

The background of the page is a composite image. It shows a close-up of a space helmet with a clear visor, reflecting the Earth and the sun. The helmet is positioned in the foreground, and the Earth is visible in the background, showing clouds and the horizon. The sun is visible on the horizon, creating a bright glow. The overall image has a futuristic and technological feel.

**Notice for the Advanced Research in
Telecommunications Systems 4.0
(ARTES 4.0) Program of the
European Space Agency (ESA)**



Canadian Space Agency
Agence spatiale canadienne

Canada



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Introduction

Canada and the European Space Agency (ESA) have been cooperating in space activities since the early 1970s. Formal cooperation began in 1979 with the signing of the first Cooperation Agreement. The Agreement has been renewed five times since. The most recent Cooperation Agreement is in effect until January 1, 2030.

The Cooperation Agreement between Canada and ESA enables companies from the Canadian space sector to participate in ESA activities and programs and allows Canada to be part of ESA's decision-making process. Through this unique agreement (Canada is the only non-European cooperating state), Canadian organizations are allowed to bid on tenders for ESA contract related to activities and programs in which Canada participates. It provides opportunities for them to create alliances with European industry and access to space qualification or flight opportunities for their technologies and products. The implementation of the Cooperation Agreement is primarily accomplished through a contribution program.

This notice aims to inform the Canadian space sector on the procedures to seek funding for the Advanced Research in Telecommunications Systems 4.0 (ARTES 4.0) Program.

The ARTES 4.0 Program, which is an optional program of ESA, is the successor of the ARTES Program. It aims to support research and development efforts of the European and Canadian industry in the area of Satellite Communications (Satcom). The program has the following main objectives:

- Maintain and improve the capability and competitiveness of industry of participating countries in the world of satellite communications market;
- Unite industry and promote industrial initiatives around large-scale partnership projects needed to catalyze substantial investments resulting in a competitive leap forward and economic impact;
- Define, assess and promote the use of satellites and space-related systems for innovative services;
- Enlarge the community of space-enabled business applications and support the development and growth of new and sustainable implementations, with the view of stimulating economic growth and/or enhancing the quality of life of citizens, with the aim of maximizing the socio-economic impact of the program;
- Carry out technological developments and experimental/pilot missions, including in-orbit demonstrations, which are identified as having a future market potential;
- Introduce and experiment new techniques for satellite systems that will be economically competitive or complementary to or an integral part of terrestrial networks;
- Promote the use of advanced technologies for emerging services;



- Strengthen synergies with the participating countries' initiatives and at European level; and
- Contribute to the solutions addressing market-driven, societal and technological needs through development actions in specific Strategic Program Lines.

Canada has been participating in the ARTES Program since its creation in 1993, with the following Canadian objectives:

- Provide opportunities for Canadian industry to partner with European companies at the research and development stage;
- Provide access for Canadian industry to the European satcom market; and
- Provide access to space and flight heritage through European-led initiatives for Canadian innovative technologies.

The ARTES 4.0 Program is complementary to national programs since it:

- Builds industrial relationships with European companies;
- Provides advancements in R&D and opportunities to test and prove Canadian technologies; and
- Involves Canadian participation in large, complex and innovative Satcom missions.

At the 2019 ESA Ministerial Meeting, the Canadian Space Agency (CSA) extended its participation in ESA's satcom activities, by subscribing 15.01M€ (approx. \$22.5M) in several elements of ARTES 4.0, namely Future Preparation, Core Competitiveness, Space for 5G, and Optical Communication – ScyLight.

It is important to note that this amount includes ESA overhead to manage the program element, which generally varies between 15% and 20% of the amount committed, according to ESA's level of effort required to manage the program element.

Program Overview

The ARTES 4.0 Program is built on four Generic Program Lines and three Strategic Program Lines.

The Generic Program Lines offer a structure that maximizes the use of well-known and optimized rules. They serve general purposes in the long term and consist in activities and projects aimed at a common strategic goal. The program consists of the following Generic Program Lines:

- Future Preparation;



- Core Competitiveness;
- Partnership Projects (Canada is not participating in this program line); and
- Business Applications – Space Solutions (Canada is not participating in this program line).

The Strategic Program Lines offer a structure that optimizes the contribution of satellite communications and space applications to participating countries' strategic agenda on national and European level. The program consists of the following Strategic Program Lines:

- Space for 5G;
- Space Systems for Safety and Security (4S) (Canada is not participating in this program line); and
- Optical Communication - ScyLight

As indicated on the [ESA's ARTES 4.0 Program website](#), ESA will fund a certain percentage varying from 50% to 100% of the total cost of the proposed activity depending on the technology readiness. The funded activities are selected either through Invitations to Tender (ITTs) based on a list of proposed activities (annual work plan) or through an Open Call for Proposals where unsolicited proposals can be submitted at any time. In most cases, an authorization provided through a letter of support is required from the national delegation of the participating state (CSA in the case of Canada).

