

**Virtual Outer Space Law Conference
University of Waikato**

3 September 2021

Information Booklet



General Information

A. Programme Schedule

The conference will commence at 8:45am on Friday, 3 September and finish at 5:45pm. (Programme Schedule is copied below). The conference will run on New Zealand time and will take place via Zoom. A Google Calendar invite for all conference speakers will be circulated shortly with the Zoom link. You can also find the Zoom details below:

Join from PC, Mac, iOS or Android: <https://waikato.zoom.us/j/87883285309> and follow the install prompts

Or join by phone: +64 (0) 9 801 1188 (New Zealand Toll) Meeting ID: 878 8328 5309

International numbers available: <https://waikato.zoom.us/u/krcrm6Onqw>

Or join from a H.323/SIP video conference room system: Dial: 130.217.226.85 Meeting ID: 878 8328 5309

PLEASE NOTE: That if you are connecting from a corporate IT environment or behind a firewall the ITS Service Desk strongly suggests you do a test call before joining meeting. To do a test call email the ITS Service Desk on help@waikato.ac.nz or phone them on 07 838 4008. If your app stays in a "connecting" mode or timed out due to "Network error" please ask your IT department to open the following network output ports for Zoom and try again. TCP 8801, 8802, UDP 8801, 8802

Please arrive by 8.40am (New Zealand time) for our Mihi/Welcome at 8:45am.

Given the very high level of interest and to allow question time for each panel, please limit your presentations to a **maximum** of **15** minutes (unless you have been advised otherwise).

All paper abstracts and author biographies have been included in this booklet for conference delegates convenience.

B. Keynote Events

We are thrilled to advise that we will have two keynote addresses. The first keynote address will be delivered in the morning by Professor Frans von der Dunk (University of Nebraska-Lincoln) and the second keynote address will be delivered in the late afternoon by Professor Steven Freeland (Western Sydney University).

C. Document Exchange and Publications

Should you wish us to exchange your paper with another participant (we will try to "match" papers by theme) to allow for more considered feedback and discussion, please submit your draft paper to abrennan@waikato.ac.nz by 22 August 2021.

We are exploring publication options for papers delivered at the conference. If you wish to be considered for inclusion in any publication, we strongly encourage you to participate in the document exchange process. However, it is not mandatory to participate in the document

exchange process in order for your work to be published. If our edited collection proposal is successful all papers will be peer-reviewed as part of the editing/publishing process.

A Roundtable Discussion on Potential Publication will take place during the conference at 4.30pm.

D. Recording

We intend to record some of the conference sessions. Please also contact us if you have any concerns about this, as we will otherwise consider your participation to constitute consent to being recorded.

E. Questions

Please contact abrennan@waikato.ac.nz if you have any questions about the event. We look forward to seeing you in September!

3 September 2021	Program
8:45	<p><i>Mihi/ Welcome</i></p> <p>Associate Professor Robert Joseph, Director, Te Mata Hautū Taketake – The Māori & Indigenous Governance Centre, <i>University of Waikato</i></p> <p>Professor Alpana Roy, Dean, Te Piringa Faculty of Law, <i>University of Waikato</i></p> <p>Dr Anna Marie Brennan, Senior Lecturer, <i>University of Waikato</i></p>
9:00	<p><i>Session 1: The Promise of Outer Space Law</i></p> <p>Chair: Professor Alexander Gillespie, <i>University of Waikato</i></p> <p>Panel:</p> <p>A Narrative of Space Law: Extra-Textual Extra-terrestrial Law Formation <i>Dr P.J. Blount, University of Luxembourg and University of Mississippi</i></p> <p>The Right of Self-Defence in Outer Space Law: Legal Issues and Way Forward <i>Professor Fabio Tronchetti, Beihang University and the University of Mississippi</i></p> <p>Frontier Mentalities and the Opportunity for New Customary Law in Space <i>Associate Professor Jennifer Brobst, Southern Illinois University School of Law</i></p>
10:00	<p><i>Session 2: Keynote Address - Professor Frans von der Dunk, University of Nebraska-Lincoln</i></p> <p>Chair: Dr Anna Marie Brennan, <i>University of Waikato</i></p>
11:00	<p>Break</p>
11:30	<p><i>Session 3: Colonisation, Self-Determination and Outer Space</i></p> <p>Chair: Professor Valmaine Toki, <i>University of Waikato</i></p> <p>Panel:</p> <p>Boots on the Moon: Managing the Return of Humans to the Moon <i>Professor Melissa de Zwart, Adelaide Law School</i></p> <p>The Moondust Kingdom <i>Mr Danny Johansen, University of Southern Denmark</i></p> <p>The Reasons for a Right to External Self-Determination in Outer Space <i>Ms Josselin Lavigne, University of Aberdeen</i></p>

