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Why Did South Korea Create a New Space Agency?

BY Jacob Bradley

On May 27, 2024, South Korean President Yoon Suk Yeol announced the creation of the Korea AeroSpace Administration (KASA), which replaced the Korea Aerospace Research Institute (KARI) as the lead government organization for Korea's space program and research activities.¹ KASA was created to reorganize disparate Korean agencies to foster greater efficiency and space innovation. Under KASA, Korea aims to become a spacefaring juggernaut, not reliant on other nations' infrastructure, and an independent producer of space technology. KASA aims to grow South Korea into one of the top five space-faring nations while also developing the peninsula's aerospace sector into a main national industry.²

Q1: How did Korea get here?

A1: In 1989, South Korea established KARI, its first aeronautics and space agency, with the goal to invest in and grow its domestic aerospace industry. KARI's mission is to promote the development of the Korean economy and enhance everyday life by new exploration

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Korean Peninsula / NASA

and technological advancements, development, and dissemination in the field of aerospace science and technology.³

Just four years later, KARI launched its first rocket, the Korean Sounding Rocket, or KSR-I.⁴ KSR-I was a small research rocket designed to measure ozone levels in the stratosphere. In December 1999, Korea successfully launched its first satellite, Arirang 1, whose mission was to observe and photograph the Korean Peninsula and the surrounding seas with its electro-optical and ocean observation cameras.⁵ Nine years later, in 2008, Yi So-yeon became the first Korean astronaut to fly in space after launching onboard the Soyuz TMA-12, a Russian passenger transport craft. While in orbit for 10 days, Yi conducted nearly twenty experiments about biology in microgravity on board the ISS.⁶

Throughout the 2010s, KARI continued to design and launch more satellites into orbit. It also developed a fleet of vertical takeoff and landing UAVs intended for

testing technology for use in urban air mobility vehicles designed to safely navigate city airspace.⁷ Since 2020, KARI completed test flights and successfully launched its own three-stage launch vehicle, Korean Space Launch Vehicle (KSLV)-II, or as it is more commonly known, Nuri.⁸ With this achievement, it is one of six nations (and the European Space Agency) that can independently launch into high orbits.⁹ In 2022, KARI successfully launched the lunar satellite Danuri into orbit around the Moon.¹⁰ The lunar orbiter is tasked with surveying lunar resource deposits as well as testing “space internet.” While enroute to the Moon, Danuri successfully transmitted a number of images and videos back to Earth, including Korean boyband BTS’s music video, “Dynamite.”¹¹

KASA aims to grow South Korea into a top five space-faring nation in the world while also developing the aerospace sector on the peninsula into a main national industry.

KASA is not only absorbing KARI, but also the astronomy focused Korea Astronomy and Space Science Institute or KASI in an effort to accelerate space technological advancements in Korea. KASI was established in 1974 as the Korean National Astronomy Observatory (KNAO) under the government’s Ministry of Science and Technology.¹² KNAO opened an optical observatory and radio observatory in 1978 and 1985

before it was reorganized into the Institute of Space Science and Astronomy in 1986; it was later renamed Korea Astronomy Observatory in 1991. Throughout the 1990s, KNAO increased its observation capabilities, including the installation of a GPS observatory in Daejeon, establishment of a new optical observation facility, construction of a solar flare telescope, and launch of an X-ray detector on the KSR-II rocket.¹³ In 2003, KNAO launched its first space telescope, the Far-ultraviolet Imaging Spectrograph. KNAO was renamed in 2005 to KASI. Since its renaming,

the institute has achieved a period of large-scale observational facility development commissioning and developed many land- and space-based astronomical observation equipment. Looking toward its future under KASA, KASI's vision is to become the world's leading national astronomy & space science research institute.

Q2: What is KASA and why was it created?

A2: In accordance with South Korea's Fourth Space Development Promotion Basic Plan, released in March 2023, President Yoon created KASA to unite scattered Korean space programs under one organization and to better foster private space industry development.¹⁴ President Yoon wants to create a stronger space program in Korea as a boost to economic growth on the peninsula. According to the Ministry of Science and ICT (MSIT), the creation of KASA will help “foster more than 2,000 space-related companies and create about 500,000 new jobs.”¹⁵

KASA will continue the goals of its predecessor, KARI, while also accelerating Korea's space development into the future. Existing agencies, including KARI and KASI, will become research institutes under KASA. KASA will take over KARI's role in Korean space exploration. It will be responsible for developing new technologies, formulating national strategies for space, and evolving plans and missions into corporal national projects. With the creation of KASA, government spending toward space programs is projected to double to ₩1.5 trillion (or about \$1.1 billion) from 2022 to 2027.¹⁶

Seoul wants to use KASA to increase the growth of the aerospace economy on the peninsula, creating more jobs within the industry for Korean citizens. “Space development has now become a key element for defense and diplomacy, industry and major social infrastructure. It is necessary to have a dedicated agency to holistically coordinate the space-related issues of the various ministries” according to KARI.