The program lines in which Canada participates are described in the following section. Also, additional information on the program can be found on the [ESA ARTES 4.0 Program website](#).

Description of the ARTES 4.0 Program Lines and Procedure for Participating

Below is a description of each program line in which Canada is participating and information about how to submit a proposal under each one.

Future Preparation Generic Program Line

Description

The objectives of the Future Preparation Generic Program Line are: to perform mission, system and general configuration studies and other activities to prepare and continuously update the medium- and long-term program of ESA in the field of telecommunications; to prepare new program lines and projects; to define the technology developments necessary for the execution of the program and their timing; and to provide these requirements as inputs for the preparation of technology work plans to be undertaken in the program.



How to Apply

This program line is composed of activities which are implemented on the basis of a rolling work plan. This work plan is established and updated based on the results of annual Calls for Ideas open to participating states' industries, satellite operators, service providers, universities and research centres, national space agencies and to ESA employees. Based on this rolling work plan, ESA issues ITTs open to all participating states, including Canada, throughout the year. Industrial activities supported under this program line are fully funded by ESA.

The Canadian industry is invited to identify activities of potential interest in [ESA's ARTES ITTs](#), and contact CSA to see if Canadian targeted funds are still available. If so, the industry shall then formally respond to ESA's ITT by following the process described in the bidding documents.

Additional information about this program line can be found on the [ESA ARTES 4.0 Program website](#).

Core Competitiveness Generic Program Line

Description

The objective of the Core Competitiveness Generic Program Line is to maintain and improve the capability and competitiveness of the industry of the participating countries in the world satellite telecommunications market through the development of satellite communications technology and products. It provides support throughout the technology development process; from the initial idea to a fully-fledged product, system or service. This program line provides the funding, multi-disciplinary expertise, business knowledge, opportunities for small and medium enterprises as well as for international consortia, and contacts needed to turn the concept into reality. This program line is structured along two components, Advanced Technology and Competitiveness & Growth, with two different approaches for applying.

Advanced Technology

Description

The ARTES 4.0 Core Competitiveness Generic Program Line's Advanced Technology Component aims to ensure the long-term readiness of the industry to respond to coming commercial or institutional opportunities by focusing the activities on technological innovation in equipment and systems for satellite communications, including support to standardization. It is ESA's main tool for preparatory development



of satellite communications technology. The space and ground segments are supported, as well as overall system-related activities. Activities under this component, which are initiated by ESA, address the initial phases of the development of hardware, software and system concepts for satellite communications using new technologies, techniques or concepts, and result in study reports, bread-boards or representative models of the item. Since these activities contain a significant amount of industrial research and technical risk, they are therefore fully funded by ESA.

How to Apply

The activities under this component are based on a “Competitive Work Plan”. This work plan is established based on the results of an annual Call for Ideas open to participating states’ satellite industries, satellite operators, service providers, universities and research centres, national space agencies and to ESA employees. Based on this work plan, ESA issues open or restricted ITTs throughout the year. An express authorization of funding by the participating state’s national delegation is required.

The Canadian industry is invited to identify activities of potential interest in [ESA’s annual work plan](#), and contact CSA to see if a specific activity could be supported by CSA and if Canadian targeted funds are still available. If so, the industry shall then submit to CSA a short proposal, as described in the next section. This proposal can be submitted at any time following the issuance of the annual work plan, even after the corresponding activity’s ITT is published by ESA on its website ([see ESA’s ARTES ITTs](#)). Sufficient time must be given to CSA to evaluate the proposal. If CSA decides to provide a letter of support, the organization should then formally respond to ESA’s ITT by following the process described in the bidding documents.

Competitiveness & Growth

Description

The ARTES 4.0 Core Competitiveness Generic Program Line’s Competitiveness & Growth Component aims to ensure the readiness of the industry to address commercial opportunities by focusing the activities on technological innovation in equipment, systems and applications for satellite communications, with the view of products ready for future exploitation within either the commercial or institutional market. This component is to identify and carry out design, development and demonstration activities in the space segment, including flight opportunities for innovative items, and ground segment, on the basis of proposals made by industry to develop future products. Products are defined to be any hardware, software, system or sub-system or services. This component co-funds with industry phases in the development targeting products ready for exploitation; ESA could fund up to 80% of the total cost of the proposed activity.



How to Apply

Contracts under this component are awarded by ESA on the basis of proposals made by industry for the development of products for future commercialization, through an “always open” Call for Proposals. Proposals can be submitted at any time, on any activities within the scope of this component. Activities are implemented through non-competitive tender actions.

