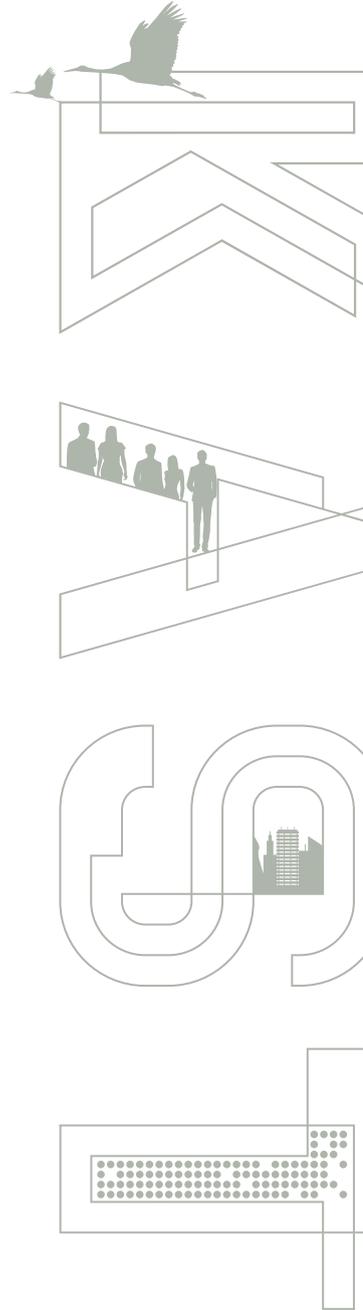


2024

ANNUAL REPORT

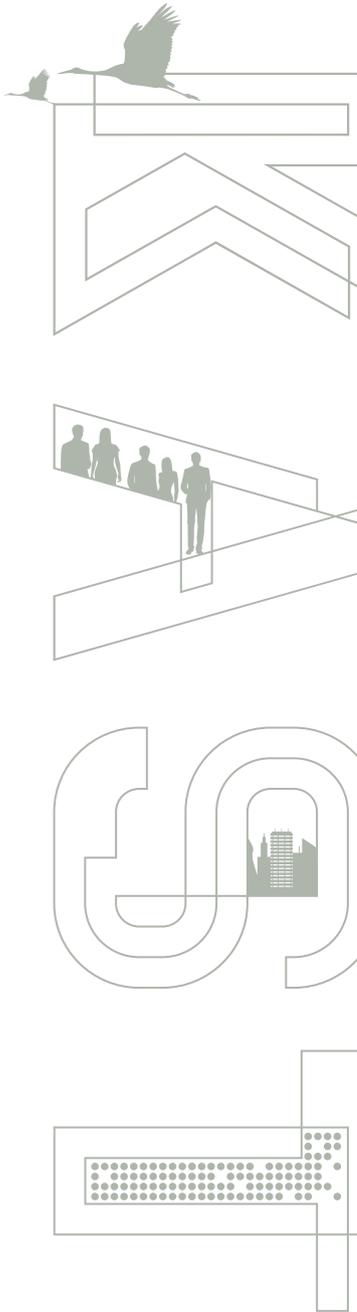
The Korean Academy of Science and Technology



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ANNUAL REPORT

The Korean Academy of Science and Technology



THE KOREAN ACADEMY OF SCIENCE AND TECHNOLOGY (KAST)

is an independent, non-governmental organization,
consisting of distinguished scholars dedicated to promoting excellence in science.

KAST functions as a pillar of non-governmental diplomacy in science & technology
through collaboration with Academies around the world.

KAST offers impartial and reliable advice on pressing issues
of the society based on the expertise of its members.



INFORMATION



한림원

Symbol Mark

During the Joseon Dynasty, officials in literature and martial arts wore embroidered badges on the chest and back of their official robe to indicate their status and class. These badges symbolized their social rank and status, which were largely influenced by the features of animals or legendary creatures: dragons, phoenixes, giraffe, peacock, crane, wild goose, tiger, turtle, and deer. Since the 18th century, literary officials wore badges embroidered with cranes, which symbolized the intellectual spirit of scholars.

KAST's symbol mark adopted the same image of the crane as a symbol of scholars devoted to studies based on the tradition of our ancestors.

This is used to express the traditional and modern significance of the status and role that KAST members hold as scholars.

Meaning of Han-lim-won

"Han-lim-won" is the Korean word for "academy." At the time when KAST was established, the word "academy" meant a "private educational institute" in Korea.

The committee behind the establishment of KAST looked for an institution that played a role similar to academies in Korean history, and came upon "Han-lim-won," which was a royal academic research institute during the Goryeo Dynasty.

It was later succeeded by Jiphyeonjeon, or the Hall of Worthies. The word "Hanlim" refers to "a place where many scholars gather". Today, "Han-lim-won" is generally used in Korea to mean "academy."

• Location

42 Dolma-ro, Bundang-gu, Seongnam-si,
Gyeonggi-do 13630, Republic of Korea

• Website www.kast.or.kr

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KAST

A Message from the President



The Korean Academy of Science and Technology (KAST), established on November 22nd, 1994, celebrated its 30th anniversary last year.

Over the last three decades, KAST has remained committed to advancing society, staying at the forefront of scientific and technological innovation in response to the needs of the times. It has conducted extensive research on scientific and technological policies, advisory projects, international exchange and cooperation, including the human resources development.



In 2024, KAST focused on further expanding and scaling its influence, building on what we have accomplished over the last thirty years.

In its policy research and advisory activities, KAST has served as a platform for exchanging ideas on national and social issues in Korea, such as strategies to overcome the disruptions in the semiconductor industry. Additionally, KAST has acted as an intermediary, enabling science and technology experts to share their insights on pressing issues. One notable example is the 'Strategic Technology Series,' a series of debates that focusing on strategies to enhance global competitiveness and foster future growth. Building on this, KAST has published "The Science and Technology Strategy for the Next 30 Years of Korea," a comprehensive work by twenty-eight leading experts that addresses emerging societal challenges such as artificial intelligence (AI), the super-aging society, and the post-pandemic era. This work aims to present a long-term vision for science and technology policy. In collaboration with the government, legislature, and research communities, KAST will continue to develop policies that will ultimately lead to the effective implementation of strategies.

KAST actively strengthened international exchange and cooperation by collaborating with other prominent global scientific organizations and academies to promote science diplomacy. We organized joint symposia with science academies from the United States, Malaysia, and other nations. Nine Asian countries participated in the Science Academies of Asia Forum. During the Forum, we issued a joint statement that urges governments across Asia to increase investment in scientific research, education, and international collaboration.

Developing young leaders of tomorrow in science and technology, we have launched the 'Meeting with KAST Scholars' program, where our experts visit schools to provide lectures on the latest advancements in science and technology. This program aims to help students to gain a better understanding of a scientist's life. We also introduced the Mentoring Program for promising students, offering a five-month, one-on-one mentoring program for those pursuing careers in science and technology. As we go on, KAST will closely collaborate with educational institutions to inspire and support the next generation in pursuing their interest in science and technology.

KAST is deeply committed to embracing new challenges as opportunities for growth and the advancement of humanity. We hope this report will contribute to shaping policies in science and technology. As KAST embarks on a new journey, we will continue to explore innovative ways to improve the quality of human life through scientific research and development. We invite you to join us on this journey.

Thank you.

February 2025

Acting President **Youngjo LEE** and
Members of the 10th Executive Committee

STATUS

THE KOREAN ACADEMY OF
SCIENCE AND TECHNOLOGY

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Summary

•• General Status

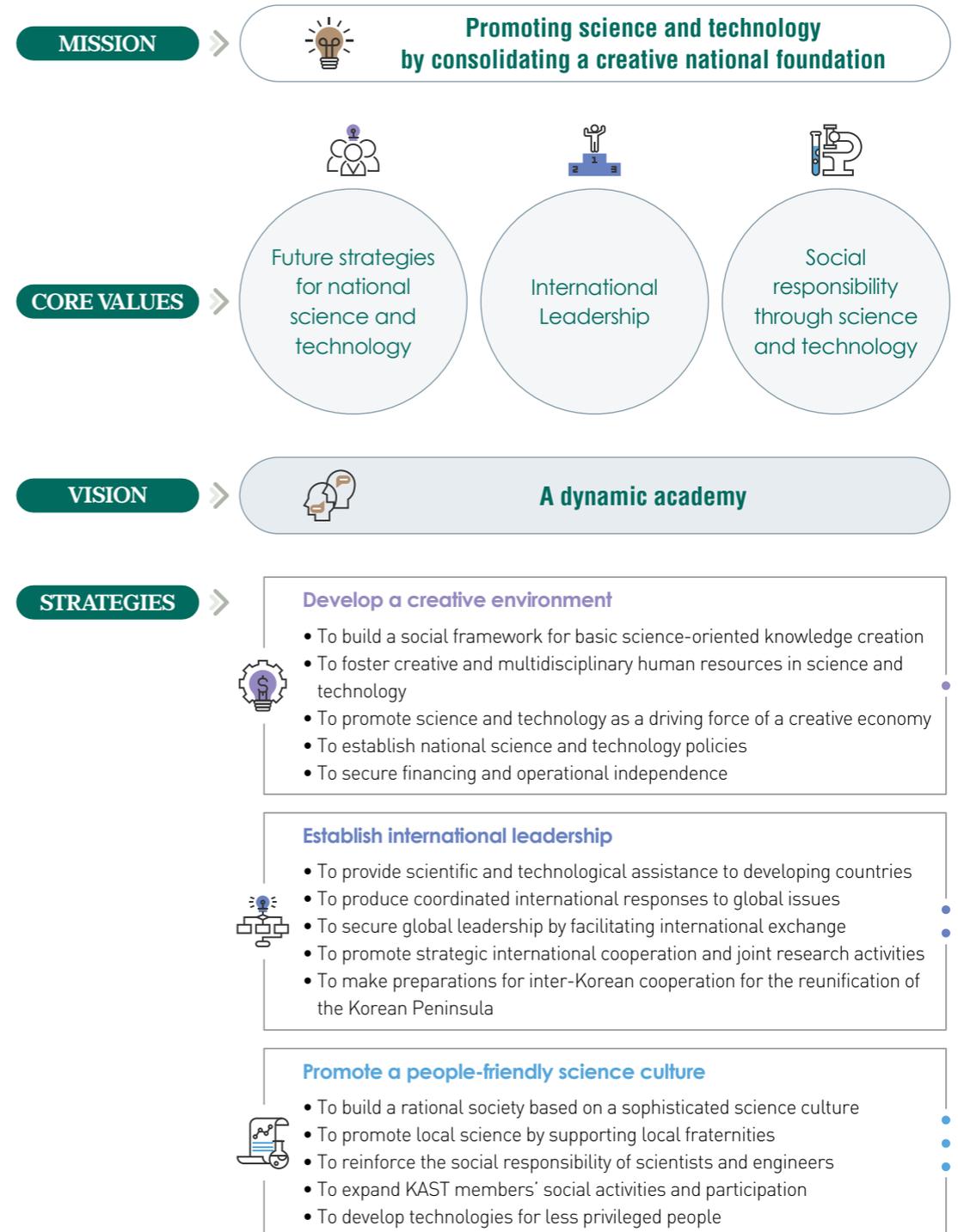
• Date of Establishment

- November 22, 1994

• Objectives

- KAST contributes to advancing scientific progress in Korea through the exceptional expertise of its members, who are elected by their peers in recognition of their distinguished achievements.
- As the nation's leading science institution, KAST plays an integral role in strengthening the foundation of science and technology while preparing to meet the challenges at both national and global levels. An independent, autonomous, and nonprofit academic organization, KAST provides professional, objective analysis and scientific advice to guide policymakers in making informed decisions.
- KAST actively fosters international academic collaborations, engages with global counterparts to uphold the highest standards of excellence, and fulfills its role in nongovernmental scientific diplomacy to advance science and technology in Korea.

