

UNIDIR 2019

SPACE SECURITY

CONFERENCE

SUPPORTING DIPLOMACY: CLEARING THE PATH FOR DIALOGUE

Conference Room XXV | Palais des Nations
28 and 29 May 2019

Conference organized by the United Nations Institute for Disarmament Research (UNIDIR) in collaboration with the Secure World Foundation, Fondation pour la recherche stratégique (with funding from the EU) and The Simons Foundation Canada. Support from UNIDIR's core funders provides the foundation for all of the Institute's activities. This event was organised with support from the Governments of Brazil, the People's Republic of China, The Holy See and the Russian Federation.

Tuesday 28 May 2019

14:00-14:20

Opening Remarks

Dr Peter Martinez, *Director, Secure World Foundation*

Dr Peter MARTINEZ is the Executive Director of the Secure World Foundation. He has extensive experience in space policy formulation, space regulation and space diplomacy. He also has extensive experience in capacity building in space science and technology and in workforce development. Dr. Martinez held the post of Professor of Space Studies at the University of Cape Town. Before this he acquired fifteen years of executive level management experience and associated general management skills gained in the research and development environment of the South African Astronomical Observatory, a National Facility under the South African National Research Foundation, where he served as Acting Director for two extended terms and for shorter periods on numerous other occasions. He is a member of the International Academy of Astronautics, the International Institute of Space Law and a Fellow of the Royal Astronomical Society. He has authored or co-authored over 200 publications on topics in astronomy, space research, space law and space policy.

Dr Xavier Pasco, *Director, Fondation pour la recherche stratégique*

Dr Xavier PASCO is the director and the Senior Research Fellow at the Fondation pour la Recherche Stratégique (FRS) based in Paris where he is in charge of the Department "Technology, Space and Security". He is working more specifically on the European and U.S. policies and on their impact on the transatlantic relationship in the space activity, both in the civilian and military domains. He has also supported several analytical works of the subcommittee on Security and Defence of the European Parliament on these issues and has been contributed to ESA on-going work on governance and data policy issues for future programmes. He was particularly in charge of the ESA-commissioned study related to governance and data policy models suitable for a European Space Situational Awareness System. Xavier is also associate Research Fellow at the Space Policy Institute in the George Washington University (Washington D.C., U.S.A.). He is also giving lectures

in the French Military School in Paris and at the Institute of Political Studies in Paris. He has also been associate Professor at the University of Marne-la-Vallée and is the European Editor of the international academic review *Space Policy*.

14:20-16:00

Panel 1. Taking Stock

Moderator **Dr Renata Dwan**, *Director, UNIDIR*

Dr Renata DWAN is the Director of the United Nations Institute for Disarmament Research (UNIDIR). She joined UNIDIR after 13 years working on peace and security issues at the United Nations, most recently as Chief of Policy and Best Practices in the Departments of Peacekeeping Operations and Field Support. In 2015-16 she led the team to implement Secretary-General Ban Ki-Moon's reform initiative on peace operations, the High-level Panel on Peace Operations, and was a member of Secretary-General Guterres' team reviewing the UN's peace and security architecture in 2017. Renata has worked on peace operations and complex emergencies at UN Headquarters and in Afghanistan, the Democratic Republic of Congo, Haiti, Mali and Syria. She led major UN-wide policy and reform initiatives on peace and security issues including security sector reform, peacekeeping partnerships and crisis management capacities.

Panel Conference on Disarmament

Amb Li Song, *Deputy Permanent Representative of the People's Republic of China to the UN in Geneva*

Ambassador LI Song is Ambassador Extraordinary and Plenipotentiary for Disarmament Affairs, and Deputy Permanent Representative of the People's Republic of China to the United Nations Office at Geneva and Other International Organizations in Switzerland. He was formerly a Minister of the Chinese Ministry of Foreign Affairs in the Department of International Organizations and Conferences. He was also Minister at the Chinese Embassy to the Republic of South Africa and Minister Counsellor at the Chinese Mission to the European Union.

