

THE (SECOND) RACE TO SPACE: A HUMAN RIGHTS ANALYSIS OF RAPID SPACE INNOVATION

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I. INTRODUCTION

With 4,550 active satellites in orbit as of September 1, 2021, it is clear that space innovation is rapidly expanding.¹ Scientists estimate that within the next couple of years, companies will launch more satellites into space than ever before.² SpaceX and OneWeb recently began routinely launching satellites into space to develop satellite internet capabilities that will reach even the most desolate areas on Earth.³ This high-end internet coverage could result in a billion-dollar industry⁴ and will provide internet access to poor, remote areas and to areas upset by natural disasters,⁵ posing a solution to an emerging human rights issue – the right to internet access.⁶

¹ *UCS Satellite Database*, UNION OF CONCERNED SCIENTISTS (September 1, 2021), https://ucsusa.org/resources/satellite-database?_ga=2.206523283.1848871521.1598077135-464362950.1598077135. See Anusuya Datta, *How Many Satellites Orbit Earth and Why Space Traffic Management Is Crucial*, GEOSPATIAL WORLD (Aug. 23, 2020), <https://www.geospatialworld.net/blogs/how-many-satellites-orbit-earth-and-why-space-traffic-management-is-crucial/> (stating that on April 1, 2020, there were only 2,666 satellites in space).

² Lyon Brad King, *Space Tech Has Outpaced Space Law, and We're at Risk of Killing Innovation*, TECHCRUNCH (Jul. 11, 2018, 3:35 PM), <https://techcrunch.com/2018/07/11/space-tech-has-outpaced-space-law-and-were-at-risk-of-killing-innovation/>.

³ See Greg Ritchie & Thomas Seal, *Why Low-Earth Orbit Satellites Are the New Space Race*, THE WASHINGTON POST (July 10, 2020), https://www.washingtonpost.com/business/why-low-earth-orbit-satellites-are-the-new-space-race/2020/07/10/51ef1ff8-c2bb-11ea-8908-68a2b9eae9e0_story.html (explaining how space leaders plan to provide high end internet coverage to various companies and to “regions too remote or poor to install it on the ground.”).

⁴ See David Jarvis, Mark Casey & Craig Wigginton, *High Speed From Low Orbit: A Broadband Revolution or a Bunch of Space Junk?*, DELOITTE (Dec. 9, 2019), <https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2020/satellite-broadband-internet.html> (“Morgan Stanley estimates that the satellite broadband market could be worth as much as US\$400 billion by 2040—fully 40 percent of the estimated US\$1 trillion global space industry that year.”).

⁵ See *How Satellite Internet is Connecting the World*, HUGHESNET, <https://www.hughesnet.com/media/how-satellite-internet-connecting-world> (last visited Sept. 2, 2021) (stating that satellite internet can be “used in places in which physical cable and telephone infrastructure has been damaged or destroyed” such as after Hurricane Maria in Puerto Rico where it was used to coordinate rebuilding efforts).

⁶ See David Rothkopf, *Is Unrestricted Internet Access a Modern Human Right?*, FOREIGN POLICY (Feb. 2, 2015, 11:26 AM), <https://foreignpolicy.com/2015/02/02/unrestricted-internet-access-human-rights-technology-constitution/> (explaining how modern day internet access is a human right as it is the modern equivalent to the rights of free speech, expression, and information).

Industry leaders SpaceX,⁷ Amazon,⁸ and OneWeb⁹ have no plans to curb their satellite internet projects. SpaceX plans to initially launch 12,000 satellites with an additional 30,000 in the future, Amazon plans to launch 3,236 satellites, and OneWeb seeks permission to launch up to 48,000 satellites.¹⁰ Industry leaders essentially have free reign regarding the limits of their satellite constellations with the sole regulation being that each company must obtain approval from their own country's national communications regulators prior to launching satellites into orbit.¹¹

The mass quantity of unregulated satellites infringe upon a multitude of other individual rights. The satellite constellations emit bright lights that can interfere with astronomers' scientific research and telescopic photography and interfere with the individual's right to a clear night sky.¹² Current estimates on the magnitude of these satellites show that they are likely visible from very dark sites even without telescopes, further interfering with individuals' rights to a clear night sky.¹³ As SpaceX and similar companies

⁷ SpaceX's satellite constellation initiative, Starlink, plans to have near global internet coverage by 2021. Starlink states they will "deliver high speed broadband internet to locations where access has been unreliable, expensive, or completely unavailable." Currently, Starlink meets all regulatory and industry standards. STARLINK, starlink.com (last visited Sept. 3, 2021).

⁸ Amazon's Kuiper initiative is in its initial stages. Amazon's David Limp stated that Kuiper will bring internet to places with unreliable or nonexistent internet access. In addition to high-speed broadband internet, Kuiper will also provide backhaul for the 5G deployment across the United States. Elizabeth Howell, *The FCC Has Approved Amazon's Plan for Its Kuiper Satellite Constellation. Here's What That Means.*, SPACE (Aug. 20, 2020), <https://www.space.com/amazon-kuiper-satellite-constellation-fcc-approval.html>.

⁹ OneWeb's satellite constellation poses a "connection for people all over the globe[.]" Their initiative aims to provide affordable internet worldwide with a goal to deliver full commercial services at the end of 2021. *OneWeb Satellites Constellation*, AIRBUS, <https://www.airbus.com/space/telecommunications-satellites/oneweb-satellites-connection-for-people-all-over-the-globe.html> (last visited Oct. 2, 2020).

¹⁰ Loren Grush, *A Future with Tens of Thousands of New Satellites Could 'Fundamentally Change' Astronomy: Report*, THE VERGE (Aug. 26, 2020), <https://www.theverge.com/2020/8/26/21401455/satellite-mega-constellations-astronomy-spacex-amazon-oneweb-bright-internet-space>.

¹¹ See Ritchie & Seal, *supra* note 3 ("[S]atellite operators have to get approval for their launch and orbit plans from national communications regulators, and anyone planning to sell services to the U.S. needs to go before the Federal Communications Commission.")

¹² See Nadia Drake, *Will Elon Musk's Starlink Satellites Harm Astronomy? Here's What We Know.*, NATIONAL GEOGRAPHIC (May 29, 2019), <https://www.nationalgeographic.com/science/2019/05/elon-musk-starlink-internet-satellites-trouble-for-astronomy-light-pollution/> (claiming that satellite constellations will be visible with the naked eye from dark sites on earth and that researchers will have to deal with satellites streaking through their images).

¹³ See *id.* Initial estimates placed satellites constellations around an apparent magnitude of 2, slightly dimmer than the north star. Later revised estimates placed the magnitude around 5 to 7, which still suggest that an unaided eye could see these satellites, even from the darkest sites.

continue launching satellites into orbit, scientists worry that these companies will ruin the dark night sky for the entire planet.¹⁴ Lastly, many are concerned with the unrestrained power of leaders in the internet space race which may “create a space-junk nightmare” or lead to massive collisions completely blocking human access to orbit.¹⁵ All of these rights are in serious danger without increased oversight, regulation, or coordination by the international community.

Part II of this Note explores the background of the conflict between the right to internet access and the right to clear skies as well as some prior approaches to resolving similar conflicts. Part III analyzes the current inability to regulate the space industry, examines possible approaches to protecting these rights, and envisions the reality of the future of these rights if regulations are not enacted. Part IV argues for amendments to current space treaties that align with the greater interests of humankind in preserving a clear night sky and astronomy rights while still allowing for innovation and universal internet capabilities.

II. HISTORICAL PERSPECTIVE OF RIGHTS

A. *Defining Human Rights*

The instability and devastation arising from World War II forever changed the world. Nations “vowed to never again allow atrocities like those of [the Second World War] to happen again.”¹⁶ For the first time, nations appeared to work together to acknowledge and protect rights of every individual regardless of color, religion, or creed.¹⁷ Fifty members of the United Nations devised a list of thirty universal human rights and freedoms,

¹⁴ Ramon J. Ryan, Note, *The Fault in our Stars: Challenging the FCC's Treatment of Commercial Satellites as Categorically Excluded from Review Under the National Environmental Policy Act*, 22 VAND. J. ENT. & TECH. L. 923, 925 (2020) (citing Jonathan O'Callaghan, *SpaceX's Starlink Could Change the Night Sky Forever, and Astronomers Are Not Happy*, FORBES (May 27, 2019, 7:42 AM), <https://www.forbes.com/sites/jonathanocallaghan/2019/05/27/spacexs-starlink-could-change-the-night-sky-forever-and-astronomers-are-not-happy/#41bd54bc59b6>) (“Ronald Drimmel, a research astronomer at the Turin Astrophysical Observatory in Italy, warned that ‘Starlink, and other mega constellations, would ruin the sky for everyone on the planet.’”).

