2024
innovations dialogue.

Quantum technologies and their implications for international peace and security

22 November 2024 ▪ **Campus Biotech**

AGENDA

REGISTRATION
08:30

WELCOME Opening Remarks
09:00-09:10

Robin Geiss Director, UNIDIR

Maricela Muñoz Director, Strategic Partnerships, GESDA

PANEL 1 Agenda and Framing of the Discussion on Quantum Technologies in the Context of International Peace and Security
09:20-09:50

Jungsang Kim Associate Director of the Duke Quantum Center, Professor of Physics, Duke University

Mira Wolf-Bauwens Responsible Quantum Computing Lead, IBM Research Europe

Moderated by

Maricela Muñoz Director, Strategic Partnerships, GESDA

PANEL 2 Overview of Quantum Technology Applications
09:50-11:10

Jungsang Kim Associate Director of the Duke Quantum Center, Professor of Physics, Duke University

Gregoire Ribordy Chief Executive Officer, ID Quantique

Kelly Richdale Executive Fellow, Centre for the Fourth Industrial Revolution Network and Partnerships, World Economic Forum

Yung Szen Yap Senior Lecturer, Department of Physics, Universiti Teknologi Malaysia (UTM)

Moderated by

Dongyoun Cho Senior Researcher, Security & Technology Programme, UNIDIR

COFFEE BREAK
11:10-11:30

#ID24

PANEL 3   Impact of Quantum Technologies on International
Peace and Security

11:30-12:50

Brad Lackey   Partner, Quantum Architect, Microsoft

Min-Ha Lee   Fellow, Stanford Center for Responsible Quantum Technology,
Stanford University, Korea Institute of Industrial Technology

Giacomo Persi Paoli   Head of Programme, Security & Technology, UNIDIR

Constanza Vidal Bustamante   Fellow, Technology and National Security, Center for a New American Security

Moderated by
Sarah Marie Clement   Researcher, Security & Technology Programme, UNIDIR

LUNCH BREAK

12:50-13:50

PANEL 4   Access for All & Advancing Capacity Building

13:50-15:10

Amal Kasry   Chief of Section for Basic Science, Research, Innovation
and Engineering, UNESCO

Barry Sanders   Professor, Faculty of Science, Department of Physics and
Astronomy, University of Calgary (online)

Amb James Ndirangu Waweru   Deputy Permanent Representative of Kenya to the United
Nations and other international organizations in Geneva

Moderated by
Marieke Hood   Executive Director Impact Translator, GESDA

COFFEE BREAK

15:10-15:30

PANEL 5   Regular, Structured Dialogue on Quantum Governance

15:30-16:50

Beyza Unal   Head of Science, Technology and International Security Unit,
United Nations, Office for Disarmament Affairs (online)

Amb Fernando Espinosa   Deputy Permanent Representative of Mexico to the United
Nations Office at Geneva

Prince Koree Osei   Lead Scientist & Director, Quantum Leap Africa (QLA)

Mira Wolf-Bauwens   Responsible Quantum Computing Lead, IBM Research Europe

Moderated by
Giacomo Persi Paoli   Head of Programme, Security & Technology, UNIDIR

CONCLUDING REMARKS   Conference Closing

16:50-17:00

Maricela Muñoz   Director, Strategic Partnerships, GESDA
Giacomo Persi Paoli   Head of Programme, Security & Technology, UNIDIR

FEATURED SPEAKERS

OPENING REMARKS

Robin Geiss
Director, UNIDIR

Dr Robin Geiss is the Director of the United Nations Institute for Disarmament Research (UNIDIR). He was appointed by Secretary-General António Guterres and assumed the post in April 2021. As Director, Dr Geiss charts UNIDIR's strategic direction, mobilizes resources and manages the Institute's staff. He brings to the position over 20 years of experience in peace, security and international affairs. Previously, he served as tenured Professor and Director of the Glasgow Centre for International Law and Security at the University of Glasgow. He was also the Swiss Chair of International Humanitarian Law at the Geneva Academy of International Humanitarian Law and Human Rights and Visiting Professor at the Paris School of International Affairs, Sciences Po, Paris. He served as Legal Adviser and delegate to the UN Human Rights Council for the International Committee of the Red Cross (ICRC). He is an ex officio member of the UN Secretary General's Advisory Board on Disarmament Matters and remains (affiliate) Professor at the University of Glasgow.

Maricela Muñoz
Director, Strategic Partnerships, GESDA

Mrs Muñoz currently serves as the Director of Strategic Partnerships for GESDA (Geneva Science and Diplomacy Anticipator Foundation), a Swiss public-private foundation that anticipates future scientific and technological developments to maximize benefits for society. She has worked as a diplomat, serving as Minister Counsellor and Chargé d'Affaires a.i. at the Permanent Mission of Costa Rica in Geneva, Switzerland. Prior to that, she held regional positions at the United States Agency for International Development(USAID), The Nature Conservancy, the U.S. Department of State, Singkee Consulting, and AVINA Stiftung.

