

# A strategy for Swedish space activities





Photo: ESA

# Space activities bind the world together

In its written communication A strategy for Swedish space activities (2017/18:259), the Government presents a strategy that should form a platform for Sweden's long-term work on space activities. The strategy includes an overall description of the areas the Government wishes to prioritise and the targets that exist for the respective areas..

## International cooperation for the peaceful and sustainable use of space

Space is a common resource that all countries have the same right to use and explore for peaceful purposes. This forms the basis of all space activities and is increasingly important to emphasise as space becomes accessible to increasing numbers. Sweden's freedom of action in and access to space can be strengthened through the contributions the country makes to a long-term sustainable use of space in which the extra-terrestrial environment is kept safe and predictable. Safeguarding this should be a strategic objective.

This objective is linked to another strategic objective, namely opposing the placement of weaponry in space and preventing space from becoming an arena for conflicts, and to a third objective - the use of space and space services for peaceful purposes in a way that

benefits human welfare and sustainable development. A fourth objective is for space activities to take place in an open and transparent manner. Openness and cooperation require standard-setting agreements, both voluntary guidelines and legally binding treaties and regulations. A fifth objective should therefore be for Sweden, through its participation in international negotiations, to contribute to the development of international regulations for space activities.

Space debris forms the single largest threat, for which humans are responsible, to the extra-terrestrial environment. Space debris mostly consists of defunct satellites, loose objects or fragments of satellites that have detached or resulted from collisions of objects orbiting the Earth. The amount of debris is steadily increasing as the result of daily space activities but collisions and, in the worst cases, deliberate attacks on satellites could

lead to the formation of large amounts of new debris. Managing the problem will require a combination of increased understanding of this phenomenon, technical solutions and new regulations. To emphasise the importance of this, a sixth objective should be for Sweden, through its participation in international negotiations, to contribute towards international efforts to manage the problem of space debris.

## Space data is used across society as a whole

The many satellites in space provide large amounts of data. This applies in particular to the navigation initiative of the EU and the European Space Agency (ESA) using the Galileo satellites and Earth observations using Copernicus. The Government is establishing two strategic objectives for space data. The objectives should be for Sweden to benefit from participation in these programmes and for data from space



Samantha Cristoforetti Italian astronaut at European Space Agency.  
Photo: ESA/NASA

systems in general, and from the EU's satellite programmes in particular, to be easily accessible for the development of technology and services. In these contexts, Sweden's national security should be safeguarded and secrecy, security protection and the protection of personal privacy should be upheld.

#### The 2030 Agenda and the Global Goals

The large amounts of data from observations of the Earth provided by Galileo and Copernicus can be used in the work of the 2030 Agenda and the Global Goals. One strategic objective should therefore be for the Swedish space industry and space research to contribute towards global environmental and climate monitoring work and the implementation of the 2030 Agenda and the Global Goals.

Sweden's security must be considered in space activities

Space activities have foreign policy, security policy and defence policy dimensions, which are becoming more substantial as greater numbers of actors become involved in space. The capacity to act in space and use space services entails advantages in military strategy and security policy. International security policy developments, particularly in Sweden's neighbourhood, must be considered for Sweden's international cooperation, as well as in decisions and prioritisations concerning Swedish space activities. One strategic objective should therefore be for state space activities to contribute towards increasing Sweden's security by contributing to the fulfilment of Sweden's foreign policy, security policy and defence policy interests and to strengthen the national military capability.

Critical infrastructure needs to be protected

Modern society is dependent on space services for communications, navigation, weather forecasting and many other functions. The critical interdependence of important activities and across national borders means that interruptions and disruptions can have major consequences. Dependence brings vulnerability to disruptions in access to space services. The Government is therefore setting up two strategic objectives to protect critical infrastructure. These should be ensuring that space activities contribute towards restricting the risks inherent in society's dependence on individual space services, and ensuring, through the coordination of the actors concerned, that infrastructure important to society has strong resilience towards extreme solar storms and deliberate disruptions.

# The space industry makes space accessible

The stringent demands that the space industry's products work in such extreme environments as space are pushing the boundaries for what can be manufactured and constructed. This provides knowledge that can also be used in other areas, thereby contributing towards stronger competitiveness, even outside the space industry. To make it easier for the space industry to participate in international cooperation, and so contribute to strengthening Swedish competitiveness, the Government is setting three long-term strategic objectives. One objective should be for central government support to the technological development of space activities to lead to stronger competitiveness for the participating companies. Another objective should be for Sweden's participation in the EU's space work, international cooperation and the Swedish National Space Board's participation in ESA programmes to be predictable over the long term. A third objective should be to utilise synergies between cen-

tral government support for the technological development of space activities and other support for civil and military activities.

## Esrange

The European Space and Sounding Rocket Range (Esrange), situated east of Kiruna, is a civilian space centre for the launching of rockets and balloons which are used for research in the upper atmosphere and near-Earth space. One strategic objective should be for the infrastructure of Esrange to be scaled up to become an important national and European strategic resource for national and international research, development, demonstration, test activities and other space-related activities. Sweden's foreign policy, security policy and defence policy interests must be considered when international cooperation takes place.