¹⁵ Morgan McFall-Johnsen, *SpaceX's Starlink Internet Satellites Could Make Astronomy on Earth 'Impossible' and Create a Space-Junk Nightmare, Some Scientists Warn*, BUSINESS INSIDER (Nov. 16, 2019, 8:31 AM), <https://www.businessinsider.com/spacex-starlink-satellites-risks-astronomy-space-junk-2019-11>.

¹⁶ *History of the Declaration*, UNITED NATIONS, <https://www.un.org/en/about-us/udhr/history-of-the-declaration> (last visited Aug. 31, 2021).

¹⁷ Amnesty Int'l UK, *What Is the Universal Declaration of Human Rights?*, (Oct. 21, 2017, 12:44 AM), <https://www.amnesty.org.uk/universal-declaration-human-rights-UDHR>.

later adopted as the Universal Declaration of Human Rights.¹⁸ The Declaration specifically mentioned the rights to life, liberty, freedom of opinion and expression, education, and an adequate standard of living, among others.¹⁹ Following the adoption of this non-binding Declaration, the application of human rights began to transcend the reach of this international agreement.

Rights-specific conventions in the international community set out to apply human rights to various fields, but the scope of the language is unclear. Many legal scholars advocate for the expansion of the rights language to apply on a greater scale.²⁰ Since the adoption of the Universal Declaration of Human Rights, the United Nations made efforts to expand the reach of human rights to specific classes including women, minorities, and other vulnerable groups.²¹

In a workshop hosted by the European Parliament's Subcommittee on Human Rights, Professor Malcolm Langford stated that advocates should push for expansion.²² Professor Langford acknowledged that recognition of social rights and the rights to development can help unify countries and can lead to support of civil and political rights in developing countries.²³

Professor James Nickel alternatively points to the potential overreach of the rights language, especially within international environmental law.²⁴ He warns that using rights language too loosely may cause people "to claim rights

¹⁸ See *id.* ("The UDHR marked an important shift by daring to say that all human beings are free and equal, regardless of colour, creed or religion. For the first time, a global agreement put human beings, not power politics, at the heart of its agenda.").

¹⁹ See G.A. Res. 217 (III) A, Universal Declaration of Human Rights (Dec. 10, 1948), arts. 3, 19, 25, 26. ("Everyone has the right to life, liberty and the security of person.") ("Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.") ("Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family . . .") ("Everyone has the right to education.").

²⁰ Giulia Bonacquisti, Rosa Freedman, & Malcolm Langford, *Expansion of the Concept of Human Rights: Impact on Rights Promotion and Protection*, EUROPEAN PARLIAMENT'S SUBCOMMITTEE ON HUMAN RIGHTS, 1, 12 (2018). But see David Petrasek, *Human Rights "Inflation"—What's the Problem?*, OPEN GLOBAL RIGHTS (Feb. 19, 2020), <https://www.openglobalrights.org/human-rights-inflation-whats-the-problem/> ("The case for resisting rights expansion is grounded in diverse arguments: too many rights trivializes the concept, . . . or, this expansion creates unrealizable demands, in turn weakening the stature of human rights.").

²¹ *Global Issues: Human Rights*, UNITED NATIONS, <https://www.un.org/en/global-issues/human-rights> (last visited Aug. 31, 2021).

²² Bonacquisti et al., *supra* note 20, at 9.

²³ *Id.* at 9-10.

²⁴ See James W. Nickel, *The Human Right to a Safe Environment: Philosophical Perspectives on Its Scope and Justification*, 18 YALE J. INT'L L. 281, 282 (1993) ("It is better to phrase most environmental discourse in terms of environmental goods, of respect for and responsibilities towards nature, and of obligations to future generations.").

that are excessively metaphorical and rhetorical.”²⁵ Professor Rosa Freedman similarly believes that expanding rights language weakens claims to fundamental human rights, with some states even using this expansion to undermine core civil and political rights.²⁶ Society must strike a careful balance to avoid “needlessly abandon[ing] a valuable normative asset.”²⁷ Rights language inherently drives public interest, which can lead to changes for the greater good of humanity. This balance would not lessen the meaning or importance of ‘rights’ but would still garner public support for proliferation of rights and access.

States can use rights language as a vector to guarantee individual rights. Under international law, there is not a single actor charged with ensuring compliance, so in using rights language, states have more power to act together to “take on the task of correcting for the shortcomings of the rights-violating state.”²⁸

Since human rights can exist in various forms, including “(a) a shared norm of actual human moralities, (b) a justified moral norm supported by strong reasons, (c) a legal right at the national level (where it might be referred to as a ‘civil’ or ‘constitutional’ right), or (d) a legal right within international law[,]” rights language already reaches further than the Universal Declaration of Human Rights initially stated.²⁹ Although scholars disagree on the definition of rights, taking a more all-encompassing approach may lead to greater protection provided by international human rights law, thereby continuing the growth, evolution, and elaboration of fundamental rights and freedoms.³⁰

B. Right to Internet Access

Internet was an unknown concept at the adoption of the Universal Declaration of Human Rights. Yet, in 2011, the United Nations issued a report stating that internet access is a human right,³¹ with most countries backing this

²⁵ *Id.* at 282.

²⁶ Bonacquisti et al., *supra* note 20, at 6.

²⁷ Nickel, *supra* note 24, at 283.

²⁸ Adam S. Chilton, Book Review (reviewing Charles R. Beitz, *The Idea of Human Rights*), 25 HARV. HUM. RTS. J. 237, 239 (2012).

²⁹ JAMES NICKEL, *Human Rights*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY, (Edward N. Zalta ed., 2019) (internal quotations omitted).

³⁰ See *The Foundation of International Human Rights Law*, UNITED NATIONS, <https://www.un.org/en/about-us/udhr/foundation-of-international-human-rights-law> (last visited Oct. 10, 2020) (stating that over time specific human rights treaties have become more focused and specialized, but now human rights treaties as a whole address a wider reach of international concerns).

³¹ See David Kaye, *Human Rights Council, Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression*, U.N. Doc.

proposition.³² In today's modern world, internet access is necessary to participate in economics, politics, social interactions, and cultural expression.³³ Although internet access is not widely accessible in today's world, this right to internet access stems from numerous freedoms universally recognized: freedom of expression, right to education, and right to development.

Internet provides individuals with both freedom of expression and access to information as the world increasingly turns to the Internet as a forum to exchange opinions and ideas.³⁴ Many states recognize freedom of expression in their state constitutions,³⁵ and at least seven international agreements recognize the right of expression.³⁶ Professor Xiaowei Wang argues that internet is so entangled in everyday life, that "one cannot even live without it in our modern society."³⁷ The United Nations has further stated that internet access is a necessary means for society to progress and that only in

A/72/350 (Aug. 18, 2017) (stating that the rights of freedom and expression through internet connectivity deserve strong protection).

³² See Tim Sandle, *UN Thinks Internet Access Is a Human Right*, BUSINESS INSIDER (July 22, 2016), <https://www.businessinsider.com/un-says-internet-access-is-a-human-right-2016-7>. (stating that most countries backed the UN's position that internet access is a human right that must be protected, but that Russia, China, and South Africa rejected the proposal).

³³ Stephen Tully, *A Human Right to Access the Internet - Problems and Prospects*, 14 HUM. RTS. L. REV. 175 (2014).

³⁴ *Id.* at 185 (explaining how exchanging information is a part of the freedom of expression and that steps must be taken to protect this right).

³⁵ See, e.g., The Constitution of the People's Republic of China: The Basic Law of the Hong Kong Special Administrative Region of the People's Republic of China, (July 2020) Chapter II, Article 35 (stating that Hong Kong residents shall have the freedom of speech and freedom of assembly); The Constitution of Japan (May, 3, 1947), art. 21, (stating that freedom of assembly and speech are guaranteed).

³⁶ See, e.g., G.A. Res. 217 III (A), *supra* note 19, art. 19 ("Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers."); International Covenant on Civil and Political Rights art. 19(2), Dec. 16, 1966, 999 U.N.T.S. 171 ("Everyone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice."); African Charter on Human and Peoples' Rights art. 9, June 27, 1981, OAU Doc. CAB/LEG/67/3 rev. 5 ("Every individual shall have the right to receive information."); European Convention for the Protection of Human Rights and Fundamental Freedoms art. 10(1), Nov. 4, 1950, 213 U.N.T.S. 221 ("Everyone has the right to freedom of expression. This right shall include freedom to hold opinions and to receive and impart information and ideas without interference by public authority and regardless of frontiers. This Article shall not prevent States from requiring the licensing of broadcasting, television or cinema enterprises.").

