Soundwaves of Science:
Exploring the Science of Korean Music

3 April 2025 – 27 June 2025
Korean Cultural Centre UK

The Korean Cultural Centre UK(KCCUK) is pleased to present ***Soundwaves of Science: Exploring the Science of Korean Music*****,** from 3 April to 27 June 2025, in collaboration with the **National Science Museum of Korea(NSM Korea)**. For the first time in the UK, a country renowned for its rich scientific heritage, traditional Korean music will be explored through the lens of science in this groundbreaking special exhibition. This unique event aims to foster a cultural and scientific knowledge exchange between the UK and Korea, offering audiences an innovative perspective on Korea's musical heritage.

Marking the 80th anniversary of the National Science Museum of Korea, this exhibition makes its international debut at the Korean Cultural Centre UK. With the global rise of K-pop and an increasing interest in traditional Korean culture, *Soundwaves of Science* invites UK audiences to experience Korean music in an innovative way—through the science of sound.

Soundwaves of Science: Exploring the Science of Korean Music bridges history and innovation, revealing how music, physics, and technology come together to shape Korea's

unique sonic heritage. The exhibition begins with the sacred sounds of ***Jongmyo Jeryeak*****,** the royal ancestral ritual music, where the instruments ***Chuk*** and ***Eo*** mark the ceremony′s opening and closing. These sounds are more than mere signals—they are 'heaven-opening' vibrations that connect the divine and human realms because in Korean tradition, music serves as a powerful force linking heaven, earth, and humanity.

In Part 1, exploring the scientific and mathematical foundations of instrument-making during the Joseon dynasty, this section delves into King Sejong′s standardisation of pitch through the ***Pitch pipes*** and the ***Pyeongyeong*** (stone chimes), the fundamental tone of Korean music. Visitors will discover how early scientific principles and technologies were applied to create an exact musical scale and its connection to the precise weights and measures.

A comparative analysis of Eastern and Western instruments follows, focusing on the unique acoustics of traditional Korean instruments. Through an exploration of materials, resonance, and frequency, Part 2 in the exhibition dissects the physics behind the sounds of the ***Taepyeongso, Daegeum, Gayageum,*** *and* ***Jing***.

In Part 3, this section bridges the tradition and the future of Korean music. Visitors will explore the tradition through ***Jongmyo Jeryeak*** and ***Daechwita,*** ceremonial and military music played in the royal court. A highlight of this section is the two AI ensembles on the themes of *Sujecheon* and *Mitdodri,* through mathematical and AI reinterpretations of the ancient melodies.

Finally, passing through the 15th-century blueprints of musical instruments in *Akhak Gwebeom (1493)*, visitors will meet a ***Gayageum*** and a ***Geomungo*****,** specially made by the National Intangible Cultural Heritage of Making Musical Instruments (*Akgijang*) and here they will experience the transmission of traditional wisdom to the future.

Through this immersive and interactive experience, *Soundwaves of Science* offers a fresh perspective on Korea's rich musical heritage while highlighting its scientific ingenuity.

Seunghye Sun, Director of KCCUK, stated, "We are honoured to present the essence of Korean aesthetics in the UK. Aesthetics is the exploration of beauty, and music and science serve as the starting points of this journey. Just as the Korean phrase *giun saengdong* (energy in motion) suggests, music and science are deeply interconnected through the physics of

sound, brain activity, and creativity. By interpreting Korea's traditional music through science and technology, we aim to contribute to the future of cultural heritage."

Sukmin Kwon, Chairperson of NSM Korea, stated, "We are delighted to present the first overseas exhibition of National Science Museum within the UK, a country renowned for its contributions to both science and the arts. This exhibition, which reinterprets traditional Korean music through science and technology, has been a bold and innovative endeavour for the National Science Museum of Korea. We hope it provides UK audiences with a fresh perspective on traditional Korean music."

For further press information and a selection of press images about the exhibition, please contact Jaemin Cha on jaemin.cha@kccuk.org.uk

Notes to Editors

About the Korean Cultural Centre UK

The Korean Cultural Centre UK (KCCUK) was opened by the Korean Ministry of Culture, Sports and Tourism in January 2008 under the aegis of the Embassy of the Republic of Korea. The role of the KCCUK is to further enhance friendship, amity and understanding between Korea and the UK through cultural and educational activities. From the KCCUK's central London location, near Trafalgar Square, its dedicated cultural team work to further develop cultural projects, introduce new opportunities to expand their Korean events programme in the UK, and encourage cultural exchange.

