2024 Call for Proposals

Space Instruments Program

Netherlands Space Office (NSO)

With this Call for Proposals the Netherlands Space Office (NSO) invites scientists and experts from the Dutch space field to submit proposals for the development of – technology for – future space instruments in the fields of Earth Observation, planetary research, and astronomy. In this Call for Proposals you'll find information about the aim of NSO's space instruments program, the conditions for application and how your proposal will be assessed.

Change log: updated Version 1.1 (20 December 2024)

- Section 2.3.4: Indication of ARL is only applicable for EO missions/instruments.
- Appendix A: Clarification added on TRL, SRL, and ARL.

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. The Dutch space ecosystem, including science institutes and industry, comprises state-of-the-art research and development in both 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 Objective

Within the context of the Dutch national space policy and funded by the Ministry of Education, Culture, and Science (OCW), the objective 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

Space Instruments

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. See Appendix C for a more detailed definition of space instruments as is understood for this Call. 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.

Topics and user needs

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.

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 Proposals

Until 2025, NSO aims to support the development of one or more space instruments as under development on TRL 4-6 at Dutch organisations. Earlier in 2024, in preparation of this Call for Proposals, NSO issued a Call for Ideas to get an idea of current space instrument plans and developments in The Netherlands. The present Call for Proposals is open for Dutch space experts from science and industry, irrespective of submissions to the earlier Call for Ideas. Applicants are invited to submit proposals for the development of – technology for – future space instruments in the fields of satellite Earth Observation, planetary space research, and space-based astronomy. Proposals should be in line with the constraints provided in section 1.

2.1 Available budget

The ministry of Education, Culture and Science has provided funding for the Space Instruments Programme for the period 2023-2025. Within the duration of this programme, two funding rounds will be published. This Call for Proposal concerns the first funding round, for which the total budget is €2,37M.

The available budget will be allocated across two categories: large projects with a maximum budget of €700k each, and smaller feasibility studies up to a maximum of €50k each.

2.2 Submission deadline

The deadline for submitting proposals is February 27th 2025, 12.00 CET.

2.3 Conditions for applicants

2.3.1. Who can apply:

Proposals 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 (universities, scientific/research institutes). NSO encourages proposals to be submitted by consortia rather than by individual applicants.

The main applicant submits the proposal to NSO. During the assessment process, NSO will communicate with the main applicant. After a proposal has been awarded funding, the main applicant will become the project leader and will be responsible for the whole project (scientific, technological, financial, management), and will be single point of contact for NSO.

2.3.2. What can be applied for:

You can submit a proposal in one of the following categories:

1. Large projects

For an application in this category, a maximum of €700k can be applied for. These projects comprise technology development activities on TRL 4-6.

2. Feasibility studies

For an application in this category, a maximum of €50k can be applied for. These studies may comprise study activities on TRL 2-4 to address feasibility of an instrument concept.

For both categories, funding requests may include only those costs that are vital to successfully carry out the project. This should be motivated clearly in the proposal and will be part of the eligibility assessment by NSO.

Funding requests cannot include costs for which funding from other national or EU funding sources has been or will be received, nor costs made before the kick-off of the project.
Funding requests may include costs for personnel, equipment, and outsourcing to third parties.
In case VAT can be offset these costs are not fundable.
The subsidy can only be used for non-economic activities.
The maximum project duration is 5 years.

2.3.3. Which instruments are eligible:

Space instruments included in the proposal, should aim at scientific use, or a combination of scientific and other (societal, commercial) use. A description of the intended users of the instruments needs to be included.

2.3.4. For which development status is this call:

The current technological development status of the submitted proposal, in terms of Technological Readiness Level (TRL), should be at least TRL 3. The submitted proposal 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) associated with the proposed space instrument development should be indicated. In line with the TRL increase, the SRL should reach 4-6, and the applicants should indicate what activities are to be done, by themselves or others, to reach this SRL. For instruments in the field of Earth Observation the submitted proposal should also indicate the current Application Readiness Level (ARL) associated with the proposed space instrument development. In line with the TRL increase, the ARL should reach 3-5, and the applicants should indicate what activities are to be done, by themselves or others, to reach this ARL.
See Appendix A for a definition of TRL, SRL, and ARL.

