

2024 Call for Ideas

Space Instruments Program

Netherlands Space Office (NSO)

With this Call for Ideas the Netherlands Space Office (NSO) invites scientists and experts from the Dutch space field to submit ideas and suggestions for the development of – technology for – future space instruments in the fields of Earth Observation, planetary research, and astronomy.

1. NSO's Space Instruments Program

1.1 Background

Space instruments are at the core of the usefulness and benefits of space activities. Data (including observations, signals) from space instruments are useful for a variety of applications in many fields of science, society and economy. Examples abound, including Earth's climate change, astronomy, cosmology, planetary research, societal security, environment, biodiversity, Sustainable Development Goals, and many more.

The Netherlands have a long standing tradition in the development of space instruments, particularly in the optical domain, but upcoming microwave/radio domain as well. Dutch instruments in the field of high and low energy astrophysics, as well as atmospheric composition, take top positions in international space research. The Dutch space ecosystem, including science institutes and industry, comprises state-of-the-art research and development in these fields. These organisations have a long history in collaboration in national and international consortia.

Current developments in space show that science and society are ever more depending on space instruments. New Space shows a trend towards smaller and cheaper spacecraft and therefore smaller instruments, combined with a more sustainable use of space. At the same time, breakthrough technologies enabling novel types of observations often require larger budgets, and may lead to more complex space projects, especially in science.

1.2 Goal

Within the context of the Dutch national space policy and funded by the Ministry of Education, Culture, and Science (OCW), the goal of the Space Instruments Program (IOP) is to maintain, strengthen, and broaden the position and expertise of the Netherlands in the field of space instrumentation, driven by the needs and requirements of the users. Therefore, this program supports the development of – technology for – future (scientific) space instruments that are of national scientific relevance and interest, and that are complementary to developments in other programmatic contexts such as those of European or other space agencies

1.3 Scope and boundaries

The program addresses space instruments, which, in this context, are defined as systems operating on space platforms, that deliver (measured or generated) data to users. The program focusses on the hardware of space instruments ('upstream', including relevant on-board software and instrument-critical data processing technologies), meaning that the development of – software for – applications with space data ('downstream') is not part of the program.

The program is open for technology developments on TRL 4 to 6. Please note that for lower TRL, other programs are better suited and available. Also note that the program is not open for higher development phases TRL 7 to 9, typically addressing the realisation (building, launch and operation) of the instrument.

The main focus of the program is on scientific space instruments, while taking into account the close synergy in space instrument development between science and industry, as well as taking into account the synergy that exists in the use of space instruments between scientific and other (societal, commercial) applications.

1.4 Topics and user needs

In general, the space instruments program is open for instrument developments that are in line with scientific priorities of the Dutch scientific community and the Dutch space policy, including the priorities indicated in the Long Term Space Agenda (LTR). The program is open for instrument developments in the fields of satellite Earth Observation, Planetary space research, and space-based astronomy/astrophysics, which are priorities of the national space policy for OCW.

In the national space policy, the maximization of the benefits of the use of space for science and society is one of the main goals. Space developments are more and more driven by needs from scientific and societal (end)users. The program will therefore strongly focus on space instruments for which clear user needs are available as much as possible, taking into account that, since the program aims at future instruments, these user needs may still require further specification, concretization and user commitment.

2. This Call for Ideas

For the 2022-2025 timeframe, NSO aims to support the development of one or more space instruments as under development on TRL 4-6 at Dutch organisations. For this, NSO intends to issue a dedicated call in the 2nd part of 2024. In preparation to that instrument call, NSO would like to know what are the current space instrument developments in the Netherlands that could benefit from such a call. To obtain this overview and to give a level-playing-field opportunity to all space experts to announce their ideas and to possibly join existing similar ideas, this Call for Ideas is issued first.

This Call for Ideas invites Dutch space experts from science and industry to submit ideas and suggestions for the development of – technology for – future space instruments in the fields of satellite Earth Observation, planetary space research, and space-based astronomy.

