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Egypt and the "space race"

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Abstract

Egypt has decided to join the world space club and the decisions to form Egypt's Space Agency and to build EgyptSat – A, are significant steps to achieve this strategic goal.

The Egyptian satellite program has both scientific and military implications. Egypt highlighted the civilian aspects of the satellites, but the EgyptSat-2 satellite was designed to provide high-resolution imagery for the Egyptian military and other government agencies in the country.

The decision to stick with a Russian manufacturer and China for the Egyptian remote sensing satellite might be more about Egyptian geopolitics than just the need for a reliable satellite imaging system.

The EgyptSat-A project

On August 13, 2018, Egypt and China signed mutual letters for the implementation of a satellite named EgyptSat-A, according to an official statement by the Ministry of Investment and International Cooperation. The Chinese grant hits $US 45 million for the remote sensing Earth observation satellite built by the Russian RSC Energia.

The letters were signed by Sahar Nasr, Egypt's minister of investment and international cooperation, and the Chinese ambassador to Egypt, Song Aiguo.

During Egyptian President, Abdel-Fattah El-Sisi, visit in China in September 2018, the two countries signed the agreement to manufacture the Egyptian satellite, as well as a framework agreement for future projects in the coming three years.

The previous Egyptian satellite EgyptSat-2 was launched in April 2014, and it was lost in 2015. The satellite was taking pictures of the planet in the visible and infrared spectrum with panchromatic and multispectral modes.

According to Russian press reports, EgyptSat-A will have improved performance capabilities compared to the failed EgyptSat-2. In particular, the replacement satellite will feature an improved electro-optical system and onboard control systems, high-speed radio links, and solar panels with increased efficiency.

RSC Energia will produce the vast majority of components for EgyptSat-A, compared to Egyptsat-2 where 60 percent of the components were manufactured in Egypt.

Egypt and Russia intended to launch the new Egyptian satellite by 2019, from a Russian space base in Baikonur, Kazakhstan.

The Egyptian space program

The Egyptian satellite program has both scientific and military implications. Egypt's first space program was initiated in 1960 and was subsequently shelved numerous times until its first independent budget was adopted in 2000 to fund space research, following the launch of the country's first satellite NileSat1 in 1998.

The Russian Sputnik agency reported in April 2015 that Egypt aims to develop its space program and Russia could be a strategic partner to establish a specialized space agency in Egypt. President Abdel Fatah El-Sisi also signed in February 2015 a memorandum of understanding in the space field with his counterpart Vladimir Putin.

The Egyptian satellite program is run under the National Authority for Remote Sensing & Space Sciences (NARSS). The NARSS defined the Egypt Space Program vision:

a. Egypt to join the Space age through gradual manufacturing of small research and remote sensing satellites, acquiring technological knowledge and capabilities, and building required infrastructure to achieve self-capability for Egypt to design & manufactures its own small satellites.
b. Utilizing the space technologies & application to develop the scientific research and technologies development in Egypt and to serve the national developments plans.
c. Establishing a scientific and research base for advanced industries in Egypt.

Egypt's Space Agency

Egypt's House of Representatives approved in December 2017, a law to establish Egypt's Space Agency. The law aims to push Egypt forward in the vital area of space and satellite technology in a way that should serve the country's national security and development objectives.

The law is based on a 25-page report prepared by parliament's committees on education and scientific research, telecommunications and information technology, defense and national security, the budget, and legislative and constitutional affairs.

The Egyptian Space Agency (ESA) will be a Cairo-based public organization that will have branches in different parts of Egypt.

The agency will be affiliated with the president of the republic, having financial, administrative and technical independence to be able to do its job in a professional way.

The agency will be mainly responsible for drawing up a national space technology program within the next few years. It will be primarily focused on launching self-made satellites that should serve the development and national security objectives.

Egyptian Space Agency will be set up on Cairo-Suez Road (in Egypt's space and satellite city). Egypt hopes that in seven years Egypt's space and satellite technology city will contribute at least 10 percent to the national income.

