# 2023
# ANNUAL REPORT

The Korean Academy of Science and Technology

KAST 한국과학기술한림원
The Korean Academy of Science and Technology

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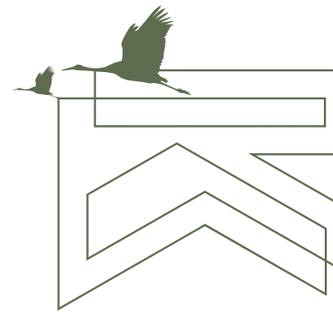
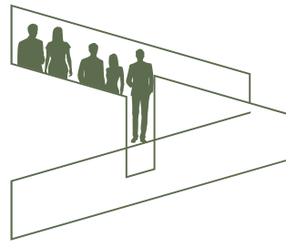
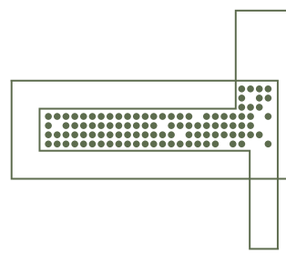






## THE KOREAN ACADEMY OF SCIENCE AND TECHNOLOGY

is an independent and nongovernmental organization,
consists of distinguished scholars in order to promote excellence in science.

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

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

KAST 한국과학기술한림원
The Korean Academy of Science and Technology

# Information

## Symbol Mark

In the Joseon Dynasty, officials in literature and martial arts wore embroidered badges on the chest and back of wearer's official robe to indicate their status and class. The badges were designed after animals such as dragon, phoenix, 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 get together." Today, "Han-lim-won" is generally used in Korea as a word meaning "academy."

한림원

- **Location**

  KAST building, 42(Gumi-dong), Dolma-ro, Bundang-gu, Seongnamsi, Gyeonggi-do 13630, Korea

- **Online channel**

  www.kast.or.kr

# Contents

# MESSAGE FROM THE PRESIDENT AND THE EXECUTIVE COMMITTEE

## “Creating a bright future for Korea and humanity through fostering talent and promotion of S&T”

In 2023, the international academic journal Nature selected 10 scientists who influenced the scientific community, and additionally recognized the generative AI ChatGPT. This marks the first time Nature has included a technology rather than a person, acknowledging ChatGPT’s significant role in scientific progress and innovation. Since 2010, the computational speed of AI has increased tenfold annually, and the computing power of chatbots has improved a hundredfold every two years. It is no exaggeration to say that we are living in an era of technological revolution. In this AI-driven industrial ecosystem, what is the role of humanity?

The Korean Academy of Science and Technology (KAST) firmly believes that the answer still lies with people. We must focus even more on nurturing talented individuals who will drive innovation, creating a science and technology ecosystem that is humane, and ensuring that scientific and technological achievements can enhance the lives of citizens and humanity. Particularly, as KAST comprises distinguished scholars in science and technology, our role and mission as leaders in this field are becoming increasingly significant.

Over the past year, KAST has tirelessly dedicated itself to the development of science and technology in Korea, the cultivation of talent, and the creation of a healthy research and development ecosystem.

First, we held 18 expert discussions, including the KAST Roundtable Discussions, throughout the year, utilizing them as a platform for communication in science and technology across society and for proposing policies. Additionally, we launched a new initiative called Great Scholar Career Decisions, a project aimed at documenting and disseminating the research know-how of leading figures in various scientific and technological fields. The outcomes of these lectures and writing programs have been repurposed into science culture content such as videos and comics tailored to the general public, thereby contributing to presenting role models for budding scientists. We have also worked diligently to enhance international recognition and status for top researchers in basic science by actively promoting scientific and technological exchanges with academies in developed countries. We hosted two joint symposiums with the academies of Israel and Germany and successfully concluded ten InterAcademy Workshops.

In the era of declining population, we sought opinions from various sectors on continuously securing scientific and technological talent and explored future directions. As a priority, we strengthened talent development programs to help young people interested in science realize the pure joy and value of scientific research and choose careers as researchers. We also emphasized exchanges with middle and high school educational institutions.

KAST engaged in activities to enhance social value as well. Through the “Science and Technology Project to See and Hear Together,” we produced and distributed 12 discussion videos and four lectures on advanced science and technology issues with sign language and subtitles, both online and offline, making science information and culture accessible to socially neglected groups. This is part of our continuous efforts to enhance the social value of science and technology.

This year marks the 30th anniversary of KAST. We have built a strong foundation over the past 30 years thanks to support from the scientific community and the dedication of our members. Now, it is time to set firm goals and move forward unwaveringly.

KAST will expand the participation of science and technology experts in national policy-making, enhance our policy research and advisory functions to address national issues and future challenges based on science and technology, and effectively convey expert consensus on topics in demand by the government and the National Assembly.

Furthermore, through science and technology diplomacy, we will elevate the stature of Korean science and secure international leadership. We will develop projects for international cooperation and joint research based on networks with advanced countries, and promote mutual growth through active talent exchanges with developing countries.

Hans Moravec, an American robotics engineer, once paradoxically highlighted the difference between human and computer abilities in the 1970s by saying, “What is easy for humans is hard for computers, and what is hard for humans is easy for computers.” KAST will focus on nurturing talent to bridge the eternal gap between humans and artificial intelligence, and continue to shape a hopeful future that only humans can achieve.

Thank you.

February 2024
**Ook Joon Yoo,** President of KAST
and Members of the 10th Executive Committee

# 10 HIGHLIGHTS FROM 2023

## 01 Hosting of Nobel Prize Dialogue Seoul 2023

On September 24, KAST co-hosted the Nobel Prize Dialogue Seoul 2023 with Nobel Prize Outreach, a subsidiary of the Nobel Foundation in Sweden. The event was attended by 1,306 people, including 5 Nobel laureates and 20 world-renowned scholars who engaged with the Korean public on the theme “Future Learning: Exploring Science and Technology.” The audience, which included young students, university students, scientists, educators, businesspeople, and parents, actively participated in lectures and discussions.

## 02 Presenting expert opinions on key issues of science and technology

One of KAST’s foundational purposes is to make scientific and technological knowledge accessible and comprehensible to all. The KAST Roundtable Discussions, which began in 1996, serve as a platform for communication and policy proposals on science and technology across society. In 2023, one of the most talked-about social issues was the domestic impact of the discharge of treated Fukushima contaminated water, which was the focus of an in-depth discussion that garnered significant public interest. Additionally, through the “Quality of Life Series,” KAST addressed topics closely related to the lives of the public. Throughout 2023, KAST held 18 events, including the KAST Roundtable Discussions, joint forums, and meetings, covering a wide range of topics from science and technology policies and strategies to national and societal issues affecting citizens’ lives.



## 03 Expanding cooperation with high schools to strengthen support for nurturing talent in science and technology

KAST is committed to providing opportunities for high school students with an interest and talent in science to grow into key figures in science and technology, thereby enhancing the future competitiveness of Korea’s science and technology. To this end, KAST has strengthened talent development programs and collaborations with frontline educational institutions. One session of the KAST Roundtable Discussions on the topic of “Desirable Student Selection and Education as Discussed by Principals of Science, Gifted, and Autonomous Private High Schools” was held to examine the problems of existing admissions and education systems and explore solutions with various experts in education. KAST also signed agreements with the Council of National Science High School Principals and the Busan Institute for Gifted Education and Promotion to enhance the quality of youth science education and continuously foster scientific talent.

## 04 Presenting role models for aspiring scientists through Great Scholar Career Decisions

This year, through the “Great Scholar Career Decisions” initiative, KAST broadly disseminated the research know-how of leading figures in various scientific and technological fields. Approximately 30 distinguished scholars participated, sharing the challenges they faced, the secrets to overcoming them, and their research philosophies. The outputs from these lectures were repurposed into science culture content such as videos and comics to make them accessible to the general public.

# 10 HIGHLIGHTS FROM 2023

## 05 Expanding scientific and technological exchange in collaboration with similar academies in developed countries such as the UK, Germany, and Israel

KAST facilitates the exchange of information and opinions on current issues with foreign academies and hosts academic events on areas of mutual interest, expanding global networks for Korean researchers and promoting international cooperation and exchange. This year, it held bilateral symposiums with the UK, Germany, and Israel, representing Korean science and technology at international scientific organizations. Additionally, the Science Networking Center, established in 2022, has been utilized to share the latest achievements and provide networking opportunities for domestic scientists with world-class researchers.

## 06 Strengthening leadership in Asia

Since 2012, KAST has been actively operating the Association of Academies and Societies of Sciences in Asia (AASSA) Secretariat, asserting leadership in the Asian region. AASSA, supported by Professor Emeritus Yoo Hang Kim of Inha University, established the Prof. Yoo Hang Kim Young Women Scientists Award to support international academic activities of young female scientists in Asia. Earlier this year, KAST also delivered funds raised by its esteemed members for scientists affected by the earthquake in Türkiye.

## 07 Planning and proposing research support programs to foster a creative and efficient R&D ecosystem

Through planning and research, KAST actively advises relevant ministries on research policies necessary for the development of science and technology in Korea. This year, the “Discovering System on Establishing Future Promising Seed Technology” project was launched to move beyond the “catch-up” R&D system and establish a world-leading R&D framework. Additionally, KAST proposed measures to implement the “Research Support Program for Distinguished Scientists.” The National Science Challenges Support & Network (NSCN), active since 2020, has been recognized for building a Korean-style R&D support system, contributing to fostering a progressive and risk-taking research culture.



## 08 Expanding contributions to enhance social value

KAST produced and distributed 12 discussion videos and four lectures on advanced science and technology issues with sign language and subtitles through the “Science and Technology Project to See and Hear Together.” Moreover, as part of the “Meeting with KAST Scholars” program, four topics were selected and developed into sign language-embedded science lecture materials, which were distributed to 394 institutions, including schools for the hearing impaired and welfare centers, making science information and culture accessible to neglected groups and enhancing the social value of science and technology.

## 09 KAST Hall renovation and supporting member exchange events

The KAST Hall, built 20 years ago, is under renovation. Last year, President Ook Joon Yoo revamped the first-floor lobby into a lecture and writing space, which has been used for social contribution activities and exchanges among scientists, including the “Great Scholar Career Decisions” lectures. In 2023, the basement auditorium and lobby were also renovated.

## 10 Improving the membership evaluation system by adopting qualitative assessment

KAST is exerting efforts to recruit outstanding members, improving its membership selection system to acknowledge scholars with recognized academic excellence. Moving away from quantitative evaluations such as journal impact factors (IF) or author h-indices, the focus has been on thoroughly reviewing the quality of candidates’ research achievements and the originality of their publications. KAST aims to ensure that scholars serve as role models demonstrating the excellence of Korean science and technology, and will continue to select members with greater rigor and attention.

