

Space Regulations Library

Patricia Margaret Sterns
Leslie I. Tennen *Editors*

Private Law, Public Law, Metalaw and Public Policy in Space

A Liber Amicorum in Honor of Ernst Fasan

 Springer

Space Regulations Library

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Editors

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A Liber Amicorum in Honor of Ernst Fasan

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Foreword 1

Dr. Ernst Fasan is among the longest active members of the International Academy of Astronautics (IAA). Elected a corresponding member of the IAA in 1971, at a time when corresponding members were not yet considered a temporary transitional class of membership, he took a very active part in the new Social Sciences section consisting of lawyers, historians, managers and economists. He devoted his life to law and banking that made him recognized by the International Institute of Space Law (IISL), first as a member and later as a Board member and Secretary, and finally as an Honorary Director. Elected a full member of the International Academy of Astronautics in 1986 he has supported numerous IAA activities and attended each year the Academy Day in various countries throughout the world.

Among other activities, in 1989 Dr. Ernst Fasan urged the IISL to support with the IAA the Search for Extraterrestrial Intelligence (SETI) Committee to prepare a position paper on the declaration of principles concerning activities following the detection of extraterrestrial intelligences. This led to the presentation of these principles to the UN Committee on the Peaceful Uses of Outer Space (COPUOS) and later with the impetus of Dr. Ernst Fasan, the UN General Assembly endorsed in 2000 the report of the COPUOS at its 43rd session.

Dr. Ernst Fasan has shown during his entire career a rare very broad expertise in many fields covering technical, juridical, economical and policy making, with a special mention of the numerous articles, papers and manuscripts he published over the years. He has served his country and the international community as a renowned expert and I am proud to honor him. I am very pleased to write this foreword to celebrate a *Liber Amicorum* in Honor of Ernst Fasan.

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Dr. Jean-Michel Contant

Foreword 2

The Space Law community is a strange collection. There are academics, some committed to its study, while others dabble. There are civil servants engaged in government or inhabiting international organisations. Then there are the practitioners, including employees of private companies engaged in the space business, and those in private practice who earn their crust through advising and acting for such clients as may come to them. Then there is also a group who make their living in what I might call the practice of ‘ordinary law’, but who maintain a strong interest in Space Law. Their value is that, among other things, specialising in varieties of terrestrial law, they have their feet on the ground and as a result can offer valuable insights into Space Law, which others, too immersed in the subject, may not have seen. Dr. Ernst Fasani is one such.

I encountered Ernst – ‘met’ would be such an anodyne word to apply to him – when I re-entered the world of Space Law. In 1963 I had gone to McGill’s Institute of Air and Space Law with only a limited understanding of what that might entail. There, through the late Ivan A. Vlasic, I came across Space Law and found it intriguing. An LL.M. followed, but so did a lectureship back at Aberdeen where Public Law filled my vision for the next few years. In the late 1980s an invitation to a symposium from Bin Cheng to speak about INTELSAT brought me to the attention of Messrs Bourelly and Lafferranderie, and through them I got to know of the International Institute of Space Law. And there, there was Ernst.

Ernst had been in at the beginning of the IISL. Although in private practice in law in Neunkirchen in Austria he was also interested in space matters and the nascent International Astronautical Federation, becoming one of the founders of the International Institute of Space Law and, soon after, one of its Directors. His writings are many, his terse style identifying and occasionally solving many problems of the emergent concepts of Space Law. His book *Relations with Alien Intelligences: The Scientific Basis of Metalaw* of 1970 of course remains a standard for those working on SETI. Elaborating the concept first expounded by Andrew Haley and basing itself on Kant’s Categorical Imperative, Ernst’s book identifies eleven aspects of general validity for sentient entities, not just humans.

When we met, Ernst was friendly and supportive of the new recruit. His interest in the thoughts and thought processes of others was stimulating. Others, including many of the contributors hereafter, have had the same experience. At the IISL Board his interventions often cut through clutter, identifying the essentials of a discussion to the benefit of all. And, apart from all that, he is a delightful companion.

It is good that this festschrift celebrates the life and accomplishments of someone who has contributed so much to our common field of interest. But I would add that it is also a tribute to his wife, Gerti, who keeps him going. We salute you both.