PANEL 1

Jungsang Kim

Associate Director of the Duke Quantum Center, Professor of Physics, Duke University

Dr Jungsang Kim is the Schiciano Family Distinguished Professor of Electrical and Computer Engineering and Professor of Physics at Duke University. He is also a co-founder of IonQ, and served as the Chief Technology Officer. He is a leading expert in quantum computing and quantum networking with atomic systeMs Professor Kim received his BS degree in Physics from Seoul National University, and Ph.D. in Physics from Stanford University. He served as a Technical Manager at Bell Laboratories working on developing optical and wireless communication technologies before joining Duke University in 2004.

Mira Wolf-Bauwens

Responsible Quantum Computing Lead, IBM Research Europe

Dr Mira Wolf-Bauwens is Responsible Quantum Computing Lead and Technical Quantum Ambassador at IBM Research, and one of the foremost leaders in the Responsible Quantum Computing movement, championing the use of the technology for societal good and benefit. Mira's team collaborates to tackle business and socio-economic challenges through technological innovation. They address the societal questions arising from the development of Quantum Computing and Quantum-safe technologies. As a leading expert in quantum computing and its ethical implications, Mira is highly sought after for her insights on the intersection of emerging technologies and societal impact. Among others, she has co-authored the first Quantum Computing Governance Principles with the WEF, is on the Advisory Board of the Open Quantum Institute and served as an expert on the UNESCO World Commission on the Ethics of Scientific Knowledge's panel on Quantum Ethics.

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PANEL 2

Jungsang Kim

Associate Director of the Duke Quantum Center, Professor of Physics, Duke University

Jungsang Kim is the Schiciano Family Distinguished Professor of Electrical and Computer Engineering and Professor of Physics at Duke University. He is also a co-founder of IonQ, and served as the Chief Technology Officer. He is a leading expert in quantum computing and quantum networking with atomic systeMs Professor Kim received his BS degree in Physics from Seoul National University, and Ph.D. in Physics from Stanford University. He served as a Technical Manager at Bell Laboratories working on developing optical and wireless communication technologies before joining Duke University in 2004.

Gregoire Ribordy

Chief Executive Officer, ID Quantique

Mr Ribordy is a pioneer in the field of quantum technologies. After obtaining his PhD in physics from the University of Geneva in the late 1990's for his research on quantum communications, Mr Ribordy co-founded ID Quantique (IDQ) and has been its CEO since then. IDQ was the first company to exploit quantum physics to enhance data security, with several world premieres. He was a member of the High-Level Group on Quantum Technologies, in charge of advising the European Commission on technology and innovation aspects related to this field in 2016 to 2017. Mr Ribordy is the author of more than 30 scientific papers in the field of quantum technologies and cited as an inventor on more than 20 patents. He is the recipient of several innovation awards, such as the University of Geneva Innovation Medal (2017) or the Digital Shaper Switzerland Award (2018).

Kelly Richdale

Executive Fellow, Centre for the Fourth Industrial Revolution Network and Partnerships, World Economic Forum

Kelly Richdale is a Senior Advisor for SandboxAQ, Alphabet's AI and Quantum spin off, and an Executive Fellow - Quantum at the World Economic Forum. She has 20+ years' experience in cybersecurity and transformative technologies (quantum, AI, blockchain). She also holds roles as Venture Partner with Amadeus, a European deeptech investor, and is a board member for a Swiss insurance company. Previously she was on the Innovation Council for Innosuisse, the Swiss federal government's agency for technology innovation, as well as on the executive team of Libra, Meta's blockchain-based payment project. Prior to that she was EVP for Quantum Safe Security at ID Quantique, a Swiss leader in QKD and QRNG. Her extensive track record includes board governance, strategic leadership, entrepreneurship and building high growth international businesses. She holds an MBA from INSEAD and a CISSP in Cybersecurity.

Yung Szen Yap
Senior Lecturer, Department of Physics, Universiti Teknologi Malaysia (UTM)

Dr Yap is currently a senior lecturer at Universiti Teknologi Malaysia (UTM), a specially appointed associate professor with the Center of Quantum Information and Quantum Biology (QIQB), Osaka University and a researcher with Prof. Rainer Dumke Lab, Centre for Quantum Technologies (CQT). He worked on Electron Spin and Superconducting Quantum Computers at millikelvin temperatures. Since 2023, he is also an active member of the quantum community Malaysia Quantum Information Initiative (MyQI), which functions to help promote and advocate quantum information in Malaysia.