Falcon-9 launch of Korea Pathfinder Lunar Orbiter / DVIDS

president, Dr Lee Sang-Ryool, KASA will lead Korean aerospace policy, research and development, and international and private business cooperation.¹⁷ In addition to centralizing Korean space policy, KASA also looks to grow the South Korean aerospace industry. “So far, space development has been focused on government-led technology development, resulting in a very weak structure in terms of the space industry. If KASA becomes the main body and promotes the development of the space industry, the related industry will also be able to invest actively,” Lee elaborates.¹⁸

Q3: What are KASA's goals for space exploration?

A3: With the formation of KASA, MSIT looks to capture ten percent of the global spaceflight market by 2045.¹⁹ This is an ambitious vision, and members of the Korean space community are excited by the potential for scientific advancement. Cho Kyung-Suk, a solar physicist at KARI, is eager to use Korean data in his research rather than U.S., European, or Japanese data.²⁰ Cho said he, “has always hoped that Korea would undertake space missions capable of producing world-class scientific achievements.” With this institutional change, Korea is positioning itself to grow into a global leader for spaceflight and innovation.

KASA has many space exploration goals for the next couple decades. It plans to land on the Moon by 2032, and to establish a lunar base by the 2040s. It also aims to send an orbiter to Mars by 2035 and land on the planet by 2045.²¹ KASA plans to launch a spacecraft to explore the Apophis asteroid when it passes close to the Earth in 2029.²² KASA also plans to partner with other nations to launch a solar observation probe to rest at Sun-Earth Lagrange point L4.²³ With the recent investments in reusable launch vehicle technology, Korea looks to advance its own launch capabilities by developing its own reusable rocket.²⁴ Finally, KASA intends to continue the successful Nuri program with annual launches planned for next several years.²⁵

At the present, Korea is dependent on U.S. and international satellites for Global Navigation Satellite System (GNSS) services in the country, outside of a newly certified satellite-based augmentation system (SBAS) used by aircraft to improve navigation signals.²⁶ KASA, and KARI before it, plans to launch a Korean owned and operated positioning, navigation, and timing (PNT) satellite constellation. By 2035, KASA plans to build, “a precise, reliable satellite navigation system that can provide centimeter-level location information to the Korean Peninsula and surrounding areas as Japan and India do.”²⁷ Currently un-augmented GPS has up to a 10-meter error radius in South Korea; this is too large of a threshold to run self-driving cars, UAV drones, and other kinds of up-and-coming positioning reliant technology, but the establishment of a local GNSS system and the continued adoption of its new SBAS signal will reduce this error radius to just centimeters.²⁸

In relation to satellite improvements, KASA also plans to continue developing high resolution imaging satellites. According to *Gold Rush: The 2024 Commercial Remote Sensing Global Rankings*, a CSIS independent analysis, KARI’s KOMPSAT-3A has the highest resolution Mid-Wave IR (MWIR) commercial space-based remote sensing capabilities in the world. Despite being launched nearly ten years ago in 2015, the KOMPSAT-3A continues to offer the best commercial MWIR product on the international market.²⁹ As Seoul continues to strengthen its investment in space technologies, KASA aims to continue the groundbreaking satellite innovation initiated by its predecessor.

In a world with more and more space-faring nations, where each nation’s private sector aims to increase its market share, KASA hopes to act as a banner organization for the Korean Peninsula’s developing industries to rally around. With heavy material investment in space exploration, a restructuring of space bureaucracy, and new partnerships with private enterprises, Korea has the ability to meet its lofty goals for the next twenty years. If Korea develops into a top five space nation, the rest of humanity will reap the benefits. ➤

