ACADEMY OF INTERNATIONAL AFFAIRS NRW

AIA NRW
BOOK PREVIEW

Responsibility in Outer Space

Interdisciplinary Approaches to Governance Beyond Earth

Manuel Becker, Adam Bower, Katja Freistein, Raúl González Muñoz, Güneş Ünüvar, Mayssoun Zein Al Din

RETHINK POLITICS

Forthcoming: Edited Volume "Responsibility in Outer Space. Interdisciplinary Approaches to Governance Beyond Earth" (Routledge)

Drawing on the in-depth engagement with the geopolitics of outer space, the Academy's former annual focus topic, the Academy of International Affairs NRW is happy to announce the forthcoming publication of its first edited volume. The co-edited book on **"Responsibility in Outer Space. Interdisciplinary Approaches to Governance Beyond Earth"** will come out in early 2027.

The book reflects on and advances current debates in key fields of outer space governance against the background of growing geopolitical tensions, rapid technological developments and the commercialisation of space. The aim of the book is to analyse what concepts and practices of responsibility shape outer space governance. The individual chapters introduce different philosophical, legal, political and practical understandings of responsibility, and examine how these influence the actions of relevant actors as well as the development of international rules and standards. The group of authors includes experts from both academia and the public and private sector, who have engaged with particular challenges of outer space governance systematically.

Because of their particular relevance, the authors focus on three key areas: the exploration and use of space, environmentalism and sustainability, and geopolitics and security. Building on different notions of responsibility, such as accountability or respect the multidisciplinary approach to some of the most urgent current and future questions highlights a variety of aspects that show how outer space governance can to be shaped. In establishing responsibility as a key analytical and normative perspective, the edited volume can be seen as an academic and practice-oriented intervention that helps to envision a just, sustainable, peaceful and effective governance of outer space.

Chapters

Forewords

Robin Frank

Stephan Hobe

What Responsibility in Outer Space Means

Responsibility in Outer Space: Interdisciplinary Approaches to Governance Beyond Earth

Katja Freistein, Manuel Becker

Responsibility in Outer Space: Perspectives from Ethics, Law, Politics, and Policy

Adam Bower, Chelsea Haramia, Raúl González Muñoz, Güneş Ünüvar

States' responsibility or responsible States?: A multifaceted legal concept

Laetitia Cesari

International Responsibility and International Liability

Franz von der Dunk

Section I: Exploration and Use

Space Exploration and Use in an Age of Space Settlement: A Tale of Evolving Responsibility

Katja Grünfeld

Space industry contracts – a culture of non-responsibility?

Ingo Baumann

Norms Protecting Science Amidst Lunar Exploration and Development

Christopher D Johnson

Collaborative Pathways for Responsible Space Use and Exploration

Francesca Faedi

Responsible Discovery in Astrobiology: Lessons from four controversial claims

Daliah Bibas, Clément Vidal

Space Data and Environmental Security: Sustaining Focus Amid Global Conflict

Agnieszka Lukaszczyk

Section II: Environmentalism and Sustainability

Legal Principles Governing the Sustainability of Space Mining Operations: A Proposal

Leonardo Alberto López Marcos, Rossana Deplano

Responsibility, Sustainability and Justice in Outer Space Governance through the Lens of
Environmentalism – A TWAIL Perspective

Shrawani Shagun

Spaceports and the challenges of sustainability on Earth

Katharina Glaab, Alla Pozdnakova, Nicolai Myklebust

Breaking Circles of Blame: the case of the unknown environmental impact on the upper
atmosphere of burning up satellites on re-entry at the end of their working lives

Fionagh Thomson

Environmental Impacts Throughout a Satellite Megaconstellation Lifecycle

Roohi Dalal

Global Sustainable Space Forum and how we can get there

Kristina Tamane

Section III: Geopolitics and Security

Security Actors and Responsible Behavior

PJ Blount

Preparing for a "Normalized" Space Domain: the Meanings and Implications of the Use

of the Language of "Responsibility" in Space Security Debate

Béatrice Hainaut, Guilhem Penent

Verification as a Practice of Responsibility: The Promise and Perils of Space Situational Awareness in UN. PAROS.