Dongyoun Cho
Senior Researcher, Security & Technology Programme, UNIDIR

Dr Dongyoun Cho is a senior researcher in the Security and Technology Programme at the United Nations Institute for Disarmament Research (UNIDIR). Her research focuses on the convergence of security and emerging technologies, including artificial intelligence, autonomy, cyber, and quantum. As a former Major in the Republic of Korean Army with over 20 years of experience in intelligence, military strategy, defense policy, and the aerospace and defense industry, she brings a wealth of expertise. Additionally, she serves as an Assistant Professor in the Department of Military Studies at Seokyeong University, where she established and led the Center for Future Defense Technology and Entrepreneurship as a director. Dongyoun graduated from the Korea Military Academy and holds a master's degree in public administration from the Kennedy School of Government at Harvard University. She was also recognized as a World Fellow (2018) at Yale University.

PANEL 3

Brad Lackey
Partner, Quantum Architect, Microsoft

Dr Brad Lackey is a quantum architect and leads the quantum networking program at Microsoft. Prior to Microsoft, he was a senior technical leader in the U.S. DoD, specializing in design and analysis of quantum and post-quantum cryptography, and adjunct Professor of Computer Science at University of Maryland. His research interests include quantum information science, quantum algorithms and error correction, quantum cryptography and cybersecurity, and foundations of quantum theory.

Min-Ha Lee

Fellow, Stanford Center for Responsible Quantum Technology, Stanford University, Korea Institute of Industrial Technology

Dr Min-Ha Lee is Fellow at the Stanford Center for Responsible Quantum Technology at Stanford University and a Principal Researcher at the Korea Institute of Industrial Technology (KITECH) and a Professor at the University of Science and Technology (UST) in South Korea. He earned his PhD in Metallurgical Engineering at Yonsei University (2004) and has developed a comprehensive expertise that bridges the disciplines of engineering and policy development, underpinned by rigorous analytic assessment. A pioneer in his field, Min-Ha has been at the forefront of advocating for comprehensive studies and policies regarding the sustainability and accessibility of CRMs and Rare Metals. His tenure as a Senior Researcher at the Korea Materials and Components Industry Agency (KMAC) within South Korea's Ministry of Trade, Industry, and Energy (MOTIE). He was a Senior Scientist & Research Professor at Leibniz Institute for Solid State and Materials Research Dresden in Germany.

Giacomo Persi Paoli

Head of Programme, Security & Technology, UNIDIR

Dr Persi Paoli is the Head of the Security and Technology Programme at UNIDIR. His expertise spans the science and technology domain with emphasis on the implications of emerging technologies for security and defence. His recent work focused on arms control, technology horizon scanning, AI and cyber security. Before joining UNIDIR, Giacomo was Associate Director at RAND Europe where he led the defence and security science, technology and innovation portfolio as well as RAND's Centre for Futures and Foresight Studies. He served for 14 years as warfare officer in the Italian Navy and has been extensively engaged in small arms and light weapons research in support of UN processes. He holds a PhD in Economics from the University of Rome, Italy and a master's degree in Political Science from the University of Pisa, Italy.

Constanza Vidal Bustamante

Fellow, Technology and National Security, Center for a New American Security

Constanza M. Vidal Bustamante, Ph.D. is a Fellow with the Technology and National Security Program at the Center for a New American Security, a bipartisan think tank in Washington, D.C. She leads the Center's quantum technology policy research, with a focus on national security applications, strategic investments, and technology protection.

Sarah Marie Grand-Clement

Researcher, Security & Technology Programme, UNIDIR

Sarah Grand-Clément is Researcher in the Conventional Arms and Ammunition Programme and the Security and Technology Programme of the United Nations Institute for Disarmament Research (UNIDIR). Her work examines the intersection of technology and conventional arms, exploring both the benefits of technology for arms control and violent conflict prevention, as well as the challenges and threats technology can pose to international security. Prior to joining UNIDIR, Sarah was a Senior Analyst in defence and security issues at RAND Europe.

PANEL 4

Amal Kasry

Chief of Section for Basic Science, Research, Innovation and Engineering, UNESCO

Dr Amal Kasry is currently the Chief of Section for Basic Sciences, Research Innovation and Engineering, which is part of the Division of Science Policy and Basic Science, Natural Sciences Sector at UNESCO. Her major role is to Design, implement, monitor, and evaluate basic and engineering sciences programme in order to ensure the delivery of the expected results approved by UNESCO's governing bodies in the fields of basic and engineering sciences capacity development for research, education and innovation. She also delivers expert advice and comprehensive programmes to Member States.

