conducting activities in outer space, including the moon and other celestial bodies, agree to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities. On receiving the said information, the Secretary General of the United Nations should be prepared to disseminate it immediately and effectively." For an extensive discussion of the treaty, see, for example, Lyall & Larsen, *supra* note 3, at ch. 3.

[17] *But see* Lyall & Larsen, *supra* note 3, at 494 (noting that: "The major body of international law relevant to most SETI enquiry is the allocation and use of the radio spectrum secured through the mechanisms of the International Telecommunication Union (the ITU)."). The authors give a detailed description of the ITU and its Radio Regulations in Chapter 8 of their book. See also the *AJIL Unbound* Symposium on "The New Space

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Responding to these concerns, the SETI community has developed several protocols or declarations setting out principles and procedures that scientists, institutes, researchers, and other participants in SETI-related activities ought to observe.[18] The Declaration of Principles for Activities Following the Detection of Extraterrestrial Intelligence—the so-called "First Protocol"—was developed and adopted in 1989 and revised in 2010 by the SETI Permanent Committee of the International Academy of Aeronautics (IAA) and has been endorsed or approved by many leading space-involved associations and most SETI researchers and institutions.[19] It establishes principles and procedures regarding the confirmation and dissemination of information relating to a detection of ET intelligence and provides in substance, that: (1) all SETI experiments should be conducted transparently; (2) discoverers should make all efforts to verify the authenticity of a supposed detection of ET intelligence; (3) if a detection's authenticity is confirmed, discoverers should openly disclose the detection to the public, scientific community, and UN Security Council and make any data available to the scientific community; and (4) if a detection is confirmed, a Post-Detection Task Group should be established under the auspices of the International Academy of Astronautics' SETI Permanent Study Group to assist in any matter that might arise and its subsequent scientific and public analyses. While the First Protocol primarily addresses "passive" SETI concerns, its Principle 8 provides: "Response to Signals: in the case of a confirmed detection of a signal, signatories to this Declaration will not respond without first seeking guidance and consent of a broadly representative body, such as the United Nations."

A proposed second Protocol, the Declaration of Principles Concerning Sending Communications to Extraterrestrial Intelligence, has also been prepared under the auspices of the SETI Committee of the IAA, in consultation with Committee 51 of the International Astronautical Union, by a special subcommittee under the leadership of Michael Michaud.[20] It has been endorsed by the Academy, the International Institute of Space Law, and a number of other space and astronomy organizations, and sent to a number of UN member states with a request to bring it to the attention of the UN Committee on the Peaceful Use of Outer Space (COPUOS) for its further study and action. However, the Declaration has not yet been opened for acceptance or endorsement by the individual scientists, institutions, or researchers engaged in SETI-related or METI activities.

Race," 113 AJIL 92–129 (2019), *at* https://www.cambridge.org/core/journals/american-journal-of-international-law/ajil-unbound-by-symposium/the-new-space-race.

[18] *See generally, e.g.*, Lyall & Larsen, *supra* note 3, "SETI Protocols," at 500–05; IAA SETI Permanent Committee, *IAA SETI Permanent Committee SETI Protocols*, *at* http://www.setileague.org/iaaseti/protocol.htm. The IAA SETI Permanent Study Group has also developed several "scales" as tools to assist in evaluating components of SETI-related decisions: the Rio Scale to quantify the impact of any public announcement regarding the detection of ET intelligence; the San Marino Scale regarding risks of transmissions from Earth; and the proposed London Scale regarding the detection of intelligent alien life.

[19] IAA SETI Permanent Committee, *Declarations of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence*, *at* http://setileague.org/iaaseti/protdet.htm; Lyall & Larsen, *supra* note 3, "SETI Protocols," at 500–05.

[20] *See, e.g.*, Lyall & Larsen, *supra* note 3; IAA SETI Permanent Committee, *Draft Declaration of Principles Concerning Sending Communications to Extraterrestrial Intelligence*, *at* https://iaaseti.org/en/seti-reply-protocols; IAA, *IAA Position Paper: A Decision Process for Examining the Possibility of Sending Communications to Extraterrestrial Civilizations, A Proposal* (2005), *available at* https://iaaweb.org/iaa/Studies/seti.pdf.

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Addressing METI issues more directly, the Draft Communications Declaration proposes an international process for deciding whether and how "Humankind" (its term) should send communications to an extraterrestrial civilization. The Declaration includes the following general 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 an extraterrestrial intelligence, it should be sent on behalf of all Humankind, rather than from individual states or groups; and (3) the content of such a message should be developed through an appropriate international process, reflecting a broad consensus. Principle VIII of the proposed Draft Declaration provides expressly that: "No communication to extraterrestrial intelligence should be sent by any state until all appropriate consultations have taken place. States shall not cooperate with attempts to communicate with extraterrestrial intelligence that do not conform to the principles of this Declaration."