Tegan Lily Harrison

The emergence of the responsible behaviours paradigm

Almudena Azcárate Ortega

Instrumental deployment of 'responsibility' in space security

Haley Rice

Russia and the hybrid warfare in space

Lina Pohl

Balancing Military Ambitions and Civilian Safety: Exploring Responsibilities for Space

Security Under the Outer Space Treaty

Jacqueline Reichhold

Space Middle Powers: Iran and Israel's Strategic Rivalry and Responsibility for Space Security

Daniel Sidiqie, Mayssoun Zein Al Din

Conclusion

Katja Freistein, Manuel Becker, Adam Bower

The Authors

Ingo Baumann

BHO Legal

Dr. Ingo Baumann is a founding partner of BHO Legal, a technology law firm based in Cologne, Germany. He is member of the International Institute of Space Law, the European Centre for Space Law and various space industry associations. He is active in several programmes as a member for start-ups in the space sector.

Manuel Becker

Academy of International Affairs NRW

Manuel Becker is Head of the Scientific Programme at the Academy of International Affairs NRW since 2023, as well as a Privatdozent at the Institute of Political Science and Sociology at the University of Bonn. His main areas of research include the politics of history, the history of political ideas, comparative research into dictatorships and extremism, and education and higher education policy. Following his PhD in 2013, he completed his habilitation at the University of Bonn in 2022 with a thesis on university education in Germany.

Daliah Bibas

Center Leo Apostel, Vrije Universiteit Brussel, Belgium

Daliah Bibas is a doctoral scholar at Vrije Universiteit Brussel, Belgium where she researches the philosophical and ethical implications of discovering non-human intelligence, focusing on extraterrestrial and artificial general intelligences. With a background in astrobiology, space exploration, and science communication, her interdisciplinary interests engage with topics such as the nature of intelligence, the ethical treatment of non-human intelligences, and the long-term future of humanity.

P.J. Blount

Space Research Centre, Durham University

Dr. P.J. Blount is Assistant Professor of Space Law at Durham University. Blount's primary research areas are international space law with a focus on space security and cyberspace law and governance. He has published and presented widely on the topic of space law and has given expert testimony on Space Traffic Management before the U.S. House of Representatives' Subcommittee on Space. His book, Reprogramming the World: Cyberspace and the Geography of Global Order, was published open access with e-International Relations Press in 2019. He is an editor of the Proceedings of the International Institute of Space Law and was formerly the Editor-in-Chief of the Journal of Space Law. He currently serves as the Executive Secretary of the International Institute of Space Law and is a licensed attorney with the State Bar of Georgia (USA).

Adam Bower

University of St Andrews

Adam Bower is a Senior Lecturer in International Relations at the University of St Andrews. He is a member of the Steering Committee of the Institute for Legal and Constitutional Research at St Andrews and management team of the Scottish Council on Global Affairs, a Fellow of the Outer Space Institute, and Associate Fellow at the Academy of International Affairs NRW in Bonn. He received a PhD in Political Science from the University of British Columbia in Vancouver, Canada.

Roohi Dalal

Science and Global Security Program at Princeton University

Roohi Dalal is a Research Collaborator in the Science and Global Security Program at Princeton University. Her research takes an interdisciplinary approach to space policy, leveraging her background as an astrophysicist, alongside law, policy and social science to advance safety, security and

sustainability in outer space. Roohi was previously a Postdoctoral Fellow in Space Security and Sustainability at the Outer Space Institute. She received her PhD in Astrophysical Sciences, alongside a Certificate in Science, Technology and Environmental Policy from Princeton in 2024. Prior to her PhD, she was a Fulbright scholar at Leiden University, and received her Bachelor's degree in Astrophysics and History from the California Institute of Technology.

Frans G. von der Dunk

University of Nebraska

Professor Dr. Frans G. von der Dunk holds the Harvey and Susan Perlman Alumni / Othmer Chair of Space Law at the University of Nebraska's Programme on Space, Cyber and Telecommunication Law and is Director of Black Holes BV, Consultancy in space law and policy, based in Leiden, The Netherlands. He has published several leading books and more than 200 articles, has served as visiting professor at over 50 universities and other academic institutions worldwide, and has given over 500 public talks, including on TV, radio and at events such as TEDx and PINC. As a consultant, he has advised hundreds of clients all over the world including many governments, international organizations, space agencies and private commercial operators on issues of space law and policy.