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Francis Lyall

Preface

As we travel through the avenues of life, we sometimes are privileged to encounter individuals who cause us to reflect and examine new paths that we may not even have been aware existed. Ernst Fasan is such an individual. We first became acquainted with Ernst through his writings while we were attending law school. Whether by chance or fate, we happened to find a handful of books on space law, which happened to be in our law school library. Included among them was a small and unassuming book by Ernst Fasan with the title *Relations With Alien Intelligences The Scientific Basis of Metalaw*. Not only was the subject of space law intriguing, but here were serious articles by respected authorities from around the globe examining subjects that literally were out of this world. And there was the book that made much of this look mundane by comparison – on metalaw, an analysis of the rules to apply to interplanetary relations.

That was all it took. Life was changed forever. To say we devoured these writings would be an understatement. We were children of the space age, and grew up watching the first rocket launches, and failures, on live television, and followed each manned space flight with awe. The attraction to space law for these young law students was natural, and in hindsight, probably inevitable.

What followed led to communications with Professors Stephen Gorove and Carl Q. Christol, who were very supportive and invited Les to present a paper he was co-authoring at the upcoming IISL Colloquium during the International Astronautical Congress (IAC), which happened to be in Anaheim, California. For a third year law student, this was an almost unbelievable opportunity. There were, in person, many of the very authorities whose writings had been so intriguing, discussing contemporary issues of space law, within the larger context of the IAC with astronauts, cosmonauts, diplomats, and the engineers, scientists, and administrators that launched satellites and put men on the moon.

We both attended the next IAC in 1977, and became regular participants at the IAF Congresses. We actually befriended Ernst's wife Gerti first, as she and Les sat next to each other at a crowded lunch counter at the IAC in Tokyo. The four of us quickly became close friends. When Patricia was writing her first paper on metalaw, she no longer had access to our law school library and was not able to locate a copy

of Ernst's book, which was out of print. When she asked Ernst if he knew if a copy of the book may be available, he sent his original, personal library copy personally inscribed to her. This magnanimous gesture is indicative of Ernst's caring for younger space lawyers and their growth in the field.

We are pleased to be the editors of this *Liber Amicorum* as a way to express our appreciation to Ernst and Gerti for their many years of friendship and support. The authors to this *Liber Amicorum* include legal practitioners, members of academia, and the scientific community. These contributors come from every continent save Antarctica, and represent the second and third generation of space lawyers as a means of underscoring the global influence Ernst has had that extends far beyond his generational contemporaries.

We are especially pleased to be able to include the republication of *Relations With Alien Intelligences The Scientific Basis of Metalaw*, first published in 1970, so that it is again available to today's space lawyers, scientists and other interested parties. The relevance of *Metalaw* was underscored as this book was in preparation, as the Breakthrough Prize Foundation announced a \$100 million funding effort to search for evidence of intelligent extraterrestrial beings.

We would like to acknowledge and thank Ram Jakhu for his support of this project. We also would like to thank Neil Olivier and Diana Nijenhuijzen of Springer for all of their assistance in bringing this book to a reality. Finally, we would like to thank all of the contributors to this *Liber Amicorum*, each of whom enthusiastically join us in honoring our good friends Ernst and Gerti Fasan.

Phoenix, Arizona
October, 2015

Patricia Margaret Sterns
Leslie I. Tennen

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List of Abbreviations

ABSCICON	Astrobiology Science Conference
ATA	Allen Telescope Array
BSTI	Basic Space Technology Initiative (of the UN)
BUSTIND	National Bureau of Science, Technology and Industry for National Defense
CASC	China Aerospace Science and Technology Corporation
CCL	Commerce Control List
CD	Conference on Disarmament
CETI	Communication with Extraterrestrial Intelligence
CGWIC	China Great Wall Industry Corporation
CISSM	Center for International & Security Studies at Maryland
CNSA	Chinese National Space Administration
COSPAR	Committee on Space Research
COSTIND	State Commission of Science, Technology and Industry for National Defense
COTS	Commercial Orbital Transportation Services Demonstration program
CSIRO	Commonwealth Scientific and Industrial Research Organization
CSLA	Commercial Space Launch Act
DFH-1	Dongfanghong-1
DLR	German Aerospace Center
DoD	Department of Defense
EANA	European Astrobiology Network Association
EARs	Export Administration Regulations
ELV	expendable launch vehicles
ESA	European Space Agency
ET	Extraterrestrial
ETI	Extraterrestrial Intelligence
EWCH	High Court of Justice of England and Wales
EU	European Union
FAA	Federal Aviation Administration