Ideas should be in line with the constraints provided in section 1.

2.1 To apply

Who can submit

Ideas can be submitted by applicants affiliated with Dutch universities, scientific institutes, research institutes, and industry. In the latter case (industry), the consortium is required to include at least one main/lead partner from academia. NSO encourages ideas to be submitted by consortia rather than by individual applicants.

Scientific instruments

Space instruments included in the ideas, should aim at scientific use, or a combination of scientific and other (societal, commercial) use.

Development status

The current technological development status of the submitted ideas, in terms of Technological Readiness Level (TRL), should be at least TRL 3. The submitted idea should also indicate the expected increased TRL after the work, which can be maximally TRL 6 under this program. In addition, the current Scientific Readiness Level (SRL)

and Application Readiness Level (ARL) associated with the proposed space instrument development should be indicated. In line with the TRL increase, the SRL should reach 4-6 and the ARL should reach 3-5, and the applicants should indicate what activities are to be done, by themselves or others, to reach these SRL and ARL levels.

See Appendix A for a definition of TRL, SRL, and ARL.

Application form and planning

Ideas should be submitted by using the application form in Appendix B.

Submission deadline: ~~30 April 2024~~ **Extended deadline: 14 May 2024**

Application forms should be send by email to: AdminNSO@spaceoffice.nl

2.2 Assessment of the ideas

NSO will assess the submitted ideas for eligibility within the IOP, taking into account in any case the adherence to the Dutch space policy and scientific priorities, the development status (TRL, SRL, ARL), and the programmatic context. Furthermore, in view of the budgetary and policy constraints of the following instrument call, also the feasibility and timeliness will be taken into account.

Based on the assessment, NSO will provide feedback to the applicants, including a non-binding advice on submission or not for the following instrument call, advice and suggestions for changes and/or improvements of a possible future proposal, and suggestions on consortium building and user involvement.

Contact

For questions or more information related to this Call for Ideas or the Space Instrument Program please contact Joost Carpay j.carpay@spaceoffice.nl

Appendix A: Definition of TRL, SRL, ARL

TRL 1: Basic principle
TRL 2: Application formulated
TRL 3: Proof-of-concept
TRL 4: Functional verification
TRL 5: Breadboards (reduced scale) verification in relevant environment
TRL 6: Models (full scale) demonstration in relevant environment
TRL 7: Model demonstration for operational environment
TRL 8: Flight qualified
TRL 9: Flight proven

SRL 1: Initial scientific idea
SRL 2: Consolidation of scientific ideas
SRL 3: Scientific and observation requirements
SRL 4: Proof-of-concept
SRL 5: End-to-end performance simulations
SRL 6: Consolidated science and products
SRL 7: Demonstrated science
SRL 8: Validated and mature science
SRL 9: Science impact quantification

ARL 1: Basic research (baseline ideas)
ARL 2: Application concept (invention)
ARL 3: Proof of application concept (viability established)
ARL 4: Initial integration and verification (prototype/plan)
ARL 5: Validation in relevant environment (potential determined)
ARL 6: Demonstration in relevant environment (potential demonstrated)
ARL 7: Application prototype in partner's decision making (functionality demonstrated)
ARL 8: Application completed and qualified (functionality proven)
ARL 9: Approved, operational deployment and use in decision making (sustained use)

Appendix B: Application form

Ideas should be limited to 4 pages (A4). The idea description should include the following sections:

1. Title
2. Main applicant, contact details
3. Description of the instrument, including type, technology, method, foreseen application, and users
4. Consortium (role, expertise, indication of tasks of all consortium members)
5. Description of the proposed work (technical, scientific, user needs/involvement/commitment)
6. Indication of the development phase: TRL, SRL, and ARL (current level, to-be-increased level, substantiation)
7. Indication of the budget (and possible own contributions) needed when submitted in the Instrument Call.
8. Programmatic context (agency, program(s), follow-on funding opportunities)