³⁷ Xiaowei Wang, *Time to Think About Human Right to the Internet Access: A Beitz's Approach*, 6 J. POL. & L. 67 (2013).

exceptional circumstances can one restrict access to certain types of information.³⁸

Internet rights increase educational accessibility. The International Covenant on Economic, Social and Cultural Rights recognizes universal rights to education that allow individuals “to participate effectively in a free society, promote understanding, tolerance and friendship. . . .”³⁹ Academics attempt to explore and discover more efficient ways to use the Internet to improve education, but lack of access hinders the ability of many countries to do so.⁴⁰ Access to information through the Internet is fundamental in improving both quality of education and sustainable development, but without inclusive and equitable internet access, the international community cannot achieve this goal.⁴¹

Due to varying interests, developed and developing countries do not always agree on international issues. The UN’s Declaration on the Right to Development, however, recognized that development was an international issue and took a cooperative approach to the improvement of the global population.⁴² The Declaration explains that States have an individual duty to take necessary measures to develop and ensure opportunity for their own people, but that States also have a duty to cooperate with other states for the benefit of the world.⁴³ Internet access is intertwined with the ability to develop, as internet can accelerate the development of e-commerce and narrow the distance between developed and developing countries by narrowing the information gap.⁴⁴ Countries must consider these rights

³⁸ See Frank La Rue, *Human Rights Council, Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression*, U.N. Doc. A/HRC/17/27 (May 16, 2011) (stating that dissemination of information can only be restricted to “(i) protect the rights or reputations of others, or (ii) to protect national security or of public order, or of public health or morals”).

³⁹ International Covenant on Economic, Social and Cultural Rights art. 13, Jan. 3, 1976, 993 U.N.T.S. 3.

⁴⁰ See *Internet Access and Education: Key Considerations for Policy Makers*, INTERNET SOCIETY (Nov. 20, 2017), https://www.internetsociety.org/resources/doc/2017/internet-access-and-education/#_edn1 (stating that lack of broadband connectivity is one of the primary reasons individuals are unable to access the internet).

⁴¹ *Id.* (“Our goal at the Internet Society is to ensure that access policies are put in place that allow an Internet of opportunities to flourish and that the Internet thereby contributes fully to achieving these objectives.”).

⁴² See G.A. Res. 41/128, Declaration on the Right to Development (Dec. 4, 1986) (“Bearing in mind the purposes and principles of the Charter of the United Nations relating to the achievement of international co-operation in solving international problems of an economic, social, cultural or humanitarian nature, and in promoting and encouraging respect for human rights and fundamental freedoms for all without distinction . . .”).

⁴³ *Id.* arts. 4, 8.

⁴⁴ Huawen Liu & Yuting Yan, *Interpretation of the Concept of the Right to Internet Access from the Perspective of International Law*, 15 J. HUM. RTS. 140, 145 (2016) (“[A]s a communication means, the internet can narrow the distance between marginal areas and

collectively because internet access acts as a driving force for social and sustainable development.

The right to internet access is already well-integrated in developed states, but developing states lag far behind. This lag is threatening reliable, consistent sources of information, as well as access to technological advances that require internet connectivity to function.⁴⁵ Internet connectivity is a source of improved quality of life and likely leads to better health outcomes, but only for wealthier individuals.⁴⁶ As internet advancement continues, states with financial resources and reliable internet will also develop better medical technology, reduced health care costs, and higher quality health care.⁴⁷

Due to the interconnectivity of internet rights with so many other recognized rights, some are skeptical to say that internet access constitutes its own human right. In the United States, FCC Commissioner Michael O’Rielly stated that internet access cannot be a human right as it is not a day-to-day necessity, while simultaneously advocating for subsidized internet for low-income Americans.⁴⁸ O’Rielly hesitated to recognize Internet as a right because of the idea that human rights should only encompass necessities that one cannot survive without, such as food and shelter.⁴⁹

While the validity behind the right to internet is uncertain, universal internet access is a pressing concern for many states, and human rights organizations will continue to advocate for universal internet access. Leaders in the internet race deftly hold on to hopes for internet access in rural, inaccessible, and impoverished communities by making efforts to appeal to human rights advocates. By enveloping the progress of human rights into the hopeful billion-dollar space industry,⁵⁰ companies may blind the world to the

developed areas, so that the economic and cultural development gap will not expand because of the information gap . . .”).

⁴⁵ Kathleen Stansberry, Janna Anderson, & Lee Rainie, *The Internet Will Continue to Make Life Better*, PEW RESEARCH CENTER (Oct. 28, 2019), <https://www.pewresearch.org/internet/2019/10/28/4-the-internet-will-continue-to-make-life-better/>.

⁴⁶ *See id.* (claiming that internet access will lead to better human-health outcomes, but these benefits may not reach everyone).

⁴⁷ *Id.* One individual noted that even with these advancements there are concerns of “huge inequalities in our societies in the ability of individuals to access such technologies, causing both social disruption and new causes for mental health diseases . . .”

⁴⁸ *See* Lulu Chang, *The Internet Is Not a Human Right, FCC Commissioner Says*, DIGITALTRENDS (July 2, 2015), <https://www.digitaltrends.com/web/internet-is-not-a-human-right-fcc/> (“It is important to note that Internet access is not a necessity in the day-to-day lives of Americans . . . I am not in any way trying to diminish the significance of the Internet in our day lives. . .”).

⁴⁹ *See id.* (stating that the term necessity should only be reserved for things that one absolutely cannot live without).

⁵⁰ The Morgan Stanley space team estimates that the satellite broadband market will be worth US\$400 billion by 2040. Estimates show that global space industry, generally, could be worth over US\$1 trillion by that same time. David Jarvis, Mark Casey & Craig

true initiative of any corporate entity—profit. Yet, the satellite internet industry continues to take up an increasingly larger proportion of the overall space industry, and advocates continue to argue for more nonfinancial benefits of this industry.⁵¹

C. *Rights to the Night Sky*

While no international treaty directly covers rights to the night sky, scientists and legal analysts have recognized this right through numerous environmental declarations. The Stockholm Declaration was one of the first international agreements discussing international environmental rights.⁵² The Declaration proclaims that “[m]an has constantly to sum up experience and go on discovering, inventing, creating and advancing.”⁵³ This statement shows that the intention of the Declaration was not to halt scientific progress, innovation, or technological advancement. Rather, it warns that the environment can be advantageous or deleterious to humankind, depending on human behavior, and therefore people must take responsibility to preserve and improve their environment, together as citizens, communities, enterprises, and institutions.⁵⁴ While not explicitly stated, the Stockholm Declaration likely protects the night sky as a part of the advancement of the natural environment.

Twenty years after the Stockholm Declaration, nations built upon its framework at the United Nations Conference on Environment and Development.⁵⁵ Once again, night skies were not specifically addressed, but nations agreed that “[t]he right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.”⁵⁶ Clearly, developmental and environmental progress remained

Wigginton, *High Speed From Low Orbit: A Broadband Revolution or a Bunch of Space Junk?*, DELOITTE INSIGHTS (Dec. 9, 2019), <https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2020/satellite-broadband-internet.html>; see also *A New Space Economy on the Edge of Liftoff: The Space Economy's Next Giant Leap*, MORGAN STANLEY (Feb. 17, 2021), <https://www.morganstanley.com/Themes/global-space-economy>.

⁵¹ JARVIS ET AL., *supra* note 50, (explaining how organizations in this industry point to nearly universal internet access, increased economic development, disaster relief support, and educational access as some of the nonfinancial benefits to satellite internet).

⁵² U.N. Conference on the Human Environment, *Declaration on the Human Environment*, U.N. Doc. A/CONF.48/14/Rev. 1, reprinted in 11 I.L.M. 1416 (1972) [hereinafter Stockholm Declaration].

⁵³ *Id.* at 3.

⁵⁴ *Id.*

⁵⁵ U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. 1), annex I (Aug. 12, 1992) [hereinafter Rio Declaration].

⁵⁶ *Id.* at princ. 3.

a large concern.⁵⁷ While not explicitly protecting rights to the night sky, the new Declaration certainly suggests that the international community should consider environmental rights, like rights to the night sky, in times of developmental progress.

In 2007, international agencies including UNESCO, UNWTO, and IAU meet with members of the academic community to develop the Declaration in Defence of the Night Sky and the Right to Starlight.⁵⁸ The Declaration recognized the right to the night sky in the form of access to the light of stars and astronomic observations lending to scientific, cultural, educational, environmental, safety, and energy benefits.⁵⁹ The Declaration directly protects rights to the night sky, yet is a non-binding agreement between only a handful of organizations, institutions, and initiatives.⁶⁰ This Declaration references the importance of the right to the night sky by mentioning its foundation in the Rio Declaration, stating that the “integral and interdependent nature of the Earth”⁶¹ must be defended, and that includes defending the night skies.⁶²

Nations have also agreed to recognize the importance of the night sky through non-profit organizations such as the International Dark-Sky Association, an organization operating sixty-five chapters in eighteen different countries.⁶³ The Dark-Sky Association aims to preserve the night skies for present and future generations to enjoy through designated international dark sky communities, parks, reserves, sanctuaries, and urban night sky places.⁶⁴ Organizations like the Dark Sky Association usually focus more on educating the international community, rather than instituting regulations to accomplish preservation. These organizations would likely need international support through laws and regulations to see a large change in a nation’s behavior.