FAST	Five hundred meter Aperture Spherical Telescope
FCC	Federal Communications Commission
FFT	Fast Fourier Transform
FP7	Seventh Framework Programme on research and innovation of the EU (2007–2013)
GA	United Nations General Assembly
GEO	Geostationary Earth Orbit
GSO	Geosynchronous Orbit
HRMS	High Resolution Microwave Survey
IAA	International Academy of Astronautics
IAC	International Astronautical Congress
IAF	International Astronautical Federation
ICAO	International Civil Aviation Organization
ICC	International Chamber of Commerce
ICJ	International Court of Justice
ICSID	International Centre for the Settlement of Investment Disputes
IISL	International Institute of Space Law
ILM	International Legal Materials
ISM	industrial, scientific, medical
ISS	International Space Station
ITARs	International Traffic in Arms Regulations
ITU	International Telecommunication Union
KESE	Kepler Energy and Space Engineering
KLT	Karhunen-Loève Transform
LEO	Low Earth Orbit
LIAB	Convention on International Liability for Damage Caused by Space Objects
MCSA	Million Channel Spectrum Analyzer
MEO	Medium Earth Orbit
METI	Messaging to Extra-Terrestrial Intelligence
MPL	Maximum Probable Loss
NARSDA	National Space Research and Development Agency
NASA	National Aeronautics and Space Administration
NPC	National People's Congress
NRAO	National Radio Astronomy Observatory
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
OSETI	Optical SETI
OST	Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies
P3	Public-Private Partnership
PAROS	Prevention of an Arms Race in Space
PCA	Permanent Court of Arbitration
PCA	Advisory Group of Experts

PLA	People's Liberation Army
PPP	Public – Private Partnership
PPWT	Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects
PRC	People's Republic of China
P/V	photovoltaic
REG	Convention on Registration of Objects Launched into Outer Space
RFI	radio frequency interference
RLV	reusable launch vehicles
RpK	Rocketplane Kistler
SASTIND	State Administration for Science, Technology and Industry for National Defense
SBSP	space-based solar power
SETI	Search for Extraterrestrial Intelligence
SPS	solar power satellite
SRT	Sardinia Radio Telescope
SSA	space situational awareness
SSL	Berkeley Space Sciences Lab
STM	space traffic management
TCBMs	Transparency and Confidence Building Measures
U.K.	United Kingdom
UKTS	United Kingdom Treaty Service
UNCITRAL	United Nations Commission on International Trade Law
UNCOPUOS	United Nations Committee on Peaceful Uses of Outer Space
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNIDIR	United Nations Institute for Disarmament Research
UNIDROIT	International Institute for the Unification of Private Law
UNTS	United Nations Treaty Series
US	United States of America

Biography of Ernst Fasan

Ernst Leo Albin Fasan was born August, 1926, in Vienna, Austria, as the only child of the physician Dr. Leo Fasan and the philologist Dr. Irmgard Fasan, nee Taigner. He grew up in the house of his parents in Neunkirchen, Lower Austria. There he attended grade school, and then high school in the nearby city of Wr. Neustadt. At the age of 16, together with his entire class, he was conscripted into the military. He was captured and became a prisoner of the Soviet Army, and was transported to the district of Wladimir. He was held for more than 2 years after the end of the war, and finally returned home in November, 1947.

Ernst immediately started law studies at the University of Vienna and earned his Doctor of Law degree in 1950. He practiced at the Vienna Courts and formed his own Law Office in Neunkirchen in 1955, where he continued to practice, together with several junior partners, until his retirement in 1994. He has been an examiner of applicants of young judges and lawyers at the High Court in Vienna, and has served as a judge at several Moot Courts.

In 1960 he was a founding member of the International Institute of Space Law (IISL). He became Secretary, and then Honorary Director of the Institute. He is a full member of the International Academy of Astronautics. From 1994 to 2001 he was the Coordinator of the Annual Symposia at the UN Committee on the Peaceful Uses of Outer Space in Vienna. He was a member of the Editorial Board of the *Journal of Space Law*, edited by the University of Mississippi. He is the author of two books, *Weltraumrecht* in 1965, and *Relations with Alien Intelligences The Scientific Basis of Metalaw* in 1970, as well as dozens of papers and addresses on space law since 1960.

He served as a member of the Hermann Oberth Society – Internationaler Förderkreis W.v. Braun, H. Oberth, and as Chairman of its Space Law Section.

He has been awarded the Golden Hermann Oberth Ring, the Golden Wernher von Braun Medal, the Andrew Haley Award, and the IISL Lifetime Achievement Award.

Ernst Fasan is married to Gertrude, nee Albrecht, and is the father of three children and grandfather of two grandchildren.