UN Disarmament Commission Working Group II

Amb Jeroen Cooreman, *Deputy Permanent Representative of Belgium to the UN*

Amb Jeroen COOREMAN is the Deputy Permanent Representative of Belgium to the UN (General Assembly, ECOSOC, Peacebuilding Commission, other bodies) He is also the member of Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space. A career diplomat, he has been the ambassador to Colombia and Venezuela, the diplomatic advisor to Belgian Federal Government- Cabinet of Minister of Economy Vincent Van Quickenborn, the counselor of political affairs in the embassy of Belgium in Washington DC, the counselor and deputy head of mission in the embassy of Belgium in Bangkok, head of representation of Belgium in Kabul.

Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space

Amb Guilherme Patriota, *Special Representative of Brazil to the Conference on Disarmament*

Amb Guilherme de Aguiar PATRIOTA is the Special Representative of Brazil to the Conference on Disarmament. A career diplomat since 1983, he has been a delegate of Brazil accredited to the Organization of American States in Washington, the Latin American Integration Association, in Montevideo, the Embassy of Brazil in New Zealand, the World Trade Organization and the World Intellectual Property Organization, in Geneva (2005–08), and twice to the United Nations in New York. He was International Advisor to the Brazilian Minister of Science and Technology and Deputy Foreign Policy Advisor to the President of the Republic. Ambassador Patriota was a graduate student in biological sciences at the Federal Universities of Rio de Janeiro and Brasilia. He has worked for many years in multilateral diplomacy, in particular in the fields of development, trade, regional integration, science and technology, information society, cybersecurity, health, social issues and disarmament

General Assembly and First Committee

Mr Andrey Belousov, *Deputy Permanent Representative of the Russian Federation to the UN in Geneva*

Mr Andrey BELOUSOV has been Head of the Multilateral Disarmament Division, Department for Nonproliferation and Arms Control, of the Ministry of Foreign Affairs of the Russian Federation since 2013. Mr Belousov deals with matters pertaining to the prevention of an arms race in outer space, BTWC, CCW, and UN multilateral disarmament machinery. He regularly participates as an expert in the work of Russian inter-agency delegations at various multilateral disarmament fora, and has been a permanent member of the Russian delegation in the UNGA First Committee since 2012. Mr Belousov also participated in the open-ended consultations on the draft International Code of Conduct for Outer Space Activities. He was a member of the Russian delegation that assisted the Russian governmental expert in the UN GGE on TCBMs. Mr Belousov served on various posts in the Division for Military-Political Issues in Russia-U.S. Relations of the North America Department, Ministry of Foreign Affairs of the Russian Federation, where he dealt with nuclear disarmament and non-proliferation issues, as well as with strategic stability issues in the Russia-U.S. relations.

Committee on the Peaceful Uses of Outer Space

Dr Natália Archinard, *Head of the Swiss Delegation to UNCOPUOS, Federal Department of Foreign Affairs*

Dr Natália ARCHINARD works with the Swiss Federal Department of Foreign Affairs in Berne where she holds the space portfolio with emphasis on international diplomacy. She leads the Swiss delegation to the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) where she was designated Chair of the Scientific and Technical Subcommittee for the period 2020-2021. Ms Archinard contributes to space policy at national level and to the Swiss positions in disarmament fora on space-related issues. She is member of the Swiss delegations to the European Space Agency (ESA) and the United Nations General Assembly 1st and 4th Committees. Involved in multilateral negotiations on space-related

initiatives, like the EU-led code of conduct project, she developed a crosscutting approach to space policy and space security. Ms Archinard was educated in mathematics at the University of Geneva and received her PhD in 2000 from the Swiss Federal Institute of Technology (ETH) in Zurich.

16:15-17:45

Panel 2. What is a 'Space Force'?

Moderator **Dr John Borrie**, *Research Coordinator & Programme Lead – WMD & Other Strategic Weapons, UNIDIR*

Dr John BORIE is the research coordinator and programme Lead, WMD and Other Strategic Weapons Programme in UNIDIR. His working experiences have covered many aspects of arms control, disarmament and humanitarian affairs, and he has published extensively on these and related topics, from nuclear weapons risk and nuclear arms control to cluster munitions, armed drones and autonomous weapons. He has a D Phil from the University of Bradford in the United Kingdom, and a BA (Hons) in History from the University of Canterbury in Christchurch, New Zealand. Prior to joining UNIDIR, John worked on weapons issues at the International Committee of the Red Cross. Before that, he was a New Zealand disarmament diplomat. His areas of expertise include: armed violence, disarmament and humanitarian action, the future of war, geopolitical strategy, human impact of weapons, multilateral negotiation process, new weapons technologies, nuclear disarmament.

