

The Absence of Passion in Space Exploration Policy and How to Find It

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Why the Lack of Space Policy Is a Growing Issue

The exploration of space has the potential to benefit humankind for many reasons, including the resources and technological knowledge that could be gained from developing better space programs (Szocik et al., 2017, p. 31). However, current international policies surrounding space exploration and settlement are neither thorough nor specialized enough. In fact, they are incredibly idealistic, stating that space should be free and peaceful, lacking any real substance to ensure these policies remain in place (United Nations, n.d., n.p.). Some countries, such as Russia, are open to measures ensuring cooperation in space, while others, such as the US and China, seem to be trending towards a more competitive unilateral approach to space exploration. The fact that countries are already preparing for international conflicts in space shows the importance of garnering a stronger understanding of how we can continue to explore space peacefully and avoid competition for the benefit of humanity (Szocik et al., 2017, p. 34).

Space contains infinite unknowns, such as the progression of technology and the possibility of inhabiting other planets. This, coupled with the rapid development of the field, is a large issue when trying to define space policy. Working to improve our understanding of these unknowns and plan for them will prove valuable when faced with international conflicts surrounding space. Ideally, countries would be more cooperative than competitive. One of the largest contributors to space becoming competitive is the commercial focus, which could lead to resource wars. This commerciality is closely linked to the government due to funding and regulation requirements, which further highlights the importance of strong international space policy to ensure space exploration is peaceful (Shammas & Holen, 2019, p. 3). It is important to study ways to guide society towards avoiding violence in space and build our understanding of the issues we could face.

For the reasons above, I intend to qualify history and science fiction as valuable sources of information for constructing more thorough and effective international space policies. I will use historical case studies and examples of how science fiction influences law and culture related to new technologies and space. Using Neeley and Luegenbiehl's "Beyond Inevitability" and Arnold Pacey's "The Culture of Technology" as frameworks for analyzing my research, I analyze the reasons why science fiction writers may be better suited to providing a sense of direction for the policies of space travel instead of the politicians and economists that currently control it. This is due to the creative values that are inherent to space travel and to science fiction writers who have technical expertise and what people are interested in and afraid of.

Concerning Recent Developments in Space Policy Around the World

Human history has revolved around the discovery and colonization of new land, and the conflicts that ensue as a result (Szocik, 2017, p. 31). Similarly, in the context of space exploration, it is imperative to have a strong understanding of common historical cycles surrounding unclaimed territory. Szocik et al. (2017) studies many cases of peaceful and violent colonization in the context of culture, politics, the law, and psychological challenges (p. 31-32). For example, the Space Race in the 1960s was a highly competitive approach towards space exploration, being closely tied to the political and cultural tensions between the United States and Russia during the Cold War (Szocik, 2017, p. 33). On the other hand, there is also a history of peaceful collaboration between countries regarding the International Space Station and the use of Russian space craft for American astronomical purposes (Szocik, 2017, p. 33-34).

Right now, it appears the world is spiraling towards a competitive political approach to space exploration. Drawing comparisons between space policies across different countries

reveals a serious dissidence in ideals that threatens the potential to explore space freely and peacefully. In 2021, the Russian Federation's deputy addressed the United Nations about their concern that some countries view space "as an arena for combat operations due to the implementation of unilateral policies for the placement of weapons in outer space" (Vorontsov, 2021, n.p.). They proposed that the UN should push harder to get individual nations to recognize that "the exploration of outer space is carried out exclusively for peaceful purposes and for the benefit of humankind" (Vorontsov, 2021, n.p.). Highlighting their concerns, in 2018 the United States rejected an agreement that proposed a very similar idea to what the Russian Federation conveyed in their statement (Vorontsov, 2021, n.p.). At the extreme, in 2021 Chinese president Xi Jinping stated that China aims to "overtake all nations and become the leading space power by 2045" (Kharpal, 2021, n.p.).

Furthermore, in 2020, the US issued a National Space Policy directive that addressed commercialization of space, exploration, and defense of the US and its allies in space (Office of Space Commerce, 2020, n.p.). It is clear with this treaty that the US is content to focus solely on themselves, their allies, and their economy when exploring space, rather than attempting to create a true worldwide agreement. The use of the word defense in this policy indicates that the US is already expecting international conflicts with their political opponents to become a problem in space. If some countries continue to view space with this sort of mindset, other countries that are currently committed to keeping their outer space operations peaceful could be forced to become more competitive in hopes of protecting their own interests. It is clear that the current international policies in place have not been effective at preventing countries from making their own nationally focused and dangerously competitive legislation related to space

exploration. The differences between countries' views on space highlights the lack of effective international guidelines and agreement.