Francesca Faedi

University of Leicester School of Business, Space Park Leicester

Dr. Francesca Faedi lectures at the University of Leicester School of Business on Space Economy, space innovation, entrepreneurship, and the commercialisation of emerging technologies. She is Academic Liaison for Commercial and Innovation Activities at Space Park Leicester, Research Lead for the Institute for Space, and an Associate Fellow of the Leverhulme Centre for Humanity and Space. With a PhD in Astrophysics and more than 15 years of research experience, she has contributed to over 100 peer-reviewed publications and major international scientific collaborations. Her work focuses on innovation ecosystems, responsible space exploration, public-private partnerships, and the

translation of research into societal, industrial, and policy impact at the intersection of space, business, innovation, and society.

Katja Freistein

Academy of International Affairs NRW

Katja Freistein is a Senior Researcher and Academic Coordinator of the Fellowship Programme at the Academy of International Affairs NRW. She was previously a Senior Researcher and Group Leader at the KHK/Centre for Global Cooperation Research at Universität Duisburg-Essen, Germany. Her research expertise includes international political sociology, global inequalities, international organisations, regional politics in East and Southeast Asia, development cooperation and visual narratives. Her research has been published in academic journals, including Cooperation and Conflict, International Studies Perspectives, International Political Sociology and Review of International Studies. She is a co-editor of Imagining Pathways for Global Cooperation (Edward Elgar, 2022)

Katharina Glaab

Department of International Environment and Development Studies, Norwegian University of Life Sciences.

Katharina Glaab is an Associate Professor of International Relations and at the Norwegian University of Life Sciences (NMBU), where she teaches and conducts research on global environmental politics, international relations theory, and science and technology politics. Her recent work focuses on the political, societal, and environmental implications of the rapidly evolving space sector, with particular attention to Arctic space activities, responsible innovation, and the governance of emerging technologies. She is currently participating in several interdisciplinary research projects examining the intersections of space infrastructure, security, sustainability, and regional development in the Nordic Arctic. She leads the project 'Nordic Space Infrastructures - Environment, Security, and Future Imaginaries of Outer Space in the High North' (NordSpace) funded by the Norwegian Research Council and the UArctic network 'Arctic-space sustainability'.

Béatrice Hainaut

MOD

Béatrice Hainaut is a research fellow at the Institute for Strategic Research (IRSEM) in Paris. She has expertise on outer space issues as she has held multiple space-related positions in the French Air and Space Force for more than ten years. She holds a PhD in Political Science, International Relations from University Pantheon-Assas Paris 2, France, which deals with Space Security.

Chelsea Haramia

UK SETI Research Network

Chelsea Haramia is a Senior Research Fellow at the Center for Science and Thought, University of Bonn and an Associate Fellow at the Academy of International Affairs NRW in Bonn. She is also co-Director of the SETI Institute's new Discovery & Futures research lab, a member of the UK SETI Research Network's SETI Post-Detection Hub, a Science Advisory Board member and Affiliate of the SETI Institute, Management Committee member of the European COST Action FOGOS (Futures-Oriented Governance of Outer Space: Toward Peace, Equity, and Environmental Integrity), and co-editor of the journal 1000-Word Philosophy. She received a PhD in Philosophy and a graduate certificate in Women and Gender Studies from the University of Colorado, Boulder, USA.

Tegan Lily Harrison

Cardiff University

Dr. Tegan Harrison is a Teacher in Law and Politics at Cardiff University, where she gained her PhD in 2025. Her research sits at the intersection of critical security studies, international law, and outer space governance, with a

particular focus on the United Nations' Prevention of an Arms Race in Outer Space (PAROS) agenda.