Panel **Mr Doug Loverro**, *former US Deputy Assistant Secretary of Defense on Space Policy*

Mr Doug LOVERRO is a member of the Senior Executive Service, and he is the former Deputy Assistant Secretary of Defense for Space Policy. In this role, he is responsible for establishing policy and guidance to assure United States and allied warfighters the benefits of Space capabilities and to help guide the Department's strategy for addressing space-related issues. He also leads Departmental activities in international space cooperation. Mr. Loverro most recently served as the Executive Director for Air Force Space Command's Space and Missile Systems Center where he also served as the Air Force's Deputy Program Executive Officer (PEO) for Space. He has been involved in the planning and acquisition of Department of Defense (DoD) and Space Intelligence systems for over twenty years, both in and out of uniform. Mr. Loverro is credited with a wide-ranging list of accomplishments in aerospace development including the invention of the supersonic chemical oxygen-iodine laser, the initiation of the DoD's Global Broadcast Service, establishing the foundation for all Global Positioning System modernization, and leading the push for greater use of commercial manufacturing and capabilities for future DoD space and launch systems.

Dr Rajeswari Piali Rajagopalan, *Distinguished Fellow, Observer Research Foundation*

Dr Rajeswari PILAI RAJAGOPALAN is a Distinguished Fellow & Head of the Nuclear and Space Policy Initiative, at Observer Research Foundation. She is also the senior Asia defence writer for The Diplomat. Dr. Rajagopalan joined ORF after a five-year stint at the National Security Council Secretariat, where she was an Assistant Director. Prior to joining the NSCS, she was Research

Officer at the Institute of Defence Studies and Analyses, New Delhi. She is the author of four books: *Nuclear Security in India*, *Clashing Titans: Military Strategy and Insecurity among Asian Great Powers*, *The Dragon's Fire: Chinese Military Strategy and Its Implications for Asia*, and *Uncertain Eagle: US Military Strategy in Asia*. Her research articles have appeared in edited volumes, and in peer reviewed journals such as *India Review*, *Strategic Studies Quarterly*, *Air and Space Power Journal*, *International Journal of Nuclear Law*, *Strategic Analysis* and *CLAWS Journal*

Dr Jessica West *Senior Researcher, Project Ploughshares*

Dr Jessica WEST is a Senior Researcher with Project Ploughshares. She serves as managing editor for the Space Security Index project as part of a larger research and policy focus on technology, security, and governance. She holds a PhD in global governance and international security studies from the Balsillie School of International Affairs, Wilfrid Laurier University. Her research is focused on the emergence and evolution of resilience-based policies for national security in the United Kingdom, United States, and Canada.

Wednesday 29 May 2019

09:00-10:30

Panel 3. Emerging Rocket & Missile Dual Use Challenges

Moderator **Dr Xavier Pasco**, *Director, Fondation pour la recherche stratégique* (see above)

Panel **Amb Anne Sofie Nilsson**, *Swedish Ambassador for Disarmament and Non-Proliferation*

Amb Ann-Sofie NILSSON is Ambassador for Disarmament and Non-proliferation at the Ministry for Foreign Affairs in Stockholm, Sweden. She joined the Ministry for Foreign Affairs in 1996 and, prior to her current position, has served as Director-General for International Development Cooperation and as the Coordinator to the Minister for International Cooperation at the Ministry for Foreign Affairs. She has also served as the Swedish Consul General in Jerusalem and as Head of the Swedish Liaison Office in Pristina. In addition, she held positions at the Swedish embassies in Amman and Sarajevo. She has been working for the United Nations High Commissioner for Refugees. Ambassador Nilsson holds a Bachelor's degree in Behavioral Research from Stockholm University, in addition to Developmental and Law studies.