12:30	<p><i>Session 4: Contemporary Challenges in Outer Space Law</i></p> <p>Chair: Dr Andelka Phillips, <i>University of Waikato</i></p> <p>Panel:</p> <p>It's Not my Fault!: The Looming Danger of Space Debris <i>Professor William Schonberg, Missouri University of Science and Technology</i></p> <p>Regulating Space Debris: A Comparative Study of Sustainability Requirements in National Space Licencing Laws <i>Dr Cassandra Steer and Mr Henry Strong, Australian National University</i></p> <p>Emerging Principles on Safety Zones around Space Resource Utilisation Activities on Celestial Bodies <i>Associate Professor Matthew Stubbs, University of Adelaide</i></p> <p>Tourism into Space and to the Antarctic: Similarities and Differences” <i>Dr Solène Guggisberg, University of Utrecht</i></p>
2:00	Break
2:30	<p><i>Session 5: Human Rights, State Practice and Outer Space</i></p> <p>Chair: Professor Claire Breen, <i>University of Waikato</i></p> <p>Panel:</p> <p>Applying International Human Rights Law to Outer Space Settlements: The Role of the Doctrine of Effective Control <i>Dr Anna Marie Brennan, University of Waikato</i></p> <p>Women Participation in Space Exploration: A Need for A Non-Discriminatory Vision of India <i>Dr E Prema, Vellore Institute of Technology and Ms Melissa Lynch, University of Guyana</i></p> <p>Can Anyone Launch a Rocket into Space?: A New Zealand Legal Perspective <i>Dr Maria Pozza, Director of Gravity Lawyers</i></p>
3:40	<p>Roundtable Discussion on Potential Edited Collection Publication</p> <p>Chair: <i>Dr Anna Marie Brennan, University of Waikato</i></p>

4:15	Break
4:30	<p><i>Session 6: Keynote - Professor Steven Freeland (Western Sydney University)</i></p> <p>Chair: Dr Anna Marie Brennan, <i>University of Waikato</i></p>
5:30	<p><i>Mihi/ Thanks</i></p> <p>Associate Professor Robert Joseph, Director, Te Mata Hautū Taketake – The Māori & Indigenous Governance Centre, <i>University of Waikato</i> Dr Anna Marie Brennan, <i>University of Waikato</i></p>
5:45	Conference Close

A Narrative of Space Law: Extra-Textual Extraterrestrial Law Formation

Dr P.J. Blount

International law is often in the eye of the beholder. Though the traditional ‘sources doctrine’ points towards positive sources of international law, there is increasing recognition that the doctrine’s basic text, Art. 38 of the Statute of the ICJ, fails to fully account for where we find international law. The rise of soft law, the recognition of interpretive practices, and the expanding importance of national legislation, among other touchpoints, indicates that the vision of international law contained within positivists texts is problematic. International Space Law serves as an excellent case study of this shift in our understanding of international law. A salient example from this body of law is the ambiguity of the Outer Space Treaty’s Article II, which places an obligation on states to not appropriate space. This text is notoriously ambiguous and has been subject to sustained scholarly inquiry as to the content of the provision. Currently, amid increasing interest in exploration and exploitation of celestial bodies, States have been engaging in interpretive practices that attempt to define Art. II through narrative practices.

This paper will argue that norm development in international space law is currently marked by a variety of narrative practices by states geared towards norm formation. Drawing on contemporary theories of international law, this paper will use cases from space law to illustrate how the states attempt to define the content of the law from the exterior of the legal text through competing narratives.

This paper will first develop a narrative theory of international law through an examination of the myriad extra-textual ways in which the law is revealed. Next, this paper will examine the nature of space law and its move away from textual development of the law. Finally, this paper will examine this phenomenon in the specific areas of space resources, PAROS, and space traffic management.