KAST

THE KOREAN ACADEMY OF
SCIENCE AND TECHNOLOGY

## STATUS



# Summary

## General Status

### Date of Establishment

› November 22, 1994

### Objectives

› KAST contributes to progressing science in Korea supported by its members' exceptional professional competence. Its members are elected by peers in recognition of distinguished achievements in their respective fields.

› As the leading science institution of the country, KAST plays an integral role in strengthening the foundation of science and technology and in preparing to meet the challenges of future needs of our nation and the global society. KAST is also an independent, autonomous, and nonprofit academic organization. It provides the nation with professional and objective analysis and scientific advice to lead policymakers to make sound policy decisions.

› KAST actively seeks international academic collaboration and interacts with counterparts to reach the highest standards of excellence and carries out responsibilities as nongovernmental diplomacy to advance science and technology in Korea.




## Vision and Strategy

**MISSION**

To promote science and technology by consolidating a creative national foundation

**VISION**

A dynamic academy

**CORE VALUES**

- Future strategies for national science and technology
- International leadership
- Social responsibility through science and technology

**STRATEGIES**

**Develop a creative environment**

- To build a social framework for basic science-oriented knowledge creation
- To foster creative and multidisciplinary human resources in science and technology
- To promote science and technology as a driving force of a creative economy
- To establish national science and technology policies
- To secure financing and operational independence

**Establish international leadership**

- To provide scientific and technological assistance to developing countries
- To produce coordinated international responses to global issues
- To secure global leadership by facilitating international exchange
- To promote strategic international cooperation and joint research activities
- To make preparations for inter-Korean cooperation for the reunification of the Korean Peninsula

**Promote a people-friendly science culture**

- To build a rational society based on a sophisticated science culture
- To promote local science by supporting local fraternities
- To reinforce the social responsibility of scientists and engineers
- To expand KAST members' social activities and participation
- To develop technologies for less privileged people

# 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/distinguished scholars lecture/symposium launched
- The 1st KAST distinguished scholars lecture held

**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**
- Signed an MOU with the Royal Swedish Academy of Sciences
- Association of Academies of Sciences in Asia(AASA) launched and secretariat established

**2001**
- **The 3rd President In Kyu Han inaugurated**


**2002**
- KAST Advisory Committee founded

**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**
- "English/Korean and Korean/English Key Science & Technology Terminology Dictionary" published

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

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

**2008**
- Mentor 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
- 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
- "20 years of the KAST history" published

**2015**
- "Cargill-KAST Bioscience Award" launched
- "Daesang-KAST Food Science Award" launched

**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
- Nobel Prize Dialogue Seoul 2017 held


**2018**
- Sejong Science & Technology Forum held

**2019**
- **The 9th President Min-koo Han inaugurated**
- General Assembly of the InterAcademy Partnership (IAP) held
- "S-Oil Young Scientist Award" launched


**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
- The KAST Award in Physiology or Medicine established and awarded
- Implemented production projects, including science and technology Braille books, audiobooks, and sign language lecture videos for the socially disadvantaged

**2021**
- "Amgen-KAST Biotechnology Award" launched
- Proposed and prepared the IAP statement

**2022**
- **The 10th President Ook Joon Yoo inaugurated**
- Science Networking Center established
- Great Scholar Career Decisions lecture commenced

**2023**
- Nobel Prize Dialogue Seoul 2023 held

# Membership

KAST consists of approximately 1,100 members, who together represent the country's foremost expertise in the sciences. KAST contributes to progressing science in Korea supported by its members' exceptional professional expertise. Its members are elected by peers in recognition of distinguished achievement in their respective fields in both Korea and international communities.

## 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 Member.

### Fellow

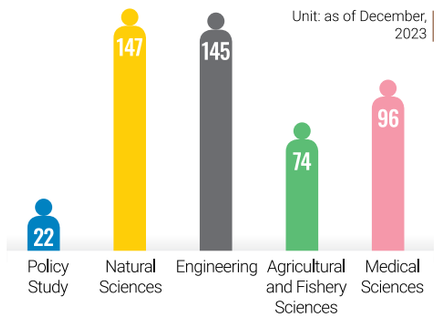
› Qualification

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

› Term

Until 70 years of age

Unit: as of December, 2023




Total **484**

### Fellow Emeritus

› Term

Lifetime

### Associate Member

› Qualification

Selected from excellent scientists up to 100 persons

› Term

5 years, possible to be reelected once

### Foreign Member

› Qualification

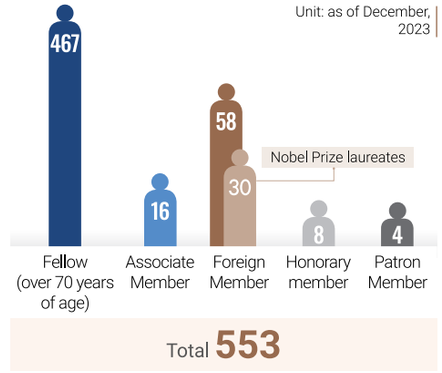
Foreign Scholars who have made outstanding academic achievements

### Honorary and Patron Member

› Qualification

Individuals, corporations and organizations supporting KAST programs

Unit: as of December, 2023




Total **553**

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

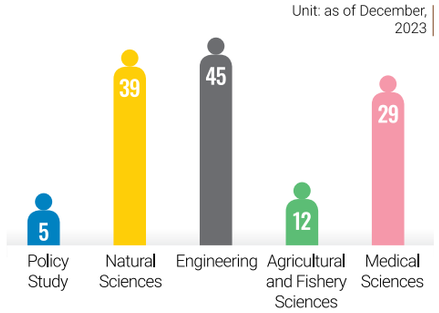
› Qualification

Brilliant young Korean scientists who are 45 years old or younger

› Term

3 years, re-appointment permitted until 45 years of age

Unit: as of December, 2023



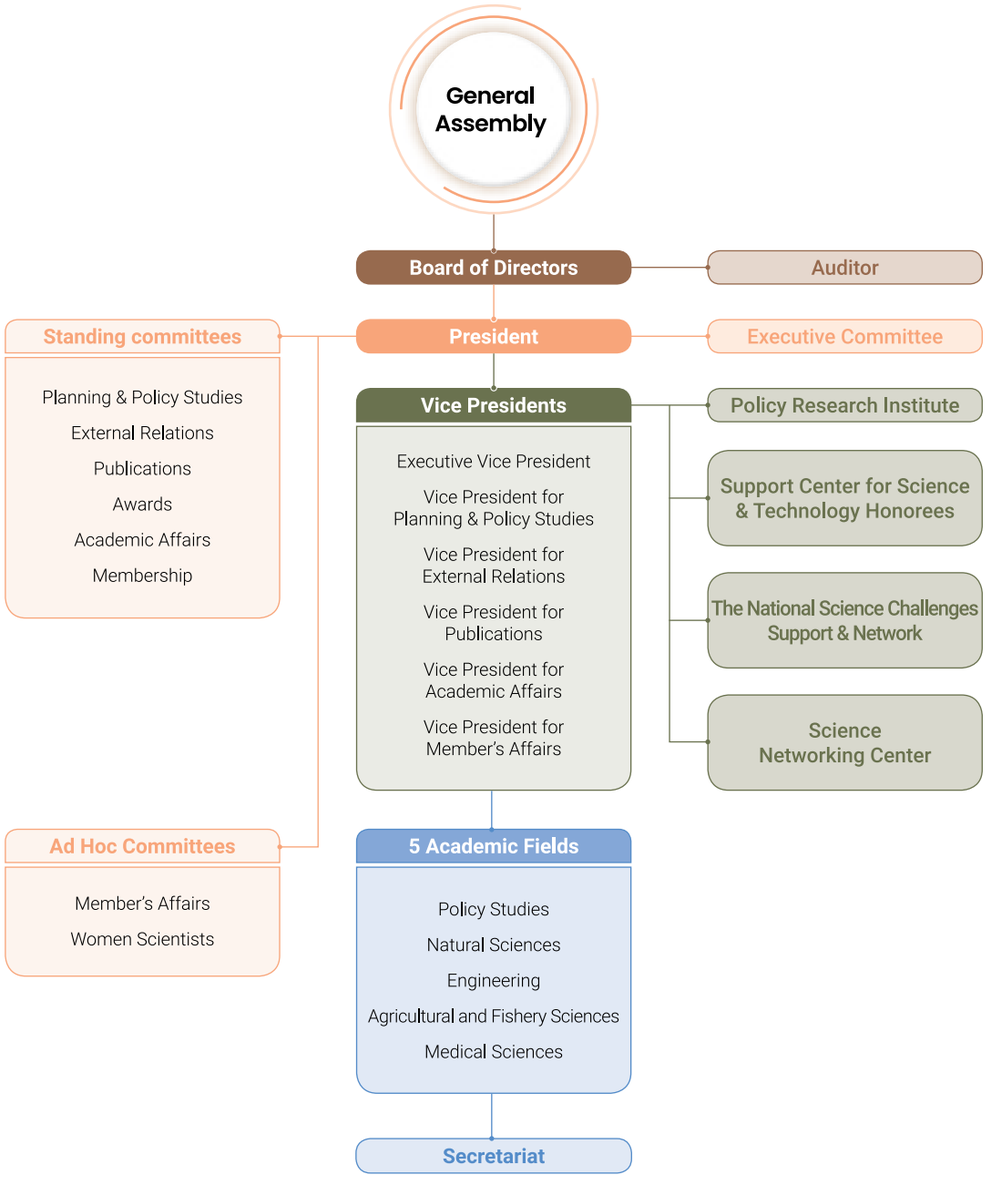

Total **130**

*** Alumni members**

**88** Appointed from among Y-KAST members whose terms are about to expire/
Term: Until 50 years of age

# Organization

## Organization of KAST






## Board of Directors

### Chairman

**Min-Koo Han**
Prof, Emeritus of Seoul National University

### Director

**Sang-Cheol Bae**
Prof. of Hanyang University

**Dongchun Shin**
Prof, Emeritus of Yonsei University

**Jung Han Yoon**
Prof, Emeritus of Hallym University

**Kong-Rae Lee**
President of Asia Innovation Research Institute

**Doo Sung Lee**
Prof, Emeritus of Sungkyunkwan University

### Auditor

**Yung-Jue Bang**
Prof, Emeritus of Seoul National University

**Sang Yeol Lee**
Prof. of Gyeongsang National University

**Youngsook Lee**
Prof. Emeritus of POSTECH

**Yong-Hee Lee**
Prof. Emeritus of KAIST

**Seung-Bok Choi**
Prof. Emeritus of Inha University

**Joonho Choe**
Prof. Emeritus of KAIST

**SangJo Jong**
Prof. of Seoul National University

**Hunjoo Ha**
Prof. Emeritus of Ewha Womans University

**Soon Hyung Hong**
Prof. Emeritus of KAIST

**Ook Joon Yoo**
President of KAST

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

## Executive Committee

**Ook Joon Yoo**
President
Prof. Emeritus of KAIST

**Changhee Lee**
Executive Vice President
Distinguished Prof. of Hanyang 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 WISET

