SYNTHESIS NO. 7

SCIENCE DIPLOMACY ACTION

An Incidental Serial for Rigorous Meeting Syntheses

November 2023

Arctic Science and Technology Advice with Ministries

Arctic Circle Japan Forum Panel

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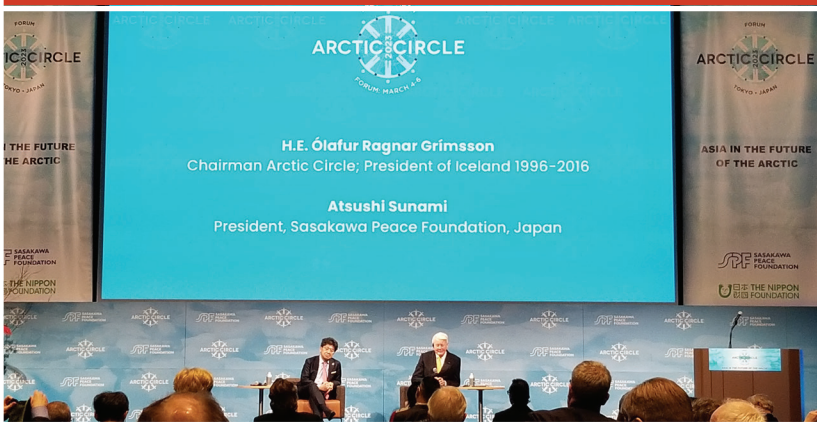

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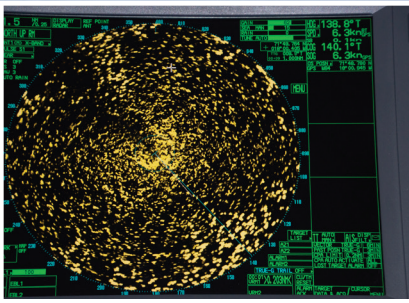

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Synthesis No. 7
(13 November 2023)

ARCTIC SCIENCE AND TECHNOLOGY ADVICE WITH MINISTRIES

ARCTIC CIRCLE JAPAN FORUM PANEL[1,2]

[1]This synthesis is produced by the co-conveners and team of panelists in the Arctic Circle Japan Forum session on *Arctic Science and Technology Advice with Ministries* that was convened in Tokyo, Japan, on 5 March 2023 during the Arctic Circle Japan Forum, which was co-hosted by the Arctic Circle and Sasakawa Peace Foundation (see Appendix 1 – Co-Author List in Alphabetical Order).

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[2]All views expressed are personal and do not reflect the views of any organization, agency or government.

ABSTRACT

This seventh *Synthesis* with the *Science Diplomacy Action* serial emerged from the panel session on *Arctic Science and Technology Advice with Ministries*, which was convened during the Arctic Circle Japan Forum in Tokyo on 5 March 2023. This session built on transdisciplinary dialogues with the February-March 2022 webinar series on *Enhancing International Scientific Cooperation: Arctic Science and Technology Advice with Ministries*, which was funded by the Ministry of Foreign Affairs of Japan with coordination and logistics provided by the United Nations Institute for Training and Research (UNITAR), as represented in *Synthesis 6*. Dialogues in both venues were strongly influence by Russia's invasion of Ukraine and the ongoing war with consequences for international Arctic scientific cooperation, as reflected by the 3 March 2022 *"pausing"* of the Arctic Council. With this background, the Arctic Circle Japan Forum session addressed three questions:

1. How can nations maintain as well as enhance international Arctic scientific cooperation, especially in the context of Open Science?
2. How can individual scientists work with ministries to build Open Science inclusively during times of geopolitical strain?
3. How can ministries facilitate continuity with the Arctic Council inclusively beyond the Arctic Council chairship rotation from Russia to Norway in May 2023?

The panel involved leaders from the Alfred Wegener Institute for Polar and Marine Research, International Arctic Science Committee (IASC), Japan Agency for Marine-Earth Science and Technology (JAMSTEC), National Institute for Polar Research (NIPR), Sasakawa Peace Foundation, Science Diplomacy Center™ and the University of the Arctic (UArctic). Panelists' international perspectives from Finland, Germany, Japan, United Kingdom and the United States are represented in the transcript of their panel dialogue, which is reproduced herein to provide insights about continuity with international scientific cooperation and Open Science inclusively to achieve progress with Pan-Arctic sustainable development.

ACKNOWLEDGEMENTS

We thank the National Institute of Polar Research (NIPR) in Japan for co-convening this panel and their generous travel support to Prof. Paul Arthur Berkman as panel moderator. We thank Dr. Atushi Sunami, Ms. Sakiko Hataya and the Sasakawa Peace Foundation for providing the transcript from the Arctic Circle Japan Forum panel dialogue on *Arctic Science and Technology Advice with Ministries* along with their approval to include the Sasakawa Peace Foundation logo on the cover. We thank President Ólafur Ragnar Grímsson for his inclusive leadership with the Arctic Circle across its first decade and his team for approval to include the Arctic Circle logo on the cover.

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INTRODUCTION

The Arctic Circle Japan Forum (ACJF) session was proposed initially in early 2021 to assess the Arctic Science Ministerial process (Table 1) in relation to the 2017 *Agreement on Enhancing International Arctic Scientific Cooperation* that entered into force in 2018 with the eight Arctic states as signatories. Both the Arctic Science Ministerial (ASM) process and the Arctic Science Agreement involve national ministries, focusing on science and scientific cooperation with the natural sciences, social sciences and Indigenous knowledge. However, only the Arctic Science Ministerial process includes non-Arctic states, notably Japan and other nations that are observers to the Arctic Council.

TABLE 2: ARCTIC SCIENCE MINISTERIAL (ASM) PROCESS INVOLVING MINISTRIES OF THE EIGHT ARCTIC STATES WITH THE SIX ARCTIC INDIGENOUS PEOPLES' ORGANIZATIONS AND NON-ARCTIC STATES INCLUSIVELY

Process	Year	Location	Host(s)	Participants	Themes
1st ASM[1]	2016	Washington, DC (US)	United States	24 Nations and European Union (EU)	**1.** Arctic-Science Challenges and Their Regional and Global Implications **2.** Strengthening and Integrating Arctic Observations and Data-Sharing **3.** Applying Expanded Scientific Understanding of the Arctic to Build Regional Resilience and to Shape Global Responses **4.** Empowering Citizens through Science Technology, Engineering, and Mathematics (STEM) Education Leveraging Arctic Science
2nd ASM[2-3]	2018	Berlin (Germany)	Finland and Germany with EU	23 Nations and EU	**1.** Strengthening, Integrating and Sustaining Arctic Observations, Facilitating Access to Arctic Data, and Sharing Arctic Research Infrastructure **2.** Understanding Regional and Global Dynamics of Arctic Changes **3.** Assessing Vulnerability and Building Resilience of Arctic Environments and Societies
3rd ASM[4-6]	2021	Tokyo (Japan)	Japan and Iceland	27 Nations and EU	**1.** *"Knowledge for a Sustainable Arctic"* is the overall theme with sub-themes: **2.** Observe the status of Arcticchanges **3.** Understand the local and globalimpacts **4.** Respond to the changes based on a sharedunderstanding **5.** Strengthen these efforts through education and capacity-building for future generations
4th ASM[7,8]	2023	St. Petersburg (Russia)	Russia	Russia[9]	**1.** The population of the Arctic, including indigenous peoples. **2.** Environmental protection, including climate change issues. **3.** Socio-economic development. **4.** Strengthening the Arctic Council.

[1] *Supporting Arctic Science: A Summary of the White House Arctic Science Ministerial Meeting (September 28, 2016, Washington, DC)*. (https://asm3.org/library/Files/Supporting_Arctic_Science_1.pdf).

[2] *Report of the 2nd Arctic Science Ministerial: Co-Operation In Arctic Science – Challenges and Joint Actions (26-28 October, 2018, Berlin)*. (https://asm3.org/library/Files/190402_ASM2_Bericht_V2_bf.pdf)

[3] *Joint Statement of Ministers on the Occasion of the 2nd Arctic Science Ministerial (26 October 2018, Berlin)*. (https://asm3.org/library/Files/ASM2_Joint_Statement.pdf).

[4] *Knowledge for a Sustainable Arctic 3rd Arctic Science Ministerial Report (8–9 May 2021, Tokyo)*. (https://asm3.org/library/Files/ASM3_Final_Report.pdf).