Author Bio: Research Fellow in Cybersecurity Governance and Regulation, SES / University of Luxembourg Adjunct Professor, University of Mississippi School of Law

The Right of Self-Defence in Outer Space: Legal Issues and Way Forward

Dr Fabio Tronchetti

In recent years, outer space has become an integral part of the international security debate, a crucial element affecting international relations and dynamics. A similar development should not be surprising once one takes into account the growing States' dependence on space assets for the provision of essential services as well as for the functioning of the national security apparatus. The strategic relevance of space is further confirmed by the establishment of military forces intended to perform military operations in space and the development of technologies aimed at affecting the functionality of satellites.

Once the importance of satellites is unveiled, it becomes evident for States the need to adequately protect their valuable space assets; this brings into the picture the possibility to exercise of the right of self-defence in space. The analysis of how this right applies to space is highly controversial; indeed, not only some scholars question the extent to which this right extends to outer space but also the forms and limits related to its exercise remain uncertain. Much of the challenges derive from the fact that the rules applicable to self-defence were not developed having outer space in mind and there is no practice on how States would act in the event to a threat to their satellites.

The purpose of the paper is to sheer light on how the right of self-defence applies to space; in doing so, analysis will take into account the jurisprudence of the International Court of Justice and the applicability of this right in other domains.

Author Bio: Dr. Fabio Tronchetti works as a Co-Director of the Institute of Space Law and Strategy and as a Zhuoyue Associate Professor at Beihang University, Beijing (China). He is also an Adjunct Professor of Comparative National Space Law at the School of Law of the University of Mississippi. Previously, he worked as an Associate Professor at the School of Law of the Harbin Institute of Technology (China) and as Lecturer at the International Institute of Air and Space Law, Leiden University (the Netherlands).

Frontier Mentalities and the Opportunity for New Customary Law in Space

Associate Professor Jennifer Brobst

My presentation would address frontier mentalities and the role and utility of lawlessness, rather than the imposition of existing legal frameworks into new worlds. Humanity and human individuals will enter outer space for the purpose of exploration, scientific advancement, imperialism, warfare, banishment, and a desire to be left alone or to create new societies. Ancient indigenous customary law and conceptions of natural law have persisted through human eras of migration, industrialization and global market interdependence as those on Earth have culturally and physically colonized each other. Its continued relevance presumably reflects self-awareness of our own biological natures, promises, and limitations. International human rights and outer space treaties have hinted at the need for application of natural law, but often Western rights ideals, into unknown worlds and associations, but they have yet to fully embrace whether concrete principles should extend into outer space. For example, we have the United Nations Commission on the Peaceful Uses of Outer Space and the broad provisions of the 1996 Benefits Declaration (51/122) on the International Cooperation in Exploration and Use “for the benefit and interest of all countries.” However, these only loosely conceive of what will form peaceful, beneficial human relations. In outer space, humans will still be humans. For millennia, we have not biologically evolved in any meaningful way, and yet the species has produced scientific and technological tools and domestic and political structures that would be wholly unrecognizable to our past ancestors. In the context of the frontiers of space, I would like to take my continuing research on the relationship between human nature and the need for autonomy, such as in the right to control levels of privacy and social interaction, into an analysis of customary and natural law to discuss whether we should encourage at least an initial lack of regulation to embrace new developments of customary law in outer space.

Author Bio: Jennifer A. Brobst is an Associate Professor of Law at Southern Illinois University School of Law. Among her various courses, she teaches Scientific and Medical Evidence, regularly including many of the space law issues and analogies laid out in the Outer Space Law Virtual Conference. She also teaches and researches in the areas of Criminal Law and Public Health Law, focusing on the legal history and future of the individual in society including conceptions of civil liberties and what makes humans thrive. See, e.g., *The Metal Eye: Ethical Regulation of the Use of Technology to Observe Humans in Confinement*, 55 *California Western Law Review* 1-127 (2019). She has degrees from Victoria University at Wellington School of Law (LL.M.) (international comparative thesis on criminal family violence defenses in British Commonwealth nations), University of San Diego School of Law (J.D.), and University of Cape Town, South Africa (B.A., with honors in Social Anthropology and Archaeology).