Agnieszka ŁukaszczykhiALtitude Consulting

Dr. Agnieszka Łukaszczyk is the founder and CEO of hiALtitude Consulting and an internationally recognized expert on space policy, government relations, and international cooperation. Previously, she served as Vice President for Government Affairs for Europe, the Middle East, and Africa at Planet, where she was responsible for strategic partnerships in those regions. In addition, she has held leadership positions at the European Commission, the Secure World Foundation, the European Space Policy Institute, and the Space Generation Advisory Council. She currently chairs the Sustainability Task Force of the International Astronautical Federation (IAF) and advocates for the sustainable use of space. As an author, speaker, and lecturer, she regularly shares her expertise at international conferences and academic institutions. Dr. Lukaszczyk earned her Ph.D. in space security from the Polish National Defense Academy and studied at renowned institutions such as Oxford University, American University, and the Warsaw School of Economics.

Raúl González Muñoz

University of Leicester

Raúl González Muñoz is a Lecturer in Space Economy and Policy at the University of Leicester. He is an Associate Fellow at the Academy of International Affairs NRW in Bonn and Board Member of the Asociación Española de Derecho Aeronáutico y Espacial. He received a PhD in Aerospace Manufacturing and Information Systems from Cranfield University in England.

Nicolai Dypvik Myklebust

University of Oslo

Nicolai Dypvik Myklebust holds a Master of Laws from the University of Oslo (2024). He has previously worked as a research assistant at the Scandinavian

Institute of Maritime Law, University of Oslo, focusing on international space law. His master's thesis on legal aspects of space resource activities was published in the Marlus publication series."

Almudena Azcárate Ortega

Secure World Foundation

Dr. Almudena Azcárate Ortega leads Space Law and Regulation work at Secure World Foundation as a Senior Program Analyst. She has a decade of experience working in international law, primarily focused on outer space issues. Prior to joining SWF, Almudena was the lead Space Security Researcher at the United Nations Institute for Disarmament Research (UNIDIR). She has published widely, briefed UN Member States on space issues, and has presented her research in multiple fora. She has led UNIDIR's participation in multilateral processes related to outer space matters, and retains an affiliation to UNIDIR as a Fellow. Almudena is also an Academic Fellow with the Center on National Security at Georgetown University, where she completed her doctorate on space security law. She holds an LL.M. in National Security Law from the same institution, and received her LL.B. from the University of Navarra, Spain.

Guilhem Penent

MOD

Guilhem Penent is currently working as a space advisor at the French ministry of the Armed Forces. He has 15 years professional experience in think tanks and public administration, both Foreign Affairs and Defence. He holds a PhD in Political Science with a focus on international relations theories and philosophy. For his doctoral work, he received the Clément Ader Prize from the French Air and Space Force in 2018.

Alla Pozdnakova

Scandinavian Institute of Maritime Law, Law Faculty, University of Oslo.

Alla Pozdnakova holds dr.juris degree (University of Oslo, 2007) and LL.M in International and European Law (Riga Graduate School of Law, 2001). Her research and teaching include international law of the sea, space law, environmental law, the Arctic and EU law. Pozdnakova is a member of the International Institute of Space Law, co-editor for Oslo Law Review, a board member of the International Law Association, Norwegian branch and member of ILA's Committee on Legal Aspects Space Debris Remediation. Pozdnakova participated as a member of the expert committee appointed by the Norwegian Ministry of Trade, Industry and Fisheries to develop a draft Space Act.

Jacqueline Reichhold

Institute of Air Law, Space Law and Cyber Law, University of Cologne, Germany

Jacqueline Reichhold, Dipl. jur. Univ., LL.M. (Aberystwyth), MJI, is a legal trainee (Rechtsreferendar) at the Regional Court of Frankfurt am Main. She previously served as a research assistant at the Institute of Air Law, Space Law and Cyber Law at the University of Cologne, where she managed the Cologne Manual on Space Traffic Management in cooperation with the German Aerospace Center (DLR). She is currently pursuing a PhD on international humanitarian law and space law. She is a co-founder of Young German ILA, promoting the inclusion of young voices in international legal discourse, and a prospective member of the International Institute of Space Law (IISL).

Haley Rice

Affiliation: Fellow at the Centre for Global Law and Governance, University of St Andrews

Dr. Haley Rice researches how states use (or misuse) international law for strategic gain in global politics. Her recent work focusses on areas beyond national jurisdiction, including the deep sea and outer space. As a policy

practitioner she specialises in the nexus of natural resources and conflict, with experience as a U.S. diplomat, consultant for the World Bank and various international NGOs. Dr Rice holds a PhD in International Relations from the University of St Andrews, an MPhil in Public Policy from the University of Cambridge, and a master's degree from SOAS.