## The Space Activities Act

An increased Swedish presence in space requires that regulations dealing with space activities are adjusted to needs. One strategic objective should be for Swedish space legislation both to provide support for space activities in Sweden and ensure that international commitments are fulfilled, and to enable private investment in Swedish space activities.



Galileo is fired from Europe's Spaceport in Kourou, French Guiana.  
Photo: ESA-Manuel Pedoussaut



Nebulas Carina  
Photo: NASA/ESA/M

# Space research helps us to understand the Earth

Swedish space research and research in space physics maintain high standards in international comparisons and are cited more often than the global average within most areas linked to space. Swedish higher education institutions participate in several of the ESA's programmes and in the development of instruments for Swedish satellites, often in collaboration with the Swedish space industry. At the Swedish Institute of Space Physics, satellites and instruments are manufactured which have been included in several of the ESA's expeditions to orbits around other celestial bodies. To ensure that Sweden continues to pursue cutting-edge research, the Government is setting up three strategic objectives. These should be that Swedish space research maintains a high standard in international comparisons, that Swedish space researchers perform well in international comparisons and that Sweden is a strong partner when partici-

pating in international cooperation in space exploration.

## Infrastructure for space research

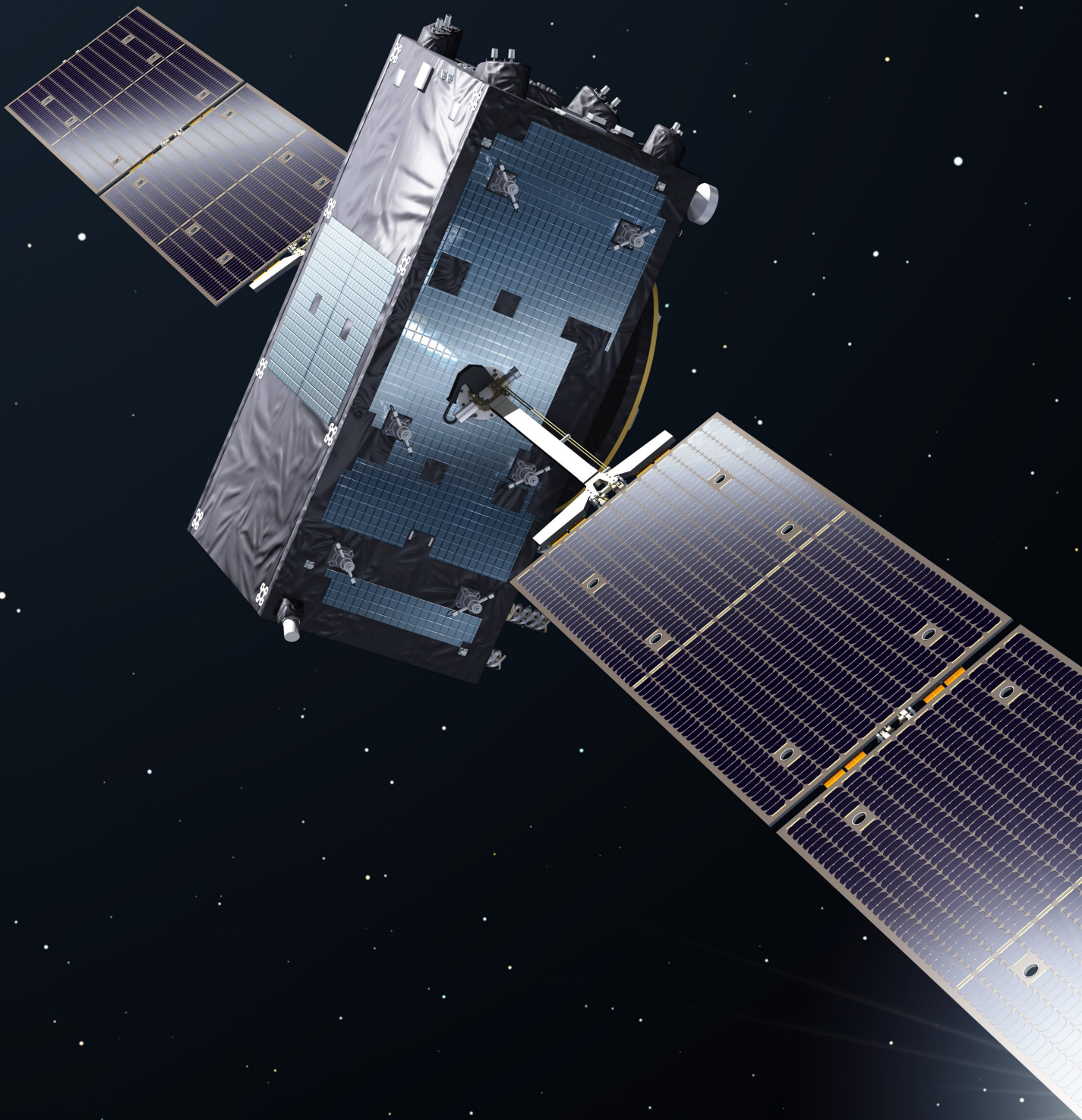
Conducting high quality research demands high quality equipment. To guarantee this, one strategic objective should be for space researchers to have access to appropriate infrastructure for their research.