[5] *Joint Statement of Ministers on the Occasion of the 3rd Arctic Science Ministerial (9 May 2021, Tokyo)* (https://asm3.org/library/Files/ASM3_Joint_Statement.pdf).

[6] *The ASM3 Project Database*. (https://ads.nipr.ac.jp/ASM3DB/).

[7] International planning for the 4th Arctic Science Ministerial was halted because of the Ukraine invasion by Russia.

[8] Reporting of the 4th Arctic Science Ministerial (https://asm4.ru/).

[9] ASM4 discussed in *High North News* article (https://www.highnorthnews.com/en/statement-chair-preserve-arctic-council) by Paul Arthur Berkman, who participated as the sole foreign participant.

Addressing the following question was considered to complement various venues supporting the "Science-to-Policy Process", which was emphasized with the 3rd Arctic Science Ministerial (ASM3) that was co-hosted by Iceland and Japan in Tokyo in May 2021 (Table 1). Initially, the central question for the ACJF session was:

- What are the relationships and synergies between the Arctic Science Ministerial process and the Arctic Science Agreement?

However, this hopeful question was posed before the Russian invasion of Ukraine in 2022 and evolved subsequently with questions that are identified in the **TRANSCRIPT** (below) from the ACJF session, with a sense of urgency to operate short-to-long term. This international, transdisciplinary and inclusive session with ACJF (**APPENDIX 2**) involved a moderated panel dialogue with institutional leaders, modelled after the:

2018 – Arctic Circle Assembly session in advance of the 2nd Arctic Science Ministerial (ASM2); and

2022 – Webinar series before-through-after the inflection point[1] of the Ukraine invasion by Russia[2] about ENHANCING INTERNATIONAL SCIENTIFIC COOPERATION: SCIENCE AND TECHNOLOGY ADVICE IN FOREIGN MINISTRIES that was funded by the Ministry of Foreign Affairs of Japan with hosting by the United Nations Institute for Training and Research (UNITAR).[3,4]

However, the context of the ACJF session extended to the 1st and 2nd *International Dialogues on Science and Technology Advice with Foreign Ministries* that were convened in 2016 and 2017, respectively, as reflected by the continuity of syntheses in the *Science Diplomacy Action* series (Figure 1).

FIGURE 1: *Science Diplomacy Action* series of syntheses that relate to science and technology advice with ministries, providing context and revealing continuity for the 2023 ACJF session.[5]

[1] Berkman, P.A. 2020. 'The Pandemic Lens': Focusing Across Time Scales for Local-Global Sustainability. *Patterns* 1(8):1-4.
[2] Brigham, L.W.B. 2022. Ten ways Russia's invasion of Ukraine impacts the Arctic and the world. *The Hill* 15 November 2022.
[3] UNITAR. 2022. *Enhancing International Scientific Cooperation: Arctic Science and Technology Advice with Ministries*. United Nations Institute for Training and Research (UNITAR), Switzerland.
[4] Berkman, P.A., Shibata, A. and Baeseman, J. 2022. Arctic Science Diplomacy Maintains Russia Co-Operation. *Nature* 604:625.
[5] Relevant syntheses in the *Science Diplomacy Action* series (https://scidiplo.org/science-diplomacy-action-serial/).

The ARCTIC SCIENCE AND TECHNOLOGY ADVICE WITH MINISTRIES session was designed to build on questions and observations stimulated by the Arctic Science Agreement[6], which have accelerated into theory, methods and skills to operate short-to-long term with informed decisionmaking[7], which now are being trained with Ministries of Foreign Affairs and the United Nations. It is noteworthy that the concept of an "informed decision", defined across a 'continuum of urgencies', was published first in *Science Diplomacy Action – Synthesis 1* (Figure 1) and elaborated subsequently (Figure 2).

FIGURE 2: "INFORMED DECISIONS" OPERATE ACROSS A 'CONTINUUM OF URGENCIES' at personal-to-planetary levels. Short-to-long term, informed decisionmaking involves negotiations to build common interests as well as resolve conflicts. The corollary to an informed decision is an uninformed decisions that only operates with urgency at a moment in time.[7,8,9]

With continuity (Figure 1), a goal of this ACJF session was to consider insights with science diplomacy that can contribute to Open Science with Pan-Arctic inclusion continuously involving research into action (Figure 3).

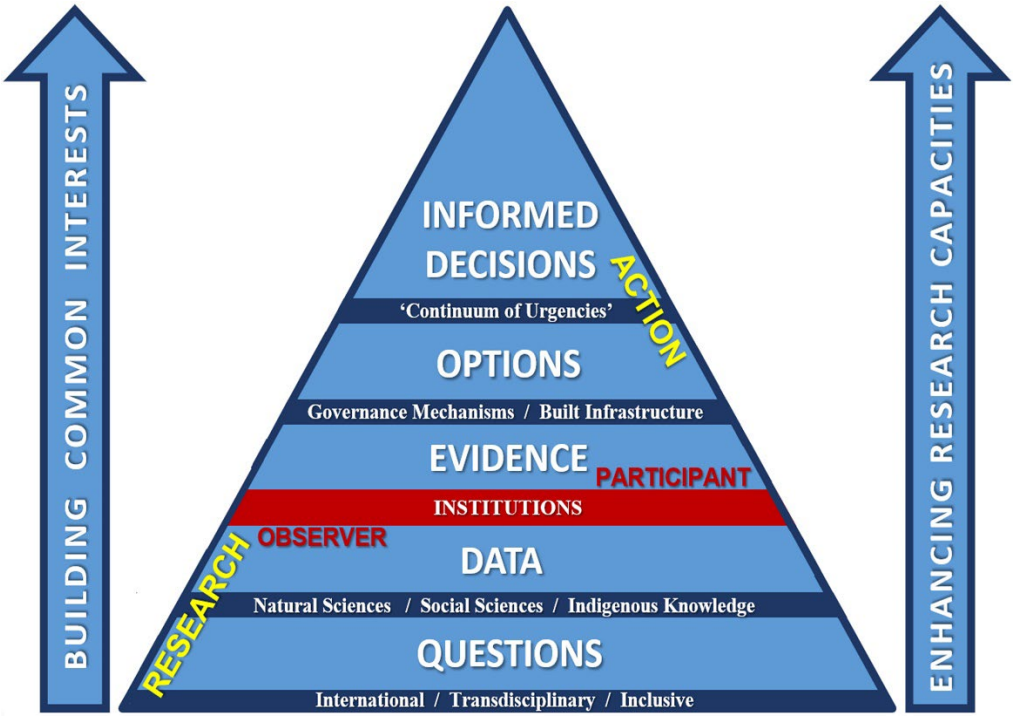

FIGURE 3: Informed Decisionmaking Pyramid methodology representing skills with research into action across the data-evidence interface with the apex goal to produce informed decisions: neither good decisions nor bad decisions, right decisions nor wrong decisions, but decisions that optimize the available information to operate across a 'continuum of urgencies' with dynamic systems short-to-long term (Figure 2).[7]

[6] Berkman, P.A., Kullerud, L., Pope, A., Vylegzhanin, A.N. and Young, O.R. 2017. The Arctic Science Agreement Propels Science Diplomacy. *Science* 358:596-598.
[7] Berkman, P.A., Young, O.R., Vylegzhanin, A.N., Balton, D.A. and Øvretveit, O. (eds.). 2022. BUILDING COMMON INTERESTS IN THE ARCTIC OCEAN WITH GLOBAL INCLUSION. VOLUME 2. INFORMED DECISIONMAKING FOR SUSTAINABILITY. Springer, Dordrecht. 454p.
[8] Figure 1, Synthesis 1 (2017)
[9] Canadian Council of Academies. INTERNATIONAL SCIENCE AND TECHNOLOGY PARTNERSHIP OPPORTUNITIES. Ottawa. in press.

TRANSCRIPT
Arctic Science and Technology Advice with Ministries
March 5, 2022 / 11:30-12:30 Tokyo

Prof. Paul Arthur Berkman:
Okay, let us begin. We have a very distinguished panel and many participants in the panel are on short time, so we're trying to be efficient.

Ohio gozaimasu! Welcome to this Arctic Circle Japan Forum session on ***Arctic Science and Technology Advice with Ministries***

My name is Prof. Paul Arthur Berkman, President, Science Diplomacy Center™. This session is being co-convened with Dr. Jenny Baeseman from Baeseman Consulting and Dr. Hiroyuki Enomoto from the National Institute of Polar Research (NIPR)… kyokuchi kenkyusho.