About the National Science Museum of Korea

The National Science Museum of Korea (NSM Korea), a government institution under the Korean Ministry of Science and ICT, is committed to fostering scientific creativity and preserving the heritage of science and technology. Located in the Daedeok Science Complex in Daejeon, NSM Korea offers interactive exhibits, hands-on experiences, and educational programs that cater to visitors of all ages. In celebration of its 80th anniversary in 2025, the Museum will present *Soundwaves of Science* to audiences in the UK, a special exhibition that highlights Korea's science and art.

https://www.science.go.kr/eps

Exhibition Details

Title:	Soundwaves of Science: Exploring the Science of Korean Music
Dates:	03 April 2025 – 27 June 2025
Address:	Korean Cultural Centre UK, Grand Buildings, 1–3 Strand, London WC2N 5BW (Entrance on Northumberland Avenue)
Telephone:	+44 (0)20 7004 2600
Website:	https://kccuk.org.uk/en/
Opening Hours:	Monday – Friday, 10am – 5.30pm, Free Admission
Facebook:	@KCCUK
Instagram:	@KCCUK @kccuk_exhibition
X:	@KCCUK

Opening Event

Opening Reception: 03 April 2025, 6-8pm, RSVP essential

Selected Works

	**Eo:** The *Eo* is a traditional Korean percussion instrument shaped like a crouching white tiger. It has 27 serrated ridges on its back, which are struck with a bamboo mallet split into nine sections to produce sound. The playing technique involves striking the tiger's head three times, followed by scraping the ridges three times, repeating this pattern. It was introduced to Korea from the Song Dynasty in the 11th year of King Yejong of Goryeo (1116). The *Eo* is always paired with the *Chuk*, another percussion instrument. While the *Chuk* is used to signal the beginning of a musical performance, the *Eo* is played only at the end, marking the conclusion of the music.
	**The Yulgwan:** The *Yulgwan* (Pitch Pipe) is a traditional Korean instrument used to produce twelve musical pitches in Korean court music. It serves as a reference tool for tuning other instruments. During the reign of King Sejong, court musician Bak Yeon crafted precise pitch pipes, allowing for the standardisation of musical tuning and the development of various instruments. According to the *Hwangjong Yulgwan* by Confucius, which produces the fundamental pitch *Hwangjong*, is made to match the length of 90 millet grains laid end to end. The *Hwangjong Yulgwan* was not only used for musical tuning but also played a crucial role in establishing the *Hwangjongcheok*, a standard length, volume, and weight measurement system in Korea. Using the *Sambeun Sonyikbeop* (Three-Part Gain and Loss Method), the length of the *Hwangjong Yulgwan* was systematically increased or decreased by one-third to create twelve pitch pipes, forming the foundation of traditional Korean musical scales.

	**Pyeongyeong**: The *Pyeongyeong* is a pitched percussion instrument made of stone, consisting of sixteen L-shaped stone slabs suspended in two tiers on a wooden frame. It was introduced to Korea from the Song Dynasty in the 11th year of King Yejong of Goryeo (1116) and has since been used in royal court ritual music. Because its pitch remains unchanging, the Pyeongyeong serves as a reference instrument for tuning other musical instruments. The sixteen stones, or *Gyeongdol*, are arranged in order of pitch, with eight stones on the upper tier and eight on the lower tier, suspended by cords. The instrument is played by striking the longer edge of each stone with a horn mallet *(Gaktoe).* The thickness of the stone determines the pitch—thicker stones produce higher sounds, while thinner ones produce lower sounds. If a stone's pitch is too high, it is ground down to make it thinner. Conversely, if the pitch is too low, the bottom of the longer edge is trimmed to shorten it and raise the pitch.
	**AI-Generated Ensemble Composition Inspired by *Sujecheon* Ⅱ-1**: This exhibition features an AI-composed wind ensemble piece based on *Sujecheon*, a traditional Korean court music piece passed down since the Goryeo Dynasty. The composition was generated by training artificial intelligence (AI) on the unique musical structure of *Sujecheon*, visualised through topological relationships among four traditional Korean instruments - Daegeum (large bamboo flute), Piri (double-reed bamboo pipe), Haegeum (two-stringed fiddle), Ajaeng (large bowed zither) By analysing the mathematical and structural connections between these instruments, the AI learned and applied algorithmic composition techniques to create an original wind ensemble piece.