**Youngjo Lee**
Vice President for Publications
Chair Prof. of Dankook University

**Hoon Teak Lee**
Vice President for Academic Affairs
Prof. of Konkuk University

**Pil Hoon Choung**
Vice President for Member's Affairs
Prof. Emeritus of Seoul National University

**Youngbae Kim**
Division Chairs for Policy Studies
Prof. of KAIST

**Byeang Hyean Kim**
Division Chairs for Natural Sciences
Prof. of POSTECH

**Hyung Hee Cho**
Division Chairs for Engineering
Prof. of Yonsei University

**Hyun Jin Park**
Division Chairs for Agricultural and Fishery Sciences
Prof. of Korea University

**Young Joon Surh**
Division Chairs for Medical Sciences
Prof. of Seoul National University

**Joong Hee Lee**
Directors for Domestic Academic Affairs
Prof. of Jeonbuk National University

**Wonwoo Nam**
Directors for International Academic Affairs
Prof. of Ewha Womans University

**Dae Young Kwon**
Directors for Domestic Cooperation
Prof. of Hoseo University

**Jun Soo Kwon**
Directors for International Cooperation
Prof. of Seoul National University

**Young Keun Kim**
Directors for Chair of Y-KAST
Prof. of Korea University

**Sunyang Chung**
Policy Research Institute Director
Prof. of Konkuk University

**Jang-Ryol Liu**
Support Center for Science & Technology Honorees / Director
Honor Researcher of KRIBB

**Hyung Jin Sung**
The National Science Challenges Support & Network / Director
Prof. Emeritus of KAIST

**Doo Sung Lee**
Science Networking Center / Director
Prof. Emeritus of Sungkyunkwan University

KAST

THE KOREAN ACADEMY OF
SCIENCE AND TECHNOLOGY

## ACTIVITIES



# Advice for Policy Makers and Society

The research and advice of KAST serve as a compass which guides policymaking on science and technology 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

As the institution's most representative forum for policy discussion since 1996, the KAST's Roundtable Discussions is established to formulate long-term visions and development strategies, and to explore solutions for pending issues in science & technology.

Distinguished scholars of KAST and other experts in diverse areas discuss in depth about extensive issues, which directly affect the people's lives as well as policies in science & technology.

In particular, this year's conference covered a variety of topics, including mid- and long-term policies such as collecting opinions for new S&T innovation policies in the era of techno-politics, social issues such as the treatment of Fukushima contaminated water, and advanced science and technology to improve the quality of life.

KAST is leading a culture of discussion based on scientific facts, seeking agendas that proactively respond to paradigm shifts in science and technology and new social needs.


## Exclusive KAST Open Forum

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

| Date | Theme |
|---|---|
| Mar. 15 | Will Korean women scientists ever win a Nobel Prize? |
| Mar. 22 | New directions for S&T policy in the age of techno-politics |
| Apr. 13 | What's wrong with our food? |
| May. 24 | The present and future of alternative protein foods and cultured meat |
| Jun. 14 | Thinking about the future of gifted education |
| Jul. 6 | Domestic impact of Fukushima contaminated water discharge after treatment |
| Jul. 12 | In search of answers to secure science and technology talent in the age of population decline |
| Aug. 17 | Desirable student selection and education discussed by principals of science high school |
| Oct. 27 | Major shift in science and technology policy for improving the quality of life of citizens |
| Nov. 9 | Data-based diets and medicine for improving quality of life |
| Dec. 5 | Personal mobility for improving quality of life |
| Dec. 19 | New medical service revolution: Digital therapeutics |

## Joint Discussion with relevant organizations

KAST jointly hosted six policy forums with relevant organizations in the science and technology sector. Online joint forums were held with the National Academy of Medicine of Korea (NAMOK) on the topic of COVID-19, while policy forums were conducted with organizations such as the Innopolis Foundation and the Presidential Advisory Council on S&T.

| Type | Date | Theme |
|---|---|---|
| Joint online forum | Mar. 23 | Forum on our coordinates and strategies for securing weapons against the next epidemic |
| | Aug. 31 | Joint forum on response tasks and improvement directions, such as vaccination preparations for the resurgence of COVID-19 |
| | Oct. 25 | Training measures for healthcare professionals in preparation for new epidemics |
| Policy forum | Jul. 28 | Future strategy forum commemorating the 50th anniversary of Daejeon Innopolis(DI) : The role of DI in the present and the future of South Korea |
| | Aug. 25 | Invitational meeting with the Vice Chairperson of the PACST: Plan for National S&T innovation envisioned by young researchers |
| | Sept. 25 | Joint seminar with NAMOK: Government R&D investment and national science and technology competitiveness |


## KAST Communique

The “Voice of the KAST” is designed to provide a long-term vision and development strategy for national science and technology, provide scientific and technological approaches to the current issues of the nation/society and derive solutions thereof.

Based on the expert analysis and opinions of scholars in related fields, improvement schemes for policies, related laws and regulations are proposed and also distributed to the Korean government, the National Assembly, and related organizations.

Started off with the first edition titled “Korean students avoiding science and engineering | How to elevate status of the Korean science and technology,” publications had been made about 5 to 10 times a year. In 2023, six editions were distributed, totaling 108 editions thus far.

| Number | Title |
|---|---|
| 103rd | Directions for the development of domestic basic science research through big science based on large-scale research facilities and equipment |
| 104th | Is our food policy okay as it is? |
| 105th | In the era of techno-politics, changes in science and technology innovation policies are now necessary |
| 106th | Urgent need for guidelines on the production and sale of alternative protein such as cultured meat |
| 107th | Systematic improvements are needed for the selection and training of outstanding talent capable of driving innovation in future society |
| 108th | Challenges and policy recommendations for enhancing competitiveness in digital therapeutics |

## S&T Policy Report

KAST members conduct research and write reports on Korea's mid to long-term policies in science & technology, and suggest to the government to reflect the research results into national science & technology policies. These suggestions primarily cover following issues; ▲Creating the foundation for promoting research in basic science ▲Assessing and advising policies in science & technology ▲Encouraging young talents to study science, and etc.

In 2023, 3 research reports were published.

| Number | Title |
|---|---|
| 150th | Responsibilities and Roles of KAST for Socially Vulnerable People |
| 151st | Policy study for the management of endocrine disrupting chemicals |
| 152nd | Major Projects for Carbon Neutrality Based on Climate and Environmental Information |

## Issue Report

These are scientific and technological policy proposals that directly offer scientific insights from leading experts in the field, addressing the challenges facing our society. They also reflect the perspectives of expert research committees. Scientists are highly regarded for providing essential expertise and data, which are valuable resources for policymakers in government, the National Assembly, and related agencies.

In 2023, 3 issue reports were published.

| Number | Title |
|---|---|
| Vol. 01 | Is our food okay in the era of climate crisis? |
| Vol. 02 | New directions for science and technology innovation policies in the era of technological hegemony |
| Vol. 03 | Measures to utilize highly skilled senior female scientists in the era of population decline |



## Young Academy Report

"Young Academy Reports" is policy recommendation based on the thoughts and ideas of young scientists, mainly the members of the "Young Korean Academy of Science and Technology (Y-KAST)". Each report contains policy approaches to support promising science and technology research areas and core technologies to strengthen national competitiveness on the global stage.

In 2023, 4 young academy reports were published.

| Number | Title |
|---|---|
| Vol.01 | Next-generation tandem solar cell technology: K-Solar |
| Vol.02 | New medical service revolution: Digital therapeutics |
| Vol.03 | Achieving true collaboration between theoretical and experimental research? |
| Vol.04 | Technological evolution and future possibilities of artificial intelligence language models |

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

KAST has published a policy proposal called "Great Scholar Career Decisions," selecting five scholars and deriving future development strategies for each research field based on the research know-how of science and technology leaders.

In 2023, 4 strategy reports were published.

| Number | Title |
|---|---|
| Vol.01 | Policy recommendations for securing breakthrough technology for perovskite solar cells |
| Vol.02 | Statistics: Paths of academic study and industrial application |
| Vol.03 | Science leadership proposed by Myung Oh, the first deputy prime minister for science and technology |
| Vol.04 | Climate-smart forestry in the carbon-neutral era |

## National Science Challenges Support & Network (NSCN)

KAST has been operating the “National Science Challenges Support & Network (NSCN)” for the successful execution of the “National Convergence Research of Scientific Challenges Project,” which is a leading convergence R&D project that approaches unresolved scientific challenges with creative and innovative ideas.
KAST is in charge of discovering and selecting candidates for scientific challenges, and planning customized scientific challenges. We support conferences, annual reports, and international cooperation activities where researchers can exchange knowledge and experiences accumulated through challenging scientific research.