About the Authors

Tare Brisibe, LL.B., (Hons) (Jos) B.L., M.S.S., (ISU) Ph.D. (Leiden), Barrister and Solicitor of the Supreme Court of Nigeria, began a career in 1991 practicing in civil litigation, general commercial law, mergers and acquisitions with two leading Nigerian law firms. A former Director of Regulatory Affairs at SITA OnAir (subsidiary of airline consortium, Société Internationale de Télécommunications Aéronautiques) he served as Deputy Director (Legal Services & International Cooperation) with the National Space Research and Development Agency of Nigeria (NASRDA). He also held appointments with a Luxembourg based law firm focused on space and satellite communications law, as well as with Inmarsat plc. (the privatized International Maritime Satellite Organization – INMARSAT). Dr. Brisibe participated at the Third United Nations Conference on the Peaceful Uses of Outer Space (UNISPACE III) and as a Delegate at sessions of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) including its Legal and Scientific & Technical Subcommittees. He was a member of the Committee of Governmental Experts at the International Institute for the Unification of Private Law (UNIDROIT) for preparation of a Space Protocol to the Cape Town Convention. He has participated at International Telecommunication Union (ITU) World Radiocommunications Conferences, ITU Development Sector Study Groups, International Civil Aviation Organization (ICAO) Aeronautical Communications Panel, and Asia Pacific Telecommunity (APT) Wireless Forum. He was an Observer at the Association of Southeast Asian Nations (ASEAN) 14th Telecommunications Regulatory Council, and has been involved with the African Leadership Conference (ALC) on Space Science and Technology for Sustainable Development. He was appointed, by the Secretary General of the Permanent Court of Arbitration (PCA), member of the Advisory Group on Optional Rules for Arbitration of Disputes Relating to Outer Space Activities, and elected Chairman of the UNCOPUOS Legal Subcommittee for the biennium 2012 to 2014.

José Monserrat Filho, Head of the International Cooperation Office of the Brazilian Space Agency. Former Head of the International Affairs Office of the Ministry of Science and Technology (2007–2012). Former Director of Communication of the

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Steven Freeland is Professor of International Law at the University of Western Sydney. He is also a Visiting Professor at the University of Vienna, Permanent Visiting Professor of the iCourts Centre of Excellence for International Courts, Denmark, a Member of Faculty of the London Institute of Space Policy and Law, and was a Marie Curie Fellow in 2013–2014. He has taught courses at Universities in The Netherlands, Austria, Belarus, China, Italy, Germany, Bulgaria, Estonia, Slovakia, United Kingdom, New Zealand, Denmark, United States, Australia, Turkey, France and Singapore. He has also been a Visiting Professional within the Appeals Chamber at the International Criminal Court (ICC), and a Special Advisor to the Danish Foreign Ministry in matters related to the ICC. Among other appointments, he is a Director of the Paris-based International Institute of Space Law, a member of the Space Law Committee of the London-based International Law Association, and a member of the Advisory Board of the Australian Centre for Space Engineering Research. He sits on the Editorial Board of a number of international journals, including the Australian Journal of Human Rights, the Australian International Law Journal, the Canada-based Annals of Air and Space Law, the German-based German Journal of Air and Space Law / Zeitschrift für Luft- und Weltraumrecht and the China-based Space Law Review, and on the Advisory Board of the India-based Asian Journal of Air and Space Law and the UK-based Journal of Philosophy of International Law, as well as a series of books entitled Studies in Space Law. He is also Co-Editor of Annotated Leading Cases of the International

Criminal Tribunals, a long-established series of casebooks annotating the jurisprudence of the International Criminal Court, the International Criminal Tribunals for the former Yugoslavia and for Rwanda, the Special Court for Sierra Leone, the Extraordinary Chambers in the Courts of Cambodia, the Special Tribunal for Lebanon and the Special Panels for Serious Crimes in East Timor. He has authored approximately 300 publications on various aspects of International Law and has been invited to present over 700 expert commentaries by national and international media outlets worldwide on a wide range of legal and geopolitical issues. He is also a frequent speaker at national and international conferences, having been invited to present conference papers and keynote speeches in Australia, Austria, Belarus, Belgium, Bulgaria, Canada, China, Denmark, Estonia, France, Germany, India, Italy, Japan, Mexico, The Netherlands, New Zealand, Norway, Romania, Singapore, Slovakia, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States and Vietnam.