Our Arctic Circle Japan Forum dialogue today is far more important than was ever imagined when this session was first proposed in 2020, before the 3rd Arctic Science Ministerial, which also was co-hosted by Iceland and Japan in Tokyo. Beyond ministries of foreign affairs, science, environment, fisheries and education as anticipated – ministries of defense now are fundamentally influencing Open Science in the Arctic short-to-long term. With heightened relevance, today's dialogue remains true to the original session concept "*in relation to the 2017 Agreement on Enhancing International Arctic Scientific Cooperation"* that is in force with the eight Arctic states.

With context, let me first introduce you to esteemed colleagues and friends involved with this dialogue that has been ongoing during the past decade:

Contributing with the *1st and 2nd International Dialogues on Science and Technology Advice with Foreign Ministries* in 2016 and 2017, respectively – it is an honour as well as pleasure to welcome:

Dr. Atsushi Sunami, President, Sasakawa Peace Foundation – Japan

Contributing with the Arctic Circle Assembly dialogue on *Enhancing International Arctic Scientific Cooperation* in 2019, preceding the 2nd Arctic Science Ministerial – it is an honour as well as pleasure to welcome:

Prof. Larry Hinzman, Executive Director, Interagency Arctic Research Policy Committee; Former President International Arctic Science Committee (IASC) – United States

Dr. Kirsi Latola, Vice-President Networks, University of the Arctic (UArctic); former Chair, European Polar Board – Finland

Dr. Volker Rachold, Head, German Arctic Office, Alfred Wegener Institute, co-convener of the 2nd Arctic Science Ministerial – Germany

Contributing with the February-March 2022 webinar series on *Enhancing International Scientific Cooperation: Arctic Science and Technology Advice with Ministries* that was hosted by the United Nations with funding from the Ministry of Foreign Affairs of Japan – it is an honour as well as pleasure to welcome:

> **Mr. Henry Burgess**, Head, UK Arctic Office, British Antarctic Survey; Current President, IASC – United Kingdom
>
> **Dr. Hiroyuki Enomoto**, Vice-Director General, National Institute for Polar Research (NIPR); Current Vice-President, IASC – Japan

This webinar series last year also involved contributions from Drs. Hinzman, Latola and Rachold.

Additionally, it is an honour as well as pleasure to welcome to this ongoing dialogue:

> **Dr. Takashi Kikuchi**, Director, Institute of Arctic Climate and Environment Research, Japan Agency for Marine-Earth Science and Technology (JAMSTEC) – Japan

Just after this session was first proposed in 2020, the COVID-19 pandemic erupted with devastating consequences worldwide. Two years later, war erupted in Europe with the Russian invasion of Ukraine.

Now, events in and beyond Ukraine (<u>especially in the Arctic</u>) have created peril that has the potential to cascade into world war, something we all have responsibilities to prevent – all 8 billion of us**.**

With global relevance – the 2017 Arctic Science Agreement and the Arctic Science Ministerial process represents science diplomacy, which first and foremost involves science, inclusively: natural sciences, social sciences and Indigenous knowledge.

This inclusive wisdom established the Arctic Council in 1996 with the eight Arctic states and Indigenous Peoples' Organizations as signatories.

However, the Arctic Council now is in jeopardy, noting it will end unless there is *"an orderly handover of the chairmanship"* from the Russian Federation to Norway in May 2023.

At minimum – for the Arctic Council to continue as a *"high-level forum"* – the upcoming rotation will require a *"Statement from the Chair,"* following the precedent of the 2019 Finnish chairmanship, when consensus also was impossible to produce an Arctic Council Ministerial Declaration among the eight Arctic states.

With respect for the ministers and decisionmakers here [as a science diplomat, introducing options (without advocacy), which can be used or ignored explicitly] – to signal, encourage and enable the procedural statement from the Russian chair of the Arctic Council.

Consider the lessons from the 3rd International Polar Year (IPY) that was renamed as the 1957-1958 International Geophysical Year, which guided the United States and Soviet Union to cooperate continuously in Antarctica and Outer Space throughout the Cold War *"in the interests of science and the progress of all mankind."*

In their statement, the Russian chair of the Arctic Council could facilitate continuity with Pan-Arctic inclusion by focusing short-to-long term on the 5th IPY in 2032-2033, enabling allies and adversaries alike to continue building common interests with the North Pole *"as a pole of peace,"* as inspired by Mikhail Gorbachev a generation ago with his suggestion to create an "Arctic Research Council."

Importantly, starting with the 1st IPY in 1882-1883 – the International Polar Year process represents the longest continuous climate research program humanity has produced, testing the resolve of nations to build common interests across centuries as a globally-interconnected civilization.

For the session to be efficient with many contributors, I respectfully requested each to write 3-4 minute opening remarks with a question or two to be read, considering the following:

- How can nations maintain as well as enhance international Arctic scientific cooperation, especially in the context of Open Science?

- How can individual scientists work with ministries to build Open Science inclusively during times of geopolitical strain?

- How can ministries facilitate continuity with the Arctic Council inclusively beyond May 2023?

With the panel dialogue, each contributor will be invited to address questions they have posed or to frame a new question. The remaining minutes will be open to queries from the audience. I will serve as moderator.

Emphasizing dialogues in the Arctic short-to-long term with inclusion (who, what, when, where, why and how) – *"for the benefit of all on Earth across generations*" – with no further ado, let's begin. We begin with Dr. Sunami, please.

Dr. Atsushi Sunami:

Thank you, Paul. And once again, welcome to Tokyo for this Arctic Circle, Japan Forum. The issue of open science is very, very important at least, especially at this time, as I can say that as we are in Japan, preparing to host the G7 summit this year in Hiroshima. And in conjunction with this, there'll be G7 Science Ministerial Meeting, which will be in Tsukuba, yes. But anyway, in one of the topics of the Science Ministerial Meeting is to how to keep the open science as a way in the form of collaboration and advancing our scientific cooperation, at least among G7 nations.

Coming out of the pandemic, I was sort of very hopeful listening to some of the leading academics in life science and others that are converting the challenges that posed by the pandemic, and COVID, that they were saying that how now they discovered the importance of collaboration, rather than competing for papers and publications, and sort of the kind of usual things that the scientists obviously do. But coming out of this COVID, the lesson that they learned is to the importance of cooperating, sharing data, and even in the process of completing its own research project, but they really do cooperate as long as if that result comes out to the end, answer those challenging questions as a scientist as responsible to facing these global challenges.

And so, I was hoping that with a lesson that we learned from the COVID, the world post-COVID will be something that was more hopeful for international community of scientists, to coming out and addressing

the difficult issues, of course, with the COVID pandemics, but other issues in that area, but geopolitical issues and the fact that it's really changed completely that atmosphere. That's one of the reasons why we're taking this open science as a huge topic for among G7 Ministry of Science Ministerial Meeting, as an important urgent message that the science needs to be collaborative, the data has to be shared in order to produce valuable results to solve the global challenges.

And I thank you, Paul, for actually remind us during the Cold term, Cold War era, and how science diplomacy was very important in that, and I was thinking, I was thought that even during the Crimea incident, the people, we sort of thought that cooperation, international cooperation in space, and Arctic, will never be challenged, even through the time of the Crimea and others. And we kept that with Russians and our friends in terms of maintaining International Space Station Program and so and so forth, the Arctic was really, Arctic science was advising, I guess through it.

But this time, now, as Paul was mentioning that the whole cooperation in Arctic has been seriously challenged, and I think that affected the science cooperation tremendously. But now, the other hand, is can then science cooperation and science diplomacy, solve this international cooperation need necessary to challenge they are facing in the Arctic. So, I think in this panel, I'm very much hope to discuss how the science cooperation, science diplomacy, is now solve the geopolitical challenges that we're facing, particularly in the area of Arctic. So, I'm looking forward to the experts point, discussions on this. Thank you very much.

Prof. Paul Arthur Berkman:
Thank you very much Sunami-san. Enomoto-san, please.

Dr. Hiroyuki Enomoto:
Thank you very much for this opportunity. Paul mentioned the science cooperation agreement since 2017. I try to remember how the number of our colleagues of Arctic researchers has increased in the last 30 years, and how is the situation now and what should be in the future. I've talked about the many increasing members and challenging area and time, and issues we have constantly. So, it's the whole point.

As far as I remember the 1990s, the Arctic was very much focused as IASC established. I went to the Ny-Ålesund station in 1991, to open our Arctic station. At that time, Arctic science was a very regional science. We wondered Arctic is a big concern, but it seemed to be limited in the Arctic region. We were surprised that there is very unique ecosystem there, and behavior was also changing by region. And we noticed the Arctic with connections to the global climate system. That important monitoring of the global condition will be possible in such a remote area as it indicates global background condition.