Ms Isabelle Sourbes, *Research Director, Centre national de la recherche scientifique*

Ms Isabelle SOURBES is the research director and senior researcher of Centre national de la recherche scientifique (CNRS) in Paris. She is one of the few French researchers specialised in the study of outer space activities and related national space policies. History and geography constitute her academic background. After she became a professor, she conducted research about the Geography of Outer Space, dealing with the different forms of occupation of Earth orbits and the corresponding national space policies of the Space Club members. After working as a Junior Researcher at CNET (National Centre for Telecommunications Studies) during three years, she obtained a permanent position at CNRS in 1988. Since then, she belonged to different CNRS laboratories moving from Imageo (space cartography), to CREST (Centre for Research on Strategy and Technology, Ecole Polytechnique) and LCP (Laboratory on Political Communication as Deputy Director) before joining her current organisation, CAK (specialised in the history of sciences and technologies) as Deputy. Her research focuses on the interface of national public policy and technological ambitions taking into account very different issues such as strategic matters and international security, the impact of public opinion and the role of media as support to space activities.

Mr Tal Inbar, *Head of the Space Research Center, Fisher Institute for Air & Space Strategic Studies*

Mr Tal INBAR is the Head of the Space Research Center at the Fisher Institute for Air & Space Strategic Studies. He studied Political Science and Security Studies in Tel Aviv University, Israel. He started working at the Fisher Institute for Air and Space Strategic Studies in 2003 and became the director of the institute's space and UAV research center in 2007. He co-founded the

international Ilan Ramon Space Conference in 2006 and is a leading member of its academic committee ever since. Admitted as a member to the American Institute of Aeronautics & Astronautics (AIAA) in 1997, and he is a member in many scientific organizations. Mr. Inbar follows the space programs of Israel for almost 30 years and has written numerous articles and op-eds in national and international media. Under Mr. Inbar's supervision and guidance, the Fisher institute conducted major research into Israel's space policy. Another on-going project is a series of articles on the history of Israel's space program, which Mr. Inbar presents annually at the International Astronautical Congress. He is a member of the history committee of the International Academy of Astronautics, and the Asia-Pacific regional group of the International Astronautical Federation and was the editor of the 2015 IAC proceedings of the history of astronautics symposium. Mr. Inbar is a frequent speaker at international conferences, workshops and seminars, and briefings to US congress and Senate. He is a guest lecturer in various courses, among them the school of airpower studies, the command and staff college, Intelligence branch units and more. In his daily work, Mr. Inbar covers several space issues such as space policy and technical assessments of foreign space and missile programs of Iran, North Korea and China. He is a visiting scholar to RAND and the Washington Institute, and adviser to the Israeli Space Agency on various issues including space education.

10:45-12:15

Panel 4. On-orbit Proximity Operations: Friend or Foe?

Moderator **Amb (ret) Michael Biontino**, *Advisor*

Amb (ret.) Michael BIONTINO is the consultant and advisor of disarmament and international security. He has been the head of the delegation of the Federal Republic of Germany and Permanent Representative of the Federal Republic of Germany to the Conference on Disarmament. His main research areas at executive level include global disarmament and arms control, security policy, multilateral negotiations, peace keeping operations.

Panel **Prof Guglielmo Aglietti**, *Surrey Space Centre Director, University of Surrey*
Prof Guglielmo AGLIETTI is an internationally-recognised expert in space engineering and, specifically, in spacecraft mechanisms. He is Director of the Surrey Space Centre, which pioneers small satellites, leading and managing both research and teaching, and managing the exploitation of the research through the university spin-off company, Surrey Satellite Technology Ltd (SSTL). Some of the results of his academic research work have found applications in various industrial hardware developments, from satellites subsystems to whole satellite analysis and testing related activities, contributing to European Space Agency guidelines. He has carried out consultancy work on various aspects of spacecraft structures for most of the key players in the UK space industry, SSTL, Airbus defence and Space, MSSL, SSBV, SULA Systems, Lockheed Martin, ABSL, JCR Systems, SIL. In addition, he also leads the development and execution, of space missions to demonstrate technologies ranging from space debris removal (e.g. the RemoveDebirs mission) to in orbit demonstration of hardware developed

by UK companies (e.g. AlSat-1N) supporting knowledge transfer towards developing countries.