Based on current trends, space is becoming more capital and commercially focused, which could lead to history repeating itself with powerful classes exploiting less powerful classes for their own personal gain (Shammas & Holen, 2019, p. 3). However, right now, commercial activity in space is closely linked to the government and the state due to the requirements of funding, infrastructure, and regulations (Shammas & Holen, 2019, p. 3). Currently, there are many examples of capitalist corporations looking to explore and profit off of outer space, including Elon Musk's SpaceX and Jeff Bezos's Blue Origins. They have support from the US government, which seems to be focusing more on their national space policies rather than working with other countries (Office of Space Commerce, 2020). This threatens the concept of peaceful and collaborative space exploration and handling of the resources in space that could benefit humanity. Therefore, international policy must be effective at preventing colonialism and resource wars in space (Szocik et al., 2017, p. 32-33). The cost of failing to address these problems before conflict arises in space is catastrophic, so working towards the peaceful exploration of space would benefit humanity immensely.

It is essential to use history to become aware of trends in space travel and create policies to prevent competitive or violent space exploration. In comparison to the Space Race, the International Space Station (ISS) has been much more successful at international collaboration. One key difference between these two ventures is the ISS's focus on scientific discovery as opposed to the Space Race's focus on political rivalries. If we approach space policy with less emphasis on the political and economic ventures and focus more on the incredible and inspiring

scientific discoveries it could bring, it is more likely that space will remain a peaceful collaborative space.

Having a strong understanding of the technological shifts that could occur in this field is essential, as accounting for unexpected changes in technology is one of the most difficult issues to address when creating long-term legislation (Travis, 2011, p. 247-248). In the 1998 case of *Hiram Walker & Sons Inc. v. Drambuie Liqueur Co.*, the company's advertising contracts failed to account for the rise of Internet advertising. This case and many others highlight the importance of improving our understanding of the potential future of human society as we travel deeper into space.

The Connection Between Science Fiction, Policy, and Culture

Just as important as improving our understanding of our future in space is tapping into our creativity and imagination of it. Science fiction may be relevant to studying space technology's influence on society and governance and to developing institutional protocols to prepare for space exploration (Caroti, 2010, p. 393-394). The judges of many speculative court cases have used science fiction to address and make rulings on hypothetical technologies such as artificial intelligence, torture carried out by machines, and "the increasingly porous boundary between life and death" (Travis, 2011, p. 248). Furthermore, science fiction has historically been a good platform for discourse while exploring alternatives to real-life legal, social, and technological systems (Travis, 2011, p. 241). The imaginative social issues presented in science fiction have been shown to be closely tied to the law by drawing from and influencing cultural attitudes (Travis, 2011, p. 257). For example, the book *Dune* imagines a feudalist system based on planetary ownership, which is inspiring for understanding how space could become

competitive. On the other hand, the TV show *Star Trek* presents many problems and solutions that an international space governing force may encounter far in the future (Vertesi, 2019, 138). Therefore, it is important for institutions and society to keep works of science fiction in mind when predicting the future of space exploration.

Though it is daunting to develop regulations and agreements that encourage peaceful space exploration, there are a vast amount of sources from which discourse on space policy issues can draw from. Neeley and Luegenbiehl's "Beyond Inevitability" stresses the importance of beginning such overwhelming tasks using creativity and by understanding the choices that can and need to be made for an effective sociotechnical system. I model my STS research and analysis off of this work, along with Arnold Pacey's "Culture of Technology," which gives further insight into how to frame the idea of space exploration as a sociotechnical system. Using these methods, I focus on how space exploration should be framed as a human passion rather than a necessity.