2.3.6. Application form and planning

Proposals should be submitted by using the application form in Appendix B.
Application forms should be send by email to: adminNSO@spaceoffice.nl

Timeline:

8 November 2024	Publication Call for Proposals
27 February 2025, 12:00 CET	Deadline for proposal submission
Feb – May 2025	Assessment of proposals
May 2025	Decision NSO

2.4 Assessment procedure of the proposal

2.4.1 Category 1: Large projects

For proposals submitted in the category 'large projects', the assessment procedure will consists of the following steps:

2.4.1.1 Eligibility of the proposal

NSO will assess whether the submitted proposals fit within the objectives and scope of the IOP (see 1.2 and 1.3) and whether the proposal fulfils the administrative and financial requirements. Please bear in mind that, if necessary, NSO may approach you within two weeks after the submission deadline to submit any possible additions or corrections in order to satisfy the conditions for submission.

2.4.1.2 Policy assessment by NSO

NSO will assess the submitted proposals taking into account the policy criteria in section 2.5.1.

2.4.1.3 Scientific peer review by external referees

NSO will request input from a minimum of two external referees on the scientific criteria in section 2.5.2.

2.4.1.4 Final assessment and decision taking

Based on the policy assessment and scientific assessments, NSO will prepare a final assessment of all proposals, and advice on the ranking for funding. For the ranking advice, programmatic (budgetary) and policy considerations will be taken into account in order to ensure an effective and efficient budget allocation preventing parallel funding of too similar or competing developments.
The director of NSO will take a decision about which proposals will be awarded funding.

2.4.2 Category 2: Feasibility studies

Proposals submitted in the category 'feasibility study' will undergo a light review procedure by NSO to assess whether they are sufficiently in line with the current space and science policies.

2.5 Criteria

2.5.1. Policy criteria

1. User needs and policy connection

The proposal follows on clearly identified scientific and/or societal user needs, and is well-connected to the national space policy (the LTR, Long-Term Space Agenda) and/or the national scientific policy (like the NWA and/or existing science strategies). The instrument's field of application is in astronomy, earth and environmental sciences, or planetary science.

2. Programmatic framework

The proposal addresses concrete programmatic and funding opportunities for full development of the instrument (TRL 7-9) and its subsequent exploitation.

3. Collaboration between NL parties

The consortium brings together existing scientific and technological heritage and expertise. In the development of the technology or instrument capability, Dutch parties collaborate on the basis of added value.

2.5.2. Scientific criteria

1. Technological and scientific quality

This includes the quality of the observation concepts, technological approach and technological capabilities and heritage of the consortium. It also addresses the quality of the goals, approach and methodology, and clarity of the proposal.

2. Scientific and/or societal usefulness & needs

This addresses the extent to which the proposal addresses scientific and/or societal needs as reflected in current scientific/societal challenges in Space and/or Earth science and the usefulness of the proposal in the context of ongoing scientific research in the relevant research field(s). This criterium also addresses the level of readiness of the (scientific) user community to take up the instrument and exploit the results of the mission.

3. Innovation and uniqueness in the context of (international) scientific programs

This addresses the extent to which the proposal in innovative and unique with respect to other (international) projects .

4. Timeliness and feasibility

This addresses the extent to which the proposal in timely and complementary in the context of (international) scientific (space) programs. This criterium also addresses the feasibility of the proposal including the maturity of the proposed technology and the appropriateness of the proposed activities and work planning.

2.6 Obligations for grant recipients

Grant recipients are obliged to carry out the project in line with the proposal and during the specified period.
In case the funded activities cannot be carried out according to the granted proposal, the grant recipient should inform NSO immediately.
For essential changes to the proposed project (not being part of normal work) the grant recipient should send a request to NSO and NSO has to approve of the changes. This is not required for changes affecting the subsidized costs for less than 25%.
All activities and results of the project should be publicly available. In scientific and other publications the grant recipient is obliged to include a reference to the grant.
Outsourcing to third parties should be based on transparent and market-conform contracts.
During the project, progress milestones should include meetings for which NSO shall be invited.
To finish the project the grant recipient is obliged to deliver a final report, a financial report, and an accountancy declaration.

Subsidies will be granted in line with the legal conditions as specified in the *Kaderregeling subsidies OCW* , see: wetten.nl- Regeling- Kaderregeling subsidies OCW, SZW en VWS- BWBR0037603 (overheid.nl)

Contact

For questions or more information related to this Call for Proposals or the Space Instrument Program please contact
Jolien Diekema: j.diekema@spaceoffice.nl

Appendix A: Definition of TRL, SRL, ARL

Technology Readiness Level (TRL)

Ref. ECSS, Space Engineering – Technology readiness level (TRL) guidelines, ECSS-E-HB-11A, 1 March 2017

The TRL is a measure of the maturity of a technology used in research and development phases. TRL is not intrinsic to a technology, but it depends on the target environment of application of the technology. TRL can be indicated for an element of a system, a sub-system, or for a compound, full system. The TRL of a full system cannot be higher than the lowest TRL of one of its sub-systems or elements.