Ms Victoria Samson, *Washington-Office Director, Secure World Foundation*

Ms Victoria SAMSON is the Washington Office Director for Secure World Foundation and has twenty years of experience in military space and security issues. Before joining SWF, Ms. Samson served as a Senior Analyst for the Center for Defense Information (CDI), where she leveraged her expertise in missile defense, nuclear reductions, and space security issues to conduct in-depth analysis and media commentary. Prior to her time at CDI, Ms. Samson was the Senior Policy Associate at the Coalition to Reduce Nuclear Dangers, a consortium of arms control groups in the Washington, D.C. area, where she worked with Congressional staffers, members of the media, embassy officials, citizens, and think-tanks on issues surrounding dealing with national missile defense and nuclear weapons reductions. Before that, she was a researcher at Riverside Research Institute, where she worked on war-gaming scenarios for the Missile Defense Agency's Directorate of Intelligence.

Ms Alexandra Stickings, *Research Fellow for Space Policy and Security within the Military Sciences, Royal United Services Institute*

Ms Alexandra STICKINGS is Research Fellow for Space Policy and Security within the Military Sciences team at RUSI. Her research interests include military space, space warfare, counterspace capabilities and international space programmes. She has published on space topics for RUSI Newsbrief, RUSI Defence Systems and RUSI Commentary, and regularly contributes to the media, including the BBC, Channel 4, ITV and Deutsche Welle. Alexandra holds an MSc in International Security and Global Governance from Birkbeck College, University of London, a BA(Hons) in International Studies from the Open University, and a BSc(Hons) in Physics with Astronomy from the University of Nottingham. Prior to joining RUSI she worked in a variety of fields including central and local government, as well as the private sector.

Mr Daniel Porras, *Space Security Fellow, UNIDIR*

Mr Daniel PORRAS focuses on political/legal issues surrounding space security and, in particular, the progressive development of sustainable norms of behaviour for space. He conducts research on emerging technology threats to strategic stability in the outer space theatre and makes recommendations on possible paths towards space stability. Mr Porras is the resident technical expert for multiple UN bodies working on space security issues. He also advises governments, academia and commercial actors on security related issues such as the development of counterspace technology and the application of international law to space activities. He holds an LLM in International Economics Law from Georgetown University Law Center, as well as a JD from the California Western School of Law and a Bachelor's Degree in Political Science from Baylor University.

12:45-14:00

Special Lunchtime Event: Shaping Perceptions of Space Security

Moderator **Mr Torsten Kriening**, *Editor, SpaceWatchGlobal*

Mr Torsten KRIENING is Chief Operations Officer and Co-Founder of ThorGroup, a Swiss company specialized on Business Intelligence in Space and Cyber market with a strong focus on the wider Middle East. He is also publisher of SpaceWatch Middle East, an online magazine about the space activities of a wider Middle East in a geo-political context. He is also a Business Development Executive with an excellent education and professional experience in broadcast technology and satellite communication. Successfully identifies new market opportunities and engineers the customer relationship to achieve profitable outcomes; at all times combining high levels of commercial acumen with advanced technical understanding of customer needs. Torsten studies Study of information technology and computer science at Technical College Berlin/Germany and holds an Executive MBA on Space Management from International Space University Strasbourg/France.

Speaker **Ms Jeanne Meserve**, *Former Anchor and Correspondent, CNN & ABC News*

Ms Jeanne MESERVE is a moderator who brings energy and insight to every event. Her knack for asking the right question, listening, and following up gives panel discussions direction, purpose and power. Her meticulous research, wide range of knowledge, and years of experience managing conversations on television, have made her a go-to moderator, facilitator, emcee, and host for organizations all around the world. Jeanne Meserve has been an anchor and correspondent for CNN and ABC News, winning two Emmy Awards, and an Edward R. Murrow Award. Meserve moderates on a wide array of subjects for groups including the Halifax International Security Forum, the International Women's Forum, the Munich Security Conference, and the American Red Cross. As Director of Training at The Communication Center she provided communication coaching to corporate leaders, government officials, and representatives of educational institutions and non-profit organizations around the world.