The teleconnections over long-distance of the natural system and weather system are also recognized. Then, Arctic science went from regional science to global science. And now we have many collaborating members. Arctic Council (AC) involves 8 countries and permanent participants of Indigenous communities and NGOs. But including 16 observer countries, AC has a big number of collaborators. And the International Arctic Science Committee (IASC), has 24-member countries. They're working together. And in 2021, we had ASM3 [3rd Arctic Science Ministerial]. I worked as the co-chair of the science advisory committee. At that time, 28 countries and regions and organizations joined ASM3, and as the whole, 433 projects were documented at that time.

Quite a few numbers of countries demonstrate great idea of science, and noble wishes to the Arctic. We can think how to utilize this function. Do we have some solution for the current difficult condition or not? It's a big challenge. So, we want to work with increased collaborators for the challenging area and time. Russia has been a longtime, an area where we need strategy for academic collaboration, but now it's a bit more difficult to work. And there are challenging areas, and considering the time, challenge is wintertime observation where no single country alone solves the problem.

When we think about the time domain, long term and also homogeneous monitoring is also a big issue. And when we think about the areal domain, under sea ice is unknown and there are many challenging areas.

I want to emphasize the issues of current concern for the sustainable Arctic science. I categorize the four (4) types of science, namely "Research", "Operation", "Monitoring" and "Education".

The 1st is "Research" work. It is project oriented. Under current conditions, the problem is for implementing in the Russian area. And we may pose research due to big difficulty in the coming few several years for I don't know how many years, but that is research activity which is currently paused.

The 2nd category of scientific activity is "Operation". The World Meteorological Organization (WMO) is working under the treaty of international weather collaboration. I attended the North Climate Forum and was very much impressed. Under the current politically difficult condition, Russian and this northern country's meteorological agencies are working together and discussing, sharing the information of the last six months of sea ice conditions, Russia is reporting that Eurasia continent sector and other countries reporting of other regions. They have been showing their forecast in the coming 6 months. The organizations with "World" in their names, such as WMO, WHO [World Health Organization], WTO [World Trade Organization], etc. They are robust and keep working with their functions.

Then, the 3rd category is "Monitoring". Arctic countries have great efforts for monitoring the environment. Because the Arctic Council started from the Arctic Environment Protection Strategy (AEPS). Environmental protection or monitoring is a big issue. But in this situation, they are not working by the treaty system. So, monitoring is a big concern or challenge. But, I hope, Monitoring should be continued. We are often saying Arctic is 3 times or 4 times more rapid warming than global average. But how, why we can say that 3 times 4 times? Because the data is starting from earlier times, 1900s.

Over the Cold War, and Second World War, the data was continued through such, maybe very difficult, situations. We can now see that Arctic warming is twice or 3 times, 4 times more rapid. The data showing this was obtained north of 70° N. The effort of the field operators of former Soviet Union, US, Canada, and Scandinavian countries were international, and they opened the data.

Finally, I also mention "Education". For the IPY in the coming 10-year period, we want to expect that next generation's scientists, and I hope the Russian scientists, Russian young researchers, and other young researcher out of Russia, will be working together in IPY. So, that's my wish.

Prof. Paul Arthur Berkman:

Arigato gozaimashita. Kirsi, please, Dr. Latola.

Dr. Kirsi Latola:

Thank you, Paul. Thank you very much. I have to start by saying that I'm not a political scientist. So, I feel a little bit, kind of overwhelmed with these guys here. Yeah, but I am an Arctic citizen and I live in the Arctic and we see the climate change effects in day to day lives in our lands and waters.

We heard yesterday in plenary panel about the people who live much more Northern, how they witness the changes, but we do that also in Northern Finland, and I'm connected in addition to University of Arctic, also the Nordic Arctic universities where we discuss a lot about our future and I'm basing these opening remarks on the work that we've been doing within these Nordic universities. Because we feel that we who live in the Arctic and witness the changes are the best knowers, knowledges about that. And we also feel that that science alone cannot find solutions anymore to adapt and keep the Arctic as a safe and just homeland.

So, increase in scientific cooperation should not be seen as increased cooperation only among the scientists. There's a need for knowledge-based decision making, citizen science co-created solutions done together with businesses, policymakers, scientists, communities, Indigenous and non-Indigenous.

So, co-production of knowledge of the science should be used in all phases of research, as you all very much know of, in planning, connecting quality data to research analyzing purposing, sharing the data and open access apps following the fair principles and so on. So, knowledge productions facilitated by high quality research and science policy form crucial links to ensure achievements, for example, sustainable development goals established by United Nations, or finding the solutions and ways to adapt our lives and societies to changes caused by the climate change.

To increase Arctic cooperation in research, science has to be co-produced together with all actors in stake using all knowledge systems. And we cannot be paralyzed by the current geopolitical situation, but we need to move ahead, start new cooperations and strengthen our current collaborations. Also, outside the Arctic regions, to work closely with those who can develop solutions, and with who know the land and waters and those who can influence the policies.

This calls for change in mindset on how to do the research, which has traditionally been very single disciplinary. It calls for new cooperation with stakeholders and rights holders. And most importantly, it calls for an open mindset. There is a need to develop a joint co-created understanding and agreement on research ethics, methodologies, data management and ownership with the fair principles. It also calls for changes in national and international research funding schemes, which is my message to ministries. Long term strategies for Arctic research in collaboration with the people, researchers, industry, NGOs, and policymakers in the regions are needed. Thank you.

Prof. Paul Arthur Berkman:

Thank you, Dr. Latola. And I would note that your observations are spot on in terms of policy. Dr. Rachold, Volker, please.

Dr. Rachold Volker:

Dear colleagues and friends, let me start my short introduction by thanking Paul for organizing this important session. We started this dialogue with a panel discussion on *"Supporting the Implementation of the Arctic Science Agreement"* at the Arctic Circle Assembly in Reykjavik in October 2018. The present session was originally proposed for 2020 but had to be postponed due to the Covid pandemic. Meanwhile

the pandemic seems to be under control but we are now facing an even bigger crises, namely the Russian war of aggression against the Ukraine.

The world changed dramatically after February last year and also the Arctic is seriously affected. The term "Arctic Exceptionalism" does no longer apply. At the same time, we have learned that the Arctic is not only warming three but four times faster than the rest of the world.

In the context of our session on *"Arctic Science and Technology Advice with Ministries"*, we have to state that most countries have frozen their scientific cooperation with Russia on an institutional level. The Arctic Council, the leading cross-national forum for the Arctic, is pausing its activities. This also implies that the Agreement on Enhancing International Arctic Scientific Cooperation and the planning of the next Arctic Science Ministerial Meeting, that was supposed to be co-organized by Russia and France, are on hold. However, treaty-based cooperation such as the work of the *United Nations Framework Convention on Climate Change* and the *International Maritime Organization* is still continuing.

I would like to start our dialogue with a few questions and suggestions, focusing on the future of scientific cooperation, including the Arctic Council. Firstly, on the future of the Arctic Council. Maintaining, resumption respectively, of the work of the Council is of highest priority for the Arctic States. Though the cooperation with Russia seems on the short and medium term politically impossible, the goal is to keep the Council alive and to keep the door open for Russia. Norway is taking over the Chairmanship from Russia in May but so far is not publicly known how this will be achieved.

- Will there be a stronger cooperation with observers and Indigenous peoples on issues not involving Russia?

- Can the Arctic States (without Russia) in cooperation with observers play a stronger role in global climate change mitigation and green shift?

Secondly, on scientific cooperation. Looking at the map of the Arctic, we can see that without cooperation with Russia we are lacking observations and data from half of the Arctic.

- How can we address this gap in circum-Arctic studies? Should there be more investments into Arctic cooperation and infrastructure by the Arctic and non-Arctic States (without Russia), in particular regarding remote sensing?

In light of the absence of institutional cooperation with Russia, dialogue on a personal level seems to be the only possible communication.

- How can communication on a personal level help to keep communications channels open? Should in particular younger scientists be encouraged to maintain the dialogue with Russian colleagues?

Prof. Paul Arthur Berkman:

Thank you very much, Volker. Mr. Henry Burgess, Henry, please.