•• Vision and Strategy



Historical Highlights

- 1994 • Established as the Korean Academy of Science and Technology
- The 1st President Wan Kyoo CHO inaugurated



- 1995 • KAST policy study report published
- International symposium celebrating the establishment of KAST held

- 1996 • KAST Roundtable Discussion, KAST Distinguished Scholars Lecture, KAST Symposium launched

- 1997 • KAST Colloquium launched
- Young Scientists Awards established and awarded



- 1998 • The 2nd President Mu Shik JHON inaugurated



- 1999 • KAST Science and Technology Awards established
- KAST International Symposium launched

- 2000 • Association of Academies of Sciences in Asia(AASA) launched and secretariat established



- 2001 • The 3rd President In Kyu HAN inaugurated



- 2003 • New KAST building completed
- The 1st Voice of the KAST announced



- 2004 • The 4th President Kun Mo CHUNG inaugurated
- The Project of "The Korea Science & Technology Hall of Fame" transferred to KAST



- 2005 • Promoted to a statutory body following an amendment to the Basic Science Research Promotion Act



- 2006 • "Distinguished scholars talk about science & technology" series published

- 2007 • The 5th President Hyun-Ku RHEE inaugurated
- "Ethics Code in Science & Technology" announced



- 2008 • Mentoring Program for Outstanding Students launched



- 2009 • Launched the memoir project of the deceased members

- 2010 • The 6th President Kil-Saeng CHUNG inaugurated
- Joined the InterAcademy Partnership for Science(IAP for Science)
- KAST Society for Science, Technology and Innovation established under the National Assembly



- 2011 • The 1st Prestige Workshop held
- The 1st Frontier Scientists Workshop held



- 2012 • Inter-Academy Seoul Science Forum(IASSF) launched
- The Association of Academies and Societies of Sciences in Asia (AASSA) launched and secretariat established



- 2013 • The 7th President Sung hyun PARK inaugurated



- 2014 • "Meeting with distinguished scholars of KAST" held



- 2016 • The 8th President Myung-Chul LEE inaugurated
- Elected as an Executive Committee member of the IAP for Science
- Organized the project for honorable treatment and support for the persons of distinguished service in science & technology



- 2017 • Young Korean Academy of Science & Technology (Y-KAST) launched
- Korea Science Week 2017 held



- 2018 • Sejong Science & Technology Forum held

- 2019 • The 9th President Min-koo HAN inaugurated
- General Assembly of the InterAcademy Partnership (IAP) held



- 2020 • Joined the International Science Council (ISC)
- "The National Science Challenges Support & Network" launched
- Transferred and reviewed the Korea Science Award and Korea Engineering Award project

- 2022 • The 10th President Ook Joon YOO inaugurated
- Science Networking Center established
- Great Scholar Career Decisions commenced



- 2024 • Science Academies of Asia Forum held



Membership



•• Status of members

KAST members are categorized into Fellow, Foreign Member, Associate Member, Honorary and Patron Member, and Young Korean Academy of Science and Technology(Y-KAST) Member and Alumni.

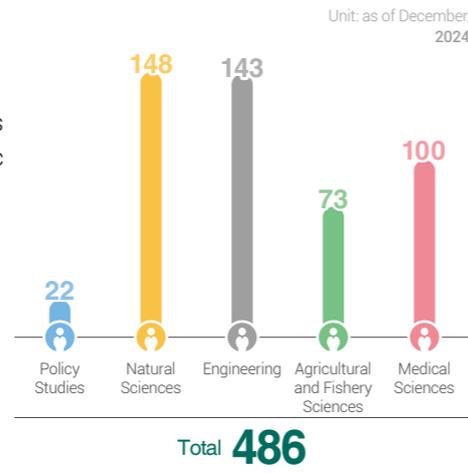
Fellow

Qualification

Korean scholars who have 25 years or more of experiences in science & technology with an outstanding academic achievements in development of science & technology.

Term

Ages up to 70 years



Fellow Emeritus

Term Lifetime

Associate Member

Qualification

Selected from excellent scientists up to 100 persons.

Term

5 years, with re-appointment permitted once

Foreign Member

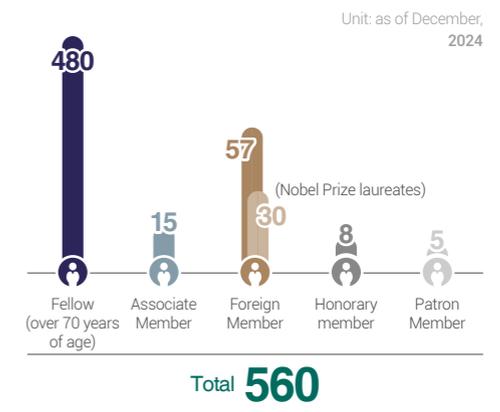
Qualification

Foreign Scholars who have made outstanding academic achievements.

Honorary and Patron Member

Qualification

Individuals, corporations and organizations supporting KAST programs.



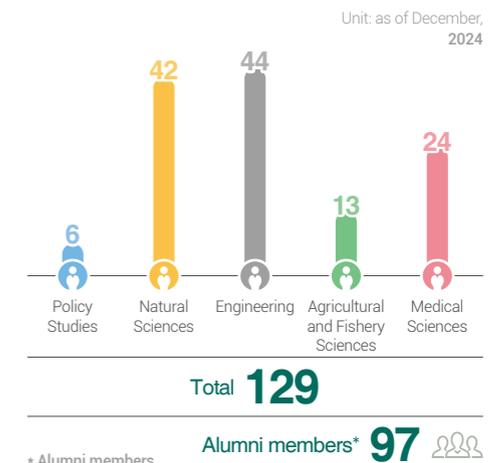
Young Korean Academy of Science and Technology (Y-KAST) Member and Alumni Member

Qualification

Outstanding research outcome & age under 45

Term

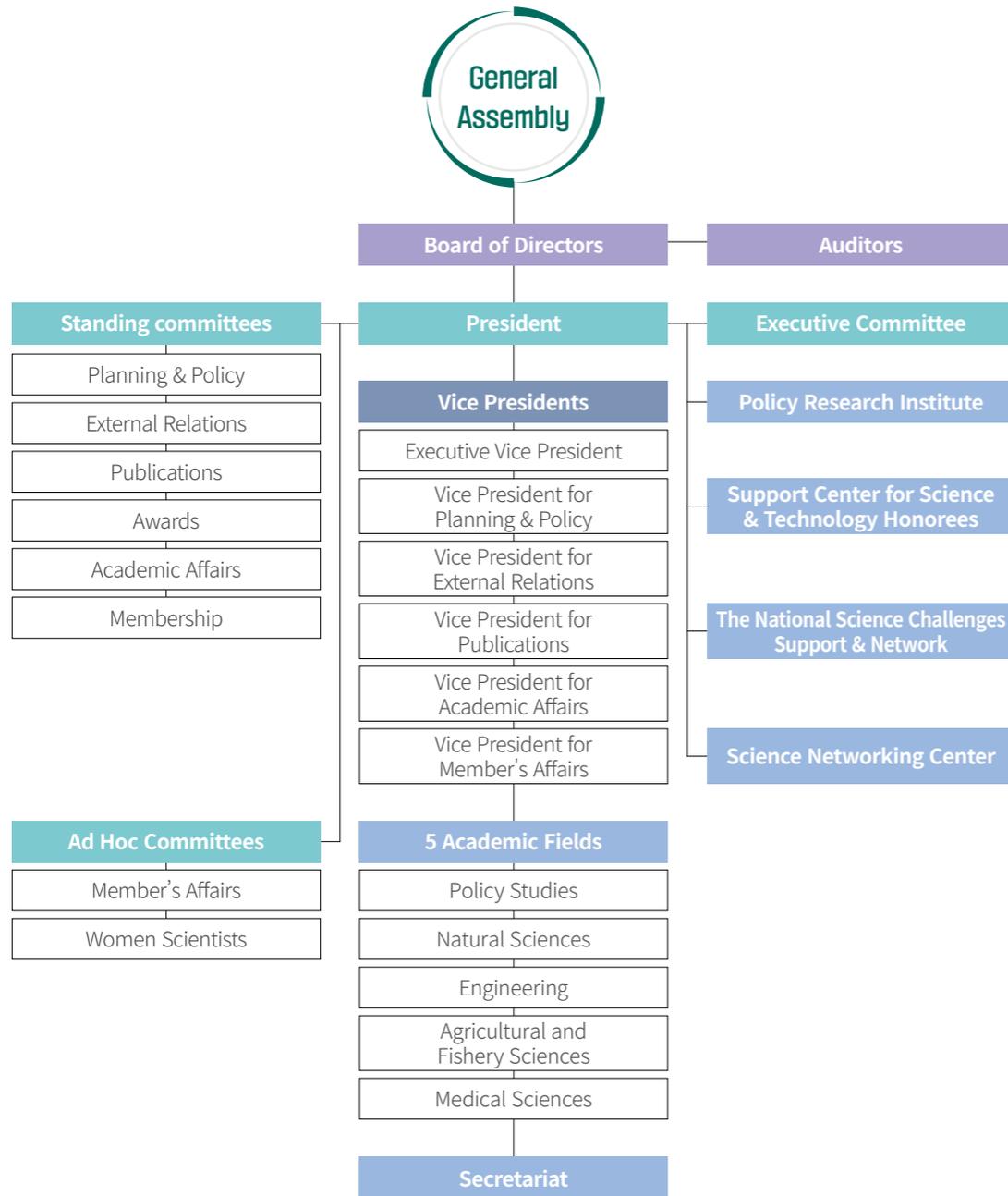
3 years, membership renewal is available until 45 years of age



* Alumni members Appointed by the Y-KAST Executive Committee based on their activities during their term, alumni members serve until the end of the year in which they turn 50.