## Major Activities in 2023

### › Selection of four major tasks and 12 scientific challenges for 2023

| | | |
|---|---|---|
| Task I | Breakthrough Challenge | ① Is artificial intelligence considering various functions of human sensory organs possible? |
| | | ② Can new scientific technologies change existing scientific theories and paradigms? |
| | | ③ Can computational science and deep learning innovate basic research theories and experiments? |
| Task II | Sustainability Challenge | ④ Is innovation possible in new materials or carbon removal processes for moonshot-type carbon neutrality? |
| | | ⑤ Is innovation possible in sustainable energy and resource recovery technologies approaching carbon zero-emission? |
| | | ⑥ What are the new approaches needed for climate and environmental monitoring and prediction? |
| Task III | Health Challenge | ⑦ Can we solve chronic pain? |
| | | ⑧ Can we overcome refractory cancer? |
| Task IV | Challenge Beyond Imagination | ⑨ What are the mathematical puzzles to be solved in the 21st century? |
| | | ⑩ Can we solve various interdisciplinary challenges in physics, chemistry, biology, medicine, manufacturing, etc., through large-scale analysis and mathematical modeling? |
| | | ⑪ Can we elucidate the theoretical principles of data science and machine learning? |
| | | ⑫ Can we overcome the limits of human prediction? |



### › National Science Challenge Initiatives of 2023

With the launch of 8 new research groups in 2023, in addition to the existing 9, a total of 17 interdisciplinary research groups are currently tackling scientific challenges.

| | |
|---|---|
| **Atmospheric Carbon Light Conversion Research Group** | Development of artificial photosynthesis factories for atmospheric carbon dioxide<br>**PI**<br>Prof. **Hyunwoong Park** (Kyungpook National University) |
| **Battery Resource Recycling Research Group** | Development of lithium iron phosphate battery recycling technology to maximize the utilization of carbon dioxide<br>**PI**<br>Prof. **Kyungjung Kwon** (Sejong University) |
| **Chiral Nano-optics Research Group** | Nano-optical control and detection of material chirality based on nano-magnetic properties<br>**PI**<br>Prof. **SeokJae Yoo** (Inha University) |
| **Mechanical Pain Control Research Group** | Development of powerful analgesics to suppress intractable chronic pain based on mechanical channel research<br>**PI**<br>Senior Researcher. **Uhtaek Oh** (KIST) |
| **Complex Electric Double Layer Research Group** | Development of water-based lithium-metal hybrid capacitor technology through control of complex electric double layers<br>**PI**<br>Prof. **Young Soo Yun** (Korea University) |
| **Dormant Cancer Ecosystem Control Research Group** | Development of control technology for dormant cancer ecosystems based on multi-scale modeling<br>**PI**<br>Prof. **Jae Ho Cheong** (Yonsei University) |
| **Carbon Negative Research Group** | Nexus of carbon-negative materials and applications<br>**PI**<br>Prof. **Jong Hyeok Park** (Yonsei University) |
| **HYPE Perceptive Nervous System Research Group** | Investigation of the mechanism of chronic pain based on patient-centric neural signaling and development of non-invasive treatment methods<br>**PI**<br>Prof. **Euiheon Chung** (GIST) |

### › Support scientific challenge research

Formation of expert committees, tailored consulting support, hosting “Performance Review Workshops,” and analysis of global trends

### › Support of international cooperation

Identifying international partners through big data analysis using Nature research-Dimensions, analyzing overseas research trends on scientific challenges and providing them to research groups, and hosting of workshops with invited overseas experts

## Other Projects

### Entrusted Research Project

› Discovering System on Establishing Future Promising Seed Technology

| | |
|---|---|
| Period | Sept. 15, 2022 - Jun. 14, 2023 (9 months) |
| Objectives | Establish a research support system that discovers leading source technologies with significant ripple effects |
| Content and Scope | • Investigation of the current status of domestic source technology development projects<br>• Analysis of advanced technology designation and development strategies of major countries<br>• Deriving key promising source technologies that require government R&D investment<br>• Establishment of legal and institutional improvement measures to establish mid- to long-term main promising source technology R&D promotion strategy |
| Expected Outcomes | • Reinforcing the consistency and continuity sustainability of mid- to long-term roadmap planning for government R&D investment and policy implementation<br>• Presenting a direction in which main promising source technologies are linked to the nation's flagship industry<br>• Using the results as the reference and basic data for policy establishment |

### Ongoing Advisory Activity

› Measures for the implementation of Distinguished Scientist Research Support Program (tentatively named Senior NRL)

| | |
|---|---|
| Period | Feb, 2023 - Mar, 2023 (2 months) |
| Objectives | By selecting outstanding scholars and scientists with exceptional research capabilities and passion, and supporting them to continue their research activities even after retirement, KAST aims to maximize the utilization of the nation's valuable science and technology assets and contribute to enhancing national competitiveness. |
| Content and scope | • Investigation of the current status of retirement systems for scientific and technological research personnel in advanced countries<br>• Review of retirement age and research productivity issues for scientific and technological personnel<br>• Proposal for the target, scale of support, selection criteria, and support period for the research support program for distinguished scientific and technological research personnel |
| Expected Outcomes | • Strategic preparation and response to the shortage of scientific and technological personnel due to aging population and low birth rate<br>• Overcoming issues of research outcomes and productivity decline among researchers aged 50 to 60 with excellent research capabilities |



### Infographic Book

KAST publishes "Infographic Book" containing highlights of Policy Study Reports and Next-generation Reports, and distributes them to middle and high schools and decision makers to help them understand our suggestions and recommendations more easily. Infographic Books are also available online via the KAST homepage and other channels.

### Science for All Conversations

KAST has launched the 'Science for All Conversations' initiative to make scientific and technological knowledge and information accessible and familiar to everyone, thereby enhancing the social value of science and technology.

KAST produced 12 video recordings of the KAST discussions, including topics closely related to people's lives, such as the 'Improving Quality of Life through Science and Technology' series, as well as recent scientific and technological issues like Fukushima contaminated water and cultured meat. These videos, featuring sign language interpretation and subtitles, have been posted on the KAST's YouTube channel.

# People-friendly Science Promotion

KAST takes the initiative in nurturing talents in science and technology to strengthen the national competitiveness in the future. All members of KAST are committed to sharing their expertise and knowledge with the public to fulfill their noblesse oblige.

KAST tries 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 recipient.

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

## Meeting with KAST Scholars

This is a nationwide science lecture program in which KAST members directly visit young students under the slogan of “Meeting between leading scientists of the country and young talents who will lead the future”.

If schools apply for the program, distinguished scholars of KAST will visit schools, deliver lectures on latest science & technology, and provide students with counseling on their career paths.

With the exceptional responses from the participating schools, the program was further expanded in 2014.

KAST has been selecting schools in areas where scientific, technological, and cultural benefits, and information are weak, compared to those of Seoul. In 2023, the lectures were held at 79 schools with timely topics that satisfied the intellectual curiosity of students, such as “new drug development,” “precision medicine and AI,” “nanomaterials,” “brain science,” “genetic correction,” “future cars,” etc., and 43 of the schools were in rural areas.

### 2023 statistics

Number of lectures
**79** times

Attendees
Approximately **10,050** students

Number of lectures targeted at schools located in rural areas
**43** times
**54** %

## Mentor Program for Outstanding Students

This is a mentoring program which provides an opportunity of 1:1 mentoring with distinguished scholars in science & technology of Korea. It was designed for scientifically talented 1st and 2nd year high school students to further develop their talents in science & technology. This program motivates creative students to grow into excellent scientists through 5-month long systematic mentoring.

In order to help students to carry out their own projects, their mentors are those from among the top scholars in the fields of mathematics, physics, chemistry, life sciences and bioengineering. The program application rate is increasing every year because of its reputation for effective learning methods focused on experimentation and practice, as well as the enthusiastic mentees.

In particular, KAST focused on striking a balance between regions and realizing gender equality by prioritizing the selection of students from rural areas and female students as mentees.

### 2023 statistics

Number of mentees
**31** mentees

Number of mentors
**31** mentors

Proportion of students from rural areas
**45** % (14 persons)

**55** % (17 persons)
Proportion of female students

## Great Scholar Career Decisions Lecture Series

Great Scholar Career Decisions was launched to derive development strategies for the Korean science and technology by utilizing the accumulated knowledge and experience of the best scientists.

In 2023, 32 lectures of the Great Scholar Career Decisions were held to share outstanding research achievements and decision-making process of individual scholars with colleagues and future scientific talents. These lectures were made into videos and posted on YouTube. One of the lectures was also turned into a comic book.

### Lectures Great Scholar Career Decisions 2023

| Date | Speaker | |
|---|---|---|
| Feb. 9 | Prof. **Changyoung Kim** | Seoul National University |
| Feb. 9 | Prof. **Ji Hoon Ahn** | Korea University |
| Feb. 17 | Prof. **Kwang Ho Kim** | Pusan National University |
| Feb. 17 | Prof. **Hyung Joon Cha** | POSTECH |
| Feb. 23 | Prof. **Ki Hun Park** | Gyeongsang National University |
| Feb. 23 | Prof. **Hyeon Gyu Lee** | Hanyang University |
| Mar. 3 | Prof. **Seong-Gyu Ko** | Kyung Hee University |
| Mar. 10 | Prof. **Jeong Young Park** | KAIST |
| Mar. 10 | Prof. **Dong-Gyu Jo** | Sungkyunkwan University |
| Mar. 17 | Prof. **Hong-Gyu Park** | Korea University |
| Mar. 17 | Prof. **Chung-Mo Park** | Seoul National University |
| Mar. 24 | Prof. **Eilhann E. Kwon** | Hanyang University |
| Mar. 24 | Prof. **Seung Hwan Ko** | Seoul National University |
| Apr. 4 | Prof. **Cheol-Heui Yun** | Seoul National University |
| Apr. 4 | Prof. **Woo-Kyun Lee** | Korea University |
| Apr. 7 | Prof. **Kook, Hyun** | Chonnam National University |

| Date | Speaker | |
|---|---|---|
| Apr. 7 | Prof. **Jung-Joon Min** | Chonnam National University |
| Apr. 12 | **Hyun Soon Lee** | Former Vice Chairman, Doosan |
| Apr. 14 | Prof. **Heung Nam Han** | Seoul National University |
| Apr. 14 | Prof. **Won-Kyo Jung** | Pukyong National University |
| Apr. 19 | Prof. **Soyoung Kim** | KAIST |
| Apr. 19 | Prof. **Wonshik Choi** | Korea University |
| Apr. 25 | **Myung Oh** | Honorary President of SUNY Korea |
| May. 4 | Prof. **Myungjoo Kang** | Seoul National University |
| May. 4 | Prof. **Sung Keun Lee** | Seoul National University |
| May. 9 | Prof. **Sung-Hoon Ahn** | Seoul National University |
| May. 9 | Prof. **Jae Hyung Park** | Sungkyunkwan University |
| May. 12 | Prof. **Jaekook Kim** | Chonnam National University |
| May. 12 | Prof. **Yongtaek Hong** | Seoul National University |
| Jun. 15 | Prof. **Sung Hyun Park** | Konkuk University |
| Aug. 11 | Prof. **Nam-Gyu Park** | Sungkyunkwan University |
| Sept. 15 | **Won-Hoon Park** | former president of KIST |

### Comic Book Great Scholar Career Decisions 2023


| Number | Title |
|---|---|
| Vol.01 | Hero of the Korean Engine, **Hyun Soon Lee** |

## Nobel Prize Dialouge Seoul 2023

KAST hosts lectures featuring Nobel laureates to foster public understanding and appreciation of science and technology, and to inspire future scientific talent. The public lectures by Nobel laureates, covering their academic achievements and the societal impact of scientific and technological advancements, have been well-received by middle and high school students, university students, and the general public.