14:30-16:00

Panel 5. Gathering Evidence in Orbit

Moderator Ms Vanessa Wood, *Counsellor, Australian Delegation to the Conference on Disarmament*

Ms Vanessa WOOD serves as Counsellor in Australia's Delegation to the Conference on Disarmament in Geneva since 2017. Ms Wood represents Australia and coordinates Australian participation at negotiations and meetings of the UN General Assembly First Committee, Biological Weapons Convention and Nuclear Non-Proliferation Treaty. Prior to that she was Director of the Nuclear Policy Section in Australia's Department of Foreign Affairs and Trade in 2016. In 2015 Vanessa completed the Defence and Strategic Studies Course at the Australian Defence College. She has worked extensively on South East Asian regional issues, including the East Asia Summit and ASEAN, and was posted to Hanoi and Manila.

Panel Dr Douglas Hendrix, *CEO, ExoAnalytic Solutions*

Dr Douglas HENDRIX is chief executive officer and co-founder of ExoAnalytic Solutions, Inc. For 25 years, Dr. Hendrix has developed advanced software solutions to enable the United States to maintain its technological superiority in EO/IR sensing for missile defense and space situational awareness. Dr. Hendrix has a broad professional background that ranges from research and development to commercial software development in the areas of atmospheric, underwater and nuclear explosions, hyper-velocity impacts, space weather, and the development of a commercial fusion reactor. As a co-founder of ExoAnalytic Solutions, he had one major idea in mind for the company, which is to build a focused team comprised of the best and brightest in the industry to develop and field cutting edge technology to greatly surpass the state of the art. In his current role at ExoAnalytic Solutions, he remains deeply involved in technology development for both missile defense and space situational awareness. Dr. Hendrix earned a B.A. in Physics from the University of California, Berkeley and obtained his M.S. and Ph.D. degrees in physics from the University of California, Irvine, and is the proud son of a former submarine officer.

Col (ret) André Dupuis, *President, Space Strategies Consulting Ltd.*

Col (ret.) André DUPUIS retired from the Canadian Armed Forces as the Director of Space requirements. In that capacity he was responsible for the requirements definition, space mission design and acquisition oversight of the Department of National Defense's national security space programme, including Surveillance of Space, Space-based Intelligence, Surveillance and Reconnaissance, Satellite Communications, Navigation Warfare and Research and Development. Colonel Dupuis joined the Canadian Forces in 1979. He has held a variety of operational and staff tours throughout his career in air defence, space operations and strategic planning. The first Canadian Forces member qualified as a Missile Warning Crew Commander at the 7th Missile Warning Squadron, Beale Air Force Base, California, he has held several command positions, including the CO-51 Aerospace and Warning Squadron and the Canadian Forces Aerospace Warfare Centre Detachment Ottawa. In 2009 he took over his current duties as the Director of Space Requirements at National Defence Headquarters Ottawa.

Dr Moriba Jah, *Associate Professor of the Department of Aerospace Engineering and Engineering Mechanics, University of Texas at Austin*

Dr Moriba JAH is an associate Professor of the Department of Aerospace Engineering and Engineering Mechanics in University of Texas at Austin. His research interests are in non-gravitational astrodynamics and advanced/non-linear multi-sensor/object tracking, prediction, and information fusion. His expertise is in space object detection, tracking, identification, and characterization, as well as spacecraft navigation. Prior to being at UT Austin, Dr. Jah was the Director of the University of Arizona's Space Object Behavioral Sciences with applications to Space Domain Awareness, Space Protection, Space Traffic Monitoring, and Space Debris research to name a few. Preceding that, Dr. Jah was the lead for the Air Force Research Laboratory's (AFRL) Advanced Sciences and Technology Research Institute for Astronautics (ASTRIA) and a Principal Investigator for Detect/Track/Id/Characterize Program at AFRL's Space Vehicles Directorate. Before joining AFRL in 2007, he was a spacecraft navigator for NASA's Jet Propulsion Laboratory (JPL) in Pasadena, CA, serving on Mars Global Surveyor, Mars Odyssey, Mars Express (joint mission with ESA), Mars Exploration Rovers, Hayabusa (joint mission with JAXA), and the Mars Reconnaissance Orbiter.