Mr. Henry Burgess:

Thank you very much. My name is Henry Burgess from the United Kingdom's Arctic Office. And I'm also the President of the International Arctic Science Committee. So, I'll speak mostly with my International Arctic Science Committee (IASC) hat on today. IASC was founded in 1990 at a time of great optimism, but also of great tension too in its own way. We are a 24-member organization. We exist to facilitate and encourage international Arctic science cooperation. Russia has been a member from the start. Russia has been able to participate in our council meetings and our working group meetings if they wished to do so. There was no restriction on Russian participation within IASC beyond the practicalities of financial sanctions based on where our secretariat is based in Iceland, which we understand.

I would like to focus on three particular things and the first of which is the State of Arctic Science Report. I have a copy here and it's downloadable from the IASC website. This is very much not about the state of Arctic science information itself. It's not facts and figures on the Arctic, you know those very well. There are very many other ways of accessing that information, but it's a report - the third one -on what the state of Arctic science itself is; where the gaps are in observations and monitoring; and where collectively we think the priorities are at the moment.

And I think that's one of the useful ways that we can make this bridge between what scientists want and need to study and the state of observation systems and making connections with policymakers and others. And the contents of this document show how urgent it is that policymakers and decision makers respond to those challenges. , To make really big changes if how they fund and support science but also to emphasize international cooperation.

And of course, the question is how you turn that into practical action, which is where the second thing that I'd like to say comes in. So we are at the beginning of a process called the International Conference on Arctic Research Planning, and it's the 4th one of those that we've had. It sounds technical, but it isn't particularly. It is about identifying the priorities for Arctic science investment and connection over the next 10 years. So, it's looking forward 10 years to where we expect to be in 2035.

We're at the start of the consultation process. IASC is steering this process, but it's very much a community initiative. I have a series of cards here at the front with a QR code on the back, and if you're interested, please take one of these cards because everyone is welcome to contribute. This really will set the agenda for the priorities for Arctic science, we hope over the next 10 years and it will culminate in a big meeting in Boulder in 2025, that will set those priorities. It's absolutely open to all people from all IASC countries and beyond. It's open to traditional western science knowledge. It's open to Indigenous and local knowledge as well. Each will be taken account of and celebrated and incorporated within these priorities.

Of course, we hope those findings in 2025, that will set the agenda for 10 years, will also feed into the plans for the 5th International Polar Year in 2032-33. This is very much a Polar initiative, so both the Arctic and Antarctic. We had a meeting last week in Vienna during the Arctic Science Summit Week, that I know some of you were at. And we had the ability there to begin those initial discussions with our Scientific Committee on Antarctic Research (SCAR) colleagues and others, on how we bring together the International Polar Year.

The UN and its agencies are involved, the International Science Council are involved. The University of the Arctic, IASC, APECS, all those kinds of organisations are all part of it. So it's the very early stages. But again, we want it to be as inclusive, as optimistic, as aspirational as we can possibly make it.

And I'll finish with a final observation, if you'll permit me. Which is that I know through my role, and IASC's history, that we and other scientists have played a huge role in what we have come to think of as science diplomacy - scientists from across the international community working very hard to break down diplomatic barriers and build positive connections for the good of science and better understanding.

But I think we're at the stage now – because of events in the course of the last year -, where, if you forgive the analogy, we need diplomacy to start to return the favour. We're going to need diplomacy and diplomats and governments to begin to reopen some of these channels for us, because we know how important it is. So, if diplomats can return the favour, that science diplomacy and scientists have been doing before, now would be a good time to do that. Thank you.

Prof. Paul Arthur Berkman:
Thank you very much, Henry. Dr. Larry Hinzman. Larry, please.

Prof. Larry Hinzman:
Thank you chair and dear colleagues. And I'm very pleased to be here today. Thank you all for joining us for this conversation. I must start my contribution to this conversation by noting that Russia's illegal war and the invasion of Ukraine has forced a new situation where cooperation with their scientists has become virtually impossible for the foreseeable future. Many of the speakers yesterday noted that the Arctic Research Community is the most collaborative space in science and I believe that is true. But to imply their return to business as usual, even in Arctic science is problematic at this point.

The United States is committed to international scientific cooperation that strives for mutual recognition of shared values, including scientific freedom, open science, transparency, honesty, equity, fair competition, objectivity, and democratic principles. However, Russia's unlawful and unprovoked full-scale invasion of Ukraine is an affront to the principles we seek to affirm, and our efforts to advance international science, technology and innovation.

Until Russia ends this war against Ukraine, United States government has limited our engagement with the Russian government in international projects and initiatives related to science and technology. And now turning to the topic of this panel, how can nations maintain as well as enhance international Arctic scientific cooperation? I'd like to draw your attention to the process that we use to foster collaborations in the United States through the Interagency Arctic Research Policy Committee, or IARPC.

So, IARPC facilitates collaborations among US Federal researchers and non-federal researchers throughout the United States and around the world. I'd ask you to take your browsers and search for iarpccollaborations.org. IARPC is integrating important research on biological, physical and social processes occurring in the Arctic into a more holistic approach. And by bringing together these research collaborations among many different disciplines and sectors of society, we are working to take on higher order challenges of importance to the people in the Arctic.

IARPC is responsible to create and implement the US Arctic Research Plan, which is accessible through the link on these postcards, and I've got these scattered around. Please pick up one of these. It's a dynamic approach to enable US federal scientists to collaborate with non-federal researchers, including international scientists. International engagement and collaboration are crucial in meeting goals of this plan. And the importance of international scientific cooperation is emphasized throughout.

This plan recognizes that international collaboration and relationships' strengthening are essential to understanding the interconnected processes that define the Arctic, and to advance trans-boundary research challenges. We recognize and emphasize that open science enhances scientific progress and achievements. So, in conclusion, I'll note that the complex societal challenges must be approached through more integrated research designs and the co-production with Indigenous communities and organizations. Collaborations among international researchers, programs and communities, including Indigenous people are more likely to result in the comprehensive teams needed to develop the robust solutions required by Arctic societies. Thank you.

Prof. Paul Arthur Berkman:
Thank you very much, Larry. Kikuchi-san, please.

Dr. Takashi Kikuchi:
Thank you very much, Paul. And I'm very happy to be here. I'm the Vice Chair of the International Arctic Buoy program and also the Vice Chair of IASC Marine Working Group. I'm an Arctic Ocean observation research scientist. So, I'd like to talk from the perspective of observation scientist, of this topic. As all of you know, environmental changes in the Arctic Ocean is progressing rapidly. However, there is a lack of data especially on the central Arctic and the Siberian side of the Arctic Ocean.

The actual state of environmental change is not well understood, even now. Regarding conditions of the Arctic Ocean observation, the situation has not changed so much, because of not only natural but also social restrictions. For example, our research vessel has never been into the Russian water. We'd never done that.

There are few joint observations projects which were conducted in the Russian water, including the Siberian side of Arctic Ocean. However, such projects have now been discontinued, unfortunately. So, the situation is not so good for us, as already you know. But I think we have a couple of good news now. One point is that, even in this situation the international observation project such as Synoptic Arctic Survey (SAS), which is a bottom-up researcher-driven project and several counties support this project.

So, we had observation under SAS project from 2020 to 2022. Because of COVID-19, it is not fully satisfied for us, but we say it is successful. So, we decided to have a second phase of the Synoptic Arctic Survey joint observation hopefully in 2030. So, I would ask Japanese government to support such kind of international observational activity again, and also international research collaboration. That is a bottom-up side story.

And another topic is a top-down side story. As I said during this forum many times, Japanese government decided to build the new research icebreaker in 2020, and would be available in 2026. We will have our first Arctic cruise in 2027. And that is a very good news for Japanese. In addition, when I was in Vienna to join the Arctic Science Summit Week 2023 last week, I knew that many other countries, Germany, Iceland, New Zealand, Republic of Korea, and Sweden are now building or planning to build new research icebreaker or research bases.

Furthermore, UK and Norway have already initiated the new research icebreakers observations in the polar regions. So, that is very good news for us. These bases will be able to expand our observation area and will enable us to promote further international collaboration in the Arctic Ocean through the second Synoptic Arctic Survey project or IPY 2032-2033. So, the data obtained in that way should be made public.

Open science is common sense for us and the details disseminate through international collaboration. So, what I want to say is that we need to continue to do the best we can. Thank you very much.

Prof. Paul Arthur Berkman:
Thank you very much, Kikuchi-san. What I'd like to do… we have about 20 minutes for the panel, so I want to thank first the panelists for being concise and brief in their initial observations. I'd like to open it up to the panel, if you have comments on any of the other panelists' statements. Are there any questions or comments from any of the panelists about any of the things that's been observed? Larry please.

