

Space and Society

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# Global Space Governance: An International Study



Springer

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# Global Space Governance: An International Study

 Springer

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*This book is dedicated to all the people and organizations actively striving to expand the benefits of outer space and their equitable sharing among all inhabitants of the planet Earth through an effective global governance regime for the peaceful and sustainable exploration, use, and exploitation of outer space and celestial bodies.*

# Foreword

This impressive endeavor undertaken by the McGill University Institute and Centre of Air and Space Law was initiated in 2014 at its Second Manfred Lachs International Conference on Global Space Governance. It culminates with the present study, which is timely in view of the intergovernmental process toward UNISPACE+50. The innovative approach to the notion of governance of space activities and the supporting cross-sectorial work being carried out in those years demonstrate the importance of efforts at the academic level in support of intergovernmental considerations at the global level.

The UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) in 2015 initiated the push toward the fiftieth anniversary of the first UN Conference on the Exploration and Peaceful Uses of Outer Space in 2018 (UNISPACE+50) (UN Document A/AC.105/L.297). In June 2016, the UNCOPUOS, upon the recommendation of its Scientific and Technical Subcommittee and Legal Subcommittee, agreed to a set of seven thematic priorities, including their objectives and mechanisms for implementation, which will collectively form the basis for decision-making by the UNCOPUOS in 2018.

Those UNISPACE+50 thematic priority areas are comprised of (1) global partnership in space exploration and innovation; (2) legal regime of outer space and global space governance: current and future perspectives; (3) enhanced information exchange on space objects and events; (4) international framework for space weather services; (5) strengthened space cooperation for global health; (6) international cooperation toward low-emission and resilient societies; and (7) capacity-building for the twenty-first century (UN Document A/71/20, para. 296).

The contribution of space law and policy to space governance and space security in the twenty-first century is a central pillar of this overarching process.

This complex intergovernmental process is engaging governments, governmental institutions, international intergovernmental and nongovernmental organizations, industry, private sector entities, academia, and civilian society. In this context, the innovative approach taken by activities within the framework of the 2014 Manfred Lachs International Conference on Global Space Governance is highly appreciated.

In May 2014, space scientists, engineers, actors of the private sector, lawyers, and regulators assembled in Montreal, Canada, at the Second Manfred Lachs Conference organized by the McGill University Institute and Centre of Air and Space Law. This gathering of over 120 experts from 22 countries set us on the road toward a comprehensive, international, and interdisciplinary study of all aspects of global governance of space-related matters. The “Montreal Declaration” was adopted on May 31, 2014. This declaration called for a global interdisciplinary effort that asked both technical and legal experts to define or recommend new laws, regulations, standards, guidelines, codes, and transparency and confidence-building measures to govern the intricate and rapidly developing domain of outer space. It was a unique gathering of experts and stakeholders who were united in the desire to look into the future and ensure how space technologies, activities, and applications can be better conducted in a more efficient and fair manner for humanity.

In short, the Montreal Declaration was a call for a pragmatic and utilitarian study of internationally identified space-related governance issues. It also called for a study to identify new solutions.

We are on the verge of a new and very productive Space Age. Actually, there are many indications that we are at the new launching point for innovative new space technologies and applications. If we manage to do this correctly, it could be an opportunity to greatly broaden the possibilities for the people of planet Earth to utilize, on a sustainable basis, the great bounty of space that beckons us. The key is a governance system that allows new opportunities and innovations, based on a system underpinned by the principles of sustainable use, sharing, fairness, and equity for all.

We need equity for all those on Earth as well as for future generations, but we also need to be fair and incentivizing for those today who make the efforts and investments to realize the technologies and systems to unlock the potential of space enterprise. A global space governance system that can make this happen needs innovative thought, fairness, and hard work.

The result of 3 years of international cooperation and study through this project to achieve such goals is contained in this book. It reviews current national, regional, and global systems of legal and regulatory governance of outer space. The book examines and makes recommendations for action with regard to satellite telecommunications, remote sensing and Earth observation, satellite navigation and tracking (global navigation satellite system, i.e., GNSS), space-based solar power, space launch systems, and human spaceflight (including new commercial offerings).

Matters of the broader perspective of space security, future space traffic management, and the management of hazardous space debris and orbiting space assets form the backbone of discussions in several chapters. Attention is also paid to the advent and use of small satellites and large satellite constellations, space mining, utilization of space resources, the worrying issues of natural cosmic hazards and planetary defense, space environmental issues, as well as perspectives of human presence and settlement on celestial bodies. Space and long-term economic development, education, and capacity building for space development and vital concept of sustainability in all aspects of space activities further form the topics of several other chapters of the book.