Methods and Limitations of Forming Space Exploration Policy Systems

Currently, widespread efforts are being made to better educate and legislate for space exploration. For instance, the UN and many other countries have established treaties and principles governing space that address its preservation, the settlement of minor disputes, the use of technology, cooperation, and basic rights such as freedom of outer space exploration (United Nations, n.d., n.p.). However, according to Szocik et al. (2017), current legislation fails to address approaches to international conflicts and the changes that need to be made as new technology is produced (p. 34). Therefore, exploring sources that can influence the world's legislation on peaceful space exploration will be absolutely necessary to prepare for the

immediate technical goal of many space groups, a journey to Mars. History and science fiction may be excellent sources for teaching us lessons and inspiring discussions about the issues we may encounter after leaving Earth. Science fiction has the power to give insight on the effects of advancing technology on society and law, and history can provide examples of conflicts surrounding unclaimed territories. Science fiction is also telling of the cultural and societal opinions on developing technologies.

After spending time researching various events in history and works of science fiction, many trends could be useful in building a discourse on the requirements of socio-technical systems for the peaceful and ethical exploration of space. Considering the current unilateral space policies of many countries, the importance of establishing better international policies is more clear than ever, especially when thinking back to the political struggles that caused the Space Race. The key difference between the success of cooperation on the ISS and the conflicts of the Space Race is the focus on science rather than politics.

Many court cases have used science fiction to describe the results of failing to uphold effective policies to prevent unethical uses of technology (Travis, 2011, p. 245-247). These examples help to qualify science fiction as a source of knowledge that can help prevent the use of technology for unethical purposes. Furthermore, many studies have illuminated the fact that science fiction has the power to address potential social issues and take from and influence cultural opinion. Recently, for example, the show “Black Mirror” raises ethical questions on technologies such as tracking devices and emulating the human brain. Literature exploring the possibilities of space exploration can be an inspiration for creating agreements to ensure the exploration of space remains peaceful and avoids violence.

Table 1. Breakdown of common themes in socio-technical system frameworks used in these papers, focusing on technology, choices, and ethics (Neeley & Luegenbiehl, 2008; Pacey, 2005) (created by author)

Theme	“Beyond Inevitability”	“The Culture of Technology”
Technology	Technological change can seem overpowering leading to inadequate socio-technical system design	Organizations and individuals control technology in different ways, through their actions, which can be for virtuosity or need
Choices	When designing socio-technical systems around developing technologies, it is essential to have a strong understanding of the choices we can make	Develop decision making processes to sort out the differences between designing for virtuosity, human need, and market need. The power of virtuosity is something we need accept and implement in the choices we make when deciding how to design sociotechnical systems
Ethics	Creativity is one of the most important factors to developing effective ethical systems around technology	“Need an ethical, if not spiritual, discipline in technology,” which goes along with charity, sharing, and meeting basic needs

One model used for this STS research and analysis is Neeley and Luegenbiehl’s “Beyond Inevitability” (2008). The key ideas in this method include the fact that the inevitability of technology is something that can sometimes be seen as overpowering, leading to insufficient discourse and development of the technology as a socio-technical system. It emphasizes the importance for humans to understand the choices they have regarding these technologies and the creativity that is involved with building this understanding. In my research, this framework is helpful as space travel technology is developing much faster than the engineering socio-technical systems that peaceful exploration of space requires. It is important to use our creativity in

exploring science fiction, history, and other sources to make space policy as advances at the technologies themselves. This would have to start with discourse on the future of the technology and how we can make them better suited for collaborative space exploration.

In order to begin to think about how to properly use these sources to improve our systems surrounding space technology, Arnold Pacey's "The Culture of Technology" (2005) is used to describe the way that ethical actions can relate to technology with a focus on the different ways that organizations and individuals control and create technology, respectively. Pacey illustrates the value of virtuosity in engineering revolving around work that does not respond to necessity. It is instead a desire for aesthetic, emotional, and intellectual empowerment that drives efforts of virtuosity.

Space technology is certainly better framed as a result of natural human curiosity and virtuosity rather than as a necessity. Exploring space does not directly solve any problems with the world right now but rather taps into the passion and creativity that the people leading the field possess. This goes along well with the idea of inevitability presented in Neeley and Luegenbiehl's paper. The exploration of space is already underway, so focusing on the ways to prevent violence and conflict surrounding it should be the main focus, especially using the power of passion and creativity of the actors in the system. Furthermore, it is important when designing international agreements surrounding space exploration to focus less on the benefit of individual people or the markets, that countries like the US and China seem to be looking towards, and more on the resources developing this technology could bring to humanity as a whole, such as a sense of inspiration, creativity, and global development.

