出國報告（出國類別：開會）

2024 ASPAC Annual Conference

服務機關：國立自然科學博物館
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Summary

Themed around empathy, the Gwacheon National Science Museum in Gwacheon, Korea hosted the 2024 iteration of the annual conference of the Asia Pacific Network of Science and Technology Centers (hereafter ASPAC). ASPAC's biennial gathering brings together museum, science center, and science communication professionals from around the region to discuss regional and global issues that impact this community's education, research, and engagement goals. The National Museum of Natural Science aims to demonstrate leadership in science outreach practice in Asia; Drs. Audrey Chang and Pin-Wei Wang attended and presented at the 2024 conference.

2024 年,位於韓國果川市的國立科學博物館以"同理心"為主題,舉辦了一年一度的亞太科學技術中心網絡會議(簡稱 ASPAC)。ASPAC 的兩年一度聚會匯集了來自亞太地區的博物館、科學中心和科學傳播專業人士,共同討論影響教育、研究和參與目標的區域性與全球性議題。國立自然科學博物館致力於在亞洲展現科學推廣實踐的領導地位, 張秀慧博士和王斌威博士參加了 2024 年的會議並發表演講。

國立科學博物館選擇"同理心"作為本次會議的主題,凸顯了博物館在培養公眾理解和關懷他人方面的重要作用。透過分享知識和經驗,與會者探討如何利用科學教育和傳播,促進社會的包容與和諧。

ASPAC 為亞太地區的科學教育工作者提供了一個寶貴的交流平台。與會者分享了各自在科學推廣方面的創新做法和成功經驗,共同探討如何應對科學傳播中的挑戰與機遇。國立自然科學博物館的代表張秀慧博士和王斌威博士也在會上分享了他們在台灣推動科學教育的心得。

這次會議不僅加強了亞太地區科學教育界的聯繫,也為未來的合作奠定了基礎。與會者一致認為,博物館和科學中心在提高公眾科學素養、激發創新思維方面扮演著至關重要的角色。透過攜手努力,亞太地區的科學教育工作者將為構建一個更加科學、包容的社會貢獻力量。

Key Words: science communication, museum, informal science education, public engagement

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I. Aims

Between September 3 and 6, 2024, Dr. Audrey Chang and Dr. Pin-Wei Wang, representing the National Museum of Natural Science (hereafter NMNS) in Taichung, Taiwan traveled to the 2024 ASPAC Conference in Gwacheon, Korea with the following aims:

- To present sessions on artificial intelligence, new collaboration models for exhibitions, and art-science engagement.
- To build a stronger international collaboration network in the Asia-Pacific region with peer institutions (i.e., science centers and museums).
- Meet with representatives of Europe-based design-build companies that have extensive experience with museums and science centers in Asia.

II. Background

The Asia Pacific Network of Science & Technology Centers (ASPAC) is an international organization that connects science centers, museums, and institutions across the Asia-Pacific region. ASPAC and its members aim to improve science communication, promote scientific literacy, and encourage public engagement in science and technology. ASPAC seeks to foster a network where members can collaborate, share knowledge, and drive innovation in science education. Its members include a variety of science centers, museums, and educational institutions from different countries in the Asia-Pacific region, including here in Taiwan.

ASPAC provides resources, organizes conferences, and hosts training sessions to strengthen science communication skills. Its 50+ members from 20 countries share best practices, develop collaborative exhibitions, and run science outreach programs to broaden public interest in science and technology. The biennial conference, such as that held in September 2024, is an example of one of its signature events. NMNS was also in attendance at the 2022 conference in Bursa, Turkey.

The 2024 conference focused on the theme of empathy: ASPAC emphasizes empathy in its approach to science engagement. By fostering collaborative connections across diverse cultures and backgrounds, ASPAC aims to make science more accessible and relatable to people from all walks of life. Their mission centers on empathy as a tool to transform science engagement, encouraging members to view science through the eyes of their audiences and inspire deeper connections. ASPAC also supports its members in adopting empathetic practices—such as

inclusive exhibit design and meaningful community interactions—to create impactful learning experiences that resonate with people's lives.

III. Process
Dr. Wang 9/1-9/9 Dr. Chang 9/3-9/6

Date(s)	Location	Activities
9-1-2024	Seoul, Korea	Arrival in Korea
9-2-2024	Seoul, Korea	Visit Leeum Museum of Art
9-3-2024	Gwacheon, Korea	ASPAC Workshop
9-4-2024	Gwacheon, Korea	Conference Day 1, Gwacheon National Science Museum Audrey Chang presentation: *AI Use in Science Centres and Museums: Futures and Outcomes* Pin-Wei Wang moderation: AI and Humanity Pin-Wei Wang presentation: *Artistic Interpretations of Black Holes and Gravitational Waves: A Fusion of Science and Creativity*
9-5-2024	Gwacheon, Korea	Conference Day 2, Gwacheon National Science Museum Audrey Chang presentation: *A New Collaborative and Sustainable Model for International Traveling Exhibitions*
9-6-2024	Gwacheon, Korea	Conference Day 3, Gwacheon National Science Museum *Mind Matters* collaboration lunch meeting Meeting with exhibition design-build firm
9-6-2024	Seoul, Korea	Excursion for all ASPAC member
9-7-2024	Seoul, Korea	Visit National Museum of Modern and Contemporary Art
9-8-2024	Seoul, Korea	Personal Leave
9-9-2024	Seoul, Korea	Departure for Taipei Taiwan

The Gwacheon National Science Museum hosted the 2024 ASPAC conference.