Organization

Organization of KAST



Board of Directors

Chairman



Min-Koo HAN
Prof. Emeritus of Seoul National University

Director



Kwang-Yong KIM
Prof. Emeritus of Seoul National University



Sang-Cheol BAE
Prof. of Hanyang University



Dongchun SHIN
Prof. Emeritus of Yonsei University



Uhtaek OH
Senior Researcher of KIST



Jung Han YOON
Prof. Emeritus of Hallym University



Yung-Jue BANG
Prof. Emeritus of Seoul National University

Auditor



Doo Sung LEE
Prof. Emeritus of Sungkyunkwan University



Sang Yeol LEE
Prof. Emeritus of Gyeongsang National University



Young-Baek LEE
Prof. Emeritus of Hanyang University



Youngsook LEE
Prof. Emeritus of POSTECH



Tae-Eog LEE
Prof. Emeritus of KAIST



SangJo JONG
Prof. of Seoul National University



Joonho CHOE
Prof. Emeritus of KAIST



Soon Hyung HONG
Prof. Emeritus of KAIST



Soon Jung HONG
Director General of Future Talent Policy Bureau of Ministry of Science and ICT

Executive Committee



Youngjo LEE
Acting President
Prof. of Dankook University



Tai Hyun PARK
Vice President for Planning & Policy
Ewha Womans University
Professor for Special Appointment



Aree MOON
Vice President for External Relations
Chairman of WISNET



Hoon Teak LEE
Vice President for Publications Chair
Prof. of Konkuk University



Pill Hoon CHOUNG
Vice President for Membership
Prof. Emeritus of Seoul National University



Youngbae JIM
Division Chair for Policy Studies
Prof. Emeritus of KAIST



Byeang Hyeon KIM
Division Chair for Natural Sciences
Prof. Emeritus of POSTECH



Hyung Hee CHO
Division Chair for Engineering
Prof. of Yonsei University



Hyun Jin PARK
Division Chair for Agricultural and Fishery Sciences
Prof. of Korea University



Young Joon SURH
Division Chair for Medical Sciences
Prof. of Seoul National University



Joong Hee LEE
Director for Domestic Academic Affairs
Prof. of Jeonbuk National University



Wonwoo NAM
Director for International Academic Affairs
Prof. of Ewha Womans University



Dae Young KWON
Director for Domestic Cooperation University
Prof. of Hoseo University



Jun Soo KWON
Director for International Cooperation
Prof. of Seoul National University



Young Keun KIM
Chair of Y-KAST
Prof. of Korea University

ACTIVITIES

THE KOREAN ACADEMY OF
SCIENCE AND TECHNOLOGY

• Advice for Policy Makers and Society	20
• People-friendly Science Promotion	28
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• Awards	42
• Persons of Distinguished Service	50
• Young Academy	54



ACTIVITIES
Advice for Policy Makers and Society

KAST's research and advice serve as a compass, guiding science and technology policymaking in the country.

Armed with experts of every distinctive field, KAST proposes a science and technology-based approach to address pending social issues. The members also gather insights and experiences to seek ways to bring innovation to science and technology.

•• KAST Roundtable Discussions

The 'KAST Roundtable Discussions' have served as the organization's premier forum for policy dialogue since 1996. This forum was established to formulate long-term visions and strategies, as well as to explore solutions to pressing issues in the fields of science and technology.

The distinguished scholars from KAST, along with experts from various fields of science, engage in discussions on topics that directly impact our lives, including science and technology policies.

Last year, KAST held five "Strategic Technology Series Forums" focused on national strategic technologies, which are gaining attention as key factors of national competitiveness and future economic growth. The forums covered topics such as semiconductors, AI, advanced aircraft engines, and biotechnology.

The Roundtable Discussion is live-streamed on KAST's official YouTube channel, offering researchers and the general public an opportunity to ask questions directly to experts in the field.



× Exclusive KAST Open Forum

Fourteen open forums were held with the experts in the field on the subject proposed by the KAST members.

Date	Theme
Jan. 31	Frailty and Sarcopenia
Mar. 13	Institutional Solutions for Essential Public Health Services
Mar. 19	We May Be Facing a Greater Threat Than COVID-19. What Should We Do?
Mar. 20	What it takes to be a First Mover - Science Networking
May. 10	Citizen Scientists
May. 29	GMO: Strategies for Sustainability
Jun. 21	Korea's Strategy for International Cooperation in the Semiconductor R&D
Aug. 21	The Threat of Avian Influenza: A Harbinger of the Next Pandemic?
Aug. 28	Doing Science with AI: A New Paradigm
Nov. 18	Independent Development of Advanced Military Aircraft Engines
Dec. 3	How Scientific is Science and Technology Policy?
Dec. 17	Advanced Biotechnology: A Game Changer in the Treatment of Incurable Diseases
Dec. 20	Neuralink: Connecting the Brain to the World
Dec. 24	Health Secrets on the Table: A Future Powered by the Microbiome

× Joint Discussion with relevant organizations

KAST co-hosted three policy forums with the National Academy of Medicine of Korea (NAMOK) on the COVID-19 and Emerging Infectious Diseases.

Date	Theme
Apr. 30	Causes of Excess Deaths from COVID-19 in Korea and What We Can Do About Them
Aug. 23	The Effectiveness of COVID-19 Vaccination and Strategies for Vaccine Development Against Potential New Outbreaks
Nov. 20	A Review of Domestic and International Laws and Regulations for Healthcare Crises from Emerging Infectious Diseases and Countermeasures

•• S&T Policy Reports

KAST members conduct research and write reports on mid- to long-term policies in science and technology, providing recommendations to the government to integrate these research findings into national policies. These recommendations primarily focus on the following areas ▲Creating a foundation to promote research in basic science, ▲Assessing and advising on science & technology policies, ▲Encouraging young talents to pursue careers in science. In 2024, KAST published the report titled "The Science and Technology Strategy for the Next 30 Years of Korea", featuring contributions from twenty-eight leading experts across various fields. The report explores timely topics, such as artificial intelligence (AI), super-aged societies, and the next pandemic.

◆ In 2024, three S&T Policy Reports were published.

No.	Title
153rd	Suggestions for a Successful Launch of Korea AeroSpace Administration: The Importance of Astronomical and Space Science Research
154th	Policy Research for Industrialization of dsRNA Pesticide to Replace Chemical Pesticide
155th	The Science and Technology Strategy for the Next 30 Years of Korea



•• ISSUE Reports

ISSUE Reports are policy proposals on scientific and technological matters, offering insights from leading experts in science to address pressing social issues. These reports represent the viewpoints of experts from various research committees. The collective data and expertise serve as crucial resources for policymakers in government, the National Assembly, and relevant agencies, supporting informed decision-making.

◆ In 2024, three Issue Reports were published.

No.	Title
Vol. 01	Citizen Science: A New Paradigm of Science for the 21st Century
Vol. 02	Career Development Support for Highly Skilled Women in Science and Technology
Vol. 03	Science Networking: Essential for Becoming a First Mover



•• Young Academy Reports

"Young Academy Reports" are policy recommendations based on the ideas of young scientists, primarily from the 'Young Korean Academy of Science and Technology (Y-KAST).' Each report outlines strategies to support promising science and technology research areas and core technologies to strengthen national competitiveness on the global stage.

◆ In 2024, three Young Academy Reports were published.

No.	Title
Vol. 01	The Strategic Approach to RE100 with National Science and Technology
Vol. 02	Connecting the Brain to the World
Vol. 03	Medical Support Staff and Effective Use of Future Nursing Staff



•• Great Scholar Career Decisions: S&T Strategy Report

KAST has been implementing the 'Scholar Career Decisions' program by creating diverse content based on the research expertise of prominent scientists. The goal is to share this content with a diverse audience. The purpose of 'Scholar Career Decisions' is to document the decision-making process when top scientists faced challenges in their study, and what kind of insights they gained from experiences of success and failure. This valuable resource is shared with fellow researchers and policymakers to shape a better future for all. Seven scholars were selected to write policy recommendation reports that outline future development strategies for various research fields.

◆ In 2024, seven S&T Strategy Reports were published.

No.	Title
Vol.01	Policy Recommendations for Optogenetic Innovation: From Basic Research to Application
Vol.02	Developing Layered Cathode Materials for Secondary Batteries: A Path to a Sustainable Future
Vol.03	Appropriate Technology in the Age of AI and Robots
Vol.04	Policy Recommendations for the Development and Commercialization of Novel Perovskite Display Materials
Vol.05	Development of Artificial Satellites and Future Water Resource Management
Vol.06	World-Class Nanotechnology Research: What Consistent Long-Term Support Can Achieve
Vol.07	A Strategy for the Development and Commercialization of Food Safety Technologies in the Context of Regulation



•• KAST Communique

"Voice of the KAST" aims to provide a long-term vision and development strategy for national science and technology, offering scientific and technological solutions to the challenges in the context of modern society.

Based on expert analysis and scholars' opinions in related fields, proposals for improving policies, laws, and regulations are made and distributed to the Korean government, the National Assembly, and other relevant organizations.

In 2024, five editions were distributed, totaling 113 editions.

No.	Date	Title
109th	Apr. 17	Balanced progress of theoretical and experimental research requires institutional improvement
110th	Jul. 22	The role of scientific research in the success of the Korea AeroSpace Administration
111th	Aug. 29	The government and science and technology organizations should encourage and promote "citizen science" programs
112th	Oct. 21	International cooperation is essential to overcome the K-semiconductor crisis
113th	Dec. 27	Independent development of advanced aircraft engines for the future of K-defense



●● National Science Challenges Support & Network (NSCN)

KAST has been running the "National Science Challenges Support and Network (NSCN)" for the successful execution of the 'National Convergence Research of Scientific Challenges Project,' which is a leading convergence R&D project that tackles unresolved scientific challenges with creative and innovative solutions.

NSCN is responsible for identifying and selecting candidates for scientific challenges, as well as designing personalized scientific challenges. Additionally, NSCN supports conferences, annual reports, and international collaborative activities, facilitating the exchange of experiences and challenges among researchers.