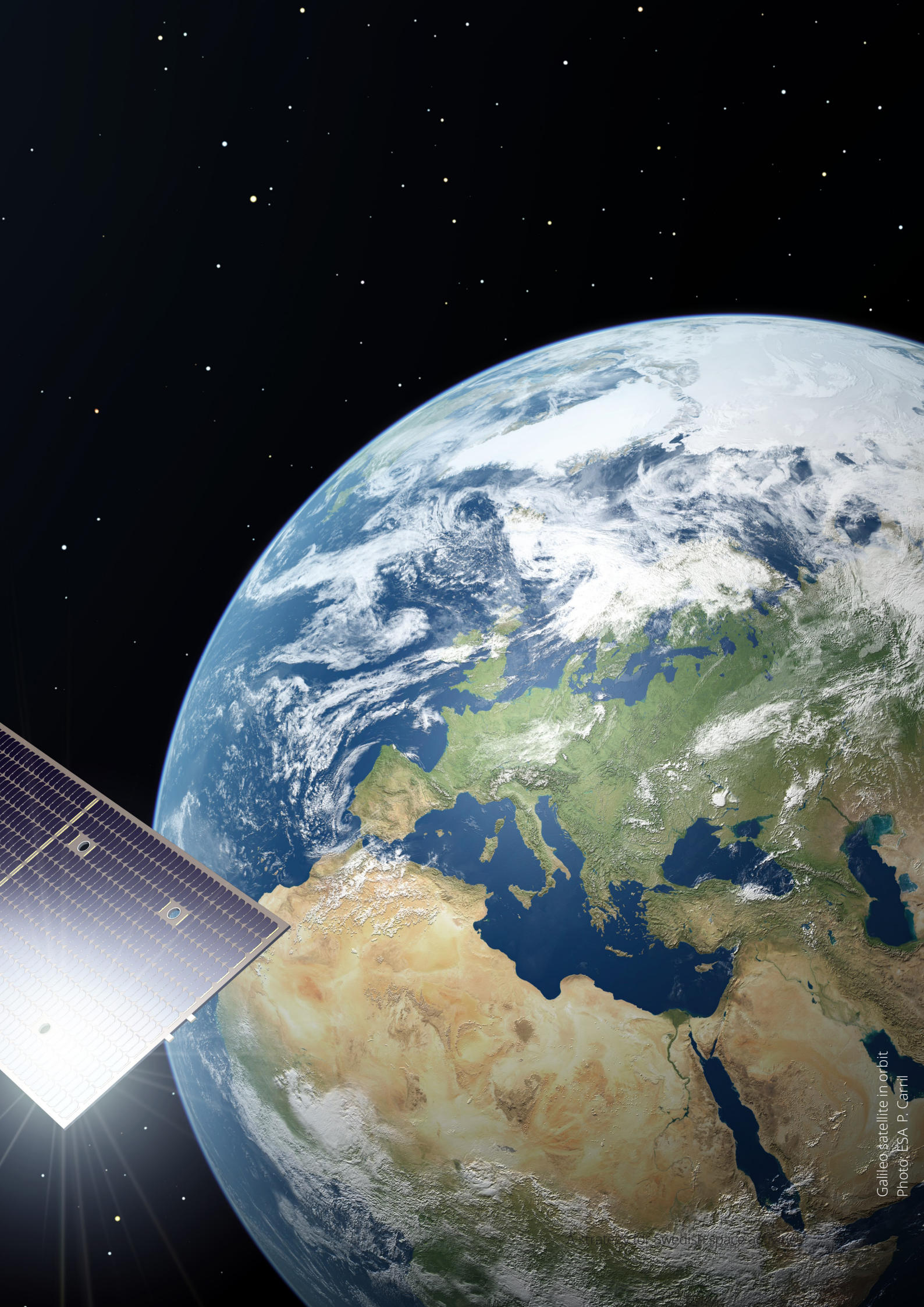
## Space activities open career paths for both women and men

Space is an area within the natural and engineering sciences that awakens particularly great interest among both women and men. This can be a path to a broader interest in the natural and engineering sciences. To contribute towards this, the Government is establishing three strategic objectives. One objective should be for Sweden to be a leading country when it comes to equal opportunities for both women and men

to pursue careers within space activities. Another objective should be for space activities to encourage both young women and young men to apply for technology and science programmes at upper secondary level and in higher education. A third objective should be for the number of students in education to be sufficiently high to fulfil the need for competence within space activities.







Galileo satellite in orbit  
Photo: ESA P. Carril

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