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CHINA'S SPACE ACTIVITIES IN 2023: A BRIEF OVERVIEW BASED ON "CHINA DAILY" MEDIA COVERAGE

Key words: China's space activities, outer space exploration, space technology.

China's space program celebrates its 30th anniversary in 2023, since the China National Space Administration (CNSA) was founded 30 years ago [1]. At the beginning of the year, China intended to launch over 200 spacecraft on more than 60 space missions [2]. China launched 64 rockets in 2022, a national record [3]. As of November 23, 54 rocket launches have taken place, suggesting that the goal will probably be accomplished [4].

Manned Spaceflight

The most noteworthy is that China can currently launch crewed missions twice a year due to its near-Earth manned space station, manned shuttle transportation system, and comprehensive framework for selecting, training, and supporting taikonauts. The Shenzhou XV mission crew returned to Earth in June after completing the Tiangong space station during their six-month mission. The Shenzhou XV team became the most experienced Chinese crew in extravehicular activity after four spacewalks and equipment installation outside the Tiangong [5, 6]. Shenzhou XVI's five-month mission, which included China's first civilian astronaut, ended in November [7]. The Shenzhou XVII crew joined their predecessors at the Tiangong in late October. The two teams' first space-based encounter of China's first, second, and third-generation astronauts is significant. [8] The Shenzhou XVII crew will stay at Tiangong for six months and return to Earth in April 2024. Crew members will work on experimental repairs during spacewalks in addition to their routine duties [9]. According to the China Manned Space Agency, China's human space program has been peaceful and has never sought "space hegemony" since its inception [10]. Moreover, China is ready to welcome international astronauts to its space station missions [11].

Deep Space Exploration

China has outlined a consistent strategy to explore the moon, asteroids, comets, and other planets [12]. A manned lunar landing before 2030 requires

scientists and engineers to build a crew commuting and short-term stay system, human-robot integrated testing, and other key technologies [13, 14]. The International Lunar Research Station (ILRS) will be built in three stages, with a basic model finished by 2030. [15] China aims to create a special international organization to construct and operate the ILRS and share scientific discoveries among its member states [16, 17].

The Chang'e 6, 7, and 8 missions will help build the research station's fundamental model in the first phase. In 2024, China's Chang'e 6 mission will land on the moon to collect samples from the far side and carry payloads from France, Italy, Pakistan, and the European Space Agency [18, 19]. International collaboration on Chang'e-8 payloads for the 2028 lunar exploration mission is being offered by the CNSA [20].

A robotic spacecraft mission has been authorized to gather asteroid samples. Tianwen 2 will send a probe to collect samples from the 2016 HO3, the smallest and closest asteroid to Earth, and return them [21]. After Chang'e 5's moon samples, Chinese space planners are targeting Mars. A sample of Martian soil is going to be sent to Earth in 2030. As Tianwen 3, it will be China's third interplanetary exploration mission [22].

Space Transportation System

It is important that Chinese rocket scientists have finalized the Long March 9's structural design. Once operational, Long March 9 will carry five times more than China's most powerful rocket, Long March 5 [23].

Space Pioneer's TL 2 carrier rocket was China's first privately produced liquid-fuel rocket to reach orbit. No commercial liquid-propellant rocket, including SpaceX, Virgin Orbit, and China's LandSpace, succeeded on the first try before the TL 2 [24]. The company hopes to launch its TL 3 carrier rocket in 2024 and give another impetus to China's commercial space launch sector [25].

China launched the first methane-fueled carrier rocket as well. The Beijing-based private company LandSpace developed and manufactured the rocket ZQ 2, which sent an experimental payload into Earth's orbit. This can be regarded as a global space industry breakthrough [26]. Galactic Energy is the first Chinese private entity to carry out a sea-based launch mission. CERES 1 carrier rocket was launched from a mobile platform in the Yellow Sea and sent four satellites 800 km above Earth [27].

China has publicly operated its reusable experimental spacecraft twice. China's reusable experimental spacecraft returned to Earth in May after 276 days' orbit. The test's success advances China's reusable spacecraft technology, making space travel more convenient and affordable in the future [28].

Hainan's Wenchang is becoming China's first commercial space launch site. Its launch capability is under crucial development, and the nation's first such site aims to begin commercial operations by 2024 [29].

Space Infrastructure

In February, China was using several satellites to survey the quake-stricken regions in Turkiye to better assess the disaster and allocate relief resources. Researchers utilized photos to properly depict the devastation and boost Turkiye's post-earthquake rescue operations [30].

BeiDou Navigation Satellite System (BDS) is one of four global navigation systems, along with GPS, GLONASS, and Galileo. It has 46 operational satellites [31]. In May, China launched a carrier rocket to transport a satellite for BDS, the first in three years [32]. China wants to upgrade BDS by 2035 – the new version will be “omnipresent, smarter, and more integrated” [33].