In 2023, KAST, in collaboration with Nobel Prize Outreach, organized the 'Nobel Prize Dialogue Seoul 2023'. This event brought together 5 Nobel laureates and 20 world-renowned scholars to engage with the Korean public in discussions on topics such as "future education" and "the impact of scientific and technological advancements on education." A total of 1,306 attendees participated in the event, listening to the lectures and discussions and actively engaging in the conversations.

| | |
|---|---|
| Host | KAST, Nobel Prize Outreach |
| Date | Sept. 24 |
| Venue | COEX Auditorium, Korea |
| Subjects | Future Learning: Exploring Science and Technology |


## Sweden-Korea Nobel Memorial Program 2023

The Sweden Korea Nobel Memorial Program is a symposium where experts from Sweden and Korea meet to present the research achievements of Nobel Prize laureates in each field and discuss the meaning of Nobel Prize research for the future and its impact on our daily lives. As the host of the science session, KAST recommended Korean experts in each field. The speakers gave lectures on "Discoveries enabling transformative science and technology – mRNA, attosecond light pulses and nanodots", which won the 2023 Nobel Prize in Physics, Chemistry, and Physiology or Medicine, and shed light on the progress that scientific development would bring.

| | | | |
|---|---|---|---|
| Host | Swedish Embassy in Korea | | |
| Partnership | KAST | | |
| Date | Nov. 22 | | |
| Venue | Seoul National University | | |
| Participants | Sweden | **Daniel Wolvén** | \| Ambassador of Sweden |
| | Korea | **Ook Joon Yoo** | \| President of KAST |
| Swedish Lecturer | Physics | **Anne-Lise Viotti** | \| Lund University |
| | Chemistry | **Johan Rockberg** | \| KTH |
| | Physiology | **Katrine Riklund** | \| Umeå University |
| Korean Lecturer | Physics | **Q-Han Park** | \| Korea University |
| | Chemistry | **Jungwon Park** | \| Seoul National University |
| | Physiology | **Sunjoo Jeong** | \| Dankook University |

## Periodicals

### Online Newsletter ‘A Close Insight’

An online newsletter, delivered twice a month by email, that shares the results of KAST Projects and the latest news about members. A total of 24 newsletters were published in 2023.

### Magazine ‘The View of KAST’

A quarterly magazine containing the philosophy and insights of KAST. In 2023, The View of KAST  adopted “Just Science and Technology” as its annual theme. It explored the multifaceted roles of science and technology in today’s world, the fairness within the Korean science and technology community, the relationship between science and social justice, and the concept of just scientists and technologists. The periodical addressed the roles and improvements needed in the science and technology sector, as well as the directions for societal contributions by scientists and technologists.



## Online Services

### 3rd Series of the Great Discovery of Nobel Prize Lareates

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 2023. 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.

| 2023 The Nobel Prize in Physics | 2023 The Nobel Prize in Chemistry | 2023 The Nobel Prize in Physiology or Medicine |
|---|---|---|
|  |  |  |
| Attosecond light pulses<br>**Q-Han Park**<br>Prof. of Korea University | Nanodots<br>**Sungjee Kim**<br>Prof. of POSTECH | mRNA<br>**Sunjoo Jeong**<br>Prof. of Dankook University |

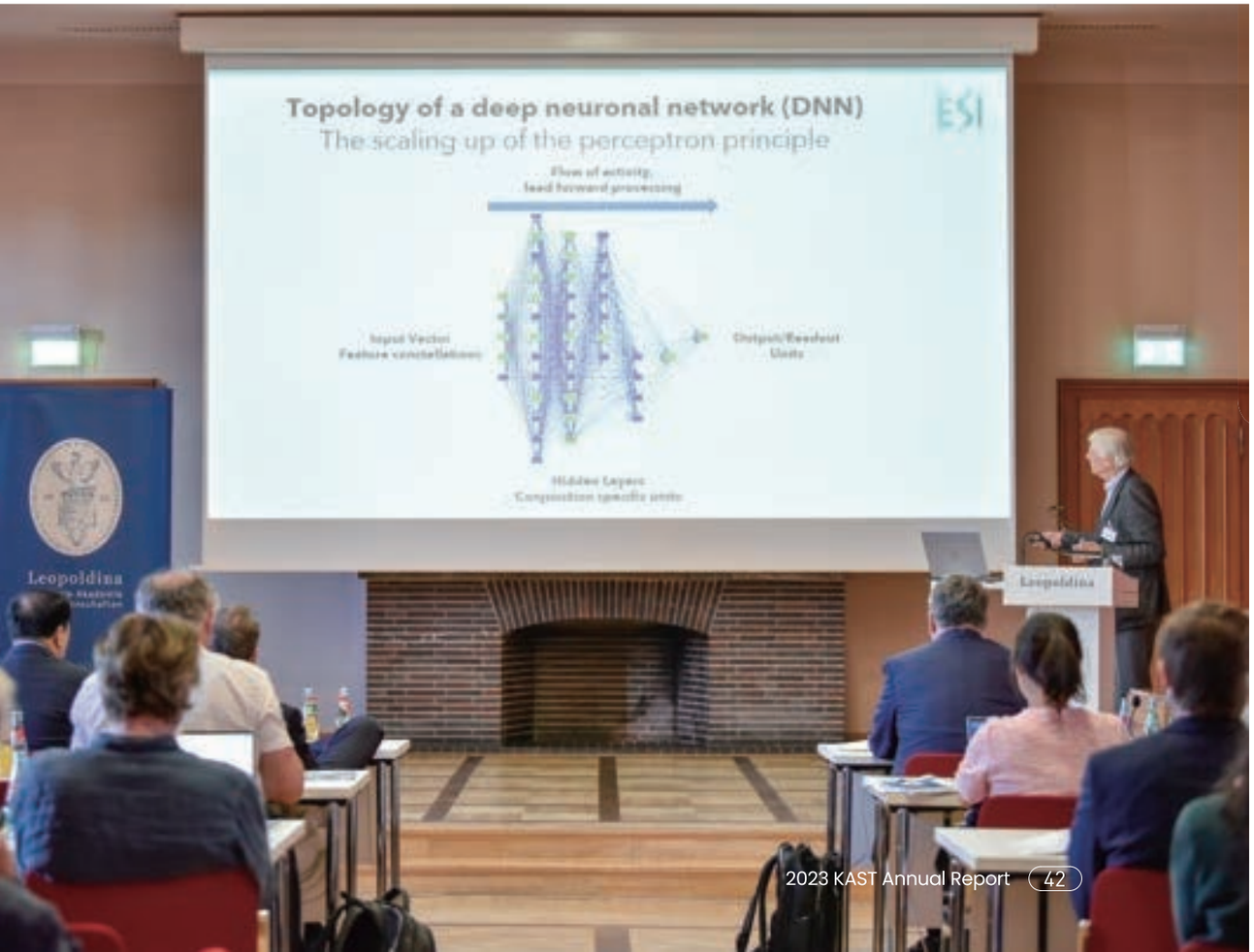
### KAST Vlog series

A Vlog 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, 3 Vlog featuring the key participants of these projects were produced in 2023. Through 3 vlogs, KAST aims to reach a wider audience and make its initiatives more relatable.

| Meeting with KAST Scholars | Mentor Program for Outstanding Students | Mentor Program for Outstanding Students |
|---|---|---|
|  |  |  |
| A Pediatric Ophthalmologist-Scientist’s Visit to a High School<br>**Jeong-hun Kim**<br>Prof. of Seoul National University | A High School Student Aspiring to Be a Neuroscientist<br>**Gayeong Kim**<br>second-year student at Minjok Leadership Academy | The Journey of Three Science Prodigies to Sweden |

# International Collaboration

KAST cooperates with 46 academic institutions in 37 countries around the world, serving as a pillar of civil diplomacy in the fields of science and technology. We raise the status of Korea's science and technology and promote the globalization of Korean science and technology by strengthening cooperation with international scientific and technological organizations and overseas 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 in the world, serving as a pillar of civil diplomacy in the fields of science and technology. As an committee member of the IAP Policy Advice, the world's largest scientific society, we are participating in major projects aimed proactively addressing current issues of the global science and technology community, thus increasing the global presence of Korea.

### Bilateral Symposia

#### › The 6th UK-Korea Research Conference

| | | | |
|---|---|---|---|
| Host | The Royal Society, KAST, Institute for Basic Science(IBS) | | |
| Date | Mar. 22 - 23 | Venue | Pyeongchang, Korea |
| Subject | Quantum Materials, Infectious Disease | | |
| Participant | 50 scholars from two academies and experts | | |

**UK-Korea Conference**

KAST and the Royal Society signed an MoU in 1998 and have held a series of joint symposiums since then. The UK-Korea Research Conference was held as a joint academic event along with KAST, IBS, and the Royal Society since 2019.

## › The 2nd KAST-IASH Bilateral Symposium

| Date | May. 22 - 23 | Venue | Seoul, Korea |
|---|---|---|---|
| Subject | When Science Meets Technology | | |
| Participant | 25 scholars from two academies and experts | | |

### Bilateral Relationship with Israel Academy of Sciences and Humanities

KAST and the Israel Academy of Sciences and Humanities (IASH) have collaborated since signing the MOU in 2000 by operating the "Korea-Israel Academy Scientists Exchange" program. In 2017, Y-KAST members visited Israel at the invitation of the Israeli government and interacted with local researchers. A joint symposium has been prepared from 2022 for the participation and continuous exchange of more scientists from both countries on various topics.


## › The 7th KAST-Leopoldina Bilateral Symposium

| Date | Jun. 28 - 29 | Venue | Halle, Germany |
|---|---|---|---|
| Subject | Advances in Brain Research | | |
| Participant | 23 scholars from two academies and experts | | |

### Bilateral Relationship with German National Academy of Sciences Leopoldina

KAST signed an MOU with the German National Academy of Sciences Leopoldina in 2012, and renewed it in 2018. The two academies have been holding a joint symposium since 2013. The academic exchange that had been postponed for two years due to COVID-19 resumed in 2022

## Participating International Conferences

### › 14th Biennial Meeting of the IHRN

| | |
|---|---|
| Host | IHRN |
| Date | Jun. 6 - 8 |
| Venue | Pretoria, Republic of South Africa |
| Participant | 35 participants, representing 25 national academies |
| Attendees | **Ook Joon Yoo** President of KAST<br>**Changhee Lee** Executive Vice President of KAST |
| Description | 'Equity in Global Collaborations', 'Gender Equality and Gender-Based Violence', 'Addressing Stigma and Discrimination', 'Safeguarding Academic Freedom', 'Advancing Social Justice through Promotion of Access to Health Care', etc |

**International Human Rights Network of Academies and Scholarly Societies**

IHRN was established in 1993, spearheaded by the Committee on Human Rights of the U.S. National Academies of Sciences, Engineering, and Medicine (NASEM). Currently, over 90 academies from around the world, including those from the United States, the Netherlands, Sweden, Italy, France, Switzerland, the United Kingdom, Sri Lanka, Morocco, Taiwan, and Germany, participate in the network. The IHRN holds a Biennial Meeting to review the human rights status of scientists and technologists in various countries, set agendas, and launch emergency campaigns (Action Alerts) in response to instances of human rights violations, providing protection to affected individuals. KAST joined the IHRN in 2013 and has been actively participating since. In 2018, KAST hosted the 13th Biennial Meeting of the IHRN.