Currently, twenty-five research groups are addressing grand challenges in science. KAST has established an expert committee to develop successful strategies and analyze these challenges. In particular, NSCN established an open platform for grand challenge proposal submissions last year, which enabled research communities to propose their ideas in addressing grand scientific challenges and to exchange ideas among researchers.



✕ Major Activities (2024)

◆ National Science Challenge Initiatives of 2024

In 2024, we selected twelve new research projects through our project planning process. NSCN utilized the collective intelligence of the Planning and Coordination Committee, consisting of twenty-three distinguished scientists and promising young researchers, to identify candidates for scientific grand challenges in Korea. This process was followed by the development of requests for proposals (RFPs), based on a technology needs survey conducted in collaboration with the Ministry of Science and ICT and the National Research Foundation of Korea. As a result, eight research groups were organized in 2024.

Research Center for Mathematical Principles of Artificial Intelligence

PI Professor. **Myungjoo KANG** Seoul National University

Project » Exploration of Mathematical Principles in Artificial Intelligence and Analysis of Big Data

Center for High-temperature Superconductors

PI Professor. **Gundo LEE** Seoul National University

Project » Elucidating the mechanism of non-Fermi liquids through thermal decoupling and developing innovative superconductors

Center for Low Carbon Resource Recovery	
PI	Senior researcher. Kyung-Guen SONG KIST
Project	» Development of low-energy, high value-added nitrogen/phosphorus resource recovery technology from highly concentrated organic waste resources
Center for Eco-Friendly N & P Resource Utilization	
PI	Professor. Nam-Hwi HUR Sogang University
Project	» Development of Eco-Friendly Integrated Technology for Resource Recovery from Nitrate and Phosphate Wastewater
Immunological Synaptosome Cancer Vaccine Research Center	
PI	Professor. Chang-Duk JUN GIST
Project	» Development of cancer vaccine using immunological synaptosomes derived from supramolecular activation clusters
T cell Neo-Signaling Pathway Research Center	
PI	Professor. Jae-Hoon CHANG Yeungnam University
Project	» Unraveling Novel Signaling Pathways Mediated by Amino Acids in T Cells and Development of Amino Acid-Based Anti-Cancer Immunotherapeutic Vaccines
Center for Solid Oxide Cell Lifespan Breakthrough	
PI	Senior Reseacher. Yoonseok CHOI KIER
Project	» Development of Real-time Performance Recovery Method for High-Temperature Energy Conversion Devices
Center for Artificial Immune Evolution	
PI	Professor. Chan-Hyuk KIM Seoul National University
Project	Integrated Platform for in vivo Artificial Immune Evolution to Conquer Refractory Cancers and Neurodegenerative Diseases

ACTIVITIES
People-friendly Science Promotion

KAST takes the initiative in nurturing talents in science and technology to strengthen the national competitiveness in these fields. All members of KAST are committed to sharing their expertise and knowledge with the public to fulfill its mission.

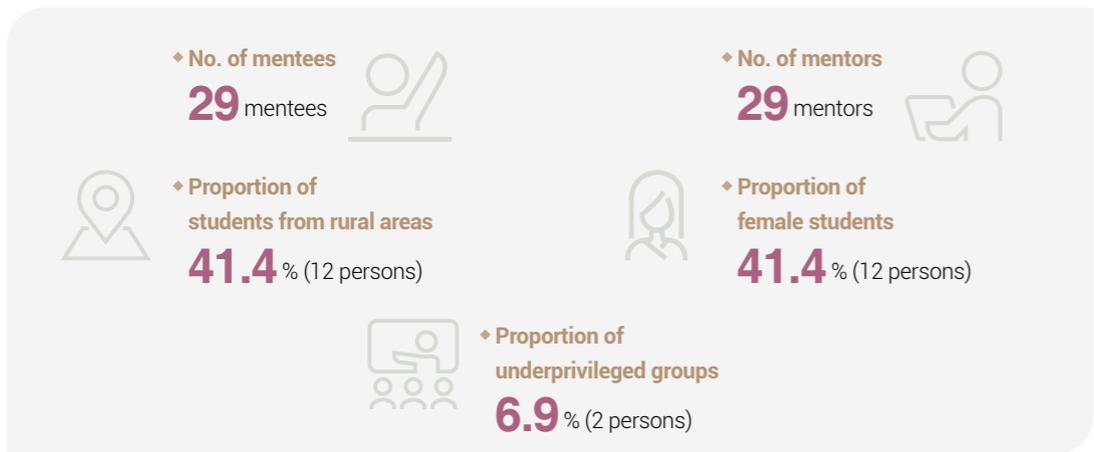
KAST strives to create a society where everyone can enjoy science. To this end, the academy carries out a variety of activities, factoring in the specific needs of target recipients.

KAST aims to build a science and technology society without discrimination by reinforcing scientific and cultural activities for the socially underprivileged.

•• **Mentoring Program for Outstanding Students**

KAST's mentoring program offers one-on-one sessions with science and technology professionals. The program is designed for high school freshmen and sophomores with strong academic performance. Students get to develop their interest and skills in science through a five-month, well-structured mentoring program. The top scholars in mathematics, physics, chemistry, life science, engineering, and pharmaceutical science join the program as mentors, supporting the students in carrying out their projects. The number of applicants for this program has been increasing each year due to its growing reputation for effective teaching strategies in science. KAST prioritizes applicants from rural areas and female students to help reduce inequalities in STEM (Science, Technology, Engineering, and Mathematics) education.

× **2024 statistics**



•• **Meeting with KAST Scholars**

"Meeting with KAST Scholars" is a nationwide science lecture program in which KAST members visit schools directly, under the slogan "A meeting between leading Korean scientists and young talents who will lead the future."

Once schools apply for the program, prominent scholars from KAST visit the schools to deliver lectures on the latest developments in science and technology, while providing career consulting services to students. The program has been expanded in 2014 due to its growing popularity and recognition.

KAST has prioritized offering this program to students from rural areas, as they have limited access to high-quality education and career opportunities in science and technology. The program was held at seventy-seven schools last year, covering a wide range of timely topics that sparked students' intellectual curiosity, such as neuroscience, and future car technology.

× **Major Activities in 2024**



●● Career Decisions Lecture Series

"Career Decisions Lecture Series" was established to develop strategies for advancing science and technology in Korea by utilizing the knowledge and experience of prominent scientists. In 2024, thirty-six lectures of the "Career Decisions Lecture Series" were held to share exceptional research achievements and decision-making processes of scholars with their colleagues and future scientific talents. These lectures were recorded and uploaded to YouTube.



●● A Korean version of the marine science guidebook for teenagers

KAST published the Korean edition of "OCEAN! How Can We Create a Sustainable Future for the Ocean?" by the Smithsonian Science Education Center (SSEC) and the InterAcademy Partnership (IAP). SSEC has released twelve science education guidebooks, each focusing on the United Nations Sustainable Development Goals (SDGs) for youth aged eleven to eighteen. These books are available free of charge to anyone interested. Originally published in 2023, "OCEAN!... for the ocean?" provides basic information on the marine environment, water, air, temperature, and fisheries, as well as essential

scientific and technological knowledge that underpins the SDGs. Suam Kim, a renowned marine and fisheries expert and an emeritus professor of Pukyong National University participated in the publication of this guidebook as a research mentor. With his support in its publication process, KAST and SSEC were able to agree on producing the Korean edition. KAST distributed printed copies of the Korean guidebook to science museums nationwide and to schools in remote areas to ensure accessibility to Korean youth. A PDF version is available for download on the SSEC's official website.



●● Other Projects

× Infographic

KAST decided to create infographics that summarize the key points of the results from policy research and advisory services. These infographics are then distributed to middle and high schools, including decision-makers, giving them a clearer picture of our suggestions and recommendations. In 2024, KAST produced six infographics on topics such as RE100, highly pathogenic avian influenza, decrepitude and sarcopenia, future mobility, brain-machine interfaces (BMI), and artificial intelligence (AI). These infographics are available on our website.



× NoMad Scientist

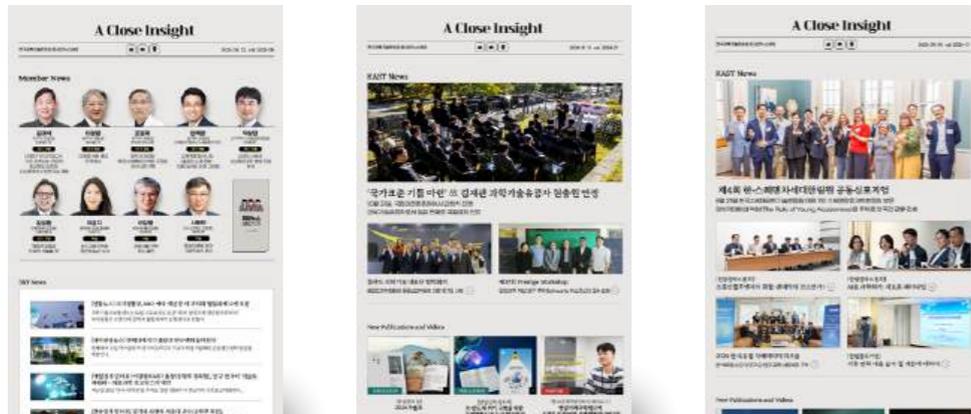
KAST produced five videos to promote public interest and to provide a deeper understanding of social issues related to science and technology. These videos are available on our YouTube channel. KAST members openly discuss high public interests, such as artificial intelligence and cybercrime, while drawing connections to policies and systems.



●● Periodicals

× Online Newsletter 'A Close Insight'

"A Close Insight" is an online newsletter, delivered twice a month via email, that shares the results of KAST Projects and the latest news about our members. A total of twenty-four newsletters get published each year.



× Magazine 'The View of KAST'

"The View of KAST" is quarterly magazine that showcases the philosophy and insights of KAST. In 2024, "The View of KAST" embraced its annual theme: "Looking Back at the 30 Year History of Korean Basic Science."



●● Online Services

× 4th Series of the Great Discovery of Nobel Prize Laureates

KAST has been producing high-quality scientific contents and disseminating it broadly through YouTube to contribute to the cultivation of future science and engineering talents and the popularization of science and technology. KAST produced a series of commentary on the Nobel Prize in Science in 2024. The Series of the Great Discovery of Nobel Prize Laureates has continued to attract high viewership long after its release, remaining a popular educational content in the field of science.



× KAST V-Log series

A V-Log is a portmanteau of 'video' and 'blog,' referring to video content that captures and shares aspects of one's daily life. To introduce KAST's projects in a more approachable manner, 5 V-logs featuring the key participants of these projects were produced in 2024.