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

Brief description of TRLs:

TRL 1: Basic principle
Potential applications are identified following basic observations but element concept not yet formulated.

TRL 2: Application formulated
Formulation of potential applications and preliminary element concept. No proof of concept yet.

TRL 3: Proof-of-concept
Element concept is elaborated and expected performance is demonstrated through analytical models supported by experimental data and characteristics.

TRL 4: Functional verification
Element functional performance is demonstrated by breadboard testing in laboratory environment.

TRL 5: Breadboards (reduced scale) verification in relevant environment
Critical functions of the element are identified and the associated relevant environment is defined. Breadboards not full-scale are built for verifying the performance through testing in the relevant environment, subject to scaling effects.

TRL 6: Models (full scale) demonstration in relevant environment
Critical functions of the element are verified, performance is demonstrated in the relevant environment and representative model(s) in form, fit and function.

TRL 7: Model demonstration for operational environment
Performance is demonstrated for the operational environment, on the ground or if necessary in space. A representative model, fully reflecting all aspects of the flight model design, is build and tested with adequate margins for demonstrating the performance in the operational environment.

TRL 8: Flight qualified
Flight model is qualified and integrated in the final system ready for flight.

TRL 9: Flight proven
Technology is mature. The element is successfully in service for the assigned mission in the actual operational environment.

Scientific Readiness Level (SRL)

Ref. Scientific Readiness Levels (SRL) Handbook, ESA Mission Science Division (EOP-SM), EOP-SM/2776, issue 1 revision 1, 17/06/2015

The purpose of the SRL is to establish the standard measure of the maturity of evolving science with respect to a mission concept, satellite mission, or satellite instrument activity. They have been developed for the Scientific Readiness Assessment of (new) EO missions but are analogously applicable to astronomy and planetary missions. SRLs should not be used to judge the importance or relevance of one particular scientific discipline or its value compared to another.

SRLs can be related to objective milestones during mission development and implementation. In addition, peer-reviewed literature provides a reference for scientific developments directly or indirectly related to the scientific objectives and disciplines – independent of the mission implementation process.

SRL	Title	Related to mission phase
1	Initial scientific idea	Pre-Phase 0
2	Consolidation of scientific ideas	Pre-Phase 0
3	Scientific and observation requirements	(Pre-)Phase 0
4	Proof-of-concept	0
5	End-to-end performance simulations	A
6	Consolidated science and products	B, C, D,
7	Demonstrated science	E1
8	Validated and mature science	E2
9	Science impact quantification	F

Brief description of SRLs (here described for EO missions, but analogously applicable to astronomy and planetary missions):

SRL 1: Initial Scientific Idea
An idea combined with a general scientific objective is stated and a scientific hypothesis is presented. An interest from the (scientific community) users has been expressed and high-level user requirements are created. The idea can still be decoupled from specific mission activity objective or a specific measurement concept. The scientific idea can also be based on a problem statement.

SRL 2: Consolidation of Scientific Ideas
Scientific evidence and supporting scientific theories are established addressing one or more scientific ideas. This could for example be done based on theoretical grounds or through laboratory experiments. Observations and theories are linked to the consolidated user requirements and/or the problem statement. The scientific strategy to address the scientific challenge is defined.

SRL 3: Scientific and Observation Requirements
A first iteration of top-level scientific and observation requirements, e.g. product accuracy and temporal and spatial sampling, is performed and mapped against the user requirements. During this process a justified selection of the conceptual measurement technique(s) is developed based upon derived observational requirements.

SRL 4: Proof of Concept
The measurement concept is validated. A model linking geophysical parameters and measurements is established. Sensitivity of the measurements to the targeted geophysical parameter is demonstrated through extensive analyses by means of dedicated experiments but at least through simulations.

SRL 5: End-to-End Performance Simulations
An end-to-end measurement performance simulator is developed, tested and validated using realistic and / or actual measurements1. The performance model used is applicable to a predefined range of conditions (including realistic uncertainties of natural and observational nature) and can be used to address the needs originating from the science requirements in an end-to-end manner. Retrieval algorithms applicable for a realistic range of error sources (both geophysical and technical) are demonstrated against a pre-defined performance metric reflecting observation and measurement requirements.