While these protocols provide very useful guidelines, neither of them is legally binding; they are, in international lawyers' parlance, at best, soft law. Nation-states are not parties to the Protocols, and they are intended to apply only to those SETI-involved scientists, institutes, and researchers voluntarily accepting or endorsing them. Since neither protocol is legally binding and enforcement mechanisms are lacking, compliance with their principles is uncertain. While in most cases considerations of personal and professional responsibility can be expected to bring about observance, special situations may arise where strong governmental or other pressures lead to noncompliance.

III. Developing a Treaty or Soft Law

In view of the importance of SETI and METI issues and the nonbinding and other limitations of the SETI protocols, some commentators have proposed enshrining the principles of both protocols—perhaps with provisions addressing additional SETI and METI issues—in an international agreement legally binding upon states, most likely prepared under the auspices of the UN Committee on the Peaceful Use of Outer Space (COPUOS) and its Office of Legal Affairs.[21]

There are several arguments for preparing such a Treaty, including the following. First, the "Breakthrough Listen" initiative, China's new FAST radio telescope, and other recent SETI programs have increased chances for "First Contact," which, while unlikely, still might occur at any time, and the consequent need for currently establishing a legally binding or more robust international oversight and regulation of SETI-related activities. Second, since SETI and METI could have consequences for all nations and peoples, UN and COPUOS

[21] For discussions generally noting SETI-related issues and/or calling for international attention, agreements, oversight and/or regulation of SETI-related activities, see for example: Lyall & Larsen, *supra* note 3, at 504–05; Gertz, *supra* note 3; Michael A.G. Michaud, *An International Agreement Concerning the Detection of Extraterrestrial Intelligence*, 26 Acta Astronautica 291 (1992); Allen E. Goodman, *Diplomacy and the Search for Extraterrestrial Intelligence*, 21 Acta Astronautica 137 (Feb. 1990); P. Ney, *An Extraterrestrial Contact Treaty?*, 38 J. Brit. Interplanetary Soc'y 521 (1986); Martin Dominik & John C. Zarnecki, *The Detection of Extra-Terrestrial Life and the Consequences for Science and Society*, 369 Phil. Transactions Royal Soc'y A 409 (2011); Mazlan Othman, *Supra-Earth Affairs*, 369 Phil. Transactions Royal Soc'y A 693 (2011); Francis Lyall, *SETI and the Law: What if the Search Succeeds?*, 14 Space Pol'y 75 (May 1998); Glenn Harlan Reynolds, *International Space Law: Into the Twenty-First Century*, 25 Vand J. Transnat'l L. 225 (1992).

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consideration of SETI issues would ensure a broader and more inclusive nation-state and international scientific and other expert participation and involvement in these issues than the SETI community alone can now provide. Third, a treaty on this subject should be relatively easy for COPUOS to consider and prepare since much of the study, preparatory discussion, and drafting has already been done by the SETI community in developing the two Protocols previously suggested. Finally, UN and COPUOS involvement might allow and spur consideration of a broader treaty dealing more generally with additional SETI and METI issues—such as "who should speak for Earth?" and how our international community might deal with an actual encounter with ETs or an alien civilization.[22]

The principal arguments against preparing such a treaty might include the following. First, it is unnecessary and untimely, since the existence of ET intelligence and civilizations is unproven and debated and the likelihood of our contact with an alien civilization, especially in the immediate future, is remote. Second, the existing SETI protocols already deal adequately with these issues and UN and COPUOS consideration and involvement may only confuse and possibly reduce their authority and effectiveness. Third, UN and COPUOS consideration of such a treaty may delay or divert the UN and COPUOS from dealing with more important and urgent matters and issues. And finally, in any event, any need for further international oversight and involvement might be better dealt with, if at all, not by a formal treaty, but instead either by COPUOS's preparation of a UN Declaration regarding these SETI issues, which might strengthen the normative influence of the existing SETI protocols, or by establishing a continuing UN committee, perhaps under the auspices of the UN Security Council and/or secretary-general, to monitor and advise them on any issues regarding SETI, METI, or "First Contact" that might arise.

In my opinion, there is no immediate need to seek a formal and legally binding UN treaty regarding SETI-related activities. As suggested, the likelihood of our soon contacting extraterrestrial beings and civilizations is speculative and remote. The issues raised by SETI and METI are of principal concern only to the relatively few countries and scientists—mostly from developed nations—currently engaged in SETI research. Moreover, the existing SETI protocols and principles—developed by experts most involved—already well address the most important of these SETI and METI issues. Even though the SETI protocols are not legally binding, they are in practice likely to be observed by the professionally responsible researchers involved. Consequently, many UN members may have little interest in participating in the development of such a treaty and may regard efforts to do so an unnecessary and wasteful diversion of UN resources from other more immediate and important problems. Indeed, if such a treaty was in fact developed but received only limited ratifications and