ACTIVITIES
International Collaboration

KAST cooperates with 46 academic institutions in 39 countries around the world, serving as a pillar of civil diplomacy in the fields of science and technology. We enhance the status of Korea's science and technology and promote its globalization by strengthening cooperation with scientific and technological organizations and academies. One way KAST achieves this is through its participation in the IAP Policy Advice Committee. Additionally, we operate the secretariat of the Association of Academies and Societies of Sciences in Asia(AASSA) and the Science Networking Center(SNC) to further enhance collaboration.



•• **Cooperation with International Academic Organizations**

KAST cooperates with international organizations and national scientific academies worldwide serving as a pillar of civil diplomacy in the fields of science and technology. As a committee member of the IAP Policy Advice, the world's largest scientific society, we are participating in major projects aimed at proactively addressing current issues of the global science and technology community, thus increasing Korea's global presence.

× **Bilateral Symposia**

The 5th Korean-American Kavli Frontiers of Science Symposium

Date	Jan. 9 ~ Jan. 12
Venue	California, USA
Participant	56 young scientists in the US and Korea

Bilateral Relations with the National Academy of Science

The KAST and the National Academy of Sciences (NAS) held their first joint symposium in 2002 and have continued to extend bilateral relations. The two sides have held KFoS Symposium on a regular basis since 2013.

KAST-ASM Bilateral Symposium 2024

Date	Jan. 22
Venue	Kuala Lumpur, Malaysia
Subject	Current Status of Science and Technology in Korea and Malaysia and Measures for Cooperation
Participant	60 scholars from two academies and experts

Bilateral Relations with the Academy of Sciences Malaysia

KAST has maintained its relationship with the Academy of Sciences Malaysia (ASM) since 1999, when the two organizations signed the first memorandum of understanding (MOU). In 2014, they jointly implemented the KAST-IAP (InterAcademy Partnership) project, and in 2015, a KAST delegation was invited to attend the ASM General Meeting. The two parties agreed to amend the MOU in 2024, under which they aim to strengthen scientific and technological cooperation through joint symposia, the exchange of scientists, and the sharing of scientific publications.

× **Cooperation with Overseas Academies and Institutions**

Science 20 Brasil 2024

Date	Jul. 1 ~ Jul. 2
Venue	Rio de Janeiro, Brazil
Description	Science 20 2024 in Brazil was attended by representatives from G20 science academies with experts in science and technology from 19 countries. The delegates discussed and finalized the content of a joint statement on five topics: artificial intelligence (AI), bioeconomy, energy transition, health, and social justice.

●● The Association of Academies and Societies of Sciences in Asia (AASSA)

The Association of Academies and Societies of Science in Asia is a non-profit international organization with science, technology and innovation (STI) interests. It consists of scientific and technological academies and science societies in Asia and Oceania. It was launched in 2012 through the merger of two organizations, i.e., AASA (Association of Academies of Sciences in Asia, founded in 2000) and FASAS (Federation of Asian Societies and Academies of Sciences, founded in 1984). Its current membership includes 33 national academies and societies of sciences from 30 countries and one regional academy of engineering and technology.

By providing administrative support for the activities of AASSA, KAST fulfills its role as a springboard for the science and technology network in Asia and as a hub for research and development. At the 6th AASSA General Meeting in 2024, KAST's term as the Secretariat was extended to 2030.

In 2024, AASSA Regional Workshops were held in Türkiye, Mongolia, India, Sri Lanka, and the Philippines.

× AASSA Operations

AASSA Board Meeting of 2024

Date	Oct. 29
Venue	Manila, Philippines
Agenda	Report on AASSA Activities in 2024 and Plans for 2025

The 6th AASSA General Assembly

Date	Oct. 30													
Venue	Manila, Philippines													
Agenda	<ul style="list-style-type: none"> • AASSA Secretariat Renewal (KAST, 2024~2030) • Election of the Next Executive Board Members(2024~2027) 													
	<table border="1"> <tr> <td>President</td> <td>Ahmet Nuri Yurdusev</td> <td>Türkiye</td> </tr> <tr> <td>President-elect</td> <td>Satryo Soemantri Brodjonegoro</td> <td>Indonesia</td> </tr> <tr> <td>Vice President</td> <td>Mohammad Reza Shams Ardekani</td> <td>Iran</td> </tr> <tr> <td>Treasurer</td> <td>Narinder K. Mehra</td> <td>India</td> </tr> </table>	President	Ahmet Nuri Yurdusev	Türkiye	President-elect	Satryo Soemantri Brodjonegoro	Indonesia	Vice President	Mohammad Reza Shams Ardekani	Iran	Treasurer	Narinder K. Mehra	India	
	President	Ahmet Nuri Yurdusev	Türkiye											
	President-elect	Satryo Soemantri Brodjonegoro	Indonesia											
	Vice President	Mohammad Reza Shams Ardekani	Iran											
	Treasurer	Narinder K. Mehra	India											
	<table border="1"> <tr> <td rowspan="6">Member-at-Large</td> <td>Frances Separovic</td> <td>Australian</td> </tr> <tr> <td>SATAKE Kenji</td> <td>Japan</td> </tr> <tr> <td>Dohan KIM</td> <td>Korea</td> </tr> <tr> <td>Dilip Subba</td> <td>Nepal</td> </tr> <tr> <td>Pavel Krestov</td> <td>Russia</td> </tr> <tr> <td>B.V.R Chowdari</td> <td>Singapore</td> </tr> </table>	Member-at-Large	Frances Separovic	Australian	SATAKE Kenji	Japan	Dohan KIM	Korea	Dilip Subba	Nepal	Pavel Krestov	Russia	B.V.R Chowdari	Singapore
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			Dohan KIM	Korea										
Dilip Subba			Nepal											
Pavel Krestov			Russia											
B.V.R Chowdari		Singapore												

× AASSA Regional Workshop

AASSA – TUBA Regional Workshop Science Diplomacy for a Sustainable Development

Date	Jun. 28 ~ Jun. 29
Venue	Ankara, Türkiye
Host	AASSA, Turkish Academy of Sciences (TÜBA)

AASSA-MAS Regional Workshop Environmental Hazards in Asia

Date	Aug. 13 ~ Aug. 15.
Venue	Ulaanbaatar, Mongolia
Host	AASSA, Mongolian Academy of Sciences (MAS)

AASSA-INSA Regional Workshop Science Policy Futures for Asia

Date	Sep. 1 ~ Sep. 3
Venue	Delhi, India
Host	AASSA, Indian National Science Academy (INSA)

AASSA-NASSL Regional Workshop Resilience to High Impact Low Occurrence (HILO) disasters: A cross-sector comparison

Date	Sep. 5 ~ Sep. 7
Venue	Colombo, Sri Lanka
Host	AASSA, National Academy of Sciences of Sri Lanka (NASSL)

AASSA-NAST PHL Regional Workshop Digital Transformation in Healthcare

Date	Oct. 29 ~ Oct. 30
Venue	Manila, Philippines
Host	AASSA, National Academy of Science and Technology, Philippines (NAST PHL)

●● International Symposium

The KAST International Symposium is an open symposium, in which major international science and technology issues are selected as themes, and both domestic and foreign experts participate. Through research exchanges with world-class scholars, the foundation of domestic science and technology research has been broadened, and providing an opportunity for the next generation of researchers to reach a global level.



× The 55th KAST International Symposium

Date	May. 20
Venue	Seoul, Korea
Subject	Signaling and Chromatin

× Science Academies of Asia Forum 2024

Date	Nov. 21
Venue	Seongnam-si, Korea
Subject	Advancement of Science and Technology in Asia
Participants	<p>Ahmet Nuri Yurdusev AASSA</p> <p>Daniel Murdiyarto Indonesian Academy of Sciences</p> <p>Mamoru Mitsuishi Science Council of Japan</p> <p>Muzaffer Şeker Turkish Academy of Sciences</p> <p>Dilip Subba Nepal Academy of Science and Technology</p> <p>Sirojiddin Mirzaev Academy of Sciences of the Republic of Uzbekistan</p> <p>Aslam Baig Pakistan Academy of Science</p> <p>Jaime C. Montoya National Academy of Science and Technology, Philippines</p> <p>Tengku Mohd Azzman Shariffadeen Academy of Sciences Malaysia</p> <p>OokJoon Yoo KAST</p>

●● Networking with World-leading Scientists

KAST supports Korean scholars in networking with their global peers and expanding their international influence in the field of science and technology by supporting academic exchanges with international organizations and inviting distinguished scholars from overseas.

× Frontier Scientists Workshop

No.	Date	Venue	Theme
45th	Nov. 10 ~ Nov. 12	Barcelona, Spain	Evolution of Genomes

Frontier Scientists Workshop

Held two to four times annually overseas, this intensive workshop aims to reinforce academic exchanges and networking between Korean scientists, both residing in and outside of Korea, and international scholars while promoting international joint studies.

× Prestige Workshop

No.	Date	Venue	Theme
36th	Jul. 2	Seoul, Korea	New conceptual developments in sustainable nanomaterials
37th	Oct. 31	Seoul, Korea	Single Molecule Nucleic Acids Research

Prestige Workshop

A small workshop held in Korea that provides a forum for in-depth and active academic discussions with excellent domestic scientists by utilizing foreign scholars who are staying in Korea or planning to visit Korea

× The 73rd Lindau Nobel Laureate Meetings

Date	Jun. 30 ~ Jul. 5
Venue	Lindau, Germany
Field	Physics
Participants	3 young scientists of Korea

The Lindau Nobel Laureate Meetings

Each year, one field from physics, chemistry, or physiology is selected to invite Nobel laureates in the corresponding field and young scientists from around the world to give lectures and engage in discussions. As an Academic Partner of the Lindau Foundation, KAST selects 3 to 4 young scientists every year to participate in the event.

●● Facilitating the Networking of Scientists

KAST operates the Science Networking Center (SNC) to internationally promote the excellence of Korea's distinguished scholars in basic sciences. Both leading scientists and rising scientists are offered strategic support to share their outstanding research achievements with the world.

× Overview



Objectives	Providing all-round opportunities and channels to internationally promote the research achievements and capabilities of top Korean scientists in basic science
Director	Doo Sung LEE Prof. Emeritus of Sungkyunkwan University
Period	Apr. 01, 2022 – Dec. 31, 2024
Expected Outcome	① Serve as a center for strategic and professional global publicity ② Enhance Korea's soft power and strengthen national competitiveness

× Major tasks

◆ Selection of a leading and rising scientist

In 2024, 3 scientists were selected in three fields, physics, chemistry, and life science, by forming a specialized field committee(by stage) that guarantees objectivity and expertise.