SRL 6: Consolidated Science and Products
Consolidated geophysical retrievals are established and implemented. These are Level 1, Level 2, and higher order algorithms (if applicable) providing measurements and observations that directly respond to the Mission Activity measurement and observation requirements.

SRL 7: Demonstrated Science
Retrieval algorithms verified using real mission activity measurements. Retrieval uncertainties are provided and mapped against the measurement and observation requirements of the Mission Activity.

SRL 8: Validated and Matured Science
Data products are systematically generated and disseminated. The Mission Activity scientific goals and objective are tested and evaluated. The scientific aim is tested. Science linked to the Mission Activity is advancing leading to a growing scientific community, new applications, and new scientific insights.

SRL 9: Science Impact Quantification
The measurements and observations have been re-processed ensuring high quality data sets. The scientific aim and objective of the Mission Activity are evaluated. The end-to-end scientific impact across the Mission Activity with respect to the user requirements is assessed and quantified. The requirements have been revised and based on the outcome future strategies are being discussed.

Application Readiness Level (ARL)

Ref. L. Larson, NASA's The Application Readiness Level Metric, NASA Applied Sciences Program, 2017

The ARL is adapted from the TRL and originally developed by NASA to track and manage the progression and distribution of funded projects. It indicates the 'maturity' of the applied-sciences project. ARLs specifically apply to Earth Observation missions.

ARL	Title	Phase
1	Basic research (baseline ideas)	I – Discovery & Feasibility (research)
2	Application concept (invention)	
3	Proof of application concept (viability established)	
4	Initial integration and verification (prototype/plan)	II – Development, Testing & Validation (development)
5	Validation in relevant environment (potential determined)	
6	Demonstration in relevant environment (potential demonstrated)	
7	Application prototype in partner's decision making (functionality demonstrated)	III – Integration into End-user's System (deployment)
8	Application completed and qualified (functionality proven)	
9	Approved, operational deployment and use in decision making (sustained use)	

Brief description of ARLs (for EO missions):

ARL 1: Basic research (baseline ideas)
This level is the foundation upon which application concepts are developed. At this level, basic scientific concepts, connections, and insights are observed and reported, and research produces results that provide the basis for applications ideas.

ARL 2: Application concept (invention)
Application invention and formulation of concept begins here. Initial understanding and characterization of the decision making activity are articulated. At this level, the full application system is still speculative and there is no proof or detailed analysis to support the assumption.

ARL 3: Proof of application concept (viability established)
Feasibility studies to assess the potential viability of and provide a proof-of-concept for the application are conducted. In addition, a more complete characterization of the decision making process is completed. Different components of the application system are not yet integrated.

ARL 4: Initial integration and verification (prototype/plan)
Basic components of Earth science products and the decision making activity (decision support system, tool, etc.) are integrated together into a prototype “application system” to establish that they will work together. At this level, the technical, organizational, and human process issues related to the decision support activities are also worked out. Project team must verify that components will work together to achieve this ARL.

ARL 5: Validation in relevant environment (potential determined)
Basic components are integrated with reasonably realistic supporting elements so application can be tested in a simulated decision making environment. Prototype implementations conform to the end-user’s target environment and standard interfaces. Validation that the decision making activity both functions with the Earth science products and is projected to improve performance is achieved. Project team must articulate the potential for performance improvement in decision making to achieve this ARL.

ARL 6: Demonstration in relevant environment (potential demonstrated)
Achieving this level represents a major increase in the application’s demonstrated readiness. The prototype application system is demonstrated in a relevant environment or in a simulated operational decision making environment. Any application component(s) already deployed in the end-user’s environment are tested in operational decision making context. Project team must demonstrate the potential for performance improvement in decision making to achieve this ARL.

ARL 7: Application prototype in partner’s decision making (functionality demonstrated)
Prototype application system and all pre-deployed components are fully integrated into the end-user’s operational environment, such as the partner’s decision making activity. At this level of application system maturity, functionality is demonstrated to win the confidence of the partner. Project team must demonstrate the functionality of the integrated components in the decision making activity to achieve this ARL.

ARL 8: Application completed and qualified (functionality proven)
Actual application system is completed and ‘qualified’ by the partner through testing and demonstration in the targeted decision making activity. The application is proven to work in its final form and under expected conditions. In addition, most user documentation, training documentation, and maintenance documentation are completed. Partner must approve the application system for use in their decision making activity to achieve this ARL.