### › STS Forum Annual Meeting 2023

| | |
|---|---|
| Host | STS Forum |
| Date | Oct. 1 - 3 |
| Venue | Kyoto, Japan |
| Participant | 1,500 global leaders from the fields of science, technology, policy, and business |
| Attendees | **Ook Joon Yoo** President of KAST |

**Science and Technology in Society Forum** (STS Forum)

The STS forum was founded in 2004. The basic concept of the STS forum is to bring together scientists and global leaders in the fields of politics, business and academia. At the forum, they discuss strengthening the lights and controlling the shadows of science and technology from the long-term perspective of 100 years or 500 years for the future of humanity, not as representatives of their organizations but as concerned individuals.

### › The 22nd SCA Conference

| | |
|---|---|
| Host | The National Academy of Sciences, Republic of Korea, KAST |
| Date | Oct. 19 - 20 |
| Venue | Seoul National University Hoam Faculty House, Korea |
| Subject | Science for Sustainability, Resilience and Human Well-being |
| Participant | A total of approximately 250 participants, including 7 keynote speakers and about 80 session speakers. |
| Description | A total of over 80 research outcomes were presented across 10 specific topics. The event included eight main sessions on topics such as 'Science and Technology for Sustainable Development' and two additional special sessions. After these sessions, scholars from various countries gave presentations and engaged in discussions. |

**SCA(Science Council of Asia)**

SCA was established in 2000 to promote sustainable development and improve the quality of life in the Asia region through academic exchange and cooperation. Currently, it includes 31 institutions from 18 countries in the Asia region.

# 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 is 32 national academies and societies of sciences from 30 countries and one regional academy of engineering and technology.
In 2023, AASSA Regional Workshops were held in Türkiye, Indonesia, Sri Lanka, and Bangladesh.

## AASSA Operations

### › Secretariat Meeting for the President's Visit

| | |
|---|---|
| Host | Apr. 2 - 4 |
| Venue | KAST, KAIST |
| Agenda | Review of AASSA Board Agenda Items and Discussion on AASSA Activities, etc. |

### › The 1st AASSA Board Meeting of 2023

| | |
|---|---|
| Host | Apr. 28 |
| Venue | Istanbul, Türkiye |
| Agenda | Discussion on partnerships with other institutions, AASSA's funds, and other matters |

### › The 2nd AASSA Board Meeting of 2023

| | |
|---|---|
| Host | Nov. 29 |
| Venue | KAST(online) |
| Agenda | Report on AASSA Activities in 2023 and Plans for 2024 |

### › The 1st Temporary AASSA Board Meeting of 2023(Follow-up to the 2nd Board Meeting)

| | |
|---|---|
| Host | Dec. 21 |
| Venue | KAST(online) |
| Agenda | AASSA's Own Funds Planning and Selection of Proposals as Part of the 2024 Plan |

## AASSA Regional Workshop

### › AASSA – TÜBA Joint Symposium

The Role of Science Academies towards the Future of Basic Sciences

| | |
|---|---|
| Date | Apr. 28 - 29 |
| Venue | Istanbul, Türkiye |
| Host | AASSA, Turkish Academy of Sciences(TÜBA) |
| Agenda | • Importance of comprehensive, equitable basic science education in Asian secondary schools<br>• Promotion of basic science research by science academies to address global issues |

### › AASSA-AIPI Hybrid Seminar

Science Literacy in the Digital Era

| | |
|---|---|
| Date | Jun. 20 - 21 |
| Venue | Jakarta, Indonesia (Hybrid) |
| Host | AASSA, Indonesian Academy of Sciences(AIPI) |
| Agenda | • Emphasizing the importance of science research, education, and literacy, and their relevance to the strategic goals of the InterAcademy Partnership and sustainable development objectives<br>• Formulation of collaborative action plans for sustainable and integrated growth support within local communities and sectors by strengthening scientific literacy and disseminating knowledge |

### › AASSA-NASSL International Workshop

Institutionalising Science Advice to Governments

| | |
|---|---|
| Date | Jul. 6 - 8 |
| Venue | Colombo, Sri Lanka (Hybrid) |
| Host | AASSA, National Academy of Sciences of Sri Lanka(NASSL) |
| Agenda | • Documentation and analysis of the science advisory system, and dissemination of the Colombo Declaration, urging the governmental institutionalization of science advice with support from IAP and AASSA<br>• Establishment of the Colombo Framework to facilitate governmental institutionalization of science advice, which can be utilized in other regions |

### › AASSA-BAS Hybrid Workshop

Institutionalising Science Advice to Governments

| | |
|---|---|
| Date | Oct. 7 - 8 |
| Venue | Bangladesh (Hybrid) |
| Host | AASSA, Bangladesh Academy of Science(BAS) |
| Agenda | • Themed speeches on the role of nature in sustainable development and panel discussions on the role of national science academies<br>• Presentation of collaborative plans to support sustainable and inclusive growth for domestic and international participants |

## International Symposium

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

In 2023, the 54th KAST International Symposium was held at the KAST on July 3rd, under the theme ‘The Future of Korean Science and Technology’. The symposium aimed to encourage joint research and collaboration through networking activities among Korean scientists and technologists both domestically and internationally. It also discussed collaboration strategies between KAST and the Korean-American Scientists and Engineers Association (KSEA) for the future of Korean science and technology.


## Networking with World-leading Scientists

KAST helps Korean scholars network with their global peers and thereby expand their international influence in the field of science and technology by supporting academic exchanges with international organizations and inviting distinguished scholars from overseas.

### 44th Frontier Scientists Workshop

| Date | Venue | Theme |
|---|---|---|
| Jun. 20 - 21 | Stockholm, Sweden | Packaging Nanotechnology in Functional Foods and Pharmaceuticals for Future Human Wellness |

**Frontier Scientists Workshop**

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

### 72nd Lindau Nobel Laureate Meetings

| Date | Venue | Field | Participants |
|---|---|---|---|
| Jun. 25 - 30 | Lindau, Germany | Physiology/Medicine | **Min-Sub Kim** \| Sungkyunkwan University<br>**Eunji Kim** \| Seoul National University<br>**Yedam Lee** \| Korea University |

**The Lindau Nobel Laureate Meetings**

One field of physics, chemistry, or physiology is selected each year to invite Nobel laureates of the corresponding field and young scientists from around the world to give lectures and engage in discussions. As an Academic Partner of the Lindau Foudation, 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

SCIENCE NETWORKING CENTER

| | |
|---|---|
| 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. 1, 2022 – Dec. 31, 2024 |
| Expected Outcome | ① Serve as a center for strategic and professional global publicity<br>② Enhance Korea's soft power and strengthen national competitiveness |

9th InterAcademy Workshop

## Major Tasks

### › Selection of a leading and rising scientist

In 2023, Selection of 8 scientists in three fields, including physics, chemistry, and life science, by forming a specialized field (by stage) committee that guarantees objectivity and expertise.

| | | | |
|---|---|---|---|
| Physics | **Young-woo Son** \| KIAS | **Hawoong Jeong** \| KAIST | |
| Chemistry | **Kimoon Kim** \| POSTECH | **Kyung Hwan Kim** \| POSTECH | **YongKeun Park** \| KAIST |
| Life Science | **Sang Yup Lee** \| KAIST | **Eunjoon Kim** \| KAIST | **Young Seok Ju** \| KAIST |

Leading /Rising


Wikipedia

### › Academic exchange support

In 2023, 7 InterAcademy Workshop (closed academic exchange) events were held.

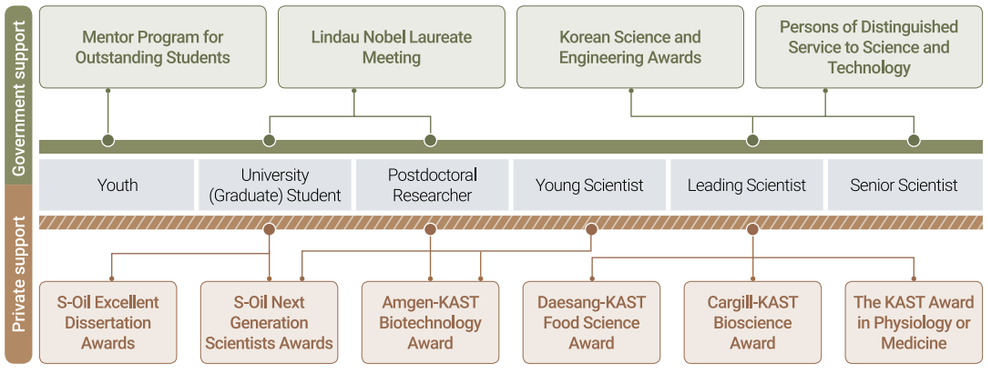
| Number | Title |
|---|---|
| 4th | Membrane Protein Structure and Folding |
| 5th | Nanoparticles and Nanostruture |
| 6th | Vascular and Neuroimmune Interactions |
| 7th | Non-equilibrium and Meso-scale Frontiers of Quantum Many –body Physics |
| 8th | Multidisciplinary Approaches to Understanding and Combating Human Diseases |
| 9th | Energy Conversion and Storage |
| 10th | Somatic Mosaicism in Human Development, Aging, and Diseases |

5th InterAcademy Workshop

4th InterAcademy Workshop

# 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 nextgeneration scientists to senior scientists and highly experienced science and technology scholars.




In 2023, 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 Awards, 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 Awards, for top-notch scientists who are 45 years of age or under. Thanks to our efforts, the S-Oil Next Generation Scientists Award was launched this year to select promising scientists with outstanding research outcomes in the fields of physics, chemistry, physiology and medicine, and materials engineering, and to provide research funds in order to further solidify the foundations of basic science research ▲Daesang-KAST Food Science Award, to support outstanding scientists and engineers in food science; ▲Cargill- KAST Bioscience Award, to recognize internationally renowned scholars in the field of agriculture, fishery; ▲The Amgen-KAST Biotechnology Award, to recognize young researchers who have shown outstanding achievements in the fields of life science and biotechnology.