Physics	Chemistry	Life Science
Hong-Gyu PARK Seoul National University	Ki Tae NAM Seoul National University	Eui-Cheol SHIN KAIST

◆ Academic exchange support

In 2024, nine InterAcademy Workshop (closed academic exchange) events were held

No.	Title
11th	Catalytic Activation of Low-Reacting Bonds toward Sustainable Organic Transformations
12th	Vascular and Neuroimmune Interactions
13th	Ultrafast Science Utilizing X-ray and Optical Tools
14th	Multidisciplinary Approaches to Understanding and Combating Human Diseases
15th	Translating research findings in autism and Neurodevelopmental Disorders
16th	Quantum Materials
17th	Materials Innovation for Light-Matter Interaction
18th	Somatic Mutations in Human Brain Disorders
19th	Nanoscience for Catalysis

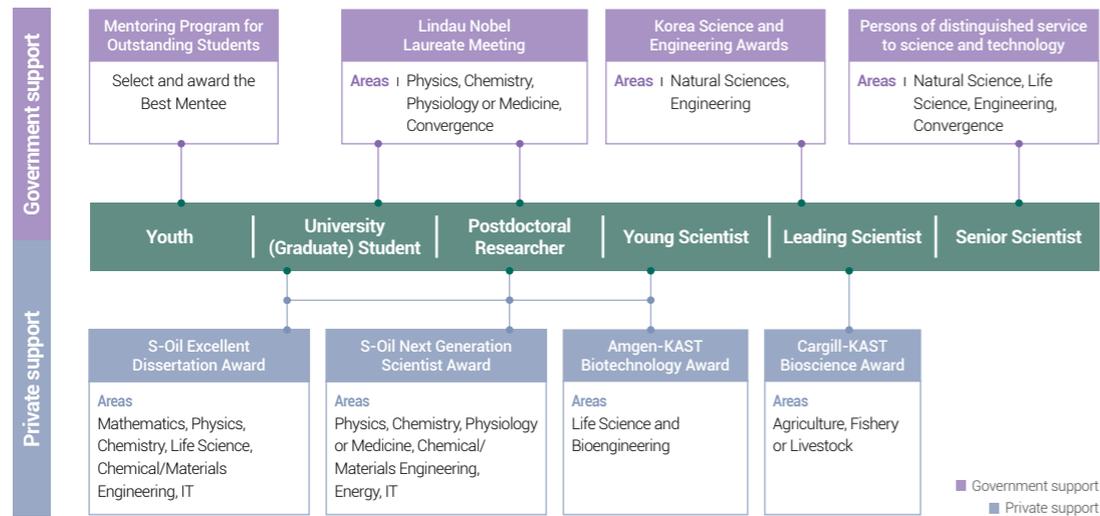


ACTIVITIES
Awards

KAST administers various award programs to recognize and encourage scientists and engineers who have made outstanding achievements in their academic fields.

With the goal of creating systematic research results over the entire life cycle of scientists and engineers, we have built our own specialized "Platform for Award Program by Life Cycle of Scientists" and continued to expand and promote it. We have been promoting support projects specialized in the growth stages of scientists and engineers, from teenagers to doctoral students, from next-generation scientists to senior scientists and highly experienced science and technology scholars.

Platform for Award Program by Life Cycle of Scientists



In 2024, the following awards were presented: ▲Korea Science Award is an award given to scientists and engineers who have achieved outstanding worldclass research accomplishments by identifying the main principles of the natural science field. ▲Korea Engineering Award is an award given to scientists and engineers who have greatly contributed to the national economy and industrial development by producing world-class research results in the engineering field. ▲S-Oil Excellent Dissertation Award, to select talented researchers with academic passion and who have made outstanding research outcomes, in order to foster them to become the leaders of our society in the next generation. ▲S-Oil Next Generation Scientists Award, for top-notch scientists who are 45 years of age or under with outstanding research outcomes in the fields of physics, chemistry, physiology or medicine, and chemical or materials engineering. ▲Cargill-KAST Bioscience Award, to recognize internationally renowned scholars in the field of agriculture, fishery or livestock. ▲The Amgen-KAST Biotechnology Award, to recognize young researchers who have shown outstanding achievements in the fields of life science and biotechnology.

•• The 24th Korea Science Award (Presidential Award)

× **Purpose** It was established in 1987 to promote Korea's independent and self-sustaining scientific development by recognizing and awarding the scientists and engineers who have achieved outstanding world-class research accomplishments through the identification of the main principles of the natural science field. It was conducted as part of the award program for outstanding scientists by the Ministry of Science and ICT.

× **Number of people awarded** 2 persons

× **2024 Awardees**



Juyoung YOON Ewha Womans University

Major Achievements:

Molecular Design of Highly Efficient Heavy-Atom-Free Triplet BODIPY Derivatives for Photodynamic Therapy and Bioimaging (Angewandte Chemie International Edition, 2020)



Woong SUN Korea University

Major Achievements:

Production of human spinal-cord organoids recapitulating neural-tube morphogenesis (Nature Biomedical Engineering, 2022)

•• The 20th Korea Engineering Award (Presidential Award)

× **Purpose** It was established in 1994 to increase the research motivation of scientists and engineers, and establish a creative research environment by recognizing and awarding the scientists and engineers who have greatly contributed to the national economy and industrial development through the production of world-class research achievements in the engineering fields. It was conducted as part of the award program for outstanding scientists by the Ministry of Science and ICT.

× **Number of people awarded** 2 persons

× 2024 Awardees



Hyung Hee CHO Yonsei University

Major Achievements:
Efficient design of heat exchange for CFB reactors in CO2 capture system regarding geometry-induced secondary flow (Energy Conversion and Management, 2021)



Jong-Beom BAEK UNIST

Major Achievements:
Mechanochemistry for ammonia synthesis under mild conditions (Nature Nanotechnology, 2021)

•• The 9th Cargill-KAST Bioscience Award

× **Purpose** It is intended to encourage scholars with outstanding achievements in the field of griculture, fishery or livestock.

× **Number of people awarded** 2 persons

× 2024 Awardees



Pil Joon SEO Seoul National University

Major Achievements:
Callus proliferation-induced hypoxic microenvironment decreases shoot regeneration competence in Arabidopsis (Molecular Plant, 2024)



HoJae HAN Seoul National University

Major Achievements:
Urolithin A suppresses high glucose-induced neuronal amyloidogenesis by modulating TGM2-dependent ER-mitochondria contacts and calcium homeostasis (Cell Death & Differentiation, 2021)

•• The 4th Amgen-KAST Biotechnology Award

× **Purpose** To contribute to the development of Korean biotechnology by inspiring, motivating, and rewarding young researchers in Korea for their outstanding achievements in life science and bioengineering

× **Number of people awarded** 1 next-generation scientist, 2 post-doctoral researchers

× 2024 Awardees

Next generation scientist category



Seung-Hee LEE KAIST

Major Achievements:
Gated feedforward inhibition in the frontal cortex releases goal-directed action (Nature Neuroscience, 2021)

Post-doctoral researchers category



Jin-Hui YOON IBS

Major Achievements:
Nasopharyngeal lymphatic plexus is a hub for cerebrospinal fluid drainage (Nature, 2024)



Dong Gyu HWANG POSTECH

Major Achievements:
Bioprinting-assisted Tissue Assembly for Structural and Functional Modulation of Engineered Heart Tissue Mimicking Left Ventricular Myocardial Fiber Orientation (Advanced Materials, 2024)



•• The 6th S-Oil Next Generation Scientists Award

- × **Purpose** To encourage scientists who are 45 years of age or under working at domestic universities or research institutes with outstanding research outcomes in 6 areas including physics, chemistry, physiology or medicine, chemical/materials engineering, energy, and IT.
- × **Number of people awarded** 6 persons (one for each six fields)
- × **Sponsorship** S-OIL Science Prodigy and Culture Foundation is a public foundation established by S-OIL in 2011 to train talented people through international exchange activity, scholarship business, and research support for social return of the company's profit.



× 2024 Awardees

Physics



Hee-Cheol KIM POSTECH

Major Achievements:

- » Swampland constraints on 5d N=1 supergravity (J. of High Energy Physics, 2020)

Chemistry



Dong Ki YOON KAIST

Major Achievements:

- » Paintable Physical Unclonable Function Using DNA (Adv. Mat., 2023)

Physiology · Medicine



Chang Gon KIM Yonsei University

Major Achievements:

- » Hyperprogressive disease during PD-1/PD-L1 blockade in patients with non-small-cell lung cancer (Ann. of Oncol., 2019)

Chemical engineering/Materials engineering



Jeong Woo HAN Seoul National University

Major Achievements:

- » Mechanistic insights into the phase transition and metal ex-solution phenomena of $\text{Pr}_{0.5}\text{Ba}_{0.5}\text{Mn}_{0.85}\text{Co}_{0.15}\text{O}_{3-\delta}$ from simple to layered perovskite under reducing conditions and enhanced catalytic activity (Ene. & Env. Sci., 2021)

Energy



Ji-Wook JANG UNIST

Major Achievements:

- » All-perovskite-based unassisted photoelectrochemical water splitting system for efficient, stable and scalable solar hydrogen production (Nat. Ene., 2024)

IT



Junil CHOI KAIST

Major Achievements:

- » Hybrid Beamforming for Intelligent Reflecting Surface Aided Millimeter Wave MIMO Systems (IEEE Trans. on Wireless Comm. 2022)



•• The 14th S-Oil Excellent Dissertation Award

- × **Purpose** To encourage young scientists who are striving for research in the field of the basic science of Korea, contributing to the promotion of the basic science research of Korea, and foster excellent talents that will become the leaders of our society in the next generation.
- × **Number of people awarded** 2 persons in 6 fields: Mathematics, Physics, Chemistry, Life Science, Chemical engineering/Materials engineering and Information Technology. 24 persons in total including 1 advisor each
- × **Sponsorship** S-OIL Science Prodigy and Culture Foundation
- × **2024 Awardees**



Mathematics		
	Awardee Seonwoo KIM Seoul Natl Univ	Advisor Insuk SEO Seoul Natl Univ
Title of Dissertation » Metastability of complex stochastic interacting systems		
	Awardee Inhyeok CHOI KAIST	Advisor Hyungryul BAIK KAIST
Title of Dissertation » Theory of random walks on Teichmüller space		
Physics		
	Awardee Wonjin JANG Seoul Natl Univ	Advisor Dohun KIM Seoul Natl Univ
Title of Dissertation » Single-shot detection based multi-electron and nuclear spin manipulation in GaAs		
	Awardee Daegun JO POSTECH	Advisor Hyun-Woo LEE POSTECH
Title of Dissertation » Generation, Detection, and Application of Orbital Dynamics		
Chemistry		
	Awardee Gyumin KANG KAIST	Advisor Sunkyu HAN KAIST
Title of Dissertation » Synthesis of High-Oxidation State Securinega Alkaloids		
	Awardee Hoimin JUNG KAIST	Advisor Sukbok CHANG KAIST
Title of Dissertation » Computational Design and Development of Selective Amination Catalysis Based on Mechanistic Elucidation of Nitrenoid Transfer Process		