ARL 9: Approved, operational deployment and use in decision making (sustained use)

Actual operational, successful use of application by users in their decision making activities. To reach ARL 9, full integration and repeated use in the decision making organization's operations has been achieved.

Appendix B: Application form

Proposals should be limited to 30 pages (A4). The proposal should include the following sections:

1. Title
2. Main applicant, contact details
3. Description of the instrument, including
    a. Background
    b. Proposed technology and competitiveness of technology
    c. 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)
    a. Work defined in work packages
    b. Planning of work packages
6. Indication of the development phase: TRL, SRL, and ARL (current level, to-be-increased level, substantiation)
7. Financial plan
    a. Budget per work package, with a distinction between labour and materials
    b. Total costs and requested budget from NSO
8. Programmatic context (agency, program(s), follow-on funding opportunities), including
    a. Proposed flight opportunities
    b. Roadmap towards a complete instrument with critical technology development deadlines
    c. Possible follow-on funding opportunities
    d. (if applicable) other current projects/studies for the technology
9. Own assessment of policy and science criteria

Appendix C: Definition 'Space instrument'

Disclaimer
It is not the intention of this appendix to provide an unambiguous, comprehensive, and conclusive definition of a space instrument. Such a definition is very difficult to formulate, and would probably not be very useful in practice. Instead, a description of a space instrument is provided that will be useful in many, if not most, situations, although in specific cases additional explanations or considerations may be needed.

This appendix contains a description of a space instrument (or satellite instrument) as it is used in the context of NSO's Space Instruments Program. To this end, space instruments are regarded as measuring devices deployed on spacecraft that collect data that contribute to the solution of scientific, societal, or commercial questions and applications, irrespective of the measurement principle or spectral domain. Measurement principles may be based on those used by instruments with a Dutch heritage, but may also involve completely new and innovative concepts. Instruments may operate in the typical spectral domain between Far-IR and X-ray or in the microwave and radio parts, but they may also utilize other principles beyond measuring radiation. Depending on the specific situation, instruments may be complete systems (like antenna, detector, front- and back-end electronics) including data processing till data level 1 (L1), or partial systems (sub-systems) that are performance critical.

Instrument

The figure below presents a schematic overview of the elements involved in the description of a space instrument. Three elements are key to this description:

1. the instrument and the associated technologies;
2. the data collected by the instrument and delivered to the processing chain;
3. the user of the data.

Ad.1 The instrument[1] (and the associated technologies) is the system delivering the data ultimately destined for use by the users (the red part in the figure). Depending on the measurement principle, the type of observable, and the specific technological realization, the instrument consists of parts (sub-systems) such as antennas, telescopes, receivers, detectors, transmitters, registration devices, optics, read-out electronics, etc.

Technologies that are necessary or essential (instrument critical) to realize the instrument for its task to deliver data of the required quality for the user (performance critical) are also regarded as part of the instrument. Such technologies can include:

- hardware technologies in the fields of optics, electronics, mechanics, photonics, etc.;
- (ground)systems/methods for verification, testing, and/or calibration that are not part of the basic development process, but have to be developed anew/unique/specifically for the instrument in question;
- (supporting) data processing technologies that are instrument critical (from the sensor to L1).

(Sub-)systems that are considered not to be part of the instrument[2] include support systems (e.g., thermal, power, electric, computing, …), platform systems (e.g., bus, construction/panels, AOCS, TM/TC, solar panels, HK, …), launch systems, ground systems (e.g., EGSE, AIT, testing, validation, …) and the associated technologies for all these systems. Although these non-instrument systems ('peripheral' systems) also deliver data, these are regarded as derived/supporting data and not instrument data delivered to the users.

[1] In the space sector sometimes the term *payload* is used when referring to an instrument deployed on a satellite platform. The distinction between payload and platform is often clear, but not always. Sometimes the satellite itself is the payload, and payload and platform have many (sub-)systems in common. Also, in small satellites like cubesats the platform-payload distinction is often less relevant. Therefore, we will not use the term payload here to refer to a space instrument.

[2] It is not possible to make a clear distinction in all cases between instrument-systems and support/platform-systems. Think of, e.g., cooling. There can be cooling systems for the satellite as a whole, or – miniaturized – cooling systems for – the core of the – sensor. The latter is regarded as part of the instrument, the former not. But if both types of cooling systems are integrated, the distinction blurs.