Shanghai strives to create a commercial rocket manufacturing chain that can produce 50 rockets and 600 satellites per year by 2025. The city will develop new-generation medium and large carrier rockets, low-cost and highly integrated satellites, and intelligent application terminals [34]. GalaxySpace, a Beijing-based private satellite maker, is creating a plate-shaped satellite that will enable operators to directly connect their mobile phones to the spacecraft for faster internet access [35].

Space Science

China plans to enhance space scientific development on five major issues, including habitable planet research and biological and physical space sciences [36]. Tiangong has 110 research and technological projects, some of which have advanced. These research programs span life science, microgravity physics, and material science [37, 38]. China unveiled the first panoramic photographs of Mars from its Tianwen 1 mission with 76 m resolution [39]. The Xuntian Space Telescope is being projected to advance cosmology, dark matter, galaxies, star formation, and exoplanets [40]. One of the world's most advanced observatories, China's Large High-Altitude Air Shower Observatory, will help scientists discover high-energy cosmic ray sources [41]. In November, Beijing hosted the 2023 International Symposium on the Peaceful Use of Space Technology–Health, which focused on space industry sustainability, next-generation spacecraft technology, Mars exploration, and space medicine [42].

Space in Popular Culture

Modern Chinese cinema, astrophotography, music, literature, conceptual art, and popular science lectures, among other things, feature space-related themes.

The Chinese sci-fi blockbuster *The Wandering Earth II* earned a huge box office (2.16 billion yuan) during the Spring Festival, ranking second among six domestic titles [43]. CCTV-9 premiered the Sino-French docu-

mentary *Beyond the Far Side, the Dawn of the Space Revolution*, which examined China's lunar exploration's global relevance and impact [44]. Paramount hosted the first Star Trek Day in China, which brought together Star Trek fans, researchers, sci-fi writers, and filmmakers [45]. London's Royal Observatory Greenwich's 15th Astronomy Photographer of the Year competition had almost 4,000 entries from 64 nations. An Jiu's *Grand Cosmic Fireworks* won the Skyscapes category [46]. The CNSA has held China's first spaceflight-themed pop music event. The two-day Beijing Cosmic Echo musical event was intended to promote China's "spaceflight culture" and attract more attention to the country's space programs. At least 40,000 music fans joined the event [47]. Chinese sci-fi authors and artists shined in this year's Hugo Awards. Zhao Enzhe won Best Professional Artist, and Hai Ya won Best Novelette for *The Space-Time Painter*. China hosted this world's biggest sci-fi event for the first time [48]. Shenzhou XVI crew members gave a lecture from the orbiting Tiangong space station. The activity marked the fourth lecture of the Tiangong class series, China's first extraterrestrial lecture series that aims to popularize space science [49].

Conclusion

Notwithstanding external challenges and circumstances, the Chinese space industry maintains a steady and well-planned progression [50]. Based on the outcomes of 2023, China has succeeded in all fields of space technology. Desire for autonomy, self-sufficiency, and innovation, as well as an emphasis on the civilian aspects of space activities, their benign and cooperative nature, are the primary trends. [51] Throughout the year, Chinese space agencies have repeatedly stressed that the country does not seek space hegemony and opposes the space race [52], considering such rhetorical techniques to be an outdated Cold War narrative [53].

Space exploration is closely intertwined with the political agenda in terms of choosing allies [54, 55]. China's achievements are documented in a white paper dedicated to the tenth anniversary of the Belt and Road Initiative [56].

In addition to actual space launches, scientific discoveries, and interstate agreements, China has made several high-profile declarative statements, the main of which is the landing of Chinese taikonauts on the moon and the construction of the ILRS by 2030. This statement represents a China-led viable alternative to the USA-led Artemis Accords. Overall, the year 2030 is regarded as an important milestone and turning point in Chinese space policy. The feasibility and outlook for the continued advancement of China's space policy can be assessed in light of the level of accomplishments as of 2030.

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«М’ЯКА СИЛА» КНР У КОРОЛІВСТВІ САУДІВСЬКА АРАВІЯ

Ключові слова: Китай, Перська затока, Саудівська Аравія, «м’яка сила».

Починаючи з винайдення терміна «м’яка сила» у 80-х рр. минулого століття американським науковцем Джозефом Наєм, цей концепт міцно закріпився в науці про міжнародні відносини. Позитивна думка населення однієї держави про іншу державу та її діяльність може сприяти двосторонньому зближенню та поглибленню міжнародних зв’язків. Для КНР, як другої економіки світу, вкрай важливо підтримувати дружні відносини з одним із найбільших світових експортерів нафти та великою державою-інвестором – КСА. Серед інструментів підтримки дружніх відносин, безумовно, є інструменти «м’якої сили».

У статті під назвою «Ставка Китаю на м’яку силу» аналітики Ради з міжнародних відносин аналізують стан і перспективи м’якої сили КНР. Автори стверджують, що концепт «м’якої сили» привернув увагу лідерів Китаю на межі першого і другого десятиліть 21-го століття, коли про нього почали згадувати Ху Цзіньтао та Сі Цзіньпін. Науковці