Life Science		
	Awardee Young-Yoon LEE Seoul Natl Univ	Advisor V. Narry KIM Seoul Natl Univ
Title of Dissertation » Molecular insights into microRNA biogenesis by DICER		
	Awardee Yoo-Jin HA Yonsei University	Advisor Sangwoo KIM Yonsei University
Title of Dissertation » Accurate detection of mosaic variants and application to disease genome analysis		
Chemical engineering/Materials engineering		
	Awardee Seung Un RYU POSTECH	Advisor Taiho PARK POSTECH
Title of Dissertation » Studies on Molecular Structure-Morphology-Performance Relationship of Organic Solar Cells		
	Awardee Ji-Hwan BAEK Seoul Natl Univ	Advisor Gwan-Hyoung LEE Seoul Natl Univ
Title of Dissertation » Controllable Formation of Zero-twisted 2D Layers via Atomic Reconstruction		
IT		
	Awardee Daeyeon WON Seoul Natl Univ	Advisor Seung Hwan KO Seoul Natl Univ
Title of Dissertation » Conductive Hydrogel Electronics based on Laser-induced Phase Separation of Conducting Polymer		
	Awardee Sungmin CHA Seoul Natl Univ	Advisor Taesup MOON Seoul Natl Univ
Title of Dissertation » Novel Loss, Layer and Applications for Neural Network based Continual Learning		



ACTIVITIES

Persons of Distinguished Service

KAST plays a major role in creating a social climate where scientists and engineers are respected. KAST will do its best to ensure that people in science & technology, the foundation of Korea's national competitiveness, are well-respected in our society so that they can devote themselves to R&D with high pride and confidence.

KAST is responsible for the implementation of the 'Persons of Distinguished Service to Science and Technology' and carries out activities to select and support persons who greatly contributed to scientific advances in Korea. In this way, KAST is taking the lead in raising the honor and pride of scientists and engineers and building a social and cultural environment where they are respected.

●● Project Summary and Major Activities in 2024

The Korean government designates persons with distinguished merits in the contribution to national scientific and technological development, among those people in the science and technology area, engaged in R&D and technological innovation activities according to the enforcement decree of the 'ACT ON THE HONORABLE TREATMENT OF, AND SUPPORT FOR, PERSONS OF DISTINGUISHED SERVICE TO SCIENCE AND TECHNOLOGY(Act Number 13579)' enacted on December 22, 2015.

KAST was selected as the competent authority for the 'Project on the honorable treatment and support for persons of distinguished service to science and technology' in 2016. KAST selected 32 persons of distinguished service who led the development of the Republic of Korea in 2017, followed by selecting 16 persons in 2018, followed by selecting 12 persons in 2019, followed by selecting 12 persons in 2020, followed by selecting 8 persons in 2021, followed by selecting 4 persons in 2022, followed by selecting 4 persons in 2023 and has been protecting the honor of scientists and engineers.

In 2024, KAST designated 6 scientists and engineers, who had received the accolades of their fellow scientists and engineers and the respect of the Korean citizens, as the 'persons of distinguished service to science and technology in 2024.' In addition, KAST produced various scientific cultural contents such as interviews, lectures, dedication lectures, etc., to make sure the public easily access the contributions of Persons of distinguished service to science and technology.

× 2024 Persons of Distinguished Service to Science and Technology (6 persons in total)

Natural Science

The Late Joseph Dal PARK (1906~1988) Former President of the Korea Advanced Institute of Science



- Co-developed Freon and Teflon, praised as "miracle organic compounds"
- Established "Park's carbanion theory" to explain reactions in organic chemistry
- Provided technical expertise for the development of Korea's domestic Freon, "Korfron-12"

Natural Science

Sunghyun PARK (1945~) Emeritus Professor, Department of Statistics, Seoul National University



- Introduced and academically systematized regression analysis, experimental design, and statistical quality control
- Supported industrial quality management practices through tailored statistics process control packages
- Advocated for the advancement of science and technology through advisory roles and policy contributions

Life Science

Sue Goo RHEE (1943~) Chair Professor, Ewha Womans University



- Established the foundation for cell signal transduction research through discoveries including phospholipase C (PLC) isozyme.
- Pioneered the field of redox biology with the discovery of peroxiredoxin (Prx) antioxidant enzyme
- Contributed to strengthening the foundation of life science in Korea, including at Ewha Womans University, Yonsei University, and the Institute for Basic Science

Engineering

The late Nam Sok CHOI (1935~2022) Former Director of LG Chemicals R&D Center



- Contributed to the development of new drugs, including Factive, while leading the R&D Center of LG Chemicals
- Developed polyester film manufacturing technology that led Sunkyung to become a global company
- Presented a successful model for corporate research centers and nurtured biotech entrepreneurs

Convergence

The late Moon Taik SHIM (1923~1998) Former Director of the Agency for Defense Development



- Achieved localization of basic weapons by the successful completion of the Lightning project
- Led the Baekgom development project for long-range surface-to-surface missile
- Contributed to the standardization of industrial technology by establishing the first quality assurance system in Korea

Convergence

Yung Bog CHAE (1937~) Chairman of the Wonjung Research Center (Foundation) Former Minister of Science and Technology



- Localized pharmaceutical and pesticide ingredients, and established a foundation for the fine chemicals industry
- Established a research system for creation of new substances in preparation for the era of material patents
- Led science and technology promotion policies, including the establishment of the University of Science and Technology (UST)

× Supporting the Persons of Distinguished Service in Science and Technology

◆ Burial in the National Cemetery

The Ministry of Science and ICT, in collaboration with KAST, requested the burial of two individuals at the National Cemetery: Zae Quan Kim, the first president of KRISS, and Sang-Dai Park, an emeritus professor at Seoul National University (SNU), in recognition of their significant contributions to science and technology. Both individuals were granted permission for burial at the National Cemetery. Eight Persons of Distinguished Service in Science and Technology also have been buried at the Cemetery under the ACT ON THE ESTABLISHMENT AND MANAGEMENT OF NATIONAL CEMETERIES.

◆ Dedication lecture

A Commemorative symposium and memorial lecture were organized by academic societies and affiliated institutions, focusing on the great achievements of individuals of merit in science and technology. Participants discussed the achievements and impacts of these key figures in the field. Additional events were also organized, such as the naming of a commemorative lecture room and the creation of a dedicated study space.



× Public Promotion

◆ Publication of a Book on Individuals of Merit in Science and Technology

The book is a comprehensive biography of distinguished Koreans in the field of science and technology. It includes their history, research achievements, contributions to the media, interviews, and personal writings. It also offers a wide range of supplementary materials, including tributes from the next generation of scholars and special contributions from historians of science. An illustrated book has been released, featuring easy-to-read information cards that highlight major events from the early stages of these remarkable individuals' lives and careers.

◆ Educational cartoons on persons of distinguished service to science and technology in Korea

KAST published a series of cartoons about sixteen individuals of distinguished service to science and technology: "Kids Science Magazine: Dong-a" from May 2023 to August 2024 and "Persons of Distinguished Service to Science and Technology in Korea: People Who Honored Korea with Science." These series have been collected into a book titled, "Persons of Distinguished Service to Science and Technology in Korea: People Who Honored Korea with Science." The series presents contributor's achievements, research journeys, and personal stories engagingly. These cartoons will be used for exhibitions, educational purposes, and children's events in 2025 at the five national science museums in Korea, such as the National Science Museum. It is also available on the Persons of Distinguished Service to Science and Technology website.



ACTIVITIES
Young Korean Academy of Science and Technology (Y-KAST)

Since 2017, KAST has been selecting outstanding young scientists under the age of 45 as members of Y-KAST and supporting their exchanges with Young Academies in other countries.

In 2024, KAST elected 20 rising young scientists as Y-KAST members, recognizing their outstanding achievements as independent researchers. Y-KAST has been actively engaged in policy recommendations, ensuring that the innovative and creative ideas of young scientists contribute to the promotion of universal values within society.

Y-KAST Executive Committee (2024. 3.~2025. 2.)

>> General



Young Keun KIM
 Chair of Y-KAST
 Prof. of Korea University
 (Fellow of KAST)

>> Division of Policy Research



Sungjoo LEE
 Vice Chair of Y-KAST
 Prof. of Seoul National University



Joo Young PARK
 Committee member
 Prof. of Seoul National University



Hakyeon LEE
 Committee member
 Prof. of SEOULTECH

>> Division of Natural Sciences



Myoungjean BAE
 Vice Chair of Y-KAST
 Prof. of KAIST



Keun Su KIM
 Committee member
 Prof. of Yonsei University



Hyo Jae YOON
 Committee member
 Prof. of Korea University

>> Division of Engineering



Hyunjoo Jenny LEE
 Vice Chair of Y-KAST
 Prof. of KAIST



Sung-Chul BAE
 Committee member
 Prof. of Hanyang University



Seok Su SOHN
 Committee member
 Prof. of Korea University

>> Division of Agriculture and Fishery Sciences



Soon-Kyeong KWON
 Vice Chair of Y-KAST
 Prof. of Gyeongsang National University



Kyung-Rok YU
 Committee member
 Prof. of Seoul National University

>> Division of Medical Sciences



Sangwoo KIM
 Vice Chair of Y-KAST
 Prof. of Yonsei University



Heejung KIM
 Committee member
 Prof. of Yonsei University



Suckchang HONG
 Committee member
 Prof. of Seoul National University

Major activities in 2024

Feb. 23

Meeting Between the Vice Minister of MSIT and Y-KAST Members

Vice Minister for Science, Technology, and Innovation, Kwang Jun RYU, met with Y-KAST members to discuss key topics, including support measures for young researchers, the development of a dynamic and challenging research environment, and strategies for nurturing the next generation of scientific leaders.



Mar.~Nov MSIT-YKAST Joint Forum

MSIT and Y-KAST held a total of four joint forums, featuring presentations and discussions by MSIT officials and Y-KAST members on key topics such as:

- University Support Strategies for Young Scientists and Engineers
- Research Environment for Innovation-Driven and High-Risk R&D
- Supporting Young Researchers in International Collaborative R&D



Mar. 28~30 The 2nd Y-KAST International Conference

The Y-KAST International Conference (Y.I.C.) is an annual event hosted and organized by the Young Korean Academy of Science and Technology (Y-KAST). This inspiring event provides a platform for young scientists to showcase their achievements, share experiences, and foster face-to-face networking among its members and members of global young academies.