Andrea Harrington is currently a doctoral candidate and Erin JC Arsenault Fellow in Space Governance at the McGill University Institute of Air and Space Law, where she has served as an Aisenstadt Teaching Fellow and been the recipient of the International Aviation Women's Association Scholarship, the Setsuko-Ushioda-Aoki Prize, and a P.E.O. Scholar Award. She is also an attorney admitted to the bar in the Commonwealth of Massachusetts. Andrea holds an LLM in Air and Space Law, also from McGill, as well as a JD from the University of Connecticut School of Law, a Master of Science in European Politics and Governance from the London School of Economics, and a Bachelor of Arts in International Relations and History from Boston University. Andrea has held a short-term contract position at Secure World Foundation as a Jr. Project Manager and, prior to seeking her doctorate, has worked in the financial compliance and insurance fields (at Bank of America and Beazley Group, respectively). Andrea's LLM thesis focused on the protection of cultural heritage in space, while her doctoral thesis is centered on insurance and liability issues for the commercial space industry.

Professor Dr. Diane Howard is Assistant Professor in the Commercial Space Operations program at Embry-Riddle Aeronautical University in Daytona Beach, Florida USA. She is responsible for curriculum development and teaching space law and policy courses that are core to the program. Diane first became involved in space initiatives in 2004, participating in citizen lobbying efforts to facilitate the passing of the Commercial Space Law Amendments Act of 2004, a critical piece of US legislation that has made possible the development of innovative technologies and a burgeoning commercial space transportation industry. Dr. Howard has retained her interest in commercial space issues. After working as a staff attorney in the Florida Appellate courts for a number of years, she took the decision to specialize in space law and attended McGill University's Institute of Air and Space Law. Her LLM thesis centered upon private space law issues and her doctoral work focused upon effective spaceport regulation. Diane serves as Executive Secretary of the International Institute of Space Law and participates in numerous legal projects,

both domestically (within the US) and internationally. She works with COMSTAC Working Groups when invited. The US Department of State named her a private sector advisor and subject matter expert in Expert Group D of the UN COPUOS STSC Long Term Sustainability of Space Activities Working Group, hoping to soon conclude its work. Dr. Howard was legal lead for the International Association for the Advancement of Space Safety Suborbital Safety (IAASS) Technical Committee, which recently finalized its guidelines. She continues to publish her research and speaks at space conferences and events throughout the world. In addition to the IISL and the IAASS, Diane is a member of the AIAA and the Florida Bar.

Dr. Ram S. Jakhu possesses professional experience of over 30 years in the field of international and national Space Law and Policy as well as in providing consultation to several private and governmental entities and drafting national laws and regulations in various countries. Currently, Dr. Jakhu is holding a tenured position of Associate Professor at the Institute of Air and Space Law, Faculty of Law, McGill University in Montreal, Canada. He is also Associate Director of Centre for Research in Air and Space Law of McGill University. He teaches and conducts research in international space law, law of space applications, law of space commercialization, space security, space safety, national regulation of space activities, law of telecommunications, and public international law. Currently he heads a multi-million dollars space law and policy research and outreach program. He served as Director, Centre for the Study of Regulated Industries, McGill University, during 1999–2004. He served as the First Director of the Master of Space Studies Program of, and held other senior positions at, the International Space University, Strasbourg, France, during 1995–1998. Dr. Jakhu has taught Space Law and Policy in several countries; made presentations to the United Nations Committee of Peaceful Uses of Outer Space (UNCOPUOS); participated in the drafting of Space Law Curriculum for the United Nations Office for Outer Space Affairs (UNOOSA); advised several countries in the preparation of national laws and policies, including National Space Law and Policy for South Africa and India; convened and participated numerous international interdisciplinary space law and policy related conferences and workshops around the world. Prof. Jakhu is a Member of the Global Agenda Council on Space of the World Economic Forum; Member of the Governance Group of the Space Security Index; and Fellow as well as the Chairman of the Legal and Regulatory Committee of the International Association for the Advancement of Space Safety. He is Managing Editor of the Space Regulatory Series, member of the Editorial Boards of Space and Evolution, Annals of Air & Space Law, Astropolitics, and German Journal of Air & Space Law. He was member of the Advisor Group of Legal Experts on Optional Rules for Arbitration of Disputes Relating to Outer Space within the Permanent Court of Arbitration, and member of the Board of Directors of International Institute of Space Law for 14 years. In 2007, he received a “Distinguished Service Award” from the International Institute of Space Law for significant contribution to the development of space law. Prof. Jakhu has co-authored two books, over 80 articles and 20 research reports and edited 6 books, including the one that received the 2011 Book Award from the International Academy of

Astronautics. Dr. Jakhu is the founder and President of *Cyber & Space Telecom Inc.*, a Montreal-based consulting firm, specializing in space and telecom business, law and policy. During the last about twenty years, the firm has undertaken over 25 consulting assignments for various governments, organizations (including the Canadian Space Agency and European Space Agency) and private companies from around the world. A Canadian citizen for about 40 years, he has visited over 70 countries in the world and has often been interviewed by the global media regarding matters related to space policy, law and programs. He holds Doctor of Civil Law (Dean's Honors List) and Master of Law (LL.M.) degrees from McGill University, Canada, as well as LL.M., LL.B., and B.A. degrees from Panjab University, India.