Prof. Larry Hinzman:
I am very pleased to hear there was a strong theme throughout, that so many of our panelists actually acknowledged the difficulty with the absence of observations and the challenge that's presented. That's become even more difficult in the last year, with respect to observations and how important it is for our nations to collaborate, our scientists to collaborate with the data that are available.

And I would like to, to emphasize that each of our nations has their own priorities with respect to observations, but it is essential to consider how our nations could collaborate with respect to supporting an international observing network. And I would welcome any comments on that.

Prof. Paul Arthur Berkman:
Sure. Thank you very much Larry. Volker, please.

Dr. Rachold Volker:
I was just starting to speak about this European funded project, Arctic PASSION, which is a network, for which is half the purpose of buildings this network, let's say from the European perspective, and funded by European money, but there is a strong cooperation with similar efforts in the US, of course, in North America. But, of course, at the same time, this is also affected by what happened in the Ukraine and the Russian invasion of the Ukraine, because also the European Union, of course, has canceled all the Russian participation in these projects. So, at the end it all goes back to setting our observing networks, that is already more than 10 years old, no, it's almost 20 years old. There are many efforts on that, but of course, this has changed now with the gaps that we have also from Russian observing systems.

Prof. Paul Arthur Berkman:
Kirsi, please.

Dr. Kirsi Latola:
I can comment on that a little bit, because I put my thinking cap on. We have post organizational cooperation, organizational cooperation, we are not stopping individual collaborations between the scientists and researchers on the kind of a private means. So, it is still possible that some people do get the data out of Russia because to do that is not complicated or hidden. But of course, it is a different situation than it was before.

Dr. Hiroyuki Enomoto:
As a cooperation, research stations in IPY 2007-08, people implemented many observations. But how they collaborated efficiently is maybe a question. Eight icebreakers went into the Arctic Ocean, but I was taught

they were not well organized for ideal distribution. Maybe the next stage will be good arrangement using the many icebreakers. And we need to have Russian icebreakers for data collection.

GTS, the Global Telecommunication System is working, it's a very nice. The weather forecast constructed on GTS data networks. WMO is keeping that connection all data of GTS and discussing with the operationally submitted data. From "Research" to "Operation" is a step. Arctic research is a challenge, but then becomes more stable if it becomes to an "Operational" work. It will maintain "Monitoring" components. This is one idea. I hope some important database will be operationally maintained and shared.

Prof. Paul Arthur Berkman:
Other observations, comments? Henry, please.

Mr. Henry Burgess:
Thanks, Paul. Thank you. And there's a joke in the UK about the particular kind of insular mindset that can be in the UK, which is a newspaper headline, 'Fog in the channel, Europe cut off'. And I think it's something we need to be aware of, in this context a little bit, just because many of our countries can't work in Russia, that doesn't mean that Russia isn't working in Russia. And it doesn't mean potentially that other Arctic countries and other IASC members or other non-IASC members can't also work in Russia.

And so, I think we need to be careful and I'm conscious of this, that we don't deliberately or accidentally end up in a bifurcated Arctic research world where we have kind of Western countries, European countries, Canada, the US, others kind of working together, and Russia and some other countries working together, because that would, I think, would be a real undermining of where we've come to so far. And I'm conscious of this in my role, as IASC president. And I think this is something we need to be aware of, because just because many of us can't work in Russia, doesn't mean everyone can't. And we need to try as far as possible, kind of maintain that sense of one community, diverse in many ways, but working together, to kind of to one point to keep alive what we can do. So, that when there is a time to rework, collectively, again, with Russia and others, then we can do that. Because, otherwise the risks are great.

Prof. Paul Arthur Berkman:
Thank you very much for those observations, Henry. Volker, please.

Dr. Rachold Volker:
This is a very important point, Henry. And, of course, this is why I also mentioned that keeping this personal contact alive is extremely important. So, we need that, we shouldn't cut that off. Although I think cooperation on the institutional level at the moment is politically impossible. Larry, I fully support what you said, actually. It's the same for us in Germany. One thing that I wanted to bring up is international funding, and that's the thing we have been fighting for and working for since longer than the International Polar Year, because there we didn't get it.

So, we were always trying to get really, truly international funding, but that never really worked. And one thing that came out of the Arctic Science Ministerial process is a group that is called Arctic Science Funders Forum. It is a pretty official forum that Germany together with the European Union, initiated after the 2nd Arctic Science Ministerial in Berlin, and then Iceland, Japan took over. And then of course, was also supposed to be given forward to the organizers of the 1st Arctic Science Ministerial, which would have been France and Russia. And of course, that didn't happen. Also, this Arctic Science Funders Forum is kind

of in limbo, it cannot really continue to work. But of course, we're hoping that with Norway taking over the chairmanship, and possibly we heard that there are some indications that Norway would be doing it, also hosting the 4th Arctic Science Ministerial that they will also help us continuing this Arctic Science Funders Forum.

So, we're not assuming that we will really get international funding, but at least we'll get the funding agencies to get their act together and to join forces to address the priorities that we know from the Arctic Science Ministerial process. So, we know what the priorities are and if the funders are really putting their efforts together to fund those kinds of things, this will help a lot.

Prof. Paul Arthur Berkman:

Thank you very much, Volker. Before turning it over to audience for a few minutes for questions, I think there are about 10 minutes left, I'd like to ask Sunami-san a question. This session was designed along the context of science and technology advice with ministries and you've had extensive collaboration with Gaimu-shō, Ministry of Foreign Affairs in Japan. How would you take these observations that have been shared by leaders of international science organizations in terms of bringing it into the ministries? What would be helpful to the ministries and from the ministries to the science that those collaboration?

Dr. Atsushi Sunami:

I was just thinking that what Volker has mentioned that it is time that diplomacy pays back to science and as a political science scientist, but I worked extensively, setting up a science advisory system for Japanese government, and now this year, actually this time, we have for the first time, science adviser to the Prime Minister. But, of course, my colleague, the Dr. Peter Gluckman from New Zealand, when we worked together on science advice, is very hard for independent science to really influences politics, in many ways. I was thinking when diplomacy really worked for science, and under what conditions that we have seen, that is a very difficult question.

And it's like under the crisis or something that we really realize that competition is not the way to survive. But, the cooperation is the only way for everyone to survive, right? I mean, in that political crisis moment, maybe diplomacy may work for science, but I think, then, looking at this individual network, and things like, when we are designing this Arctic Circle Forum in Japan, or there is a debate about should we formally invite many people from Russia and others, I mean, you know, as a private foundation, you know, we have a little bit of a flexibility as say if this were the government organized forum.

And now I'm looking back, maybe we shouldn't really just talk about, you know, what diplomacy can do. But also, we should be asking what the nonprofits or other stakeholders like funding agencies, from private sector or the scientific community supported by some other means than the government. Can we at least keep the data as sharing or those things that we'll have to have until things get better, I guess, in the condition that Larry mentioned, right?

And I don't know when that's going to happen. So meanwhile, we need to have new innovative ideas of how to keep Arctic science going, other than pressuring government. I think that would, I don't know whether that's going to work at this moment. It's a very big difficult challenge. So, science advice to the ministry is very important. I think we have to keep doing that, to remind the government of some of those importance of working together in the international framework. But we need to really, I guess, through next couple of days here even to think about how we can devise the mechanism. So, when the governments are

not cooperating, but can still make international science cooperation moving forward, maybe WMO or something, but that's another level of organizations. But I think that's a challenge. Thank you.

Prof. Paul Arthur Berkman:
That's a very innovative suggestion. I open up to the panel or the audience. Please, yes. I see two questions.

Female Speaker 1:
I was weighing the risks, but can I speak as a private Russian, perhaps the only one in this room. I came to Japan about five years ago with the hopes of contributing to both Arctic cooperation between Arctic and non-Arctic States and Japan and Russian cooperation in general. So, my question or comment really relates to what Mr. Sunami just said.

I'm a great believer in non-state actors' influence and power in changing the world for the better. Sorry for sounding so over the top. So, I was very angered not only by the actions of the Russian government, but what followed on both sides because the epistemic communities, the experts were actually shut out by the actions of governments on both sides and deprived, including the Russian side of any tools to improve the situation.