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Notes

- ¹ Dennis Normile, “South Korea Launches Its Own NASA,” Science.org, May 27, 2024, <https://www.science.org/content/article/south-korea-launches-its-own-nasa>.
- ² “Vision & Goals,” KASA, 2024, https://kasa.go.kr/eng/web/content.do?menu_cd=000049.
- ³ “Major Functions,” KARI, 2023, https://www.kari.re.kr/eng/sub01_02.do.
- ⁴ Mark Wade, “KSR-I,” Astronautix, 2019, <http://www.astronautix.com/k/ksr-i.html>.
- ⁵ “History,” KARI, 2023, https://www.kari.re.kr/eng/sub01_04.do.
- ⁶ APPEL News Staff, “International Brief: Dr. Soyeon Yi,” NASA, December 5, 2019, https://appel.nasa.gov/2012/05/24/5-5_dr-soyeon_yi-html/.
- ⁷ “Unmanned Vehicle,” KARI, 2023, https://www.kari.re.kr/eng/sub03_02.do.
- ⁸ Mike Wall, “South Korea’s Homegrown Nuri Rocket Launches 8 Satellites on 3rd-Ever Mission (Photo),” Space.com, May 26, 2023, <https://www.space.com/south-korea-nuri-rocket-launch-may-2023>.
- ⁹ Robert S Wilson and Nicholas J Wood, “South Korea,” Aerospace Center for Space Policy and Strategy, August 15, 2023, https://csp.s.aerospace.org/sites/default/files/2023-08/Wilson-Wood_SouthKorea_20230802.pdf.
- ¹⁰ “Korea’s First Step toward Lunar Exploration,” KARI, 2023, https://www.kari.re.kr/eng/sub03_07_01.do.
- ¹¹ Jin-Won Kim, “S.Korean Lunar Orbiter Sends ‘dynamite’ BTS Video to Earth,” KED Global, November 7, 2022, <https://www.kedglobal.com/aerospace-defense/newsView/ked202211070010>.
- ¹² “History,” KASI, 2024, <https://www.kasi.re.kr/eng/pageView/52>.
- ¹³ “History,” KASI.
- ¹⁴ Jun-Su Jang, “‘2045 우주경제 강국 실현’ 미래 우주경제 로드맵 이행을 위한 제4차 우주개발진흥기본계획,” Ministry of Science and IST, February 6, 2023, https://doc.msit.go.kr/SynapDocViewServer/viewer/doc.html?key=48d8cced0a674bfa8214a60b1eeddba5&convType=html&convLocale=ko_KR&contextPath=%2FSynapDocViewServer%2F.
- ¹⁵ Na-young Kim, “S. Korea Aims to Launch Full-Fledged Space Agency in May,” Yonhap News Agency, January 11, 2024, <https://en.yna.co.kr/view/AEN20240111005451320>.
- ¹⁶ Dennis Normile, “South Korea Launches Its Own NASA.”
- ¹⁷ Byung-yeul Baek, “Kari Plays Pivotal Role in Korea’s Space Development,” The Korea Times, January 15, 2024, https://www.koreatimes.co.kr/www/tech/2024/10/129_366778.html.
- ¹⁸ Byung-yeul Baek, “Kari Plays Pivotal Role in Korea’s Space Development.”
- ¹⁹ Na-young Kim, “S. Korea Aims to Launch Full-Fledged Space Agency in May.”
- ²⁰ Normile, “South Korea Launches Its Own NASA.”
- ²¹ Jack Kim, “South Korea Plans Mars Landing in 2045 as It Launches First Space Agency,” Reuters, May 30, 2024, <https://www.reuters.com/science/south-korea-plans-mars-landing-2045-it-launches-first-space-agency-2024-05-30/>.
- ²² “Space Science / Exploration,” KASA, 2024, https://kasa.go.kr/eng/web/content.do?menu_cd=000054.
- ²³ “Space Science / Exploration,” KASA.
- ²⁴ “Space Transportation,” KASA, 2024, https://kasa.go.kr/eng/web/content.do?menu_cd=000052.
- ²⁵ “Space Transportation,” KASA
- ²⁶ Jesse Khalil, “Korea’s Kass Now Certified and Operational,” GPS World, February 12, 2024, <https://www.gpsworld.com/koreas-kass-satellite-navigation-system-now-certified-and-operational/>.
- ²⁷ “KPS,” KARI, 2023, https://www.kari.re.kr/eng/sub03_08_01.do.
- ²⁸ Si-soo Park, “South Korea’s GNSS Project to Take off with \$3.3 Billion Budget,” SpaceNews, January 23, 2023, <https://spacenews.com/south-koreas-gnss-project-to-take-off-with-3-3-billion-budget/>.
- ²⁹ Kari Bingen, David Gauthier, and Madeleine Chang, *Gold Rush The 2024 Commercial Remote Sensing Global Rankings*, October 1, 2024, https://csis-website-prod.s3.amazonaws.com/s3fs-public/2024-09/241001_Bingen_Gold_Rush.pdf?VersionId=FtAy013xBa6EHM.DQJFHxJtZo3W0U1IE.