The [ARTES C&G Call for Proposals](#) presents the steps to follow to submit a proposal under the tender number AO10285. As mentioned on the website, it is mandatory that organizations wishing to do business with ESA (both prime contractor and subcontractor(s)) obtain a formal authorization from their national delegation (CSA in the case of Canada) to carry out the proposed activity. The first step to obtain such formal authorization is to contact CSA to query if this activity could be supported by CSA and if Canadian targeted funds are available. If so, the industry shall then submit a short proposal to CSA, as described in the next section. If CSA accepts to support the activity and provide the formal authorization to ESA, the Canadian industry must then respond to ESA’s Call for Proposals by submitting an outline proposal. Following a successful Outline Proposal, ESA will invite the tenderer to submit a full proposal. Upon completion of the evaluation of the proposal, ESA will inform the tenderer whether the proposal has been found acceptable or not, and proceed with contract negotiations and award, as applicable.

Additional information about this program line can be found on the [ESA ARTES 4.0 Program website](#).

Space for 5G Strategic Program Line

Description

The Space for 5G Strategic Program Line aims to integrate satellite telecommunications with terrestrial services in order to deliver resilient and continuous data services in sectors such as mobility and personal security. 5G implementations constitute a network of networks combining the different technologies, to enable a convergence of satellite and terrestrial networks. Activities supported under this program line are initiated by ESA. For the time being, there is only one project being carried out, namely Sunrise Phase 2. ESA could fund up to 100% of the total costs of supported activities.



How to Apply

The processes used to implement the Space for 5G Strategic Program Line are identical to those in place for the Advanced Technology Component and the Competitiveness and Growth Component of the Core Competitiveness Generic Program Line. Please contact us if you would like to participate in this program line.

Additional information about this program line can be found on the [ESA ARTES 4.0 Program website](#).

Optical Communication - ScyLight Strategic Program Line

Description

The Optical Communication – ScyLight Strategic Program Line aims to develop and demonstrate optical communications technology for satellites. Thirty years after fiber-based terrestrial networks laid the foundation for the Internet, optical communications technologies in space are expected to achieve major impacts on the satcom sector in the next decade. Space-based optical communications technologies are bringing unprecedentedly high levels of transmission rates, data security and resilience. Activities supported under this program line are initiated by ESA. For the time being, there is only one project being carried out, namely HyDRON (high throughput optical network). ESA could fund up to 100% of the total costs of supported activities.

How to Apply

The processes used to implement the Optical Communications - ScyLight Strategic Program Line are identical to those in place for the Advanced Technology Component and the Competitiveness and Growth Component of the Core Competitiveness Generic Program Line. Please contact us if you would like to participate in this program line.

Additional information about this program line can be found on the [ESA ARTES 4.0 Program website](#).

Proposal Submission to CSA

In order to issue an express authorization of funding or a formal authorization to carry out a proposed activity under the ARTES 4.0 Program, CSA is requesting a proposal aligned with the guidelines of the outline proposal requested by ESA for consideration for program funding. The requested proposal also includes questions relevant to the Canadian objectives of its participation in ARTES 4.0. Among others, decisions will be based on whether the opportunity is in line with the objectives of Canada's participation in ESA programs, more specifically the ARTES 4.0 Program elements under which the request is made, together with availability of



funding. Before submitting any proposal, interested organizations should contact CSA to discuss their idea and query about funding availability.

For CSA to support new ideas under any of the ARTES 4.0 Program elements, it is critical that it understands the proposed ideas and evaluate them according to the following criteria:

- European partnership;
- Flight opportunities;
- Innovation, credibility and feasibility;
- Commercial, strategic and technological relevance; and
- Expected return on investment with proposed co-funding investment by the industry.

The evaluation criteria and the format of the requested proposal can be found in the Guidelines for the preparation of a Proposal (this document is provided upon request). This approach must be respected for any request for funding under the ARTES 4.0 Program.

Proposal Selection Framework

To make sure Canadian funds are available in the ARTES 4.0 Program until the next ESA Ministerial Meeting, where additional funds could be subscribed by Canada, the following process is put in place. At the beginning of each calendar year, CSA year marks a portion of the funds subscribed at the 2019 ESA Ministerial Meeting for allocation during the year. Once the yearly allocated funds are depleted, CSA does not accept new proposals until the following year, even if Canadian funds are still available in the ARTES 4.0 Program. Moreover, CSA allocates a portion of the yearly mark funds for small- and medium-sized enterprises to help create new partnerships between Canadian organizations and European ones. A portion of the funds is also dedicated for activities funded under the annual ESA work plan (Advanced Technology Component of the Core Competitiveness Generic Program Line) where proposals are selected through a competitive process.

Finally, it is important to note that CSA will also make its funding decisions based on the best interests of the Canadian space program and in order to promote a balanced approach to favor a healthy, diversified and competitive Canadian satcom industry.

Contact

Should you have any questions about the cooperation between Canada and ESA, or about how to submit a proposal under the ARTES 4.0 Program, contact us at asc.esa_programme-esa_program.csa@canada.ca.