And I think that what followed the wave of sanctions and these formal and informal limitations on meetings, cooperation between institutions, as I said, institutional. It actually led to the opposite result that was expected. Deepen confrontation, as I said, huge gaps in scientific data necessary, vital for getting an overall picture. So, I am extremely saddened, hurt and still expecting that the situation may improve, because I think the people who are involved in these collaborations, they are in general, the most interested in investing most in international peace, cooperation, and they will be the people who will finally contribute to halting the hostilities and to bringing the world back to normal.

So, maybe it's not a question, but I want to join Mr. Sunami and yesterday, I heard that one of Sasakawa Peace Foundation researchers is going to travel to St. Petersburg to attend an Arctic related conference. And I was very happy to hear it. I will personally do everything to help her. And not because I want to promote the Russian government's actions. I'm totally against what's going on. But there is no other way than dialogue. And you cannot promote dialogue and peace talks by shutting out everyone, especially the scientists, out of the process. Sorry for being so emotional, but what you said really inspired me and I fervently believe that it will happen. And that will pave the way for peace talks and returning to normal international cooperation.

Prof. Paul Arthur Berkman:
Your observations about dialogue are spot on. I just think they resonate well. Lassi, please.

Prof. Lassi Heininen:
Thank you, the panelists. I'm Lassi Heininen, the editor of the Arctic yearbook and the Arctic yearbook is exactly doing that what someone mentioned; we have all the channels open to Russia. And the theme was the Russian article theme of the last year's *Arctic Year Book*. But my question is that, I mean, I think that this situation will test what means academic freedom or how independent is the scientific community is.

So, my question is, you mentioned, open science, science diplomacy, diplomacy should pay back to science, which I totally agree. But what would be your advice to your ministries, to your ministers about this? How independent can the scientific community be? If you really disagree with this, if you really think that the climate crisis, the environmental catastrophe, is really hitting us if we don't cooperate, so what would you say when they say that no, we can't do that, when you say that, well, the scientific facts is that we should do this? Thank you.

Prof. Paul Arthur Berkman:

Thank you very much, Lassi. So, questions, observations, or any comments from the panel, please. I would respond to Lassi's observation. We have a challenge as a world with continuity from the present short-to long-term, and in a sense, the science community isn't geopolitically motivated; it orients itself with methods, natural sciences, social sciences, Indigenous knowledge. And the challenge is continuity. So how do we, as a civilization, operate short- to long-term considering the geopolitics of the world? So, other observations? Volker, please.

Dr. Rachold Volker:

Maybe I can tell you how this worked in Germany, right after the Russian invasion of the Ukraine. Just a day later, our Ministry of Science and Education sent a letter for all the cooperation to be frozen, and there was even a letter sent to everyone that all the communication is frozen, so that we weren't even allowed to send emails to our colleagues. I started my scientific career in Russia. I worked in Siberia in the early '90s already and I did 10 expeditions to Siberia.

And of course, we had a very good, friendly relationship. And this was really difficult. And it took not too long actually also for the ministry realizing that this was a mistake to completely shutting down the communication channels. So still, I would support that still, I understand that institutional cooperation is impossible at the moment. Business as usual, is in my view, impossible. But that does not mean that any communication, personal communication with individuals should be encouraged actually, so and there's a difference so that would be my view on that actually.

Prof. Paul Arthur Berkman:

Thank you very much. Other observations, comments? Larry, please.

Prof. Larry Hinzman:

Lassi made a really good point about what to do when your personal values and views don't align with the way our federal policies are taking us? I think it's really interesting actually looking just at the focus on the question of climate change, in that for the last, well, since the '60s and '70s, the research community has been raising the alarm about climate change.

There is an ongoing process and something we need to do about it. There's not been the response that we'd hoped we would see within our governments, however, it's meetings like this, where we do have the research community, the scientific community and the policymakers where progress can be advanced. And the message has been consistent over the last 40 years. And now we're hearing that concern actually resonate with the policymakers, the decision makers, the official government agencies, and so I think, this, this forum, these discussions are being effective and are making a difference, it's just a really slow, slow recognition of the problem and slow adoption of mitigation actions.

Prof. Paul Arthur Berkman:
I note the time and with respect, please, Enomoto-san.

Dr. Hiroyuki Enomoto:
In addition, the previous panels of this forum reported the closing tendency of every channel is happening with Russia. Even in the Cold War time, some channel was kept opened, by a so-called "Peace through coexistence" is at those times. But now, many countries close channels. It is very bad condition compared with the Cold War time. After last March, the EU published a guideline of behavior against the Ukraine and Russia, Belarus concerns. It stated many controls. But, finally in the last guidelines, the guidelines indicated exceptional. This part pointed out which we should continue the engagement. They are climatic change, and health and a civil connection and the nuclear save. It's good to see some hopes in the last line. That is the document in March last year. I'm not sure still that statement alive or not. But that is a one hope.

Prof. Paul Arthur Berkman:
Thank you very much Enomoto-san. And in the absence of any other final comments. I'd like to thank the panelists for their thoughtful observations and for seeking to continue a dialogue with science and technology advice with ministries is a two-way street in terms of seeking powers of peace and cooperation on a planetary scale. I thank the audience for your attention and for your thoughtful questions as well and I wish you a successful rest of this conference. Thank you very much.

CONCLUSIONS

Implementation of the 2017 *Agreement on Enhancing International Arctic Scientific Cooperation* involves partnership between governments and the scientific community in a transdisciplinary context with natural sciences, social sciences and Indigenous knowledge contributing to informed decisionmaking short-to-long term (Figures 2-3). A primary challenge is governments often operate short-term only, making uninformed decisions at a security time scale without considering the long-term consequences.

Nonetheless, to achieve progress with sustainable development requires continuity across generations, which the science community can deliver in a transdisciplinary context with inclusion, starting with the foundational questions for knowledge discovery (who, what, when, where, why and how) that apply to any challenge or opportunity. This *Science Diplomacy Action* synthesis represents another point on a timeline (Figure 1) to develop such continuity with Open Science, independent of geopolitics, empowering next-generation science diplomats with hope and inspiration, as anticipated with the Arctic Circle Assembly 2023 session in Reykjavik, Iceland, in October 2023 (APPENDIX 3).

APPENDIX 1

LIST OF CO-AUTHORS
(alphabetical order)

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APPENDIX 2

Arctic Circle Japan Forum (2023) Session

SUNDAY, MARCH 5

ARCTIC SCIENCE AND TECHNOLOGY ADVICE WITH MINISTRIES

Organized by: Science Diplomacy Center™; United Nations Institute for Training and Research (UNITAR); Program on Negotiation at Harvard Law School; MIT-Harvard Public Disputes Program; Fulbright Arctic Chairmanship 2021-2022; Baeseman Consulting and Services, LLC; National Institute of Polar Research (NIPR)

Location: Hall A-2, Toranomon Hills Forum, Fifth Floor

SPEAKERS

- Henry Burgess, Head, UK Arctic Office, British Antarctic Survey; President, International Arctic Science Committee (IASC), United Kingdom
- Hiroyuki Enomoto, Vice Director-General, National Institute for Polar Research, Japan; Co-chair ASM3 Science Advisory Board; Vice-President, International Arctic Science Committee, Japan
- Larry Hinzman, Executive Director, Interagency Arctic Research Policy Committee; Professor, University of Alaska Fairbanks; Former President, International Arctic Science Committee (IASC), USA
- Kirsi Latola, Vice-President Networks, University of the Arctic (UArctic), former Chair, European Polar Board, Finland
- Volker Rachold, Head, German Arctic Office, Alfred Wegener Institute, Germany; ASM2 Representative
- Atsushi Sunami, President of The Sasakawa Peace Foundation
- Takashi Kikuchi, Director, Institute of Arctic Climate and Environment Research, JAMSTEC: *New Arctic Research Vessel*

Moderator: Paul Arthur Berkman, President, Science Diplomacy Center™; Senior Fellow, United Nations Institute for Training and Research (UNITAR); Faculty Associate, Program on Negotiation at Harvard Law School

APPENDIX 3

ARCTIC CIRCLE ASSEMBLY (2023) SESSION

Session name:

ARCTIC SCIENCE DIPLOMACY: THE NEXT GENERATION

Schedule: 20 October 2023 (16:10-17:05 Reykjavik), Silfurberg Hall, Harpa Center 2nd Floor

Organizing bodies:

- Science Diplomacy Center™
- Alfred Wegener Institute
- University of the Arctic (UArctic) Thematic Network on Science Diplomacy
- United Nations Institute for Training and Research (UNITAR)
- Program on Negotiation at Harvard Law School

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Head, German Arctic Office, Alfred Wegener Institute
Germany

Room setup: auditorium seating

Promotional description of the Session (this text will be used to promote your session on Social Media and in the Assembly App)

The session will be a panel-audience dialogue to inspire next-generation science diplomats, helping to produce governance mechanisms and built infrastructure as well as their coupling for sustainable development short-to-long term with informed decisionmaking.