Boots on the Moon: Managing the Return of Humans to the Moon

Professor Melissa de Zwart

Several countries have announced their intention to establish a human presence on the Moon in the coming decade. What are the laws that will regulate the sustained presence of humans on the Moon and their use of resources? How will competing uses of the Moon be governed and how can international law assist with managing any resulting conflicts or tensions?

The Artemis Accords articulate some new concepts with respect to communal uses of the Moon. Whilst modelled in part on the agreements underpinning the International Space Station, the Accords will involve different partners and new ways of working. China and Russia have also announced their intention to establish a base on the Moon, which will involve ‘experimental research facilities created on the surface and/or in the orbit of the moon.’ How will these activities co-operate in the context of the UN Space Treaties? What laws will regulate the in-situ use of resources and how will historic sites be protected? How will private operators respond to the current international law context of space law in their activities on the Moon? This paper will consider the legal frameworks that will be applied to the return of humans to the Moon and where gaps and discrepancies in those frameworks may give rise to international tensions.

Author Bio: Professor Melissa de Zwart is Dean of the Adelaide Law School. She is Deputy Chair of the Space Industry Association of Australia, a member of the IISL and a frequent commentator on military and civilian uses of outer space.

The Moondust Kingdom

Mr Danny Johansen

Humanity is leaping forward in outer space, with new technologies in hand that will enable us to feats in space that we have until now only dreamed of. One of these feats will be permanent bases on the Moon, built with materials at hand on the surface already. While ability is one thing, unresolved legal issues loom large. Article 8 of the Outer Space Treaty (OST) states that the registering state will retain jurisdiction over an object launched into space, even when its constructed on a celestial body. But what when the object was never launched into space, but constructed of materials already there? Even if it is accepted that extracting resources on the moon is not appropriation, constructing a base out of these materials and claiming quasi-territorial jurisdiction can be viewed as being in conflict with the non-appropriation principle found in article 2 of the OST.

The proposed paper wishes to delve into the question whether jurisdiction can be created in an environment that forbids jurisdiction that was not brought from Earth. The aim is to examine possible pitfalls that humanity may meet in the current legal regimes. This will be done by analyze the wording of the articles, discussing the reasons of this formulation. This will be supplemented by other relevant international treaties and frameworks like The Moon Agreement, The Artemis Accords, and the Law of the Sea, all of which may give relevant inputs to interpretations. The paper will end with a discussion about the possible interpretations of the articles, and the pros and cons of different interpretations.

Author Bio: Danny Johansen is a Ph.D. fellow at the Department of Law at the University of Southern Denmark. His Ph.D. project revolves around the legal problems of the privatization of outer space. The focus of this is the relationships between private entities and states. What happens when private entities overtake the main space effort, and how this will affect space law as a source of law under international public law. He has a master's degree in law from the University of Southern Denmark. His master thesis concerned the international legal framework for private entities entering outer space.

The Reasons for a Right to External Self-Determination in Outer Space

Mr Josselin Lavigne

Several development groups from NASA, ESA, the Russian and Chinese Space Agencies, and other scientists have studied the feasibility of space colony projects in various locations in the Solar System. SpaceX intends to use its own rules to organise life on the Red Planet, without necessarily taking into account existing law on Earth, including the Space Treaty. What would be the legal foundations of a claim to self-determination in space?

By answering this question, this article proposes to consider a whole new approach to the problems of space law. Rather than using maritime law or the law of the Antarctic, commonly used to approach space law, this paper envisages using another branch of public international law: the right to self-determination. As the current and future legal problems in space are mainly issues of political and economic sovereignty, this branch of law could bring a new perspective.

This article will look at the reasons and causes that can really push a people to apply its right to self-determination in its external phase. From this first confrontation between these two branches of law, completely new solutions can be brought to the perceived gaps in the framework of international space law

Author Bio: After completing a Masters in Public International Law at Oxford Brookes, Josselin Lavigne had the opportunity to do an internship at the United Nations, the year of the 50th anniversary of the moon landing. It was during this year that he had the chance to talk to space lawyers who told me about the urgency of the situation: that of a legal framework that is less and less respected, and increasingly present private and state ambitions. It was from there that Josselin decided to become a space lawyer by starting a PhD in space law. It has been over a year since he started this research on the right to self-determination in outer space at the University of Aberdeen. It seems to him that the disputes in outer space that humanity will face in the decades to come should not be taken lightly and that we need to increase awareness of space law from a pedagogical angle.