Contrasting the Space Race and the International Space Station illuminates how focusing on scientific developments shared across the whole world is much more peaceful and progressive

than competitive political space related ventures. It is essential to get organizations to understand and work for the desires of humanity. As previously mentioned, science fiction could be an excellent source for organizations to use to better understand the public opinion on space exploration, which would be of the utmost importance when attempting to create policies aligning with the desires of humanity as a whole. Furthermore, science fiction authors tend to have a strong basis of technical understanding surrounding their works. It is essential for space policy to be effective at taking into account the connection between technology, culture and public opinion, and the law. The virtuosic creators of science fiction are in a very unique position due to their expertise of the intersection of science and culture, and the historical precedent of their influence on the law.

As technology advances, it is important to have these conversations revolving around previous failures and successes of peaceful space exploration as early and often as possible in order to mitigate conflicts between nations. We have already seen countries begin to be unsatisfied with the current international agreements and make their own plans as their technology develops. The United States in particular seems to have the most market oriented policies to space travel, possibly due to the private industry led by entrepreneurs developing so quickly without much development of international policy. With the profound progress of these entrepreneurs in space technology, it follows that America would be more interested in investing in these programs rather than working internationally as it would suit their individual desires better than the seemingly stagnant international policy development. Using Pacey's work to frame space exploration as a venture of virtuosity makes it clear that there are many reasons that science fiction creators are better suited to provide a sense of direction for space travel than politicians.

The Role of Virtuosity in Designing Ethical Space Exploration Systems

Science fiction and history will be deeply linked to the way space exploration pans out. It is completely necessary to learn about the ways these sources have influenced our public and private systems in the past in order to better qualify them as valuable sources for space exploration. Looking into these sources will give us the power to tap into some of the most creative and passionate minds of our time, as well as giving us a better understanding of mistakes made in the past that can still be avoided, providing insight into what choices we can and need to make. Doing so can make policy making seem more reasonable and feasible, and result in a stronger push for development of international space policy.

In terms of using history, I believe that the largest difference I have observed is the difference in collaboration in technology when politics are involved compared to when science is the main focus. It seems that when focusing on science, people across different countries are much more willing and likely to contribute their findings to other countries. Tara Ruttley et al. make the claim that inherently, science is highly international and that working in partnership rather than in competition can save money and make more impactful contributions to humanity (Ruttley et al., 2017, p. 1164). In terms of the International Space Station, this collaboration allows access to more resources and the ability to take larger risks with their work (Ruttley et al., 2017, p. 1164-1166). In figure 1, the benefits of the ISS on specific space agencies' productivities are shown to nearly double with collaborative efforts. The collaboration exhibited by the International Space Station has been proven to benefit the whole of humanity in health, education, and technology in many ways. Furthermore, it seems that with the internet and the

accessibility of sharing scientific discoveries that it brings, the trend of collaborating on new technologies is likely to continue.

	Agency Only	Collaboration (Hosting)	Investigations Implemented	Collaboration (Participating)	Total Agency Impact
CSA	21	8	29	24	53
ESA	217	72	289	219	508
JAXA	376	164	540	82	622
NASA*	553	155	708	83	791
Roscosmos	356	138	494	191	685
			2060		

*NASA utilization includes investigations by the Italian Space Agency (ASI), an ISS Participant Agency

Figure 1. Positive Impacts on Various Space Agencies as a Result of International Collaboration on the ISS (Ruttley et al., 2017, p. 1166)

On the other hand, when politics are the main focus in technological developments, there tends to be closely kept secrets between competitors. It may be argued that the fact that groups are aiming to develop their technology faster than their competitors could speed up development on both sides of the dispute. However, this likely would end up with a singular focus on a certain development that is likely not beneficial to the whole of humanity. The nuclear arms race is a perfect example of this, as billions of dollars were poured into increasing the United States and Russia’s nuclear stockpile while other problems within each country were not addressed, and society was negatively impacted. During the Cold War era, widespread panic was rampant in the United States, with many citizens creating bomb shelters living in fear of a nuclear attack. Furthermore, this conflict plunged developing countries into conflicts that caused them to

sharply increase their military spending from 27.8 billion dollars in 1970 to 125 billion dollars in 1982 (Kim, 1984, p. 1101). Though it can be argued that the introduction of war industries into these countries can improve their scientific and technological growth, the reality is that the increased use of capital in these countries for military spending takes away from civilian opportunities like transportation, building, health service, and education jobs (Kim, 1984, p. 1104-1105). This makes the possibilities for social and economic progress in developing countries significantly more difficult, as their efforts are focused on military purposes rather than dealing with poverty, starvation, disease, and illiteracy (Kim, 1984, p. 1106). Clearly, the politicization and competition surrounding new technology works out poorly for the entire world.