This seminal work, which highlights the combined efforts of recognized academics, professionals, and publicists, concludes with a forward-looking discussion of the means and methods for extending the benefits of space to all humankind.

The UN Office for Outer Space Affairs salutes the scores of participants from around the world representing several countries, which have engaged in this international and interdisciplinary study, and regards it as an inspirational source. This comprehensive study is particularly valuable in its integrated approach.

The Montreal Declaration was the start of a new way for a broad range of space actors and stakeholders, including scientists, engineers, private sector representatives, political science pundits, and space lawyers and regulators to work together and share ideas and inspirations.

I believe this book is well worth reading. Hopefully, the many innovative ideas and recommendations contained herein can contribute to the further consideration of global space governance for the twenty-first century and be infused in the global discussions so vital to the future of space and the sustainability of these efforts around the globe.

In this sense, the study is a source of valuable inspiration to the overarching considerations of space economy, space society, space accessibility, and space diplomacy that will lead the space community toward “Space 2030” by building a global space governance in support of the 2030 Agenda for Sustainable Development.

The UNISPACE+50 in 2018 is the beginning and leads us forward in a strategic, well-defined process designed for intergovernmental needs and considerations. Academic support, such as through this impressive study, indeed also assists in strengthening the global role of the UNCOPUOS and the UN Office for Outer Space Affairs in international governance of outer space activities.

Simonetta Di Pippo  
Director, UN Office for Outer Space Affairs  
Vienna, Austria  
May 2017

## Second Foreword

Space is changing. Governments, agencies, and other official State organizations are rapidly increasing their development of space tools and techniques, and their utilization of outer space using indigenous, collaborative, and/or purchased assets. University and academic institutions now have the resources and capabilities to develop, either from scratch or through collaborations or kits, micro to small space vehicles that can be inexpensively lofted to low-Earth orbit. And increasingly, commercial players in a multitude of countries have developed, or are in the process of rapidly developing, sophisticated solutions in relation to launch, space-based assets, services, or applications of interest to many varied and eager customers. This exciting, innovative, and transformative situation, in common with all disruptive technological advances, is well in advance of the rules and standards that need to be developed in order to ensure that undesirable aspects do not hinder, slow down, or, worse, halt the very positive attributes that such developments can bring and are bringing to humanity.

In respect to the current situation relating to outer space activities, the rules that have been codified in the series of treaties signed and ratified almost 60 years ago, and that have served the world remarkably well over this period, are showing their age. This should not be surprising; most of the current advances in space technology and in the overall global direction in relation to space activities could not have been foreseen 60 years ago.

The UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) has, over the past 15 years or so, been steadily and effectively working on some of these major space governance issues, incorporating transparency and confidence-building measures, with many successes, including the development of guidelines in relation to the mitigation of space debris, warning and mission planning for asteroid threats, the coordination of global activities in relation to global navigation satellite systems, and principles relevant to the use of nuclear power sources in outer space. Recently, a major effort has been collaboratively undertaken by all 83 UNCOUOS Member States on developing a set of comprehensive, non-binding guidelines relating to the long-term sustainability of outer space activities with a full report and the first compendium of guidelines expected to be approved by the UN General Assembly in 2018.

More, however, needs to be done. This is why the UNCOPUOS has recently agreed to develop a new set of agenda items for the post-2018 period addressing the most pressing and urgent issues relating to the peaceful uses of outer space under the umbrella of a process called UNISPACE+50. One of the major priorities of this process is the governance of outer space activities; indeed, this key agenda item could be considered as perhaps the predominant issue that is common to all of the other thematic priorities under discussion, including exploration, space objects and events, space weather, space and global health, space in support of climate change, resiliency, and capacity building. This is why a careful reflection, discussion, and consideration of the governance of outer space activities is so timely and important, and why the current volume is significant in helping to frame the deliberations that need to be conducted between now and 2018, and beyond.

I wish you *bonne lecture* and all of us success in the fruitful contemplation, discussion, and, hopefully, action on the development of a progressive and harmonious process related to strengthening the governance of space activities so that this unique, fragile, and essential environment may continue to serve all of humanity for generations to come.