It's Not My Fault!: The Looming Danger of Space Debris

Professor William P. Schonberg

Since 1957, the near-earth population of trackable space objects has grown from 1 to over 19,000. These objects are typically softball size or larger. Of these 19,000+ trackable objects, only several hundred are operational spacecraft. The remainder are pieces of space junk, that is, objects which no longer serve any useful purpose. Some of these objects are fragments from explosions while others are from the breakup of satellites or rocket boosters. In addition to the trackable objects, there are several hundred thousand objects the size of marbles and several million objects the size of sand grains.

As a result, all spacecraft that travel through or operate in low-earth-orbit are subject to high-speed impacts by space junk, which is also called 'space debris' or 'orbital debris'. The threat of damage from high-speed orbital debris particle impacts has become a significant design consideration in the development and construction of long duration earth-orbiting spacecraft - even a marble-size piece of space debris can inflict considerable damage to or possibly destroy an orbiting operational spacecraft or satellite.

Complicating matters a bit, several companies have begun to launch several thousand satellites of their own into earth orbit, mainly for communication purposes, but also to provide a space-based world wide web. Individual satellites provide limited coverage areas, whereas a satellite system (or constellation) provides a much more extended coverage area. According to plans made public, we can expect upwards of 25,000 new satellites in earth orbit this decade. The question naturally arises, then, regarding what benefits can these large satellite constellations can provide, and what effects they might have on other space activities.

During this presentation, a variety of topics related to space debris will be reviewed, including:

- Where does space debris come from?
- How much space junk is really out there?
- What happens when a spacecraft is hit by a piece of space junk?
- How can we protect a spacecraft against damage by space debris impacts?
- Is there any way to clean up the near earth region of space?
- Will the situation improve or worsen in the future?
- What are some of the possible impacts, both positive and negative, that large satellite constellations might have on space programs and operations?

The presentation will also review recent developments in space law as applied to orbital debris, bringing to light several important issues that need to be addressed as earth orbital environments become more congested and space traffic management becomes more difficult.

Author Bio: William Schonberg is a civil engineering professor at Missouri University of Science and Technology. He received his BSCE from Princeton, his MS and PhD from Northwestern. Schonberg's research is dedicated to improving personnel safety in space flight operations. His research is supported by various agencies, including NASA and NSF. As an educator, Schonberg instructs students in technical and professional courses, such as communication and ethics. He was a Visiting Professor at University College of the Cayman Islands where he taught Engineering Law and Ethics for its new engineering program. In 2007 Schonberg received a Bessel Research Award (Humboldt Foundation), which enabled him to

spend 7 months at the Ernst Mach Institute in Freiburg. Schonberg is a Fellow of ASCE and ASME, and a Distinguished Scientist of the Hypervelocity Impact Society. He has been twice honored by the NASA Engineering Safety Center for his technical leadership in support of NASA's orbital debris programs. In 2019 Schonberg was awarded a Fulbright Distinguished Chair, which allowed him to spend 6 months at the DST Group in Melbourne, Australia. While in Australia, he was a Visiting Professor at RMIT, and delivered seminars on space debris and the interaction between engineering and art.

Regulating Space Debris: A Comparative Study of Sustainability Requirements in National Space Licencing Laws

Dr Cassandra Steer and Mr Henry Strong

Our dependency on space-based technologies in the twenty-first century for both daily life and military purposes has increased exponentially in recent decades. Our expanded activities in the near-Earth environment have had devastating environmental consequences due to the increase in space traffic and resulting space debris. Between 1994 and 2018, the orbital debris population is estimated to have increased seven-fold, to approximately 1.25 billion pieces. Collisions between satellites and debris, or between pieces of debris, can be catastrophic to the critical technologies upon which we depend. Additionally, advances in satellite technology have led to a decrease in size from several hundred kilograms to less than 1kg and smaller than 2.5cm³, thereby reducing the cost of access to space, but increasing the difficulty of tracking objects in space. The expectation is that in the next ten years, the current population of approximately 3,500 active satellites will increase to 100,000. This trajectory of human activity in space poses an enormous challenge to long-term sustainability in space.