Another concerning trend for politicians in technological policy making is their lack of expertise on the issues they are addressing, which results in a lack of understanding of the implications of their policies. For example, during Mark Zuckerberg's hearing on the recent Cambridge Analytica Facebook Scandal, policymakers struggled to understand how Facebook worked and was successful. For example, one senator asked Zuckerberg how Facebook can "sustain a business model in which users don't pay for [the] service," a question that most technologically savvy people would understand as a result of advertisements running on the platform (Stewart, 2018). This case shows the dangerous disconnect between policy makers and technology, even with Facebook being founded in 2004. If space exploration policy is left in the hands of similar policy makers who do not know much about or care for space exploration, the policies would likely reflect that. These policies would have a dangerous lack of understanding about the novel and future technologies that need to be thoroughly accounted for in order to ensure space remains a peaceful frontier. It is essential to look for passionate, creative, and

intellectual minds to point us in the right direction of development of these policies, such as science fiction authors.

Science fiction is an effective measure of public and cultural sentiments surrounding novel or possible technologies and the issues that could arise as a result of space technologies. According to Sheila Schwartz, science fiction is “a bridge between the two cultures of science and the humanities” while also being “a bridge between all cultures as it summarizes and expresses the nightmare fears, myths, and inescapable concerns of all people today (Schwartz, 1971, p. 1044). In a literature study by Christopher Menadue and Karen Cheer, they find a common theme of science fiction being a powerful tool for “scientific and social advocacy,” as well as “cultural insight” (Menadue & Cheer, 2017, p. 12). This can be by introducing scientific facts to people who are not well versed in those sorts of topics and constructing models for cultural and social systems (Menadue & Cheer, 2017, p. 12). I believe a quote by José van Dijk sums up the influence of science fiction on cultural and political institutions:

“Science Fiction, throughout the centuries, has been a significant cultural tool for comprehending and evaluating the scientific, moral and social consequences of new technologies . . . besides projecting a possible future, science fiction often entails criticism of present technological or social arrangements.” (p. 9)

Menadue & Cheer (2017) also evaluated the use of science fiction for educational purposes, specifically when used in school curricula, and found that there are mainly positive results to inspire young people’s interest in science (p. 12). Considering its powerful use as a metaphor to allow for a better understanding of science and inspire creativity about the potential future of technology to both young and old alike, it follows that science fiction creators should be prominent in discussions of the cultural, societal, and political systems surrounding the

exploration of space. Science fiction works have provided a great number of sources that can provide creative insights into the current and potential public opinions surrounding space exploration. These works have the potential to provide inspiration for institutions to implement better systems to ensure that space can be explored peacefully.

Thinking back to Neeley and Luegenbiehl's study, these examples illuminate the power of collaboration and creativity in scientific endeavors, and the dangers of politicizing these enterprises. It is essential to show international policy makers and the actors in specific countries that are preventing progress that humanity would benefit from effective and enforceable rules for space exploration, and to point them towards science fiction creators for inspiration. Showing that peaceful space exploration is not only very feasible but also more effective will make the task seem less daunting and begin a discussion about the choices that are left to be made to ensure space exploration can be ethical and collaborative. Framing this system as a primarily virtuosic pursuit based on Pacey's understanding of virtuosity, it would be most beneficial to tap into the minds of the most creative, and emotionally invested actors that are truly passionate about space exploration, such as scientists and science fiction authors. This would bring stronger technical expertise and understanding of the hopes, fears, and perceptions of the public into the policies surrounding space travel than politicians could provide. As a result, more effective space exploration policies could be realized.