Barry Sanders

Professor, Faculty of Science, Department of Physics and Astronomy, University of Calgary

Barry Sanders is Scientific Director of Calgary's "Quantum City", hosted by the University of Calgary and tasked with building a strong quantum ecosystem in Alberta. Barry's theoretical research includes quantum sensing and metrology, quantum and quantum-resilient communication, quantum computing and quantum optics. He has held numerous distinguished international visiting professorships and affiliations in Canada, the USA, China, India, Israel, Austria and elsewhere, and is a Scientist with the Creative Destruction Lab sites at the Universities of Toronto and Calgary. Sanders served as an Expert with the Canadian Council of Academies and is a member of the Scientific Board for the Banff International Research Station.

Ambassador James Ndirangu Waweru

Deputy Permanent Representative of Kenya to the United Nations and other international organizations in Geneva

Ambassador James Ndirangu Waweru, EBS, is the Deputy Permanent Representative, at the Permanent Mission of the Republic of Kenya to the United Nations Office in Geneva. He is the immediate former Registrar of Treaties, Office of Registrar of Treaties in the Ministry of Foreign and Diaspora Affairs. An Advocate of the High Court of Kenya, and Certified Secretary, Amb. Waweru received an LL. B from Nagpur University, India, (1999), and an LL.M from Warwick University, United Kingdom, (2002), specializing in International Economic Law.

Marieke Hood

Executive Director Impact Translator, GESDA

Marieke is the Executive Director Impact Translator of GESDA. She joined the foundation at its inception in 2019. Her role is to implement the most advanced science diplomacy solutions ideated by GESDA, working towards their spin-off as independent institutions. This involves prototyping real-world activities, framing their governance and securing their funding. Marieke led the incubation of the Open Quantum Institute, culminating with its launch in March 2024 as part of CERN with the support of UBS.

PANEL 5

Beyza Unal

Head of Science, Technology and International Security Unit, United Nations, Office for Disarmament Affairs

Dr Beyza Unal is the Head of Science and Technology Unit at UNODA. She specializes in the interaction between emerging technology applications and their impact on international peace and security. Before joining UNODA, Beyza was the Deputy Director of the International Security Programme at Chatham House. She formerly worked in the Strategic Analysis Branch at NATO Allied Command and Transformation, taught International Relations at Old Dominion University, and served as an international election observer during the 2010 Iraqi parliamentary elections. She has published numerous research papers in the areas of cyber security, outer-space security, protection of critical national infrastructure, nuclear weapons policy, and other emerging technology areas.

Ambassador Fernando Espinosa

Deputy Permanent Representative of Mexico to the United Nations Office at Geneva

Since 2022, Deputy Permanent Representative of Mexico in Geneva. Has served as Deputy Head of Mission at the Embassy of Mexico in Switzerland and DPR before the UPU. Held diplomatic assignments in Canada and Sao Paulo, Brazil. Has served as Deputy Director General for the Division of Europe, at the Legal Affairs Division, Foreign Policy Planning Unit, Division of Consular Affairs, Bilateral Economic Affairs and American Regional Organizations in the Mexican Foreign Ministry.

Prince Koree Osei

Lead Scientist & Director, Quantum Leap Africa (QLA)

Dr Prince K. Osei is the Centre President of the African Institute for Mathematical Sciences (AIMS) Ghana. He is also the Lead Scientist and Director for Quantum Leap Africa (QLA) in Kigali, Rwanda. Previously, he was a Fields-Perimeter and Perimeter Institute Postdoctoral research fellow and the Academic Manager for AIMS Ghana. As a lecturer and researcher, Prince has taught over 20 courses across all levels in the university. With his extensive experience in multiple fields of life, he is trusted to sit on academic boards, with the task of overseeing academic quality assurance and aiding in the creation of masters and Ph.D. prograMs He serves on the WEF council for the Future of Quantum Economy and the Advisory Committee for OQI at CERN.

Mira Wolf-Bauwens

Responsible Quantum Computing Lead, IBM Research Europe

Dr Mira Wolf-Bauwens is Responsible Quantum Computing Lead and Technical Quantum Ambassador at IBM Research, and one of the foremost leaders in the Responsible Quantum Computing movement, championing the use of the technology for societal good and benefit. Mira's team collaborates to tackle business and socio-economic challenges through technological innovation. They address the societal questions arising from the development of Quantum Computing and Quantum-safe technologies. As a leading expert in quantum computing and its ethical implications, Mira is highly sought after for her insights on the intersection of emerging technologies and societal impact. Among others, she has co-authored the first Quantum Computing Governance Principles with the WEF, is on the Advisory Board of the Open Quantum Institute and served as an expert on the UNESCO World Commission on the Ethics of Scientific Knowledge's panel on Quantum Ethics.

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CONCLUDING REMARKS

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