## The 23rd 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

**› 2023 Awardees**

**Physics**

- Awardee **Changyoung Kim** Seoul National University
- Single research achievement
  Observation of metallic electronic structure in a single-atomic-layer oxide (Nat. Comm., 2021)

**Biology**

- Awardee **Changjoon Justin Lee** IBS
- Single research achievement
  Severe reactive astrocytes precipitate pathological hallmarks of Alzheimer’s disease via $H_2O_2$ production(Nat. Neurosci., 2020)

## The 19th 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

**› 2023 Awardees**

**Biotechnology**

- Awardee **Kwang-Hyun Cho** KAIST
- Single research achievement
  A logical network-based drug-screening platform for Alzheimer’s disease representing pathological features of human brain organoids (Nat. Comm., 2021)

**Energy**

- Awardee **Joong Hee Lee** Jeonbuk National University
- Single research achievement
  Rational design of Core@shell structured CoSx@Cu2MoS4 hybridized MoS2/N,S-Co doped graphene as advanced electrocatalyst for water splitting and Zn-air battery(Adv. Energy. Mater., 2020)

## The 5th S-Oil Next Generation Scientists Awards

**› 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 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.

**› 2023 Awardees**

**Physics**

- Awardee **Heejun Yang** KAIST
- Major Achievements
  Phase Patterning for Ohmic Homojunction Contact in MoTe2 (Science, 2015)

**Chemistry**

- Awardee **Hyo Jae Yoon** Korea University
- Major Achievements
  New Approach for Large-Area Thermoelectric Junctions with a Liquid Eutectic Gallium–Indium Electrode (Nano Letters, 2018)

**Physiology · Medicine**

- Awardee **Yun-Hee Lee** Seoul National University
- Major Achievements
  STK3/STK4 signalling in adipocytes regulates mitophagy and energy expenditure (Nature Metabolism, 2021)

**Chemical engineering/ Material engineering**

- Awardee **Jeong-Yun Sun** Seoul National University
- Major Achievements
  Hydrogel-based strong and fast actuators by electroosmotic turgor pressure (Science, 2022)

**Energy**

- Awardee **Sung Jong Yoo** KIST
- Major Achievements
  Metastable Hexagonal Close-Packed Palladium Hydride in Liquid Cell Transmission Electron Microscopy (Nature, 2022)

**IT**

- Awardee **Jae-Woong Jeong** KAIST
- Major Achievements
  Wireless optofluidic brain probes for chronic neuropharmacology and photostimulation (Nature Biomedical Engineering, 2019)



## The 13th S-Oil Excellent Dissertation Awards

**› 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**

Grand prize and Excellence award in 6 fields: Mathematics, Physics, Chemistry, Biology, Chemical engineering/Material engineering and Information Technology. 24 persons in total including 1 advisor each

**› Sponsorship** S-OIL Science Culture Foundation

**› 2023 Awardees**

| Field | Awardee | Advisor | Title of Thesis |
|---|---|---|---|
| Mathematics | **Ki-Hyun Kim** KAIST | **Soonsik Kwon** KAIST | Blow-up dynamics for the self-dual Chern-Simons-chrödinger equation |
| | **Joonho Choe** KAIST | **Sijong Kwak** KAIST | A matryoshka structure of higher secant varieties and the generalized Bronowski's conjecture |
| Physics | **Dongha Kim** KAIST | **Min-Kyo Seo** KAIST | Nanoscale spin and topological optical texture in advanced magneto-optic microscopy |
| | **Jinuk Kim** Seoul Natl Univ | **Kyungwon An** Seoul Natl Univ | Experimental realization of superradiant quantum heat engine |
| Chemistry | **Seung-Jae Shin** KAIST | **Hyeong Joon Kim** KAIST | Development of Mean-field QM/MM method for Atom-scale Investigation of Electrochemical Interfaces |
| | **Jinwoo Shin** Korea University | **Jong Seung Kim** Korea University | Design, synthesis, and characterization of advanced fluorescent probes and multi-functional photo-therapeutics |
| Biology | **Dongyoon Kim** Seoul Natl Univ | **Sung-Yon Kim** Seoul Natl Univ | Neural circuits for behavioral regulation of homeostasis: ingestive and thermoregulatory behaviors |
| | **Junhyeok Lee** KAIST | **Won-Suk Chung** KAIST | Mechanisms of Structural Plasticity of Adult Synapses by Astrocytic Phagocytosis |
| Chemical engineering/ Material engineering | **Joo Sung Kim** Seoul Natl Univ | **Tae-Woo Lee** Seoul Natl Univ | Overcoming the Lifetime Limitations of Metal Halide Perovskite Light-Emitting Diodes |
| | **Jinwoo Lee** KAIST | **Bumjoon Kim** KAIST | Development of Conjugated Polymers for High-Performance and Intrinsically Stretchable Organic Solar Cells |
| IT | **Wonjoon Shin** Seoul Natl Univ | **Jong Ho Lee** Seoul Natl Univ | Low-frequency noise in horizontal floating-gate FET–type gas sensors |
| | **Jungbeom Lee** Seoul Natl Univ | **Sungroh Yoon** Seoul Natl Univ | Label-Efficient Learning for Object Recognition |

## The 9th Daesang-KAST Food Science Award

› **Purpose**

To promote the morale of scientists and engineers and find a candidate who has excellent research and development achievements in the field of food science

› **Number of people awarded** 1 person

› **Sponsorship**

Daesang Corporation, is one of the three major fermentation companies in the world, and is a general food company which has 25 domestic and overseas subsidiaries.

› **2023 Awardees**

• Awardee **Nam Soo Han** Chungbuk National University
• Major Achievements
Lactic acid bacteria: little helpers for many human tasks(Essays in Biochemistry, 2021)

## The 8th Cargill-KAST Bioscience Award

› **2023 Awardees**

• Awardee **Jun-Hwan Kim** Jeju National University
• Major Achievements
Toxic effects of microplastic (Polyethylene) on fish: Accumulation, hematological parameters and antioxidant responses in Korean Bullhead, Pseudobagrus fulvidraco. (Science of The Total Environment, 2023)

• Awardee **John Hwa Lee** Jeonbuk National University
• Major Achievements
Eukaryotic expression system complemented with expressivity of Semliki Forest Virus's RdRp and invasiveness of engineered Salmonella demonstrate promising potential for bacteria mediated gene therapy (Biomaterials, 2021)



## The 3rd 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 postdoctorial researchers

› **2023 Awardees**

**Next-generation scientist category**

• Awardee **Chanhee Kang** Seoul National University
• Major Achievements
Lysosomal control of senescence and inflammation through cholesterol partitioning (Nature Metabolism, 2023)

**Post-doctorate study category**

• Awardee **Sungjin Min** Yonsei University
• Major Achievements
Tissue extracellular matrix hydrogels as alternatives to Matrigel for culturing gastrointestinal organoids (Nature Communications, 2022)

• Awardee **Yu Jin Lee** UNIST
• Major Achievements
GPR143 controls ESCRT-dependent exosome biogenesis and promotes cancer metastasis (Developmental Cell, 2023)



# 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 2023

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 and have been protecting the honor of scientists and engineers.

In 2023, KAST designated 4 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 2023.' 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.

## 2023 Persons of Distinguished Service to Science and Technology (4 persons in total)

Natural Science

**The late Hee sung Song** 1937-2016

Prof. Emeritus of Seoul National University

- Produced outstanding research achievements in the field of the polarization phenomenon of arbitrary spin particles
- Played pioneering role in the advancement of Korea's particle physics through the establishment of education and research infrastructures

Life Science

**The late Sung Wan Kim** 1940-2020

Prof. Emeritus of the University of Utah, Salt Lake City, USA

- Pioneered new fields through interdisciplinary and international researches in chemistry, medicine, and engineering
- Pioneered the way for breakthroughs in treating intractable diseases such as cancer and genetic disorders through founding of biopharmaceutical venture companies

Life Science

**Sang-Ki Hahn** 1933

Honorary professor at the Seoul National University

- Improved and disseminated disease-resistant and high-yielding cassava varieties
- Conservation and dissemination of genetic resources for bulbous crops and edible banana

Convergence

**The late Zae Quan Kim** 1933-2017

Formerly the 1st and the 2nd President of the Korea Research Institute of Standards and Science (KRISS)

- A scientific practitioner who laid the foundation for the industrial development of South Korea by introducing frontline scientific and technological knowledge, including the design of the Pohang Iron & Steel Company (POSCO), the promotion of original car models, and the establishment of the national standards, etc.



## Support for the activities of the Persons of Distinguished Service to Science and Technology

### › Dedication lecture

Commemorative symposium and memorial lecture were held at the academic societies and affiliated institutions centering on the successors of the people of merit in science and technology, in which the participants discussed the achievements and impacts of the Persons of distinguished service to science and technology. Additional events, such as the designation of a commemorative lecture room and installation of a dedication space, were conducted.

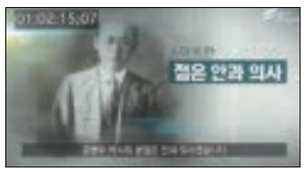
## Public Promotion

### › Publication of a book about the meritorious records of Persons of Distinguished Service to Science and Technology

The book is compiled as a critical biography of the Koreans distinguished in the field of science and technology, including a biography, their research achievements, media contributions and interviews, and the writings of each individual. It also provides a wealth of additional reading materials, including tributes written by the next generations of scholars and special contributions by science historians. An image book, consisting of easy-to-read information cards describing episodes in the early lives and the careers of these distinguished individuals was also released.

### › Production of the "Great People in the Field of Science and Technology" series video

A video containing the interview with the Persons distinguished service to science and technology and the achievements introduced by young scientists is produced and promoted widely through YouTube, etc




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

Since 2017, KAST have been selecting outstanding young scientists under the age of 45 as members of Y-KAST and supporting their exchanges with Young Academies of other countries.
In 2023, KAST has elected 24 next generation science and technology leaders, who have produced outstanding results as independent researchers, as Y-KAST members. Y-KAST has been actively involved in policy recommendations so that the innovative and creative thinking of young scientists can be realized through the universal value promotion of the social community.