⁵⁷ *Id.*

⁵⁸ Declaration in Defence of the Night Sky and the Right to Starlight [hereinafter La Palma Declaration], STARLIGHT INITIATIVE (2007), <http://www.archeoastronomy.org/downloads/starlightdeclarationc.pdf>.

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ *See id.* (quoting Rio Declaration, *supra* note 55).

⁶² *See* La Palma Declaration, *supra* note 58, para. 6 (stating that the defense of the earth “naturally includes the dimension of the night skies and the quality of the atmosphere”).

⁶³ *Find an IDA Advocate*, INTERNATIONAL DARK SKY ASSOCIATION, <https://www.darksky.org/our-work/grassroots-advocacy/chapters/find-a-chapter/> (last visited Oct. 10, 2021).

⁶⁴ *See International Dark Sky Places*, INTERNATIONAL DARK SKY ASSOCIATION, <https://www.darksky.org/our-work/conservation/idsp/> (last visited Oct. 10, 2021) (describing the five types of designations the International Dark Sky Association uses to protect dark sites around the globe).

D. Space Regulation During Expansive Innovation

The Outer Space Treaty entered into force in October 1967, laying the basic framework of international space law.⁶⁵ Among other principles, the Outer Space Treaty outlined that states would use outer space for the benefit and in the interest of all countries, be free for exploration by all states, and that these states would be liable for any damage caused by their space objects.⁶⁶

Developing countries argue that space is the common heritage of mankind.⁶⁷ Intrinsic to this statement is the inability for one state to exclude others from their own space exploration, raising an issue of access to space.⁶⁸ In particular, constellation installation in low orbit zones pose unique and unknown risks to the future access of space.

Current space law prohibits the appropriation of outer space. In negotiating this treaty, the international community intended for the treaty “to protect space from munitions at a time of escalated tension between the United States and the Soviet Union.⁶⁹ Fear arose from the Cold War, urging states to develop space law that would acutely address the prohibition of militaristic development of space.⁷⁰ For that reason, much debate stems from the interpretation and application of this ‘appropriation’ language.

It is clear that no one state may claim sovereign rights to space; yet, the extent to which one state can use outer space is unclear. States can use space for innovation and exploration, but can states continue to use space to the point where they infringe on other states’ ability to launch satellites or otherwise explore space as they see fit?⁷¹ The framers of the Outer Space

⁶⁵ See generally Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

⁶⁶ *Id.* arts. I, VI, VII.

⁶⁷ See generally Siavash Mirzaee, *Outer Space and Common Heritage of Mankind: Challenges and Solutions*, 21 RUDN J. L. 102, 105 (2017) (arguing that space needs to be classified as the common heritage of mankind and proposing amendments to current treaties so there is universal acceptance of this proposition).

⁶⁸ See Carol R. Buxton, *Property in Outer Space: The Common Heritage of Mankind Principle vs. the First in Time, First in Right Rule of Property Law*, 69 J. AIR L. & COM. 689, 692 (2004) (“Because the principle renders claims of title to designated international, common heritage areas worthless and unrecognized, the issue for countries becomes access.”).

⁶⁹ Matthew Hytrek, *Property Rights in Current Space Law: A Hindrance to Space Exploration*, 39 WHITTIER L. REV. 90, 91 (2018).

⁷⁰ See *id.* at 92 (discussing how space treaties were formed to prevent militarization of space rather than to develop guidelines for peaceful uses of outer space).

⁷¹ As companies continue launching satellites into space, space junk becomes a growing concern. Prior to satellite internet constellations, just two events created over half of all space debris: an anti-satellite test by the Chinese government in 2007 and a 2009 satellite collision. As OneWeb, SpaceX, and other companies launch increasingly large numbers of

Treaty did not predict the futures of space exploration and innovation, but as exploration and innovation progress the international community must reexamine current space law to properly regulate future expansion.⁷²

E. Conflicting Human Rights Throughout Time

Legal theorists have repeatedly examined conflicting human rights throughout history, with some even opining that human rights cannot conflict.⁷³ This opinion idealizes an absolute theory of rights, stating that rights in alleged conflict cannot actually conflict because if one person has a specific right, “nothing can override it.”⁷⁴ The absolute rights theory, however, draws a fine line between a ‘right’ and a ‘really important liberty’ by straitening the definition of a right to include only something “narrow enough not to be considered incommensurable with any other right.”⁷⁵

Human rights should not be defined by such a narrow scope. Instead, human rights should include “the right to life and liberty, freedom from slavery and torture, freedom of opinion and expression, the right to work and education, and many more.”⁷⁶ In the context of international human rights, ‘rights’ and ‘really important liberties’ are actually the same, as the inherent purposes of these rights are to promote universal “freedom, protection, status, or benefit” for each individual.⁷⁷

When looking at rights under this more general view, conflict often arises. One of the best examples of conflicting human rights in the past century is the movie *Titanic* portraying the sinking of the unsinkable S.S. Titanic.⁷⁸ The sinking stranded many people in the dark, cold waters, while numerous partially empty lifeboats waited in the distance.⁷⁹ The Universal Declaration

satellites into space, the probability of collisions will increase substantially. No international regulation is currently in place, leading to self-regulation, “and self-regulation in space is really, really dangerous.” Mark Harris, *Why Satellite Mega-Constellations are a Threat to the Future of Space*, TECHNOLOGY REVIEW (Mar. 29, 2019), <https://www.technologyreview.com/2019/03/29/136268/why-satellite-mega-constellations-are-a-massive-threat-to-safety-in-space/>.

⁷² See Hytrek, *supra* note 69, at 91-92 (explaining that current space law is inadequate to address current and future issues in space).

⁷³ See generally Alexander Green, *An Absolute Theory of Convention Rights: Why the ECHR Gives Rise to Legal Rights that Cannot Conflict with Each Other*, 16 UCL JURIS. REV. 75 (2010) (defending the notion that legal rights cannot be in conflict with one another).

⁷⁴ *Id.* at 78.

⁷⁵ *Id.*

⁷⁶ *Global Issues: Human Rights*, *supra* note 21.

⁷⁷ NICKEL, *supra* note 29.

⁷⁸ See Xiaobing Xu & George Wilson, *On Conflict of Human Rights*, 5 PIERCE L. REV., 31, 31 (2006) (comparing the portrayal of the Titanic to conflicting human rights).

⁷⁹ See *id.* (detailing the events portrayed in the movie, *Titanic*, where many people struggled in the icy waters, but the lifeboats in the distance refused to come back to help).

of Human Rights clearly includes the right to life,⁸⁰ but does not delve into the conflict of when saving one life would likely jeopardize another. If the lifeboats had returned, it was likely that survivors in the water would capsize some lifeboats, leading to more deaths. Rather than risk the safety of the women and children who already escaped the sinking ship, the lives of these women and children prevailed at the expense of the former passengers suffering nearby in the icy waters.

At present, a political issue concerning conflicting human rights is the right to abortion. On one side a fetus' life is sacrificed, which some states and political groups argue as a violation of the unborn fetus's right to life.⁸¹ In contrast, many other states hold that women have the right to bodily autonomy and to make informed decisions regarding their body and reproduction, including the right to pursue abortion.⁸²

Two international agreements conflict regarding this right with the American Convention on Human Rights stating that the right to life begins at conception,⁸³ contrasting with the Universal Declaration of Human Rights stating that "[a]ll human beings are **born** free and equal in dignity and rights."⁸⁴ There is no universal stance on the right to abortion, and as long as society has not committed to a consistent stance, this issue will likely continue to be in conflict for a great period more. In cases of conflicting rights, there are two valid claims, but one ultimately prevails.

III. ANALYSIS OF RIGHTS

The unique nature of the right to internet, the right to the night sky and astronomical access, and the right to explore and use space fundamentally

⁸⁰ See G.A. Res. 217 (III) A, *supra* note 19, art. 3 ("Everyone has the right to life, liberty and security of person.").

⁸¹ States hold the sovereign power to make law regarding the rights of a fetus. See CONSTITUCIÓN POLÍTICA DE LA REPÚBLICA DE CHILE [C.P.] art. 19 (stating that the unborn are protected by the rights to life); CONST., (1987), art. II, § 12 (Phil.) ("[The State] shall equally protect the life of the mother and the life of the unborn from conception."); see also Criminal Code, R.S.C. 1985, c C-46 (Can.) ("A child becomes a human being within the meaning of this Act when it has completely proceeded, in a living state, from the body of its mother . . .").