IV. Outcomes

The 2024 conference topics were focused on scientific disciplines, programmatic showcases, and practice/ methodologies.

Scientific disciplines

- Climate Crisis and Biodiversity, and Earth
- Artificial Intelligence (AI) and Humanity
- Space Exploration and Aviation
- Life Science (Biotechnology)

Programmatic showcases

- Science Programs for Generations
- Science Programs for Persons with Special Abilities
- Science Programs for Culturally Diverse Communities
- Metaverse-based Programs
- Sci-Art Programs

Practice/ methodologies

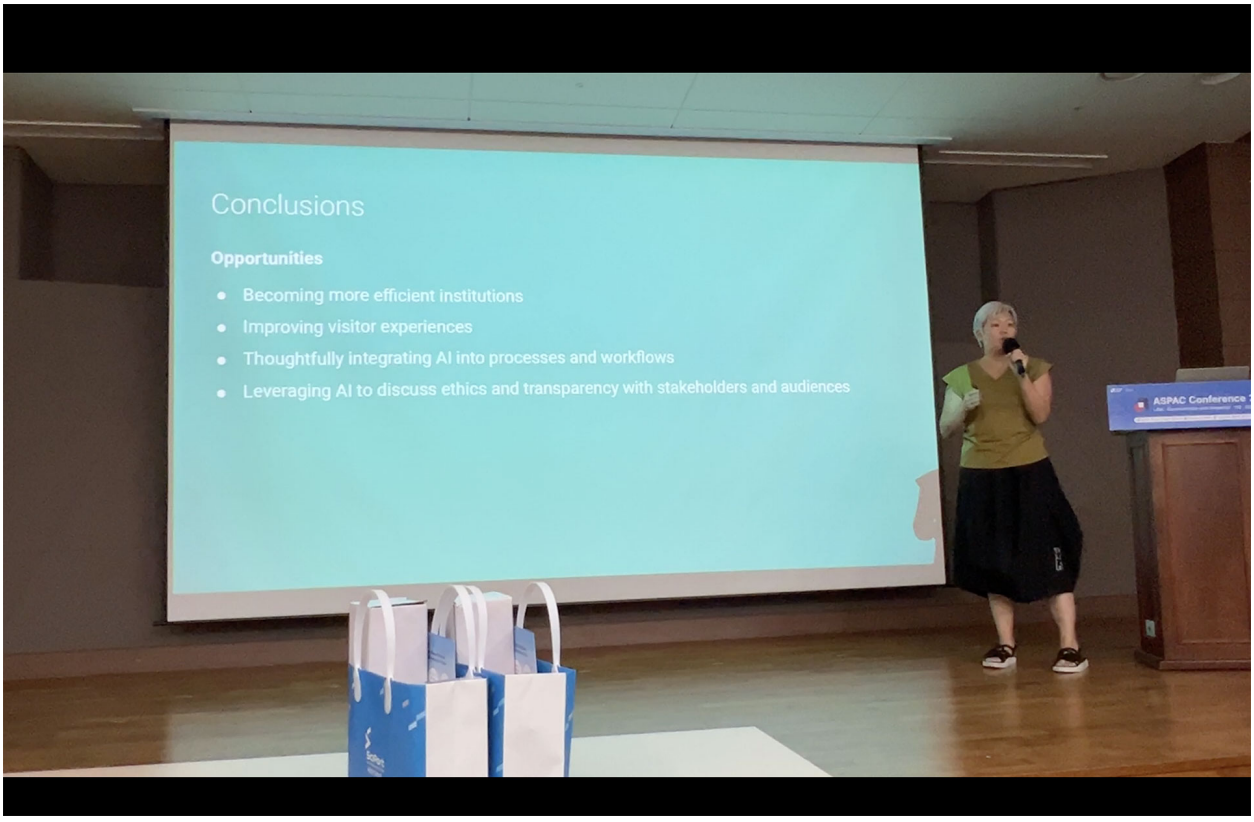
- Reinventing the Future: Future-Oriented Museums
- Traveling Exhibitions
- Outreach Programs for Disconnected People
- Science Museums/ Centers and Communities

Dr. Chang presented with Brad MacDonald (Parsons School of Design, The New School) on the outcomes of their research from summer of 2024. Debates on AI's merits and pitfalls have permeated museum and science center management over the past decade, focusing on AI's impact on institutional missions, audience engagement, and business operations. Successful AI integration models highlight the essential role of the human operator. Chang and MacDonald asked, How can organizations prepare their current and future talent to harness this powerful technology?