International space law places the onus on States to “authorise and continually supervise” space activities, but it’s up to States to interpret how they will do this. In the US blanket approvals are given to launches for “mega-constellations” of satellites. The 2019 Guidelines for the Long-term Sustainability of Outer Space Activities adopted by the UN Committee on Peaceful Uses of Outer Space are a step in the right direction, but implementation by States is voluntary. In an age of commercialisation of space, States may be driven to legislate for competitiveness rather than sustainability.

This paper compares different approaches taken in four jurisdictions to integrating sustainability measures into national space licencing laws: Australia, New Zealand, the UK and the US. We identify which models prevail in each system, the impact of the LTS Guidelines, and how local space licencing laws could better respond to the need to preserve the space environment.

Author Bios: Dr. Cassandra Steer is a Mission Specialist with the ANU Institute of Space (InSpace), and a Senior Lecturer at the ANU College of Law specialising in space law, space security and international law. She has consulted to the Australian DFAT, and the Canadian and US Departments of Defence on issues of space law and space security. Dr. Steer is a member of the Australian Space Agency's Technical Advisory Group for Space Situational Awareness, an Associate Expert on the Woomera Manual on the International Law of Military Space Operations, and a member of the International Institute of Space Law.

Henry Strong is a recent graduate of the ANU masters of International Law and Diplomacy. He has a Bachelor of European Studies from the Netherlands. He is co-founder and editor of the Kosciuszko Review, an open-access and independent research journal, with a focus on humanist topics. He interned under Dr. Steer for research to assist the Australian Space Agency.

Emerging Principles on Safety Zones around Space Resource Utilisation Activities on Celestial Bodies

Dr Matthew Stubbs

Space resource utilization will be essential to humankind's anticipated exploration and use of outer space in the coming decades. In this presentation, I focus on the emerging principles that may guide the declaration of safety zones around space resource utilization activities on celestial bodies.

Although the 1967 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies* ('*Outer Space Treaty*') does not expressly address space resource utilization or safety zones, it establishes a set of key principles which must guide any assessment of the legality of safety zones around space resource utilization activities, and which will determine the permissible nature of such zones if they are lawful. In addition, there is much of importance that can be gained from examining recent state practice and non-state efforts in this fast-evolving area, including the 2019 *Building Blocks for the Development of an International Framework on Space Resources* developed by the Hague Space Resources Governance Working Group, and the *Artemis Accords* signed in 2020.

In light of emerging State practice, I suggest that the declaration of safety zones around space resource utilization activities is likely to be lawful, provided that safety zones are declared in such a way as to ensure respect for the key principles of the *Outer Space Treaty*. I further aim to identify some criteria which can serve as a means of determining the legality of potential future safety zones around space resource utilization activities on celestial bodies.

Author Bio: Dr Matthew Stubbs is an Associate Professor in the Law School at the University of Adelaide, where he serves as Editor in Chief of the *Adelaide Law Review*. His research and teaching is focussed in the areas of space law, international law, human rights and constitutional law. Matthew is Chair of the Space Law Committee and Human Rights Committee of the Law Society of South Australia and a member of the Law Council of Australia's National Human Rights Committee. He is a core expert on the *Woomera Manual on the International Law of Military Space Operations*, and a member of the International Institute of Space Law.

Tourism into Space and to the Antarctic: Similarities and Differences

Dr Solène Guggisberg

With the recent launch of billionaires Richard Branson and Jeff Bezos into space, space tourism has taken a new turn, independent from government-funded schemes – while still experimental and sub-orbital, space tourism is now a reality. The increase in commercial tourism in the Antarctic has exploded since the 1990s, with more than 75'000 people visiting that continent in 2019. These developments can be, and have been, perceived as opening up new horizons, but they also trigger a need for regulation.

Since both space and Antarctic are areas governed as being beyond national jurisdiction, this presentation intends to examine whether some similarities and differences can be identified in how tourism might be regulated there. Questions of interest include whether the identity of the forums in which rules regulating tourism might be developed can be expected to influence the adoption of efficient rules; and how the goal of environmental protection might contribute and/or be included in any further regulation.