⁸² See *Women's Autonomy, Equality and Reproductive Health in International Human Rights: Between Recognition, Backlash and Regressive Trends*, IRISH COUNCIL FOR CIVIL LIBERTIES (2017), <https://www.iccl.ie/wp-content/uploads/2017/11/WomenAutonomyEqualityReproductive.pdf> ("Women's human rights include the rights to equality, to dignity, autonomy, information and bodily integrity and respect for private life and the highest attainable standard of health, including sexual and reproductive health, without discrimination . . .").

⁸³ Organization of American States, American Convention on Human Rights art. 4, Nov. 22, 1969, O.A.S.T.S. No. 36, 1144 U.N.T.S. 123.

⁸⁴ G.A. Res. 217 (III) A, *supra* note 19, art. 1 (emphasis added).

conflict with one another. As society progressed and technology became an essential aspect of human development, these rights have come to light with both supporters and adversaries laying claims to the validities of each right. Regardless of the classification, current international law does not provide a clear answer to the conflicting natures of these rights. International laws address each of these rights individually in some capacity, but as each comes closer to the pull of international space law, many questions are left unanswered.

A. *The Inability to Regulate Space Law Has Varying Impacts on Rights.*

Given the state of affairs in space law, space expansion is practically unbound. The Outer Space Treaty is vague and ambiguous as to the rights of parties, creating a void in regulation. This void has not halted space innovation but may jeopardize the rights of other individuals. Typically, human rights conflicts relate to life-or-death situations such as genocide, slavery, famine, or war. Human rights advocates and conflict resolution practitioners may not see a need to resolve the conflict between the right to internet access, the right to the clear sky, and the right to explore space. But addressing this issue now could help move progress forward on the international fight for human rights. If this issue is not addressed internationally, it will be up to states, private companies, and individuals to determine which rights supersede the others. One may not blatantly need to pick one right over the other, but by the continued overuse of outer space, rights to space exploration and internet access will supersede the right to a clear sky.

i. *Unregulated Space Law May Lead to Collapse of Rights to the Night Sky.*

While the right to the night sky pulls on morality, the right is not strictly bound in any far-reaching international agreement. National parks in the United States are some of the strongest supporters of protecting this right to date.⁸⁵ National parks recognize the importance of naturally dark night skies as “part of a complex ecosystem that supports both natural and cultural resources.”⁸⁶ Taken as an alternative to both international internet coverage and space exploration, the few international organizations focused on preserving the night sky fall behind.

⁸⁵ See generally *Night Skies: Protecting the Night*, NATIONAL PARK SERVICE, <https://www.nps.gov/subjects/night skies/index.htm> (last visited Sept. 2, 2021) (explaining the importance of the dark night skies to the National Park Service and the efforts they take to protect the night skies).

⁸⁶ *Id.*

The lack of research on the true impact of satellite internet constellations further undermines the claims of night sky advocates. One source states that data is partially validating many astronomers' initial fears.⁸⁷ This peer-reviewed data addresses the type of astronomy that involves searching for distant objects farther away than Neptune, and suggests that astronomers *might* struggle seeing as more and more internet constellations get in the way and limit sight.⁸⁸ Furthermore, the holistic impact of SpaceX's most recent attempt to mitigate the brightness of the satellites is unknown.⁸⁹ While SpaceX and other satellite constellation companies attempt to mitigate negative impacts, artificial light in the sky is a relatively new concept, and lack of understanding brings about skepticism of the astronomers' claims.

However, it is the limited regulation of space law that poses the greatest risk to dark night skies and astronomy rights. The Outer Space Treaty states that:

States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding.⁹⁰

Human rights are thereby a part of space law, as space law on its face must abide by international human rights law.

Yet again, we are challenged to decide what exactly constitutes international law. This framework must include customary law and conventional law, but is it customary to preserve the night sky or customary to allow for astronomical progress? If these protections are not customary, does the Outer Space Treaty protect these rights in another capacity, such as through international agreements like UNESCO's Convention Concerning the Protection of the World Cultural and Natural Heritage?⁹¹ This international convention's definition of natural heritage encompasses protection of the night skies, starlight, and astronomical progress under both "natural features consisting of physical and biological formations . . . which are of outstanding universal value from the aesthetic or scientific point of view . . . [and] natural

⁸⁷ Loren Grush, *The True Impact of SpaceX's Starlink Constellation on Astronomy is Coming Into Focus*, THE VERGE (Mar. 24, 2020), <https://www.theverge.com/2020/3/24/21190273/spacex-starlink-satellite-internet-constellation-astronomy-coating>.

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ Outer Space Treaty, *supra* note 65, art. III.

⁹¹ Convention Concerning the Protection of the World Cultural and Natural Heritage, Nov. 16, 1972, 27 U.S.T. 37, 1037 U.N.T.S. 151 [hereinafter World Heritage Convention].

sites or . . . areas of outstanding universal value from the point of view of science, conservation or natural beauty.”⁹²

Customary international law remains difficult to prove, as one must articulate the rule of law and show that states accept that rule as law.⁹³ Observation of consistent behavior in line with the possible custom is not enough; the state must regularly practice the behavior and accept the behavior as law.⁹⁴ The continued reiteration of protecting the environment in treaties like the World Heritage Convention could lead to recognizing the clear night sky as customary law, but without state action in condemning opposing behaviors the claim to customary law will fail.

ii. Unregulated Space Law Currently Promotes Rights to Internet Access.

Conversely, unregulated space law promulgates satellite internet access. Current international regulation fails to predict present and future innovation in space. The international regulations are lacking because of the increased technological advancement of the 21st century, quickly leaping past the realm of any international space treaty. The Outer Space Treaty states that the use of space should benefit all countries and requires that “[o]uter space . . . be free for exploration and use by all [s]tates . . . [and that] there shall be free access to all areas of celestial bodies.”⁹⁵ The Outer Space Treaty does not expand on this phrase and offers few repercussions should a state violate this provision; the only consequence is loss of respect within the international community.⁹⁶ In essence, the Outer Space Treaty promotes internet rights by allowing open access to space with little regulation. The Outer Space Treaty only requires states to oversee the actions of their respective governments and private actors in space to ensure that the government and private actors act in compliance with the Outer Space Treaty.

The Outer Space Treaty encourages innovation if it benefits all countries. The possibility of developing universal internet access may be in the interest of all countries, as access to information, education, and communication forums are vital to all nations. Specifically, during natural disasters, internet access can provide nations with faster and more reliable information and can streamline the coordination of resources.

⁹² *Id.* art. 2.

⁹³ DAVID HUNTER, JAMES SALZMAN & DURWOOD ZAEKE, INTERNATIONAL ENVIRONMENTAL LAW & POLICY 309 (Foundation Press, 5th ed. 2015).

⁹⁴ *Id.* at 310.

⁹⁵ Outer Space Treaty, *supra* note 65, art. I.

⁹⁶ Jill Stuart, *The Outer Space Treaty Has Been Remarkably Successful – But Is It Fit for the Modern Age?*, THE CONVERSATION (Jan. 27, 2017), <https://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>.

The COVID-19 pandemic emphasized the need for widespread internet access and brought grave inequalities to the forefront.⁹⁷ Many people in both developed and developing countries throughout the world lack home internet. The lack of internet access creates a divide in education as many students in low-income or rural areas cannot access the internet, creating technology challenges in the current virtual learning system.⁹⁸ Connectivity is a challenge due to both lacking infrastructure and affordability in many communities, showing the disparity in equity, economics, education, and health that existed long before the COVID-19 pandemic.⁹⁹ But, internet access plays a vital role in life without natural disaster, as it is practically required to stay informed, seek employment, access health and medical records, and participate in the modern global economy that is transitioning to online banking.¹⁰⁰ In these ways, to prosper in an emerging society, internet access is as necessary as basic human rights like food, water, and shelter.

The importance of internet and the lack of increased regulation on the international front incentivizes satellite internet companies to launch more satellites into lower orbit at a faster pace than ever before. As this push for internet continues, companies have no incentive to self-regulate or to take a precautionary approach, further depleting access to the night sky. This is a clear example of a tragedy of the commons, where each individual actor is acting in their own self-interest, depleting access to the shared resource. The tragedy of the commons is already well addressed in relation to space debris,¹⁰¹ and as more satellites enter low-earth orbit, clear sky depletion will reach grave levels. States will quickly approach a point where they will inevitably violate the Outer Space Treaty.