[22] *See, e.g.*, Michael A.G. Michaud, *If Contact Occurs, Who Speaks for Earth?*, 78 FOR. SERV. J. 23 (Apr. 2001). In September 2010, several British newspapers (*The Sunday Times*, *The Guardian*, and *The Telegraph*) as well as other media, reported, incorrectly, that the United Nations planned to appoint Malaysian astrophysicist Mazlan Othman, then director of UNOOSA, as the UN's ambassador to act as the first point of contact and/or meet aliens trying to communicate with or coming to Earth. However, the reports turned out to be false. *The Guardian* reported that Dr. Othman said: "It sounds really cool, but I have to deny it." *See, e.g.*, Matthew Weaver, *UN Plan for "Alien Ambassador" a Case of Science Fiction?*, GUARDIAN (Sept. 27, 2010), *at* https://www.theguardian.com/news/blog/2010/sep/27/un-alien-ambassador-mazlan-othman; N.L. *Alien Diplomacy: The UN's Secretive Alien Ambassador*, ECONOMIST (Sept. 28, 2010), *at* https://www.economist.com/babbage/2010/09/28/the-uns-secretive-alien-ambassador.

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support, its effect might be to weaken rather than buttress the normative principles set out in the protocols.

However, even if the arguments against the international community's now seeking a binding international instrument regarding SETI-related issues are persuasive, there are nevertheless good reasons why the UN and COPUOS should currently consider adopting some type of nonbinding measures concerning such issues.[23] For example, a UN General Assembly resolution or declaration of principles could serve several useful purposes—calling the international community's attention to the importance of SETI and METI issues; furnishing an occasion for broader international participation and discussion of such issues; endorsing and reinforcing the principles set out in the existing SETI protocols; providing a basis for related national legislation; establishing procedures for international oversight and monitoring of SETI and METI activities; and perhaps suggesting the study and adoption of other desirable SETI-related initiatives and measures.

As extensively discussed in the international law literature,[24] such soft law instruments and measures have helped nations to cooperate in dealing with many common issues and problems by providing norms, standards, and procedures which most countries will generally respect and observe. Moreover, since such soft law instruments are not in themselves legally binding, they might be regarded as less risky and thus easier for nations to develop, agree to, and support than formal "hard-law" treaties. As Francis Lyall and Paul B. Pearson point out in their treatise on *Space Law*, UN General Assembly declarations, resolutions, and other soft law measures may have a wider influence on international space law developments, including the subsequent negotiation of legally binding international agreements concerning the same subjects and the development of customary international law.[25]

The chances of our contact or encounter with extraterrestrial beings or civilizations may be remote. Yet, as Stephen Hawking and others have argued, the risks and impact of such a contact for our human species could be very great—even existential. Consequently, the issues raised by SETI and METI merit the international community's, COPUOS's—and international lawyers'—timely concern and consideration.

[23] In her article on *Supra-Earth Affairs*, *supra* note 21, Dr. Mazlan Othman, then director of UNOOSA, noted, as summarized in the abstract to her article, that: "The United Nations briefly considered the issue of extraterrestrial intelligence at the 32nd session of the General Assembly in 1977. As a result, the Office of Outer Space Affairs was tasked to prepare a document on issues related to 'messages to extraterrestrial civilizations,' but this area has not been followed through in more recent times." *Id.* at 693.

[24] There is an extensive literature discussing the tradeoffs between formal and legally binding treaties and other international agreements and soft-law or legally nonbinding international instruments, such as UN General Assembly Declarations and Resolutions, as well as the potential influence and effects of "soft-law" instruments in the development of "harder" and legally binding customary law. *See generally, e.g.*, INFORMAL INTERNATIONAL LAWMAKING (Joost Pauwelyn, Ramses A. Wessel & Jan Wouters eds., 2012); Gregory C. Shaffer & Mark Pollock, *Hard and Soft Law: Alternative Complements and Antagonists in International Governance*, 94 MINN. L. REV. 706 (2010). And, as regards space law more specifically, see, for example: LYALL & LARSEN, *supra* note 3, at ch. 2 (especially "UN Resolutions," at 39–45, and "Soft Law," at 45–48); SOFT LAW IN OUTER SPACE: THE FUNCTION OF NON-BINDING NORMS IN INTERNATIONAL SPACE LAW (Irmgard Marboe ed., 2012); Bran Wessell *The Rule of Law in Outer Space: The Effect of Treaties and Non-binding Norms in International Space Law*, 35 HASTINGS INT'L COMP. L. REV. 289 (2012).

[25] *See generally* LYALL & LARSEN, *supra* note 3, at 39–45 (noting, inter alia, that "the generality of states are willing to lay out principles and rules under which the exploration and use of space should be conducted and municipal space affairs be arranged," "the evidence so far at least is that the space-competent states do generally comply with the broad principles expressed in these resolutions," and that "the history of compliance with the UN Space Resolutions has swiftly elevated each of them at least to the category of 'soft law'").

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