David Kendall  
Chair, UN Committee on the Peaceful Uses of Outer Space (2016–2017)  
Vienna, Austria  
May 2017

# Editors' Note

Putting this book together has been a long and challenging, but highly enjoyable, undertaking. From the recruitment of contributors to receiving, reviewing, editing, and enhancing manuscripts and attempting to reconcile the diverse opinions and thoughts of over 80 experts from all around the world took over 3 years. In this period of time, we made every effort to resolve inconsistencies and to present a coherent and useful book addressed to policy makers, legal experts, and political leaders who shape the future of global space governance. This has been challenging because opinions and perspectives on space-related data differ all over the world. Furthermore, there are nuances and difficulties in semantics in that some terms mean different things in different contexts. For example, the term “sustainability” in the context of the UN Sustainable Development Goals refers to developing sustainable and viable practices around the world, with a special emphasis on emerging economies. Yet in reference to the “long-term sustainability” of outer space activities this refers to such concerns and issues as space debris and cosmic hazards and a concern that all people on Earth can access and use outer space for the longer term. For this reason, we have tried to define terms in context.

We have tried to use historical perspectives in analyzing issues concerning global space governance, but have also tried to be forward-looking in order to address evolving problems for the longer-term future. The role of the “State” and “commercial entities”, and how they are effectively governed today and tomorrow represent just one of the key issues that was addressed in looking to the future.

The point is that the editors have sought to present a study with findings and recommendations that balance and reflect the perspectives of the North and the South, the East and the West, the public sector and the private sector, and took into consideration the interests of all types of countries, regardless of their system of governance. We conceived the project, its nature, scope, and methodology, and prepared the outline of the study in consultation with experts from various countries. Chapters were initially drafted by several experts, expanded by many more experts, reviewed by some others, and edited and checked by desk editors and both of us. We have tried to be consistent in terms of the use of facts, figures, statistics, ideas, recommendations, and writing styles, and also strove to avoid overlaps and conflicting

interpretations of existing space programs and conceptions of space governance and law. Intentionally, some repetition and reiteration of legal provisions have been kept in several chapters in order to facilitate understanding and avoid having to flip back and forth to different chapters. This is difficult with so many contributors and viewpoints. If in some ways we have failed, we wish to note that it was not from a lack of trying.

Clearly, this book is comprehensive but does not have all the answers. Nevertheless, it is hoped that the study can at least define an original and practical way forward in seeking new and better answers in the realm of global space governance. Rather than being the final word, the book should be considered as a significant and unique step in initiating international dialog on the highly relevant, timely, and increasingly ever-present issue of the global governance of all conceivable issues, activities, and developments related to outer space.

Ram S. Jakhu  
Joseph N. Pelton

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We are indeed thankful to the following institutions for supporting this study. It is understood that they support the objective of the project, i.e. to investigate issues of global space governance from international and interdisciplinary perspectives and to provide recommendations to the international community, particularly to those institutions and individuals involved in global space governance. However, their sponsorship does not mean an endorsement of the conclusions or recommendations of this publication.

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The Roman law proverb *Quod omnes tangit ab omnibus approbetur* reminds us that “What affects all people must be approved by all people.” This “consent doctrine” has been the basis of modern governance system in the form of democracies against despotism by a few. The impact of the doctrine can also be seen as the most fundamental foundation of global governance of outer space system recognized by the international community. Within a few months of the dawn of the Space Age, the UN General Assembly unanimously adopted Resolution 1348 (XIII) on “Question of the peaceful use of outer space.” In this resolution, the General Assembly recognized “the common interest of mankind in outer space and...it is the common aim that outer space should be used for peaceful purposes only” and expressed its desire “to avoid the extension of present national rivalries into this new field [and]...to promote energetically the fullest exploration and exploitation of outer space for the benefit of Mankind.” These aspirations were reiterated in the 1967 Outer Space Treaty, Article I, which specifies that the “exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.” In other words, outer space matters to all nations and peoples, and thus all issues related to the exploration and use of this new domain must be addressed.

With this backdrop, this study was undertaken, as a bottom-up effort, by a team of individuals, in their personal capacities, from various disciplines and countries. This is really an international effort, a pure labor of love, designed to initiate a global dialog to express views on the design, scope, and nature of the system of global space governance that affects all peoples of planet Earth.

The editors of this book would like to express their deep gratitude and appreciation to the large team of experts that helped in drafting and reviewing various chapters of the book. They are the world’s leading authorities in their respective fields of expertise and are naturally extremely busy in their professional lives. Their biographies are included in the attached Appendix A. A collaborative work like this book involves a complex and time-consuming management and coordination of activities

of over one hundred individuals and numerous institutions from various parts of the world. Their names are listed in the front matter.

This study would have not been possible without the financial support of the Erin J. C. Arsenault Trust Fund at the McGill University Faculty of Law. We are deeply indebted to Cynda Arsenault, who has gifted this fund in order to support education and independent research related to the advancement of space security and sustainable space development through the rule of law. We are also thankful to a good number of other institutions for their generous support, encouragement, and advice. Their names are listed in the front matter.

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Ram S. Jakhu, Editor  
Joseph N. Pelton, Editor

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