Mr Stewart Bain, *CEO, NorthStar Earth & Space Inc.*

Mr Stewart BAIN, is the CEO and Co-Founder of NorthStar Earth and Space Inc. With twenty-eight years of experience designing and developing aerospace systems, Stewart was part of the original engineering design team for RadarSat 1 and 2. Stewart created the optical systems centre of excellence at CAL Corporation (later EMS Technologies, ComDev and now Honeywell) which commercially developed breakthrough star tracker systems for spacecraft attitude control and optical intersatellite link technologies. This centre of excellence went on to make significant contributions to Canada's first space situational awareness satellite, SAPPHIRE as well as the James Webb space telescope. Stewart has been recognized with an R&D 100 award for his collaborations with NASA Langley distinguishing his contributions to advanced high temperature polyimide composite systems for aircraft applications. He has been in the business of commercializing disruptive technologies globally for numerous aeronautical and space applications since 1996. He served as a member of the Board of Directors of the AIAC and was President of the Board Advisory Committee of the AQA (Quebec Aerospace Association). Stewart is the founder of Bain Consulting International offering management consulting services worldwide for the aerospace market with offices in France, Japan, Germany and the USA. Stewart has an MBA from Queen's University in Kingston, Ontario and a Masters of Engineering from Carleton University in Ottawa.

Moderator **Mr Niklas Hedman**, *Chief of Committee, Policy and Legal Affairs Section, UN Office for Outer Space Affairs*

Mr Niklas HEDMAN is Chief of Committee, Policy and Legal Affairs Section of the United Nations Office for Outer Space Affairs. He is Secretary of the Committee on the Peaceful Uses of Outer Space and its Scientific and Technical Subcommittee and Legal Subcommittee. He is also Secretary of the United Nations Inter-Agency Meeting on Outer Space Activities, which is the central coordination mechanism for space related activities in the United Nations system. Before joining the United Nations in 2006, he worked in the Swedish Ministry for Foreign Affairs, particularly in the areas of ocean affairs and law of the sea; space law and space policy; as well as disarmament and non-proliferation, including PAROS and the Hague Code of Conduct Against Ballistic Missile Proliferation (HCOC). Mr. He is a member of the International Space Law Committee of the International Law Association (ILA), International Institute of Space Law (IISL) and International Academy of Astronautics (IAA)

Panel **Dr Renata Dwan**, *Director, UNIDIR* (see above)

Dr Peter Martinez, *Director, Secure World Foundation* (see above)

Amb (ret) Paul Meyer, *Senior Fellow, The Simons Foundation Canada*

Amb (ret.) Paul MEYER is a Senior Fellow in Space and Cyber Security at The Simons Foundation, as well as Adjunct Professor, School for International Studies, and Fellow in International Security, Centre for Dialogue, at Simon Fraser University in Vancouver, Canada, and Chair of the Canadian Pugwash Group. He joined the then Department of External Affairs in 1975 as a Foreign Service Officer and served abroad in Oslo (1976-1978), Moscow (1982-1984) and Brussels (1988-1992) where he was Political Counsellor in Canada's delegation to NATO. From 1992-1997, he served at the Embassy in Washington D.C. as Minister-Counsellor (Political) and from 2001-2003 as Minister and Deputy Head of Mission at the Embassy in Tokyo. In Ottawa, Mr. Meyer has held a variety of positions at the Department of Foreign Affairs and International Trade, primarily in the field of international security policy. He was Director-General of the International Security Bureau from 1998-2001. From 2003 to 2007, Mr. Meyer served as Ambassador and Permanent Representative to the Office of the United Nations and the Conference on Disarmament in Geneva. His responsibilities spanned a variety of issues and organisations including human rights, humanitarian affairs, global health and disarmament. From 2007 to his retirement from the Foreign Service in September 2010, Mr. Meyer served as Director General of the Security and Intelligence Bureau at DFAIT.

Dr Xavier Pasco, *Director, Fondation pour la recherche stratégique* (see above)