Claudio Maccone, Ph.D. is an Italian SETI astronomer, space scientist, Fulbright scholar, and mathematician. He is Technical Director of the International Academy of Astronautics (IAA) for Scientific Space Exploration. In 2001 he was elected "Full Member" of the IAA, and the Asteroid 11264 was named "Claudiomaccone" in his honor by the International Astronomical Union (IAU). Since 2012, he has chaired the IAA SETI Permanent Committee. In 2002 he was awarded the Giordano Bruno Award by the SETI League, "for his efforts to establish a radio observatory on the far side of the Moon". Claudio earned his BSc in Physics from the University of Turin, Italy, in 1972, and his MSc in Physics at the University of Turin in 1974. He earned his Ph.D. at the Department of Mathematics of the University of London King's College in 1980, then joined the Space Systems Group of Aeritalia in Turin as a technical expert for the design of artificial satellites. In 2012, he became a founding member of the Advisory Council of the Institute for Interstellar Studies. He has published over 100 scientific and technical papers, most of them in *Acta Astronautica*. He is the author of four books: *Telecommunications, KLT and Relativity* IPI Press, 1994; *The Sun as a Gravitational Lens: Proposed Space Missions* IPI Press, 1998, which was awarded the 1999 Book Award for the Engineering Sciences by the IAA; *Deep Space Flight and Communications* Praxis-Springer, 2009; and *Mathematical SETI* Praxis-Springer, 2012.

Irmgard Marboe is Professor of International Law at the Department of European, International and Comparative Law at the Law Faculty of the University of Vienna. She is the head of the Austrian National Point of Contact for Space Law of the European Centre for Space Law since 2009. From 2008 to 2012 she was the chair of the working group on "National Space Legislation" of the Legal Subcommittee of UN Committee for the Peaceful Use of Outer Space which led to the adoption of the UN General Assembly Resolution No 68/74 of 11 December 2013 on "Recommendations on national legislation relevant to the peaceful exploration and use of outer space". In the academic year 2014/2015 she was a visiting scholar at The Europe Center at Stanford University, CA (USA) where she conducted a study on Earth observation data policy and law. Her publications in the area of space law include articles on telecommunication and space, national space legislation, the return of space objects and the rescue and return of astronauts, and soft law in outer space. She has been invited as a speaker at numerous international symposia and

workshops on space law, including by the European Centre for Space Law, the European Space Policy Institute, the International Institute of Space Law, the United Nations Office of Outer Space Affairs, the University of Nebraska-Lincoln and Stanford University. She was involved in the drafting of the Austrian Outer Space Act of 2011 and the implementing regulation of 2015. She teaches courses on space law at the University of Vienna and at other European universities. She has also taught at the Space Studies Program of the International Space University.