Shrawani Shagun

National Law University Delhi, New Delhi, India

Shrawani Shagun Jha is a space lawyer, and educator specialising in the environmental governance of outer space. She is currently Research Fellow, at Centre for Aerospace Power and Strategic Studies (CAPSS) and Information Society Law Center (ISLC), University of Milan, Italy. Her professional experience spans advocacy and academia, including roles as visiting faculty at institutions such as National Law School of India University Bengaluru and National Law University Delhi, where she has taught space law, international law, environmental governance, and public law subjects. She serves as NPoC-India at the SGAC and is a member of the International Institute of Space Law and the IISL Working Group on the Moon Agreement, contributing to lunar and celestial body governance discussions at UNCOPUOS. Shrawani has contributed her research to the Cambridge Journal of Climate Research, SpaceWatch.Global, and leading media including The Hindu and Bar & Bench, where she writes on space debris, climate impacts of space activities, spectrum and surveillance, and the justice dimensions of outer space governance. She is a speaker and moderator at global forums.

Daniel Sidiqie

Institute for International Cooperation and Technological Diplomacy

Daniel Sidiqie is Scientific Project Manager at the Institute for International Cooperation and Technological Diplomacy (ICI Institute). His research focuses on international relations, space security and the Middle East.

Kristina Tamane

Environmental Task Force

Kristina Tamane entered the space sector in 2019, with a big passion for sustainability and the environment. Previously, Kristina has worked in continuous improvement and change, widening participation and outreach, event management, careers and employability as well as pursuing training and education around Psychology, Philosophy and counselling. Her roles have spanned industry, academia and the public sector. Kristina is a multidisciplinary person by nature, borrowing ideas and concepts from a variety of places, to ensure impact can be achieved, with a North Star of protecting nature and all living creatures. Whilst working as a Space Sector Lead at the University of Edinburgh, Kristina co-founded the Environmental Task Force in 2020, with the express purpose of ensuring the space sector is sustainable by design. The ETF went on to publish the world's first sustainable space roadmap and continues to deliver on its' ambitious goals.

Fionagh Thomson

Durham University

Fionagh Thomson is a visual and critical ethnographer, ecologist, human geographer, philosopher of technology, environmental ethicist – based in the Centre for Extragalactic Astronomy, Durham University in the UK. She is interested in how knowledge and ideas are created (and suppressed) within our everyday world. She advices government on environmental impact on the upper atmosphere of burning up satellites on re-entry (and viable alternatives), the impact of satellite brightness on ground-based astronomy and technical advisor to the British standards institution on space sustainability standards Fieldwork locations include the rainforests of Papua New Guinea, the islands of the Scottish Hebrides, the consulting spaces of UK hospitals and mountaintop astronomical observatories.

Güneş Ünüvar

International Institute of Space Law

Güneş Ünüvar is an Associate Fellow at the Academy of International Affairs NRW in Bonn, Germany. He is Managing Editor of the Journal of World Investment & Trade and a member of the International Institute of Space Law. He is also Legal Advisor for the Moon Village Association and Of Counsel at the Ankara-based law firm Özgür Ünüvar Bakiler. He received a PhD in Law from the University of Copenhagen in Denmark.

Clément Vidal

Center Leo Apostel, Vrije Universiteit Brussel, Belgium

Dr. Clément Vidal is a philosopher with a background in logic and cognitive sciences. He is co-founder of the Evo Devo Institute non-profit. In 2022-2023 he was a visiting scholar at UC Berkeley's SETI Research Center. In 2014, he authored The Beginning and the End: The Meaning of Life in a Cosmological Perspective. He is eager to tackle big questions, bringing together areas of knowledge such as cosmology, physics, astrobiology, complexity science and evolutionary theory.

Mayssoun Zein Al Din

Academy of International Affairs NRW

Mayssoun Zein Al Din is Director of the Academy of International Affairs NRW, Associate Fellow at the Center for Advanced Security, Strategic and Integration Studies (CASSIS) and lecturer at RWTH Aachen University. Her research focuses on international relations and the Middle East.