Aug. 21 The 4th YKAST-YAS Bilateral Symposium

Y-KAST and Young Academy of Sweden (YAS) held the 4th YKAST-YAS Bilateral Symposium under the theme of "The Role of Young Academies". Fourteen members of both young academies attended and actively participated in academic discussions.



Aug. 21~22 Korea-Nordics Next Generation Leader Workshop 2024

Y-KAST and Korea-Nordics S&T Cooperation Center (KNTEC) held the workshop under the theme of "Young Innovators in Nanotechnology: Pioneering the Future". The workshop featured presentations and discussions by thirteen young scientists from Korea and Nordics, covering a wide range of nanotechnology-related topics, including electronics and materials, as well as chemistry.



Dec. 11 2024 Y-KAST Members' Day

During this event, we presented the 2024 Y-KAST achievements and our business plan for 2025. We also introduced twenty new members of Y-KAST elected in 2024.



MEMBERS

THE KOREAN ACADEMY OF
SCIENCE AND TECHNOLOGY

- Fellows of KAST Elected in 2024 58
- Members of Y-KAST Elected in 2024 62



•• Fellows of KAST Elected in 2024

In 2024, KAST elected 36 new fellows. KAST selects scientists and engineers, who have been active in the field of science and technology, for more than 20 years, produced leading research results, and contributed significantly to the development of the field through a strict screening.

A total of 121 fellows participated in 22 Membership Committees and evaluated the candidates' 10 representative papers published with the candidate as the corresponding author on the excellence and originality of the research achievements, academic influence, and contribution.

>> Division of Policy Research



Dongwon SHIN Jeonbuk National University

- History of Korean Science
- History of Korean Medicine
- History of the Body in Korea

>> Division of Natural Sciences



Yongnam LEE KAIST

- Algebraic surfaces
- Deformation and moduli of algebraic varieties
- Birational Geometry



Bohm Jung YANG Seoul National University

- Topological phases of matter
- Frustrated magnets
- Quantum geometry



Kyung-Jin LEE KAIST

- Spintronics
- Magnetization dynamics
- Angular momentum transport in solids



Seung Bum PARK Seoul National University

- Unveiling Biological Processes with Fluorescent Bioimaging and Chemical Biology



Tae-Lim CHOI ETH Zurich

- Polymer synthesis
- Living polymerization
- Controlling nano-structures



Myung Hee KIM KRIBB

- Human-microbe/microbiome interactions
- Aminoacyl-tRNA synthetase biology
- Protein structure & function



Giltsu CHOI KAIST

- Phytochrome-mediated light signaling in plants
- The role of PIFs in phytochrome-mediated light signaling

>> Division of Engineering



Sumin KIM Yonsei University

- Building Environment and Materials
- Building Energy Efficiency



Ho-Young KIM Seoul National University

- Microfluid Mechanics
- Mechanics of Soft Matter
- Bioinspired Engineering



Frank Chongwoo PARK Seoul Natl Univ.

- Robotics
- Machine learning and mathematical data science



Il-Kwon OH KAIST

- Smart Materials and Structures
- Soft Robotics and Wearable Haptics
- Mechanical Vibration



Hongsoo CHOI DGIST

- Medical Robots, Micro/Nanorobots
- Micro/Nano-technologies, Micro/Nano Manipulation



Sang-Woo KIM Yonsei University

- Triboelectric and Piezoelectric Nanogenerators
- Energy Harvesting Materials



Byungha SHIN KAIST

- Thin film physics
- Photovoltaic materials and devices
- Perovskite light emitting diodes



Byonghyo SHIM Seoul National University

- Wireless Communications
- Signal Processing
- Deep learning



Sung-Bae CHO Yonsei University

- Hybrid Intelligence
- Machine Learning
- Intelligent Agent



Bumjoon KIM KAIST

- Electroactive Polymers
- Polymer Electronics
- Polymer Electrolytes



Yong-Young NOH POSTECH

- Next-generation semiconductor materials and devices (speciality in p-type semiconductors)



Sei Kwang HAHN POSTECH

- Biomaterials
- Drug Delivery
- Smart Healthcare System



>> Division of Agriculture and Fishery Science

- | | |
|---|--|
|  <p>Choong-Min RYU KRIBB</p> <ul style="list-style-type: none"> • Host-microbe interaction • Volatile-mediated inter- and intra-specific communications |  <p>Nam-Chon PAEK Seoul National University</p> <ul style="list-style-type: none"> • Plant Senescence • Molecular genetics of flowering time • Plant abiotic stress tolerance |
|  <p>Jae Woong RYOO Kyungpook Natl Univ.</p> <ul style="list-style-type: none"> • Laboratory Animal Medicine • Disease Model Animals • Laboratory of Animal Reproduction & Physiology |  <p>Jehee LEE Jeju National University</p> <ul style="list-style-type: none"> • Development of Multi-valent Fish Vaccines • Improvement of Economic Traits in Aquaculture Species Using Genomic Selection |
|  <p>Byung-Soo CHUN Pukyong Natl Univ.</p> <ul style="list-style-type: none"> • Clean Technologies Based Natural Bio-mass Processing • Bio-active Compounds Separation using Sub and Supercritical Fluids Technologies |  <p>Sang-Ho YOO Sejong University</p> <ul style="list-style-type: none"> • Biosynthetic process development of functionally-improved carbohydrate materials • Effect of carbohydrate linkage structure on human gut microbiome |
|  <p>Min Suk RHEE Korea University</p> <ul style="list-style-type: none"> • Epidemiology and pathogenesis of emerging pathogens and potentially hazardous foodborne microorganisms |  <p>Hae-Jeung LEE Gachon University</p> <ul style="list-style-type: none"> • Functional Food • Nutritional Biochemistry • Nutritional Epidemiology (Big Data) |

>> Division of Medical Sciences

- | | |
|--|--|
|  <p>Jin-Won SONG Korea University</p> <ul style="list-style-type: none"> • Hantavirus • Emerging viruses • Zoonotic viruses, Next-generation sequencing |  <p>Jeong Ho LEE KAIST</p> <ul style="list-style-type: none"> • Brain Somatic Mosaicism • Neurological Disorders • RNA therapeutics |
|  <p>Dong Ki KIM Seoul National University</p> <ul style="list-style-type: none"> • Kidney disease • Biobank • Omics |  <p>Seung Hyun KIM Hanyang University</p> <ul style="list-style-type: none"> • Precision and Stratification Medicine for Neurodegenerative Diseases • Stem cell therapy for Amyotrophic Lateral Sclerosis |
|  <p>Kyung Rim SUNG University of Ulsan</p> <ul style="list-style-type: none"> • Glaucoma pathophysiology • Glaucoma diagnosis by imaging • Classification of primary angle closure glaucoma |  <p>Eue-Keun CHOI Seoul National University</p> <ul style="list-style-type: none"> • Mechanism of atrial fibrillation and stroke prevention of atrial fibrillation • Autonomic nervous system on cardiac arrhythmogenesis |
|  <p>Sanghee KIM Seoul National University</p> <ul style="list-style-type: none"> • Total synthesis of natural products • Drug design & discovery • Reverse lipidomics |  <p>In Su KIM Sungkyunkwan University</p> <ul style="list-style-type: none"> • Development of novel synthetic methods based on C-H Functionalization • Discovery of novel anticancer and antidiabetic agents in medicinal chemistry |



•• Members of Y-KAST Elected in 2024

In 2024, KAST elected 20 new members to Y-KAST, selecting outstanding young scientists under the age of 45. A total of 104 KAST fellows and Y-KAST members participated in the Membership Committees, evaluating candidates based on the excellence and originality of their research achievements, academic influence, and overall contributions.

>> Division of Policy Studies

Youjung SHIN Jeonbuk National University

- History of Science
- STS
- Science & Technology Policy

>> Division of Natural Sciences

Jaehoon KIM KAIST

- Graph Theory
- extremal graph theory
- combinatorics

SungBin LEE KAIST

- Magnetism & Spin Liquids
- Emergent Topological Phenomena
- Quasi-periodic Systems

Jinhee PARK DGIST

- metal-organic frameworks (MOFs)
- Catalysis, Adsorption, Sensing

Chang Hyuck CHOI POSTECH

- Fundamental understandings of electrocatalysis
- Developments of new electrocatalytic materials

Sangkyu LEE IBS

- Synthetic Biology
- Molecular Optogenetics
- Intercellular Communications in the brain

>> Division of Engineering

Kangwoo CHO POSTECH

- Environmental Electrochemistry for Wastewater Refinery

Jinhyun CHOO KAIST

- Granular Mechanics: Elasto-plasticity and Rheology
- Fractures, Discontinuities, and Interfaces

Sanha KIM KAIST

- Manufacturing
- Contact Mechanics / Tribology
- Surface Engineering

Jihwan AN POSTECH

- Renewable Energy Devices (SOFC/SOCE/ Batteries)
- Unconventional Electronic Devices

Steven Euijong WHANG KAIST

- Responsible/Trustworthy/Safe AI
- Data-centric AI
- Big Data – AI Integration

Mikyung SHIN Sungkyunkwan University

- Hydrogel
- Tissue Adhesive, Tissue Regeneration
- Medical Polymers

Dongyeop OH Inha University

- Self-assembly of Nanofibril Materials
- Nano-mechanics & Rheology
- Recyclable & Durable Polymeric Composites

Ung LEE KIST

- Process Optimization
- CO₂ Capture & Utilization
- Integrated Capture & Conversion

>> Division of Agriculture and Fishery Science

Choon-Tak KWON Kyung Hee University

- Plant genetics and biotechnology
- Genome editing
- Crop improvement

Jun Won PARK Seoul National University

- Laboratory Animal Medicine
- Comparative Medicine
- Animal Models for Human Disease

Young Hoon JUNG Kyungpook Natl Univ.

- Alternative Foods
- Biomass
- Probiotics

>> Division of Medical Sciences

Hyun Jung CHUNG KAIST

- Drug & nucleic acid delivery
- Genome editing & therapy
- Cancer gene therapy

Si-Hyung LEE Seoul National University

- Vitiligo Melanogenesis Pigmentary skin disorders
- Scar Mechanobiology Fibrosis
- Cellular Senescence Skin aging

Jae-Kook CHA Yonsei University

- Periodontal Regeneration
- Biomaterials
- Implant surgery