When looking into new space technologies, the primary actors in defining space policy should be those committed to science and passion for space, such as science fiction authors, instead of politicians. Thinking again to Pacey's framework, space exploration is certainly a pursuit of curiosity and virtuosity, rather than a necessity to the strength of the economy or the immediate benefits for any individual actors or communities of actors. It is dangerous to view it

as a political issue, as politicians tend to have a serious disconnect from the passion and creativity that space exploration is most connected with along with the technical expertise that solving this issue would require. Ensuring that passion for the science and pursuit of knowledge related to space is instrumental in the design socio–technical systems to keep space exploration ethical and peaceful would decrease the potential for political tension and likely result in more collaboration.

Using science fiction connects to the idea of the importance of creativity in the socio-technical systems frameworks that were discussed. Science fiction has provided a vast pool of many of the various choices that will be required to be made surrounding space exploration as the technology develops. Some of the best creative minds in the world have been imagining the problems that we will face, and tapping into this creativity to design systems preemptively rather than reactionarily will be essential. I believe that if space exploration systems are designed effectively to promote ethics and peace, the writers of science fiction will be significantly more influential in the discourse involved in creating these systems than the usual politicians and policy makers.

Table 2. Breakdown of how “Beyond Inevitability” and “The Culture of Technology” can be integrated into the field of space exploration, including the themes of technology, choices, and ethics (created by author)

Theme	“Beyond Inevitability”	“The Culture of Technology”
Technology	<p><i>Theme: Pace of technology can seem overpowering</i></p> <p>With the complexity and speed of development of space technology, it can seem overpowering and difficult to design ethical systems around them, but it is not in any way impossible</p>	<p><i>Theme: Need vs. virtuosity and organizations/individuals controlling technology</i></p> <p>Organizations should consider space technology as a virtuosic value rather than a human need, and individuals need to voice their concerns to these organizations for the risks of this type of technology</p>
Choices	<p><i>Theme: Understanding choices in STS</i></p> <p>In order to better understand the choices to make surrounding space technology, we need to garner a widespread understanding of the actors surrounding it and consider a variety of factors, such as organizations and the feelings of common people by looking to the past and to science fiction. If circumstances remain the same, politicians will stay in control of these systems.</p>	<p><i>Theme: Sorting out different decision-making processes based on virtuosity or need</i></p> <p>Space exploration should certainly be framed as a virtuosic field, where the most important actors are the ones who are passionate about it. It is essential to accept this fact and build socio-technical systems around it. Many science fiction authors are creative and passionate about space exploration, while politicians are not.</p>
Ethics	<p><i>Theme: Creativity is essential to an ethical system</i></p> <p>Looking towards science fiction authors for creativity around the sorts of problems we could face when exploring space will be particularly helpful at ensuring ethics are kept in mind and the values of individuals and the culture are heard, much more than with politicians</p>	<p><i>Theme: Ethical discipline is necessity with technology</i></p> <p>Because space exploration is a virtuosic value, the works of science fiction and space technology virtuosos should be considered strongly when trying to make effective ethical systems. Politicians lack the virtuosity to legislate effectively for this system.</p>

Conclusion

The technology surrounding the exploration of space is developing very rapidly. It is starting to become clear that the development of political and social systems to prevent conflicts surrounding the exploration of space are beginning to lag behind the technology that requires them. The United Nations has an idealistic view of the requirements for these systems, with bare bones legislation that focuses on keeping space peaceful, while countries like the United States and China seem to have a single-minded view that will likely result in serious conflict. For this reason, it is essential to stimulate discourse on the requirements of legislation and the choices yet to be made to keep space exploration peaceful and responsible, with a focus on the cultural and social attitudes of the public and the successes and failures of past structures that have failed to prevent conflicts.

Using history as a basis to better understand what causes technological developments to become competitive rather than collaborative has clearly shown that when technology is involved in political conflicts, it is competitive and harms humanity. On the other hand, when technology is purely used for scientific discovery and learning, it tends to become much more collaborative. This implies that when designing socio-technical systems to ensure the peaceful exploration of space, the actors need to understand how science, culture, and the law closely intersect in this issue.

Current policy makers have a weak understanding of the virtuosity inherent in the issue of space exploration, leading to a strong disconnect from current space technologies and the general public's hopes and fears about the future of space. However, science fiction authors possess the passion and virtuosity that leads to a rare understanding of science, culture, and the law that allows them to imagine in depth the way these systems might interact as new space

technologies become available. Their ideas and works, rather than those of politicians, should be the primary focus when building international policies surrounding the best ways to ensure space exploration remains ethical, peaceful, and beneficial to humanity.

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