This session offered various opportunities for leveraging AI in science communication, ranging from human resource to design to governance. The presentation discussed

- How much technical knowledge (e.g., on supervised vs. unsupervised machine learning) is necessary?
- How can museum professionals communicate and influence technology preparedness decisions among peers and supervisors?
- What skills will be needed for hiring/promotion in 3, 5, or 10 years?
- What gaps can AI fill, and what processes can it improve or support?

This session on AI and Humanity was moderated by Dr. Wang.



Dr. Audrey Chang presented on AI usage in museum and science centres.

Additionally, Dr. Chang also led a session with Mikko Myllykoski of Heureka, the Finnish Science Centre, on innovation in traveling exhibitions, introducing a potential collaboration model. A 2024 survey of a database shows that more than 110 STEM-based exhibitions are currently available to travel the globe; the number of projects increases significantly if topics such as health and wellness, design and technology, and climate are included in the count. However, very few of these exhibitions are hosted by Asia Pacific (ASPAC)-based science centres and museums. High rental fees, long periods "on the sea," and logistics coordination are frequent and real challenges to representation of ASPAC venues as hosts and producers in this vibrant international community. Chang and Myllykoski presented a collaborative model that prioritizes cost-effectiveness, efficiency and sustainability for exhibition and content exchange, to create a truly global community for science exhibitions. This model enables ASPAC venues to both inbound and outbound exhibitions at costs that align with regional budgets. Importantly, this methodology enhances the inclusion of local languages and content. Chang and Myllykoski demonstrated the case for adopting this model with a case study of an exhibition on mental health, a scientific topic with strong social, societal and cultural implications. The presenters hosted a discussion session during lunch on Day 3 of the conference to further the thinking of this model. In attendance were representatives from Japan, Singapore, Australia, the Philippines, and Thailand.

Dr. Chang and Mikko Myllykoski discuss an innovative collaboration model for the Asia Pacific science museums and science centres.

Dr. Wang presented on the confluence of art and science in the exhibition, *The Gravity Realm*, focused on black holes and gravitational waves. He described where he introduced visual arts and design in both the exhibition and its accompanying programs. The inclusion of art was designed to garner interest and further understanding of what are challenging and abstract concepts in the physical sciences. Two outstanding sub-projects were described, both of which demonstrated creativity and entrepreneurship: first, through this exhibition, NMNS was able to put on display a large-scale sculpture by Taiwanese artist Kang Muxiang; *Serenity* alludes to the merging of two black holes. As part of this exhibition, Dr. Wang also partnered with a Taichung-based bakery to produce "black hole donuts" as a marketing and promotion tool.

Dr. Pin-Wei Wang describes the collaboration with artist Kang Wuxiang.

V. Recommendations

A. Foster strong regional collaborations in exhibition exchange

As a result of the collaboration model introduced at ASPAC, NMNS is well positioned to work with the National Science Museum in Bangkok, Thailand; Science Centre Singapore; and Scitech in Perth, Australia on a world-class exhibition project, with the support of Heureka, the Finnish Science Centre. These institutions are all capable of developing and fabricating exhibitions but recognize the advantages and efficiencies in working together to inbound projects that have strong recognition and validation in the West. Rather than "re-inventing the wheel,"

such collaborations enable new content to be introduced to Asian audiences, as well as promote professional development for all project participants.

B. Creating a World-Class Science Centre

The planned renovation of the NMNS science center presents a unique chance to redefine science education in Taiwan. With new trends in narrative-driven presentation, visitor experience planning, and innovative fundraising initiatives, NMNS aims to collaborate with international design-build companies on a capital project that will better serve its 2 million-plus annual visitors. This project can thoughtfully balance exhibition spaces with interactive learning areas, technology-enhanced versus scenographic displays, and hands-on versus observational learning. The science centre renovation plan ideally would sit in dialogue with the renovations to the Museum's Life Sciences Hall, as part of a campus-wide visitor experience master planning and innovation project.

C. AI and Museums

NMNS may consider setting up an AI taskforce at NMNS that focuses beyond the technology's applications but additionally enhances understanding in AI ethics, governance and policy, and workflow solutions deployment. Additionally, NMNS could serve as the cultural and education sectors' leader on deployment of AI and other emerging technologies in public engagement. With one of the most diverse audiences in the country and its network of affiliated organizations, NMNS can support development and evaluation of AI-focused initiatives. These projects could potentially benefit museum staff as much as the public that its serves.

D. Inviting and Including Diverse Audiences through Art x Science

While NMNS has previously included art-science in its exhibitions, a deeper focus on transdisciplinary collaboration could benefit the Museum. Art-science initiatives could attract new audiences, especially youth who don't identify as "scientists," and open doors to international partnerships and funding (e.g., transdisciplinary research grants, corporate sponsorships). Artist residencies could enrich science education, adding creative ways to communicate science through theater, drama, and dance, while design and technology programs could upskill NMNS staff and support students' professional growth. This approach could enhance NMNS's reach, resources, and role in science education. As evidenced by the rich and diverse community of speakers at ASPAC, the Asia Pacific region is highly attentive to transdisciplinarity and empathy-driven experiences in museums and science centres.