The Outer Space Treaty's provision on free access to space innately requires that satellite constellations in low-earth orbit be limited in some capacity, so other actors can participate in space innovation. Without limits

⁹⁷ Mark Lieberman, *Internet Access Is a Civil Rights Issue*, EDUCATION WEEK (Sept. 23, 2020), <https://www.edweek.org/ew/articles/2020/09/23/internet-access-is-a-civil-rights-issue.html>.

⁹⁸ *Id.*

⁹⁹ *Id.* Digital divides limit access to many resources including public health announcements, online learning, and job opportunities.

¹⁰⁰ See *About*, UNITED STATES CENSUS BUREAU, <https://www.census.gov/topics/population/computer-internet/about.html> (last revised Oct. 8, 2021) (“[C]omputer usage and Internet access has become increasingly important for gathering information, looking for jobs, and participation in a changing world economy.”); Khaitan & Co., *Virtual Banks – How Far Is the Reality?*, LEXOLOGY (July 10, 2020), <https://www.lexology.com/library/detail.aspx?g=cf36beb3-f11c-4c43-99b1-2d85cb34fef1> (“Much credit goes to the internet and smartphone revolution for making available the base infrastructure [for online banking].”).

¹⁰¹ See Edward R. Finch, Jr., *Future Space Commercialization and Space Debris*, 5 AIR & SPACE LAW. 1, 11 (1991) (arguing that space debris poses an accessibility problem to LEO and GEO).

on satellites, states will reach a point where there is no safe way to access outer space due to significant amounts of space debris and constellations already in orbit. Since there is no obligation on any state to clean up space debris and the process of doing so is extremely expensive, states with satellites already in orbit may have to de-orbit some of their satellites to allow access to satellites from other states. The lack of international organization will make implementing de-orbiting requirements difficult because no state will want to voluntarily remove in-orbit satellites. To date, the removal of satellites do not pose problems; therefore, no Outer Space Treaty violation claims can be made.

As a result, internet access will proliferate as states and private actors fight to maximize profit through satellite internet constellations, allowing internet rights to succeed at the expense of preserving dark night skies. States interpret the Outer Space Treaty as giving them expansive freedom to use space; often, the loose interpretation results in a greater benefit to the respective state as opposed to the international community.¹⁰² The lack of support and communication between international and domestic regulatory bodies paves a clear path for satellite internet companies to continue launching satellites into space at unprecedented rates, strengthening internet rights and accessibility.¹⁰³ However, if the night skies are to remain clear, international action is needed to preserve the unique values offered to humankind by clear night skies and peace with nature.

B. Philosophical Reasons to Protect the Night Sky.

While the right to the night sky for both astronomers and individuals is not clearly encompassed by international law, the night sky still offers great value to society. Due to inconsistent views on how to apply rights language and the reach of various international agreements, focusing on a moral or ethical obligation to protect the night sky will encourage more domestic and international support.

i. Human Beings Benefit by Respecting and Protecting the Night Sky.

Anthropocentrism is the idea in environmental ethics that value is human-centered.¹⁰⁴ Based on this human-centered value, the international

¹⁰² Amir Saboorian, *A Brave New World: Using the Outer Space Treaty to Design International Data Protection Standards for Low-Earth Orbit Satellite Operators*, 84 J. AIR L. & COM. 575, 588 (2019).

¹⁰³ *See id.* at 589 (stating that the continued launch of satellites by each state is a method of allocating their own portion of space that cannot be occupied by others).

¹⁰⁴ Helen Kopnina et al., *Anthropocentrism: More than Just a Misunderstood Problem*, 31 J. AGRIC. ENVTL. ETHICS 109, 109 (2018).

community should protect the dark night sky for its unique contributions to society. Night skies benefit humans by providing peace and enjoyment, fulfillment, and emotional perspective.

Across the globe, human beings value the beauty and peace associated with a dark night sky, providing them with enjoyment. Within the United States, astronomy programs and moonlit hikes are some of the most desired activities within national parks.¹⁰⁵ In a visitor survey of two Utah National Parks, ninety percent of visitors revealed that they valued the ability to view the night sky and rated this as an important component of their visit.¹⁰⁶

ii. The Dark Night Skies, as a Part of Nature, Possess Intrinsic Value Warranting Protection.

An ecocentric approach to protecting nature is based not on human value, but on the intrinsic value of nature. This approach focuses more on the value of nature to all living things, regardless of human benefit.¹⁰⁷ The dark night sky provides benefits to nature in its entirety, especially wildlife and the wilderness.¹⁰⁸

Dark night skies play a vital role in wildlife survival.¹⁰⁹ A recent study on animal behavior suggests that light has an impact on orientation, reproduction, communication, competition, and predation of wildlife.¹¹⁰ Birds, frogs, moths, and seals rely on the night sky and starlight to navigate through the dark.¹¹¹ Animals with “camera eyes” can even discern individual stars which helps them maintain a strong sense of direction through the night.¹¹² Without the dark night skies and starlight to direct them, the future of some species of wildlife is simply unknown. Society should protect the intrinsic value of nature for the benefits it provides to wildlife and a wilderness free from intrusion. Therefore, outside of legal obligations, the international community must afford care to the protection of the night sky.

¹⁰⁵ Frank Turina, *Protecting Night Skies and Naturally Dark Conditions in National Parks*, VISUAL RESOURCE STEWARDSHIP CONFERENCE PROCEEDINGS, 186, 189, <https://www.fs.fed.us/nrs/pubs/gtr/gtr-nrs-p-183papers/19-turina-VRS-gtr-p-183.pdf>.

¹⁰⁶ *Id.* at 189.

¹⁰⁷ *Environmental Ethics: Between Anthropocentrism and Ecocentrism*, <http://home.iitk.ac.in/~anubha/CE213.pdf> (last visited Oct. 10, 2021).

¹⁰⁸ Turina, *supra* note 105.

¹⁰⁹ *Acadia's Wildlife Need Dark Skies*, NATIONAL PARK SERVICE (Sept. 21, 2020), <https://www.nps.gov/articles/000/wildlife-night-sky-acadia.htm#:~:text=Night%20skies%20play%20an%20important,skies%20they%20need%20to%20survive>.

¹¹⁰ Turina, *supra* note 105, at 190. (citing Longcore and Rich 2017).

¹¹¹ Chrissy Sexton, *Nocturnal Creatures Use Starlight as a Compass in the Dark*, EARTH (Feb. 22, 2018), <https://www.earth.com/news/nocturnal-creatures-starlight-compass>.

¹¹² *Id.*

C. Gaps in the Outer Space Treaty

i. Vague and Ambiguous Language

The Outer Space Treaty leaves gaps in the governing law of international space exploration by using vague and ambiguous language. This treaty guides state parties to explore and use space in peaceful ways but states this goal without providing any specific language defining peaceful use. The Outer Space Treaty, rather, states that outer space “shall be the province of all mankind.”¹¹³ In due time, states have given this phrase its own unique meanings. The United States adopted the “common heritage of mankind” and the “province of all mankind” to be one in the same, defining both as prohibiting appropriation of outer space by states.¹¹⁴ Alternatively, developing countries understood the province of mankind to mean that “common resources [in space] should be shared equitably among [all states].”¹¹⁵ Many other interpretations exist, limiting the legal breadth of these provisions due to the inadequate legal substance. In turn, the Outer Space Treaty gives great leeway to individual states.

Possible interpretations of the Outer Space Treaty are vast, and in this new age, the interpretation may need to broaden to better protect clear skies and prevent space junk. Today, interpretation of this phrase should also look to preservation and sustainable development.¹¹⁶ Our generation must not only explore space for scientific progression but should “leave it in a substantially unimpaired condition for the enjoyment and benefit of future generations.”¹¹⁷ While the interpretation remains in the hands of individual states, it is unlikely that states will unify to protect outer space and the night skies. A clear definition of “the province of all mankind”¹¹⁸ is needed to make this possible.

ii. No Governing Body

The Outer Space Treaty did not implement a governing body to assist in interpreting the treaty or to enforce the treaty through financial or other repercussions in cases of violation. The Outer Space Treaty provides that:

¹¹³ Outer Space Treaty, *supra* note 65, art. I.

¹¹⁴ J. I. Gabrynowica, *The “Province” and “Heritage” of Mankind Reconsidered: A New Beginning*, THE SECOND CONFERENCE ON LUNAR BASES AND SPACE ACTIVITIES OF THE 21ST CENTURY 691, 692 (1992). <http://adsabs.harvard.edu/full/1992lbsa.conf..691G>.

¹¹⁵ *Id.*

¹¹⁶ David Tan, *Towards a New Regime for the Protection of Outer Space as the “Province of All Mankind”*, 25 YALE J. INT’L L. 145, 164 (2000).

¹¹⁷ *Id.*

¹¹⁸ Outer Space Treaty, *supra* note 65, art. I.