In January 2018, Egypt's president Abdel Fattah El-Sisi ratified a law establishing the country's first Egyptian space agency, aiming to develop and transfer space science and technology into Egypt.

The satellites of Egypt

The EgyptSat-1

In 2007, the Egyptian government made its first attempt to acquire its own high-resolution surveillance satellite with the launch of the Egyptsat-1 spacecraft built in Ukraine.

The first satellite EgyptSat-1 was launched from Baikonur on April 17, 2007. However, the contact with it was lost in 2010. Mubarak's government kept the scientific setback secret for three months, before details leaked out. Egyptian specialists claimed then that this was an experimental project with an expected satellite's service life of no more than three years.

The EgyptSat-1 was capable of photographing sites on earth and its launch came after Egypt awarded a tender to Ukraine to construct the satellite. Under the agreement, 60 Egyptian scientists were trained by Ukraine, with the aim of Egypt developing the capability to operate the satellite independently.

Although Egypt continued working with the Ukrainian KB Yuzhnoe design bureau on a follow-on project, Cairo received a bid from Moscow to supply a state-of-the-art "eye in the sky". In 2009, Egypt awarded a contract to Russia for the development of a high-resolution imaging satellite.

In Moscow, the project was officially handled by Rosoboroneksport, a government-owned company specialized in exports of military technology. However, the actual development of the spacecraft was delegated to RKK Energia based in Korolev near Moscow and renown around the world for its leading role in the nation's manned space flight. RKK Energia's imaging satellite was originally known as E-Star, but it was eventually re-christened Egyptsat-2. The development of the satellite coincided with a major political upheaval in Egypt; however, the nation's military clearly managed to fully fund the project.

EgyptSat-2

A Soyuz-U rocket carrying an Egyptian observation satellite, EgyptSat-2, was launched from the Baikonur Cosmodrome in Kazakhstan on, April 16, 2014. Russia trained Egyptian engineers to control the satellite from a ground station near Cairo. [1]

The development and launch campaign for Egyptsat-2 has been conducted largely in secret. Only one visual of the operational spacecraft was released to the public by its manufacturer RKK Energia, after the successful launch.

The Russian-built Egyptsat-2 satellite was designed to provide high-resolution imagery for the Egyptian military and other government agencies in the country. The satellite was reportedly equipped with electric engines using xenon gas as propellant to enter its operational orbit and to conduct orbit corrections.

According to its official specifications, the satellite could discern details as small as one meter on the Earth's surface. In addition to regular photos, the satellite's optics could produce infrared imagery. The optical imager supported various modes of operation including single-scene imaging, route imaging, mapping, and stereo imagery acquisition.

In April 2015, the EgyptSat-2 completely failed in orbit but there was no official confirmation or denial from the official sources. EgyptSat-A is being built as a replacement for EgyptSat-2.

Egypt and France space cooperation

Egypt is negotiating a deal with Thales Alenia Space (TAS) to purchase an observation satellite and a military telecommunications satellite. The contract amounts to approximately one billion euros for the two satellites.

Summary

Egypt has decided to join the world’s space club, and the decisions to form Egypt's Space Agency and to build EgyptSat-A are significant steps to achieve this strategic goal.

The EgyptSat-A satellite aims to support Egypt's "presence in space," to establish the presence of Egyptian scientists and researchers in outer space and to increase new investment opportunities and enhance developmental projects.

Egypt currently owns two communication satellites, NileSat 1 and NileSat 2. Egypt highlighted the civilian aspects of the satellite, but the EgyptSat-2 satellite was designed to provide high-resolution imagery for the Egyptian military and other government agencies in the country.

The decision to stick with a Russian manufacturer and China for the Egyptian remote sensing satellite might be more about Egyptian geopolitics than just the need for a reliable satellite imaging system.

[1] The Moscow-based NPK BARL concern announced the completion of the center in October 2011.