Description of the Session for the review process:

Science inclusively as the 'study of change' (natural sciences, social sciences and Indigenous knowledge) is essential in the Arctic to understand as well as address climate and other local-to-global challenges. Continuity and inclusion (who, what, where, when, why and how) with science are required to reveal patterns, trends and processes that become the bases of decisions by institutions and governments. However, current geopolitical realities prevent Open Science across Arctic nations, inhibiting Pan-Arctic research and translation into informed decisions, operating across a 'continuum of urgencies'. Questions posed as well as addressed with panelists and the audience will be the emphasis of the session dialogue, for example:

- How can Arctic science diplomats facilitate dialogues between different stakeholders inclusively under current circumstances to build common interests?
- How can next-generation Arctic science diplomats address enhance international Arctic scientific cooperation with continuity and inclusion?
- How can next-generation leaders apply the 5th International Polar Year (IPY) in 2032- 2033 to facilitate dialogues in the same manner as the 3rd IPY (International Geophysical Year) in 1957-1958, building common interests among allies and adversaries alike across a 'continuum of urgencies'?

Ultimately, the goal of this session is to inspire next-generation leaders with lifelong learning to build common interests among allies and adversaries alike, solving local-global challenges of the 21st century short-to-long term.

Presenters:

- **PROF. PAUL ARTHUR BERKMAN** (CONFIRMED),
  - Presentation title: *Arctic Science Diplomacy: Introductory Observations*
    - *Enhancing International Scientific Cooperation: Arctic Science and Technology Advice with Ministries*, *Science Diplomacy Action*
- **DR. VOLKER RACHOLD** (CONFIRMED)
  - Presentation title: *Arctic Science Diplomacy and International Cooperation*
    - *Success Stories of International Cooperation in the Arctic*, *Arctic Circle*
- **DR. CORINE WOOD-DONNELY** (c.wood-donnelly@nord.no – CONFIRMED)
  Associate Professor of International Relations and the High North
  Nord Universitet and Uppsala University
  Co-Lead UArctic Thematic Network on Science Diplomacy Scientific Coordinator for USTNORTH Norway and Sweden
  - Presentation title: *Arctic Science Diplomacy and Governance Impacts*
    - *Science diplomacy in the Arctic: Contributions of the USGS to policy discourse and impact on governance*, *Polar Record*

- **Dr. Alexandra Middleton** (alexandra.middleton@oulu.fi – CONFIRMED) Assistant Professor, Oulu Business School, University of Oulu Collaborator, EU Science Diplomacy Alliance, Finland
  - Presentation title: *Arctic Science Diplomacy and Current Diplomatic Dialogues*
    - *Urgency of climate change unites scientists in the Arctic*, *Arctic Portal*

- **Dr. Susana Hancock (**susana@arcticbasecamp.org – CONFIRMED)
  President 2022-2023, Association of Polar Early Career Scientists (APECS) and Science Manager, Arctic Basecamp
  - Presentation title: *Arctic Science Diplomacy in the Rapidly Changing World*
    - *Arctic Science Diplomacy in the Rapidly Changing World* (coordinated by APECS and published as a volume in the *Polar Record*)

- **Mr. Joshua van de Goor** (joshua.vandegoor@outlook.com – CONFIRMED)
  Intern, German Arctic Office, Alfred Wegener Institute, Germany
  - Presentation title: Science Diplomacy in the Polar Regions
    - *Science Diplomacy in the Polar Regions*, German Arctic Office

SCIENCE DIPLOMACY: THE NEXT GENERATION video is on the Science Diplomacy Center™ YouTube Channel

ABOUT THE SERIAL

This incidental serial will share rigorous syntheses of meetings that relate to science diplomacy. The spirit of this serial is to be holistic (international, interdisciplinary and inclusive) in a manner that will be helpful to the future of our globally-interconnected civilization.

This serial is intended to integrate stakeholder perspectives, holistic evidence and governance records in a manner that reveals options (without advocacy), which can be used or ignored, with the goal of contributing to informed decisionmaking in our world.

Informed decisions are at the summit, overlying options and evidence. The evidence itself is distilled from data, with observations and information integrated from questions at the earliest stage possible for stakeholder engagement, which is the reason for the meetings in the first instance.

The decisions relate to the combination of fixed, mobile, and other built assets (including communications, research, observing and information systems) that require capitalization and technology PLUS regulatory, policy, legal, official-statement and other governance mechanisms (including insurance). Behind the decisions is the science, as the study of change, including natural and social sciences as well as Indigenous knowledge. Change itself reveals patterns and trends over time and space – to anticipate as well as respond to issues, impacts and resources – over generations within, across and beyond the boundaries of nations.

Science Diplomacy Action addresses an immediate and long-term need to publish rigorous syntheses and summaries of meetings associated with science and technology advice in government at all levels, especially among the foreign ministries of nations. This need is reflected by the rapidly growing number of meetings that focus on science diplomacy as a holistic process of evidence integration to balance national interests and common interests for the benefit of all on Earth. The value of these science-diplomacy meetings (or any meetings) is largely limited to those that attend. *Science Diplomacy Action* recognizes this unrealized opportunity to extend value beyond the meetings by soliciting and publishing rigorous meeting syntheses.

SCIENCE DIPLOMACY CENTER™

Nation states have sovereignty, sovereign rights and jurisdictions across nearly thirty percent of the Earth. In contrast, international spaces established from World War II beyond sovereign jurisdictions exist across nearly seventy percent on the Earth as well as in outer space. On a global scale, across one hundred percent of our home planet, the challenge is to balance national interests and common interests. Recognizing this forever challenge, the Science Diplomacy Center was launched in February 2017, initially at The Fletcher School of Law and Diplomacy at Tufts University with funding from the National Science Foundation (NSF). The NSF funding and Science Diplomacy Center were transferred to EvREsearch LTD in 2020, extending into the Science Diplomacy Center™ as a nonprofit in the United States in 2022.

With its three triangulated areas of focus – Education, Research and Leadership – the Science Diplomacy Center™ aims to:

- Educate the next generation of science diplomats;
- Facilitate research to transform data into evidence and options that contribute to informed decisions, operating across a 'continuum of urgencies'; and
- Provide leadership with science-diplomacy networks to build common interests among allies and adversaries alike across our globally-interconnected civilization.

The decision-support process applied by the Science Diplomacy Center™ involves holistic (international, interdisciplinary and inclusive) integration from the natural and social sciences as well as Indigenous knowledge regarding impacts, issues and resources within, across and beyond sovereign jurisdictions. This holistic integration further involves stakeholder perspectives inclusively as well as governance mechanisms that represent the operation of government institutions. Importantly, this decision-support process is designed to reveal options (without advocacy), which can be used or ignored explicitly, contributing to informed decisionmaking across the jurisdictional spectrum with its subnational-national-international levels.

To help with informed decisions, involving the combination of built elements and governance mechanisms for sustainable infrastructure development, the Science Diplomacy Center™ operates across the 'continuum of urgencies' that exists for peoples, nations and our world from security time scales (responding to the risks of political, economic and cultural instabilities that are immediate) to sustainability time scales (balancing economic prosperity, environmental protection and societal well-being across generations).

SUBMITTING MEETING SYNTHESES:

As an incidental serial for rigorous meeting syntheses, the intention is to grow this serial in a manner that is both practical and helpful. The standard for the publication in *Science Diplomacy Action* is represented by Synthesis No. 1 (September 1, 2017), which emerged from the *1st International Dialogue on Science and Technology Advice in Foreign Ministries* in October 2016. Please see the Science Diplomacy Center website for Instructions for Authors (https://scidiplo.org/science-diplomacy-research/science-diplomacy-action/instructions-for-authors/).

In an holistic manner – *Science Diplomacy Action* seeks syntheses to share questions, observations, information, data, evidence and options that contribute to informed decisionmaking about issues, impacts and resources across jurisdictions in our globally-interconnected civilization. *Science Diplomacy Action* will operate as a rigorous publication with peer review, considering the overall quality, relevance and integrity of each submission. Each accepted synthesis will be an authoritative outcome of the relevant meeting with an author point-of-contact and other meeting participants listed as coauthors with their approval. This synthesis represents a series of meetings.

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