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.¹¹⁹

As stated, the treaty simply requires states to inform the Secretary General of their activities. Only implementing reporting requirements does not effectively govern the activities of states and their independent actors. In practice, states are also required to receive permission from the state's own government before conducting activities in space.¹²⁰

This provision lacks any effective enforcement mechanism. Most states, including the United States, simply require individual actors to obtain a permit prior to launching anything in space.¹²¹ The state is technically responsible to ensure that any activities by private actors align with the provisions of the Outer Space Treaty, but there are no repercussions from the international community if states fail to comply. In the United States, one start-up called Swarm Technologies launched four satellites without obtaining permits and only faced a nationally imposed \$900,000 fine.¹²² Even after the fine, the United States relied upon negative press coverage to deter companies from launching unauthorized objects into space.¹²³

Due to the lack of any international governing body, the international community and individual states must rely on methods like state imposed fines and negative press coverage to ensure compliance with the Outer Space Treaty. This specific concept, known as naming and shaming, proves to be one of the most effective enforcement mechanisms.¹²⁴ Yet, naming and shaming only works in certain situations. First, if the actor in violation cares about its status in the international community, naming and shaming can

¹¹⁹ *Id.* art. XI.

¹²⁰ *See id.* art. VI (stating that individual states are responsible for national activities in outer space).

¹²¹ Morgan Smith, *Lunar Parking Permits*, SLATE (Sept. 20, 2007), <https://slate.com/news-and-politics/2007/09/do-you-need-special-permission-to-land-something-on-the-moon.html>.

¹²² Caleb Henry, *FCC Fines Swarm \$900,000 for Unauthorized Smallsat Launch*, SPACE NEWS (Dec. 20, 2018), <https://spacenews.com/fcc-fines-swarm-900000-for-unauthorized-smallsat-launch/>.

¹²³ *Id.*

¹²⁴ *See* James C. Franklin, *Human Rights Naming and Shaming: International and Domestic Processes*, in *THE POLITICS OF LEVERAGE IN INTERNATIONAL RELATIONS* 43, 44 (2015) (stating that naming and shaming is useful because it publicizes actions the state condemns and shames actors into abiding by widely held norms).

impose international pressures to comply with an international agreement.¹²⁵ Second, on the domestic level, naming and shaming heavily depends on the opinions of the individuals making up the domestic audience. Naming and shaming can lead consumers to “create[e] new demands on [their national] governments.”¹²⁶

An international governing body would encourage greater compliance and would more efficiently enforce the Outer Space Treaty than the current informal enforcement procedures. As a party to an international agreement, an international body could enforce the treaty by imposing fines for any violations. The international body can also mediate to assist in interpretation of the document when parties disagree over specific language.

iii. No Guidance on Appropriate International Consultations

Under the Outer Space Treaty, states are also obliged to consult with other state parties if they believe an activity in space would harmfully interfere with the other states’ activities.¹²⁷ The Outer Space Treaty specifically states that:

If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space . . . would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space . . . it shall undertake appropriate international consultations before proceeding with any such activity or experiment.¹²⁸

The language in this provision is vague and leaves much up to interpretation. These ambiguities laid out below make the provision substantively weak and difficult to enforce.

First, the treaty does not further explain under what circumstances a state would have reason to believe that an activity would be harmful. Does this provision require states to seek out information that may show an activity would be harmful to others? The treaty does not say and given the expense of actively seeking more information, it seems unlikely that states would actively seek to obtain information that may require them to halt progress on a space activity. Further, the process of consulting another party under this provision

¹²⁵ Dustin Tingley & Michael Tomz, Research Note, *The Effects of Naming and Shaming on Public Support for Compliance with International Agreements: An Experimental Analysis of the Paris Agreement*, INTERNATIONAL ORGANIZATION (forthcoming June 2021), <https://scholar.harvard.edu/files/dtingley/files/tingleytomzparis-shame.pdf>.

¹²⁶ *See id.* at 5 (internal citations omitted).

¹²⁷ *See* Outer Space Treaty, *supra* note 65, art. IX.

¹²⁸ *Id.*

does not point at any obligation to attempt to avoid the harmful result in the first place.¹²⁹ In practice, this provision does nothing more than mandate that one nation informs the other before the acting nation does something that will harm the other.

Additionally, the language in this provision states that one state must consult with appropriate parties if any action in outer space would harm the activities of other state parties. The use of the plural parties in this provision makes it seem like the state does not have to consult with another state if the harmful activity only hurts one state.¹³⁰ However, it is a principle of international law, implemented in the Vienna Convention on the Law of Treaties,¹³¹ that a treaty “shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.”¹³² Given the various means of treaty interpretation, the Convention still does not give a clear answer to whether the framers intended for consultation only when more than party would be harmed. While it is more likely that the framers meant for consultation in any case where a state is facing harm, the ambiguities create gray space that states may use to fit in with their ideals. For example, a state that would create the harm would likely rely on the plural language so they were not required to consult with others, but a harmed nation would interpret the provision to require consultation even if only one state is affected.

IV. ANALYSIS OF POSSIBLE SOLUTIONS

Protecting valuable resources like the night sky and balancing interests of state actors in the exploration and use of outer space requires changes to current international law. As seen above, the Outer Space Treaty leaves gaps in the law that decrease the effectiveness of the treaty, and the lack of support behind any international attempt to protect the night sky leaves the future of the right to the night sky vulnerable. The remainder of this Note will suggest some methods to balance these competing interests and evaluate the strengths and weaknesses of each.

¹²⁹ Laura Montgomery, *The “Non-Interference” Provision of Article IX of the Outer Space Treaty and Property Rights*, GROUND BASED SPACE MATTERS (Mar. 31, 2017), <https://groundbasedspacematters.com/index.php/2017/03/31/the-non-interference-provision-of-article-ix-of-the-outer-space-treaty-and-property-rights/>.

¹³⁰ Vishakha Gupta, *Critique of the International Law on Protection of the Outer Space Environment*, 14 ASTROPOLITICS 20, 25 (2016).

¹³¹ Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331 (stating the fundamental rules of all international treaties, used to supplement language in other treaties or to fill in gaps in treaties when specific language is missing).

¹³² *Id.* art. 31(1).

Amending the Outer Space Treaty is a proper and realistic way to balance the competing interests described above—rights to internet access, space exploration, and clear night skies.

Any state party to the Outer Space Treaty may propose an amendment.¹³³ Any proposed amendments will be enforceable against state parties that accept the amendment, following acceptance by a majority vote of the state parties.¹³⁴ However, even if a majority of state parties vote to accept the amendment, individual states may reject the amendment and would therefore not be bound by that amendment. Any state parties that join the Outer Space Treaty following the acceptance of a new amendment will be deemed to accept any prior amendments.

Amendments to the Outer Space Treaty that mandate an international governing body and require profit sharing will allow states to balance the interests of maintaining progress in astronomy, allowing individuals to enjoy clear night skies, and extending access to the internet worldwide.

A. *Mandating an International Governing Body*

An International Governing Body like the International Court of Justice¹³⁵ would better solve questions like those posed above. Unlike the ICJ, this governing body would be mandatory. States would be required to agree to jurisdiction under this body as a party to the Outer Space Treaty. When questions arise regarding interpretation or scope of certain provisions this body would have authority to determine the meaning of the provision. All decisions made by the newly formed governing body would bind state parties.

Additionally, this body would replace the current reporting requirements to the United Nations Secretary General and instead would require states to submit information to this body. As part of this reporting, each state party must report any space actions and describe the purpose of each respective action. States would also need to conduct an environmental impact assessment prior to commencing any actions in space in consultation with any other party or parties that the activity could harm.

This model would incorporate guidelines on notification and consultation set forth in the Convention on Environmental Impact Assessment in a Transboundary Context.¹³⁶ This international agreement first describes

¹³³ Outer Space Treaty, *supra* note 65, art. XV.

¹³⁴ *Id.*

¹³⁵ The International Court of Justice (ICJ) is a judicial body of the United Nations that functions as an advisory committee to which states may submit legal disputes. States must consent to jurisdiction of the ICJ but after doing so are bound by any decisions the ICJ makes without right to appeal. *How the Court Works*, INTERNATIONAL COURT OF JUSTICE, <https://www.icj-cij.org/en/how-the-court-works> (last visited Oct. 2, 2021).