Patricia Margaret Sterns graduated from Arizona State University in May 1974, with a Bachelor of Arts in Philosophy and a minor in Fine Arts; she then graduated from the University Of Arizona in May 1977, obtaining a Juris Doctor degree. Dr. Sterns is an attorney, being a member of the State Bar of Arizona. She is a partner in the Law Firm of Sterns and Tennen, and has focused on space law for more than 35 years. She formerly served for many years as a Judge Pro Tempore of the Superior Court of Maricopa County, in and for the State of Arizona. She is admitted to practice by the Supreme Court of the State of Arizona, the United States District Court, and the United States Supreme Court. She was elected as a lifetime member of the International Institute Of Space Law (IISL) in 1978, and served as a Director until her colleagues voted her to hold the lifetime position of Honorary Director. She also serves on the Membership Committee of the IISL. She is a full member of the International Academy of Astronautics (IAA), and an associate member of the Committee on Space Research (COSPAR). She is a former member of the American Institute of Aeronautics and Astronautics (AIAA), the International Law Association (ILA), as well as a former member of the Aviation Space Writers Association (ASWA). Dr. Sterns has published in legal, scientific, and technical journals more than 50 manuscripts on the subject of space law, both alone and in partnership with Leslie I. Tennen, as well as other distinguished space authorities. These papers range in topic from Planetary Protection, to SETI, property rights, commercial uses of space, and a series of papers on living and working in space. She has served as a judge in many Moot Court Competitions. Dr. Sterns frequently has participated in, and lectured at, numerous national and international symposia, workshops, colloquia, and congresses throughout the world. She has served as co-chair for many sessions of the IISL colloquia, and two scientific sessions (SETI and Planetary Protection) of the International Astronautical Congress (IAC). In 1998, Dr. Sterns was the co-recipient with Leslie I. Tennen of the IISL Award of Appreciation for their work in and for the Institute. Dr. Sterns, in cooperation with Leslie Tennen, annually sponsor an award for the Best Oralist of the distinguished Manfred Lachs Space Law Moot Court Competition. For the World Space Conference in 2002, Dr. Sterns, in cooperation with a colleague from NASA/COSPAR, co-organized and co-chaired a Symposium on the diverse and controversial topic of Planetary Protection of the Earth, Moon, and other Celestial Bodies. She attended the Third United Nations Conference on the Peaceful Uses of Outer Space (UNISPACE III). Dr. Sterns has been a frequent lecturer, consultant and advisor on space matters to both private and public organizations, on the State, National and International levels. She lives in Arizona with her Husband, Les Tennen, on her family Ranch. They

raise cows, chickens, bees, mesquite trees, cats, exquisite peacocks, and a dog named Farfel, as well as a calico house cat named Ophelia.

Leslie I. Tennen is a partner in the Law Offices of Sterns and Tennen in Phoenix, Arizona, and has focused on space law matters for more than 35 years. He is Legal Counsel for the International Academy of Astronautics (IAA). He received his B.A. and Juris Doctor degrees from the University of Arizona, and studied international and comparative law at the Hebrew University at Mt. Scopus, Jerusalem, Israel. He is a member of the State Bar of Arizona, and was awarded the highest score on the February, 1977, Arizona Bar Exam. He is admitted to practice before the United States District Court, the United States Court of Appeals for the 9th Circuit, and the United States Supreme Court. Les was appointed by the Governor of the State of Arizona to serve as a Commissioner on the Arizona Space Commission from 1994 to 2000, and is a frequent lecturer at aerospace conferences and colloquia. He has been a consultant and advisor on space matters to public and private organizations on the state, national and international levels, and has been a participant at workshops and congresses around the world. In 1998, he was the co-recipient, with Patricia Margaret Sterns, of the International Institute of Space Law Award of Appreciation. In 2006, he received the IISL Distinguished Service Award. He is the author and co-author of more than 50 publications. He currently serves as Co-Chair of the IISL Manfred Lachs Space Law Moot Court Committee, and is the former Chair of the IISL Audit Committee and a former member of the IISL Board of Directors.

Fabio Tronchetti is Associate Professor at the School of Law of the Harbin Institute of Technology, People's Republic of China, and Adjunct Professor of Comparative National Space Law at the School of Law of the University of Mississippi, United States. Before he was Lecturer and Academic Coordinator at the International Institute of Air and Space Law, Leiden University, the Netherlands. He is regularly invited to give lectures at several European and Chinese Universities. Prof. Tronchetti has participated as a speaker in several international space law conferences and has published three books and more than 20 articles in internationally peer-reviewed space law and policy journals. He holds a PhD in International Space Law (Leiden University), an Advanced LL.M in International Relations (Bologna University, Italy) and studies at the University of Cambridge, England (UK). He is Member of the International Institute of Space Law (IISL), European Centre for Space Law (ECSL), the Asian Society of International Law (ASIL) and the Italian Branch of the International Law Association (ILA).

Yun Zhao, LLM and LLB (China University of Political Science and Law in Beijing); LLM (Leiden University, the Netherlands); PhD (Erasmus University Rotterdam, the Netherlands). He is currently Professor of Law and Director for the Center for Chinese Law at the Faculty of Law of The University of Hong Kong. He is listed as Arbitrator in several international arbitration commissions. He is the winner of the Prof. Dr. I.H.Ph. Diederiks-Verschoor Award 2006 by the International

Institute of Space Law in France, the first winner of Isa Diederiks-Verschoor Prize in the Netherlands, and also first winner of SATA Prize by the Foundation of Development of International Law in Asia (DILA). He has published widely on various topics including particularly Dispute Resolution and Space Law. His recent publications include *Dispute Resolution in Electronic Commerce* (Martinus Nijhoff, 2005), *Liberalization of Electronic Commerce and Law* (Peking University Press, 2005), *Space Commercialization and the Development of Space Law* (Intellectual Property Press, 2008), *Mediation Practice and Skills* (Tsinghua University Press, 2011), *National Space Legislation in China: An Overview of the Current Situation and Outlook for the Future* (Brill/Nijhoff, 2015).