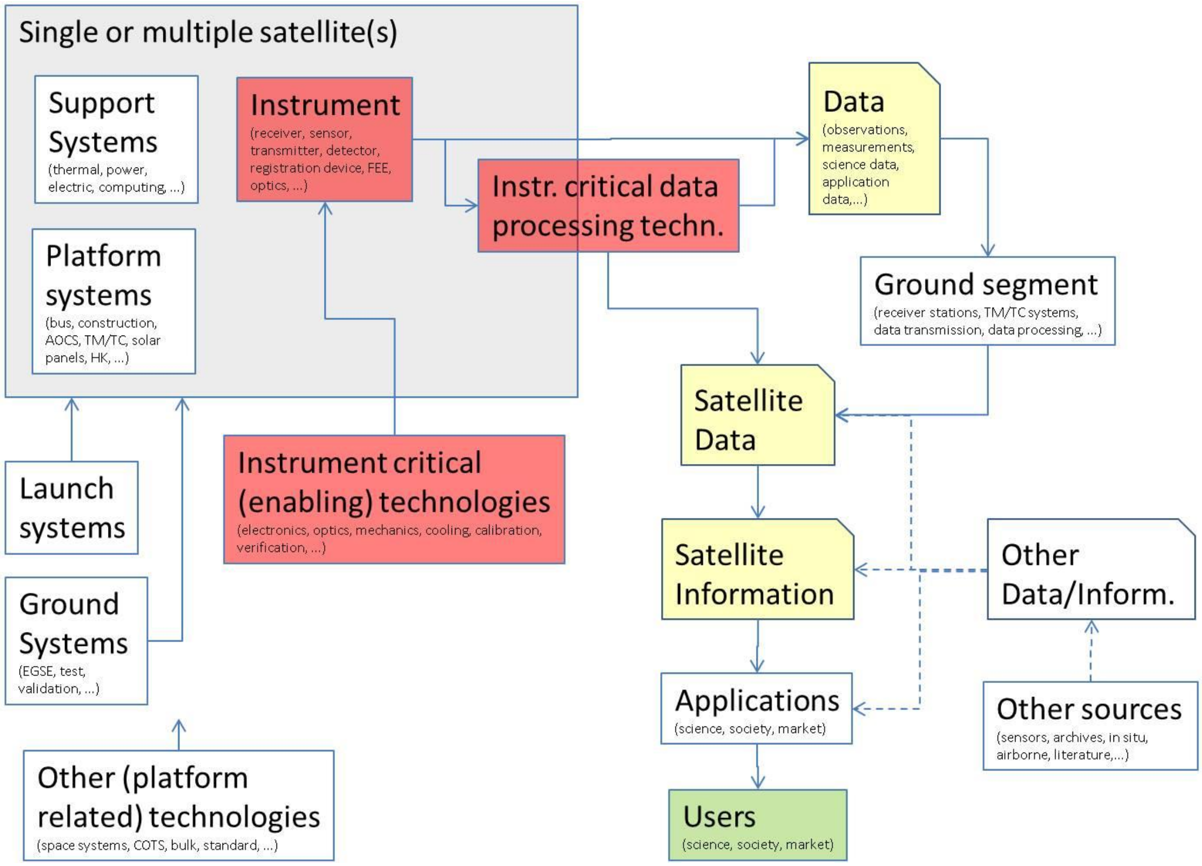
Ad.2 Data is to be understood as observations or measurements, sometimes referred to as science data, application data, instrument data, etc. (the yellow part in the figure). Data is collected by the instrument and processed through the ground segment to be delivered to the users (from raw data to information products). The typical/standard data processing systems for this step do ***not*** belong to the instrument.

Ad.3 There may be different categories of users: scientific, societal, government/institutional, commercial (the green part in the figure). Users make use of applications/products/services in which satellite data is often blended with data from other sources. Technology for applications is ***not*** part of the instrument.

Instrument criterium

In order to determine whether an instrument technology is part of a space instrument, the following criteria apply:

- the technology has to adhere to what is described under point 1 above; and
- the instrument system and technology must be directly performance-critical for the establishment of the instrument-data meant for the user with the required quality.



List of abbreviations

ARL	Application Readiness Level
IOP	Space Instrument Program
LTR	Long Term Space Agenda
NSO	Netherlands Space Office
OCW	Ministry of Education, Culture and Science
SRL	Scientific Readiness Level
TRL	Technology Readiness Level