¹³⁶ *See generally* Convention on Environmental Impact Assessment in a Transboundary Context, Feb. 25, 1991, 1989 U.N.T.S. 309.

the notification procedure containing information of a proposed activity and the nature of possible decisions.¹³⁷ The notifying party must submit relevant information to the affected party, who in turn must respond to the party of origin on its intentions to participate in any environmental assessment procedures.¹³⁸ If the responding party chooses to participate in the assessment, the parties shall meet to discuss a path forward; if they cannot agree on the likelihood of environmental impacts, the information and questions are submitted to an "inquiry commission" that will advise the parties.¹³⁹ Prior to a final decision on a proposed activity, the party must submit all environmental impact assessment documentation to the affected party for distribution to both state officials and the general public.¹⁴⁰ The party of origin must consult the other party on possible alternatives to the proposed activity and discuss mitigating the environmental impact of each proposed activity.¹⁴¹ After consultations, the original notifying party may make a final decision on the activity ensuring that "due account is taken of the outcome of the environmental impact assessment . . . as well as the comments thereon received . . . and the outcome of the consultations . . ." ¹⁴² Even after moving forward with an activity, states are required to analyze the activity through surveillance and if the state discovers any negative impacts the state must inform and consult the other party to "reduce or eliminate the impact."¹⁴³

This outline of notification, consultation, and follow-up would better protect some of the important characteristics of outer space that are not directly encompassed in the Outer Space Treaty, like clear night skies. This outlining language describes a clear path that states must follow even if they are not certain whether negative impacts will occur. Rather, the notification, consultation, and follow-up procedure takes a more precautionary approach—a principle that encourages preventive action despite uncertainty.¹⁴⁴ A precautionary approach is the proper approach to take in this situation because the science is unclear as to how the dramatic increase in satellites in orbit will impact clear night skies, astronomical progress, and access to orbit. Here, satellite internet companies and states need to conduct more research and investigations especially as it relates to satellite internet capacity to fully understand the positive and negative implications of launching satellites.

Since states are only bound if they accept the amendment following approval by the majority, this amendment may not extend as far as needed to

¹³⁷ *Id.* art. 3.

¹³⁸ *Id.*

¹³⁹ *Id.*

¹⁴⁰ *Id.* art. 4.

¹⁴¹ *Id.* art. 5.

¹⁴² *Id.* art. 6.

¹⁴³ *Id.* art. 7.

¹⁴⁴ David Kriebel et al., *The Precautionary Principle in Environmental Science*, 109 ENVTL. HEALTH PERSP. 871, 871 (2001).

make any meaningful change. While all space-faring nations are parties to the Outer Space Treaty, these states could simply reject the amendment.

Some states may hesitate to agree to an international governing body because they do not want to face additional regulation. Regulation would inherently increase costs. States involved in the satellite internet constellation initiative are already taking risks by devoting time and money into an unprecedented industry. Any further regulation may decrease their willingness to continue developing sustainable, low-cost internet access across the world.

Further, the states that need to accept this proposal for the proposal to carry any weight are the states least likely to do so. States that are not space-faring nations would likely accept this proposal; but without the acceptance by those actively participating in space activities, this proposal would have little impact. Additionally, even those states that do not participate in space activity may find that the potential for universal internet access outweighs any possible downsides to large satellite internet constellations.

States may refuse regulation by an international governing body because the precautionary approach can limit innovation. Since states do not know exactly how, or even if, their space activities pose a threat to clear night skies and astronomy, they will likely find a precautionary approach to be more debilitating than necessary.

B. Mandatory Profit Sharing

Developed countries should not continue to launch satellites into space at unprecedented rates at the expense of developing countries. One solution is to hold developed countries accountable by requiring them to share the profits obtained from the internet satellite constellations with other nations or at a minimum contribute to the economies of developing nations.

Global partnerships between developed and developing nations can be crucial to the success of developing economies and “remain[] a crucial source for financing basic health, infrastructure and energy needs.”¹⁴⁵ Although a profit sharing system would not protect astronomy rights or rights to the night skies, mandatory profit sharing would require cooperation and international support, and would ensure that private companies do not profit at the expense of developing countries.

In the alternative, the states that are developing satellite internet could offer internet services for free in developing countries,¹⁴⁶ or at least for a

¹⁴⁵ Economic and Social Council, 3d and 4th plen. mtg., *As Developing Countries Strive to Enhance Economic Performance, Developed Partners Should Honour or Surpass Aid Pledges*, Addis Conference Hears, U.N. Meetings Coverage DEV/3187 (July 14, 2015).

¹⁴⁶ The United Nations currently recognizes 46 countries as “least developed countries.” These countries are determined based on per capita income, human assets, and economic vulnerability. The United Nations identifies least developed countries (“LDCs”) in an

heavily reduced fee. Providing internet services at a reduced cost is similar to the structure of the Paris Climate Agreement, which requires developed countries to provide financial resources to developing countries, as all countries work to combat climate change.¹⁴⁷ The financial support set forth in the Paris Agreement minimizes the economic concerns of developing countries thereby allowing these countries to continue developing while also encouraging the use of resources with lesser carbon footprints. In the case of satellite technology, a financial support system would help developing countries by allowing them to continue developing while providing them with internet and technology that can assist the countries in their development.

While states may be hesitant to provide free or reduced cost internet service, this principle aligns with the goal statements of many satellite constellation companies. SpaceX, Amazon, and OneWeb all claim that they aim to provide vast internet connection in places where there is unreliable or inaccessible internet.¹⁴⁸ As corporations, these companies intend to profit off their initiatives, but since they will also profit off their claims of making internet accessible to everyone, the international community should hold these companies to this self-imposed standard.

Both profit sharing and reduced or no cost internet also align with a general principle of the Outer Space Treaty—that the use and exploration of outer space should be for “the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development”¹⁴⁹ The use of outer space for internet satellite constellations must align with this principle. By requiring profit sharing or low-cost internet access that benefits developing countries, this initiative is brought within the realm of the Outer Space Treaty’s general principle.

Although private companies will likely oppose the profit sharing and reduced cost internet proposition, it will provide the companies with many long-term benefits. First, private companies are increasingly interested in corporate activism.¹⁵⁰ Corporate activism occurs when companies work to

attempt to “signal to the international community . . . the need [for] special concessions in support of LDCs.” *UN Recognition of the Least Developed Countries*, UNCTAD, <https://unctad.org/topic/vulnerable-economies/least-developed-countries/recognition> (last visited Sept. 1, 2021).

¹⁴⁷ United Nations Framework Convention on Climate Change in Rep. of the Conference of the Parties on the Twenty-First Session, art. 9, U.N. Doc. FCCC/CP/2015/L.9/Rev.1 (Dec. 12, 2015) [hereinafter Paris Agreement].

¹⁴⁸ See *supra* notes 7-9.

¹⁴⁹ Outer Space Treaty, *supra* note 65, art. I.

¹⁵⁰ See Cory Maks-Solomon, *Corporate Activism Is More Than a Marketing Gimmick*, THE CONVERSATION (July, 8, 2020), <https://theconversation.com/corporate-activism-is-more-than-a-marketing-gimmick-141570> (stating that many of America’s largest corporations started making statements in support of racial equality and criminal justice reform).

advocate for social change through advertising or social media marketing.¹⁵¹ By pushing corporate values to advocate for progressing internet access in developing countries, companies are gaining positive endorsement, which can boost their sales.

Private companies are also drawn to corporate social responsibility, which occurs when companies conduct business in ways that positively impact society through economic, social, and environmental actions.¹⁵² Providing free or reduced cost internet allows these companies to invest in society through the economic means of increased access to education. Internet access in rural or impoverished communities has a positive social benefit, as it encourages rights such as the right to information and the right to free speech. Internet access also provides economic benefits because it allows for lower income nations or individuals to exchange information and ideas, encourages economic development, and creates access to the wider global market, leading to more economic exchange. In either case, private companies will benefit from profit sharing or providing low or no cost internet access in developing countries, as these actions will put the companies in a positive light and boost their long-term sales.

V. CONCLUSION

As evidenced throughout this Note, gaps in space law leave clear night skies or astronomy rights without international protection, but the gaps may boost access to reliable internet. There is no doubt that universal internet access comes with a great deal of benefits, like information sharing, communication, and exchanging ideas through participating in a global community. But these benefits without additional protections come at the expense of clear, dark night skies. The night skies provide so many benefits of their own—scientific progression, peace, enjoyment, and the development of natural habitat—that should not be deemed less important than universal internet access. In fact, as this Note proposes, with additional regulation in the form of an international governing body these rights may be able to coexist.

¹⁵¹ Kiely Kuligowski, *How to Make Your Corporate Activism Really Count*, BUSINESS NEWS DAILY (Aug. 19, 2020), <https://www.businessnewsdaily.com/15772-meaningful-corporate-activism.html>.

¹⁵² See Jason Fernando, *Corporate Social Responsibility (CSR)*, INVESTOPEDIA (Aug. 26, 2021), <https://www.investopedia.com/terms/c/corp-social-responsibility.asp> (“By practicing corporate responsibility, . . . companies can be conscious of the kind of impact they are having on all aspects of society, including economic, social, and environmental.”).