Introduction

One of the central foci of the life of Austrian lawyer Ernst Fasan has been his participation in and sustained support of the International Institute of Space Law (IISL) associated with the International Astronautical Federation. Because Dr. Fasan was one of the founders, and the history is so little known, we should recall briefly the initial period of formation of the IISL.

Following the historic launch of Sputnik by the USSR on October 4, 1957, two well qualified practicing attorneys, Welf Heinrich, Prince of Hanover, and Andrew G. Haley, with a profound interest in the law of outer space, undertook two tours in October/November 1957, visiting multiple universities in the United States¹ and in Europe,² as well as numerous learned societies, technical institutes and specialty groups interested in astronautics. The attendance at the lectures was evidence of a great interest in space law and the need for an international forum at which opinions concerning the newly required law might be exchanged. As a result, a decision was made to convene the first colloquium on the law of outer space. It was decided to meet at The Hague, August 29, 1958, and to invite lawyers from around the world.

The record of that historic meeting is set forth in *First Colloquium on the Law of Outer Space*, published originally by Springer-Verlag in 1959, and reprinted with permission by the IISL in 1997. That document contains the papers presented and selected records of commentary on those papers. A committee was formed at that time under the auspices of the International Astronautical Federation, known as “The Permanent Legal Committee of the International Astronautical Federation.” The original committee roster was published as an appendix to the First Colloquium. The roster listed 153 members from 37 countries. The committee grew with time as more interested persons learned of its existence, and joined.

¹ Schools visited included the Universities of California (Berkley and UCLA), Chicago, Colorado, Detroit, Georgetown, Gonzaga, Harvard, Maryland, Michigan, Minnesota, Montana, Montana State, Northwestern, Princeton, St. Lewis, Utah, Washington, and American University.

² One or the other of the two attorneys visited universities in Belgrade, Berlin, Copenhagen, Leningrad, Lisbon, Madrid, Moscow, Munich, Paris, Prague, Stockholm, Stuttgart, Warsaw and the Evangelical Academy at Loccum.

From the outset, the space law colloquia were held in conjunction with the annual International Astronautical Congresses (IACs) of the International Astronautical Federation (IAF). Thus, when scientists and engineers gathered from around the world to discuss developments in astronautics, it was possible for lawyers also to gather and discuss developments in the relevant law. The proceedings of the *Second Colloquium on the Law of Outer Space*³ not only contain individual papers brought by experts in their fields, but also included the statements of work and membership of eleven special international working groups established by the IAF to address issues in space law.

During the Xth Congress of the IAF, in London, on the motion of Eugène Pépin, the IAF plenary unanimously adopted a resolution providing that “The General Counsel of the IAF [A. G. Haley] is authorized to establish immediately such working groups as are necessary to consider the legal problems of space, which are today considered perhaps capable of resolution, for example, space radio allocation frequencies, now being considered by the International Telecommunication Union in Geneva, Switzerland.” This proposal was prompted by Andrew G. Haley, former President of the IAF, and a strong supporter of international radio frequency allocations for safe and efficient space craft operation.

A summary of the Working Group topics established at the Xth International Astronautical Congress included:

1. The upper limit of national airspace and legal status of vehicles in the airspace and beyond.
2. The legal definition of space rockets, space vehicles and artifacts intended for use in space.
3. The legal status of celestial bodies other than Earth and the status of activities in outer space.
4. Identify the treaties applicable to space activities and address liability for damages done by such activities.
5. The nature and scope of regulations to relate to registration, pre-flight inspection, flight rules, safety, search and rescue, emigration and immigration, prevention of forward and back contamination, collection and dissemination of data on matters such as weather, radiation, meteorites and similar conditions encountered in space.
6. The roles of extant or newly required international organizations, provisions for arbitration, and the role of the International Court of Justice.
7. The requirements for new international radio laws and treaties, national and international. Is the ITU properly configured to meet the needs of space communications?
8. The extent of private rights, property rights, and state authority over areas in outer space.
9. How shall injury or damage to life and property by spaceflight activities be managed?

³Originally published by Springer-Verlag in 1960, reprinted with permission by the IISL in 1995.