Author Bio: Dr Solène Guggisberg is a postdoctoral researcher at Utrecht University, where she is based at the Netherlands Institute for the Law of the Sea (NILOS) and the Utrecht Centre for Water, Oceans and Sustainability Law (UCWOSL). She is currently working on Antarctic tourism as part of a Dutch Research Council (NOW) project funded by the Netherlands Polar Programme. Her research focuses on the importance of the concept of non-use and the role of non-user States in regulating Antarctic tourism in a manner that respects the fundamental values and principles of the Antarctic Treaty System. On the basis of a comparative study with other regimes on global goods and commons, she aims to identify best practices and provide policy recommendations (1) to enable proper recognition of non-use; and (2) to further the interests of non-user States.

Applying International Human Rights Law to Outer Space Settlements: The Role of the Doctrine of Effective Control

Dr Anna Marie Brennan

Since the United States announced its intention to establish a military force to safeguard its interests in outer space the military and commercial exploitation of outer space has attracted considerable media and academic attention. Instantaneously, National Aeronautics and Space Administration (NASA) and private commercial enterprises such as SpaceX have announced their intention to establish human colonies on both Mars and the Moon. Even though science and technology are developing precipitously to bring these plans to fruition the applicability of international law to these developments is ambiguous and in many cases completely absent. Without doubt, these future developments will have significant consequences for the application of international human rights law in view of the extreme adverse environment in outer space and the perils involved in establishing sustainable colonies in outer space compatible with human life. An exploration of the legal issues in this area is pivotal. To kick-off, this paper will examine whether international human rights law is capable of extra-territorial application in outer space in view of the present standing of outer space law. In doing so, it will provide a synopsis of some of the key human rights issues that are pertinent to living in outer space. The role which the doctrine of effective control may have to play on this matter will also be critically examined.

Author Bio: Dr Anna Marie Brennan is a Senior Lecturer in Law at the University of Waikato, New Zealand. Previously she was a lecturer at the University of Liverpool in the United Kingdom and University College Cork in Ireland. She has worked on the defence team of Radovan Karadzic (both trial and appeal) at the United Nations International Criminal Tribunal for the Former Yugoslavia and for Judge Sylvia Steiner on the Bemba trial at the International Criminal Court.

Women Participation in Space Exploration: A Need for Non-Discriminatory Vision of India

Dr E Prema and Ms Melissa Lynch

‘No Job is Man’s Job’! The International Labour Organization in its report on global gender gap, states that the current global labour force participation rate for women is 49% and men is 75%. The world nations, in the international arena establish that the rights of women are protected and there is a drastic increase in women participation in all sector. Being one of the emerging sectors, space technology-industry, the participation of women in this sector is very low. The development of a sector would be remarkable only if there is an equal and balanced participation of both men and women. The present paper will discuss the issues and challenges confronted by women on non-participation in space sector. The basic requirements to educate and empower women in space industry requires certain duties and responsibilities which have to be fulfilled by the world nations. India being a space faring nation, though ready for the space race is not equipped with opportunities in the space industry. Specifically, the number of women interested and involved in the space sector is very minimal. Even in New Zealand, a well-developed economy is lagging behind in encouraging and engaging women in the space sector. It is very important to reduce the gender gaps in labour force participation as it will substantially boosts global GDP. The United Nations Sustainable Development Goals 5 compels State to tack action to achieve gender equality in all kinds of development. Additionally, SDG 4 on quality education where investments and infrastructure need to be developed for providing the future generation the opportunity for employment and research. Many countries like India, not only lack legislation but relevant education, is either expensive or unavailable. In the conclusion, the present research results with a valuable suggestion that the diplomatic ties with Russia will help India to reach laurels in the space sector and develop space law.

Author Bios: Dr E Prema is an Assistant Professor-Senior at VIT School of Law at the Vellore Institute of Technology, India. Ms Melissa Lynch is a Lecturer-Iat the University of Guyana.

Can Anyone Launch a Rocket into Space?: A New Zealand Legal Perspective

Dr Maria Pozza

In 2017 New Zealand enacted its first space-related legislative framework aimed at regulating the activities outer space and also established a licensing agency. But what exactly does the legislative regime permit, and how does the licensing agency regulate those activities? Can anyone launch a rocket and satellite in space? These questions and more will be considered in this presentation which will focus on New Zealand's developing space law, regulatory scope, and the future of space activities from New Zealand.

Author Bio: Dr Maria Pozza is the Director of Gravity Lawyers