## Y-KAST Executive Committee (2023. 3.-2024. 2.)

**General**

**Young Keun Kim**
Chair of Y-KAST
Prof. of Korea University(Fellow, Engineering)

**Division of Policy Studies**

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

**Joonmo Ahn**
Committee member
Prof. of Korea University

**Division of Natural Sciences**

**Myoungjean Bae**
Vice Chair of Y-KAST
Prof. of KAIST

**Ho Seong Hwang**
Committee member
Prof. of Seoul National University

**Hyo Jae Yoon**
Committee member
Prof. of Korea University

**Division of Engineering**

**Jeong-Yun Sun**
Vice Chair of Y-KAST
Prof. of Seoul National University

**Sung-Chul Bae**
Committee member
Prof. of Hanyang University

**Seok Su Sohn**
Committee member
Prof. of Korea University

**Division of Agricultural and Fishery Sciences**

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

**Tae-Gyu Lim**
Committee member
Prof. of Sejong University

**Division of Medical Sciences**

**Mi-hyun Kim**
Vice Chair of Y-KAST
Prof. of Gachon University

**Sangwoo Kim**
Committee member
Prof. of Yonsei University

**Jung-Hwan Lee**
Committee member
Prof. of Dankook University



## Major Activities in 2023

### 2023. 3. The 1st Y-KAST International Conference


- As part of an exchange event for young scientists, including next-generation members and key members of major countries' young academies, KAST invited key officials from the Ministry of Science and ICT and journalists from the Science Journalists Association to a policy forum at Jeju Shinhwa World Landing Hall.
- After selecting themes for interdisciplinary research, small-scale academic presentations were made in various fields, and opinions were shared among researchers.

### 2023. 11. The 3rd Korea Science Journalists Association-YKAST Forum

A total of 40 people, including next-generation (alumni) members and members of the Korea Science Journalists Association, gathered to enhance public understanding of the latest scientific and technological achievements through timely presentations on science and technology topics.

### 2023. 12. Meeting between the First Vice-Minister of the MSIT and Y-KAST members

Vice Minister Seong Kyung Cho, two officials from the Ministry of Science and ICT, three KAST officials, and five Y-KAST members discussed supporting measures for young researchers, fostering a creative and challenging research environment, and nurturing future generations.

### 2023. 12. 2023 Y-KAST Members' Day

- Presented the 2023 Y-KAST achievements and 2024 business plan
- Introduced the research fields of the new 2024 members

KAST

THE KOREAN ACADEMY OF SCIENCE AND TECHNOLOGY

## PEOPLE



# Fellows of KAST Elected in 2023

In 2023, KAST elected 33 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 120 fellows participated in 23 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 Studies

**Sungeun Chung** Sungkyunkwan University

- Risk Perception and Preventive Behaviors
- Health and Science Communication
- Persuasion and Attitude Change

## Division of Natural Sciences

**Sijong Kwak** KAIST

- Geometry and Syzygies in Algebraic Geometry
- Combinatorics and Commutative Algebra with a viewpoint of Algebraic Geometry

**Jae Choon Cha** POSTECH

- Topology and Related Algebra
- Geometry
- Analysis and Applications

**June E Huh** Princeton University

- Algebraic Geometry
- Combinatorics
- Lorentzian Polynomials

**Yong Baek Kim** University of Toronto

- Aggregation Physics Theory
- Ferro-Relational Quantum Materials
- Topological Quantum Materials

**Hyeonsik Cheong** Sogang University

- Optical Spectroscopy of Semiconductors and Nanostructures
- Magnetic Van Der Waals Materials

**Sungchul Hohng** Seoul National University

- Single-Molecule Biophysics
- Gene Regulation & Genome Maintenance
- Liquid Biopsy for Cancer Diagnosis

**Jwa-Min Nam** Seoul National University

- Nanoparticles
- Plasmonics
- Biosensors

**Hyotcherl Ihee** KAIST

- Reaction Dynamics
- Reaction Control
- Structural Dynamics

**Mi Hee Lim** KAIST

- Inorganic Chemistry (Bioinorganic Chemistry)
- Metals in Biology & MetalloNeurochemistry
- Chemical Biology

**Sungwoo Hong** KAIST

- Organic Synthetic Methods
- Catalysis
- Photochemistry



## Division of Natural Sciences

**Charles Lee** The Jackson Laboratory

- Structural Genomic Variation
- Cancer Genomics
- Precision Medicine

**Junho Lee** Seoul National University

- Genetics of Behavior
- Neural Circuits and Connectome
- Maintenance and Evolution of Telomeres

**Changjoon Justin Lee** IBS

- GABA Synthesis and Release from Glia
- Molecular Mechanisms of Glutamate and D-Serine Release from Glia

**Won Do Heo** KAIST

- Bio-imaging (molecule, cell and in vivo imaging)
- Controlling Diverse Intracellular Molecules by Developing Molecular Optogenetics

**Myungshin Im** Seoul National University

- Observational Astronomy
- Galaxy Evolution and Observational Cosmology
- Multimessenger Astronomy and Transients

## Division of Engineering

**Thomas Kang** Seoul National University

- Structural Design, Tall Building Design
- Seismic and Wind Design
- Smart Jack for Post-Tensioning

**Minha Choi** Sungkyunkwan University

- Water, Ecosystem and Environmental Science, Land Surface-Atmosphere Interactions
- Soil moisture Dynamics, Evapotranspiration, River Management, Sediment Transport

**Ilkyeong Moon** Seoul National University

- Supply Chain Management
- (Maritime) Logistics
- Simulation, Analysis of Manufacturing Systems

**Kisuk Kang** Seoul National University

- Material Engineering
- Batteries
- Secondary Battery

**Cheolmin Park** Yonsei University

- User-Interactive Sensing Displays Based on Self-Assembled Light Emitting Polymers
- Non-Volatile Ferroelectric Polymer Memory

**Hyungbo Shim** Seoul National University

- Control Theory
- Robust Control
- Multi-Agent Systems

**Jong Chul Ye** KAIST

- AI for Healthcare and Medical Imaging
- Deep Learning for Inverse Problems
- Computer Vision

**Ho Seok Park** Sungkyunkwan University

- Energy Materials
- Energy Storage
- Electrosorption & Electrocatalysis

**Sang-young Lee** Yonsei University

- Printable/Flexible Batteries
- Organic-Based All-Solid-State Batteries
- Battery Electrolytes, Binders, and Separators

## Division of Agricultural and Fishery Sciences

**Tae-Jin Yang** Seoul National University

- Genomics and Bioinformatics for Medicinal Plants
- DNA Superbarcoding and Barcoding for Authentication of Medicinal Plants

**In-Jung Lee** Kyungpook National University

- Plant Hormone
- Plant-Microbe Interaction
- Plant Stress Physiology

**Sang-Do Ha** Chung-Ang University

- Food Safety Policy and Regulations
- Control of Food-Borne Pathogens
- Risk Assessment and Communications

## Division of Medical Sciences

**Woong Sun** Korea University

- Neurodevelopment and Regeneration
- Neural Organoids/Stem Cells
- Mitochondrial Cell Biology

**Bon-Kwon Koo** Seoul National University

- Coronary Artery Disease, Atherosclerosis
- Physiology
- Imaging

**Seock-Ah Im** Seoul National University

- Translational Research Using Emerging Targeted Agents
- Clinical Trials for Breast Cancer and Early Phase Clinical Trials

**Kwangmeyung Kim** Ewha Womans University

- Molecular Imaging
- Nanomedicine
- Cancer Immunotherapy

**Sun Choi** Ewha Womans University

- Computer-Aided Drug Design (CADD)
- Molecular Modeling and Multiscale Simulation
- Artifical Intelligence (AI) Based Drug Discovery



# Members of Y-KAST Elected in 2023

In 2023, KAST elected 24 new members of Y-KAST. KAST selects outstanding young scientists under the age of 45 as members of Y-KAST. A total of 110 KAST fellows and Y-KAST members participated in Membership Committees and evaluated the candidates' 3 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 Studies

**Hyunwoo Park** Seoul National University

- Network Analysis and Visualization
- Operations Management and Supply Chain Management
- R&D Strategy and Policy Evaluation

**Hakyeon Lee** SEOULTECH

- Technological Forecasting
- Innovation Analytics
- Data Business

## Division of Natural Sciences

**JungHwan Park** KAIST

- Knot Theory
- Knot Concordance
- Topology

**Beomjun Choi** POSTECH

- Geometric Flows
- Singularity Formations
- Parabolic and Elliptic PDEs

**Dongmin Gang** Seoul National University

- Quantum Field Theory
- String Theory
- Quantum Topology

**Min-Kyo Seo** KAIST

- Light-Matter Interaction
- Optical Resonators
- Quantum and Nonlinear Optics

**Gil Young Cho** POSTECH

- Quantum Materials
- Quantum Information Physics in Quantum Matter
- Emergent Quantum Phenomena

**Woon Ju Song** Seoul National University

- Metalloenzymes
- Metalloprotein Design

**Jongwoo Lim** Seoul National University

- Batteries
- Electrocatalysis
- Elelctrochemical Applications

## Division of Engineering

### Tae-Hyuk Kwon KAIST

- Energy Geotechnology
- Biogeotechnics
- Landslides

### Eun Ju Kim KIST

- Nanotechnology-enabled water treatment
- Emerging micropollutants
- Microplastics

### Young-Jin Kim KAIST

- Lasers
- Optical Metrology
- Precision Engineering

### Min Sang Kwon Seoul National University

- Polymer Design and Synthesis
- Polymer Materials for Sustainability
- Functional Polymer Materials

### Hyun-Wook Lee UNIST

- Energy Storage
- Lithium-Ion Batteries
- In-Depth Analysis

### Hyunjoo Jenny Lee KAIST

- Brain Machine Interface
- Therapeutic Ultrasound
- Ultrasound Transducers

### Junil Choi KAIST

- 5G/6G Wireless Communications Systems
- Wireless Communications Using Metamaterials
- Machine-Learning Communications Systems

### Dae Woo Kim Yonsei University

- Membrane
- Nanomaterial
- Separation Science and Technology

### So Youn Kim Seoul National University

- Polymer Nanocomposites
- Colloids
- Small Angle Scattering

### Seungwoo Lee Korea University

- Nanofabrication
- Optical Materials
- Wave Energy

## Division of Agricultural and Fishery Sciences

### Hyo-Jun Lee Korea Research Institute of Bioscience & Biotechnology

- Plant Response to Environmental Changes
- Plant Cell Reprogramming
- Photosynthesis

## Division of Medical Sciences

### Alan Jung Park Seoul National University

- Cognition
- Neural Circuit
- Synapse

### Keehoon Jung Seoul National University

- Cancer Immunology
- Immune-Vascular Cross-Talk
- Drug Development

### Ki Hyun Kim Sungkyunkwan University

- Discovery of Natural Products
- Metabolomics
- Nanobiotechnology of Natural Products

### Sung-Hwan Choi Yonsei University

- Orthodontics
- Biomaterials
- Biofilm

2023

# ANNUAL REPORT

The Korean Academy of Science and Technology

KAST 한국과학기술한림원
The Korean Academy of Science and Technology

KAST building, 42(Gumi-dong), Dolma-ro, Bundang-gu, Seongnamsi, Gyeonggi-do 13630, Korea
**T** +82-31-726-7900 **F** +82-31-726-7909 **E** kast@kast.or.kr www.kast.or.kr

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