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# Open eScience Call 2024 (OEC 2024)

Empowering researchers  
across all disciplines  
through advanced  
research software

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# 1 Introduction

## 1.1 Purpose of this call

This call for proposals supports research that requires the development and application of advanced research software. Each submitted proposal should address an urgent methodological research challenge that can count on broader support from the research community in which the applicants are active. The call reflects the eScience Center's mission to empower researchers across all disciplines through innovative research software.

In this call, 'research software' refers to digital tools (for example code, scripts, packages, libraries, programmes, etc) that contribute to answering research questions by creating and/or analysing research data and research results. Applicants are invited to propose a concrete research problem that requires a digital solution of this kind.

Projects receive in-kind funding. This means that a team of research software engineers (RSEs) from the eScience Center will work together with the applicants to improve, build, and apply research software within the context of a larger research community, and as integral members of a research team.<sup>1</sup>

A competitive proposal should

- make clear why new or improved research software is required to solve the stated research problem and how this falls within the eScience Center expertise.
- explain how the proposal strengthens and connects to research communities that require, and may be expected to contribute to, the research software.
- include a clear strategy for the future maintenance and sustainability of the research output (software or otherwise) resulting from the project, and a realistic and concrete plan describing the measures that will be taken to ensure its usability and availability beyond the duration of the project itself.

## 1.2 About the Netherlands eScience Center

The Netherlands eScience Center is the national centre of expertise for innovative software solutions in academic research. Established in 2012 as an independent foundation, it receives its funding from NWO and SURF. The eScience Center aims to bridge the gap between digital technologies on the one hand and scientific and scholarly inquiry on the other. Its vision is to establish a robust research community, in which all investigators in all domains are able to exploit advanced digital technologies and research software to answer innovative research questions, keeping the Netherlands at the forefront of cutting-edge international research.

The core activities of the eScience Center are carried out by Research Software Engineers (RSEs). RSEs are high-end, university-level specialists who do two things: they do research using digital technologies and

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<sup>1</sup> Read more about what working with the eScience Center means on our [webpage](#).



methodologies, and they engineer software. To keep their technological skill set up to date, they share knowledge, participate in internal training activities at the eScience Center and attend workshops and conferences. By working with the eScience Center, applicants will not only benefit from the expertise of the particular RSE(s) assigned to their project, but they will benefit from the wider expertise of the whole organisation.

In addition to their specific focus on the development of advanced research software, RSEs at the eScience Center will work with the applicant to interpret the results of their research and to make the tools and methods that emerge from the project (re)usable for the wider research community. They will co-author research and methodological publications together with members of the research team.

### 1.3 eScience Center expertise

To maximize the added value and impact for applicants, the technological needs and requirements of the project should match with the Center's expertise. Its current expertise areas are:

- Software quality: workflow technologies, software practices, software sustainability, optimisation
- AI: machine learning, AI image processing, Natural Language Processing, responsible AI
- Analytics: big data analytics, text and image analysis, visualization
- Data processing: accessible and searchable data, real-time data analysis, interoperability
- Computing: hardware accelerators, high performance computing, cloud computing combining simulations

For an overview of the eScience Center's expertise areas, see Appendix B (eScience Center Expertise). For an overview of the research software that has been developed and contributed to over the past few years, please consult the [Research Software Directory](#).

The proposal will be matched with one of the following research areas:

1. **Life Sciences**, incl. biology, medical and health sciences, neuroscience.
2. **Natural Sciences and Engineering**, incl. astrophysics, chemistry, computer science, engineering, mathematics, physics.
3. **Social Sciences and Humanities**, incl. anthropology, archaeology, communication studies, economics, education sciences, history, human geography, law, linguistics, literary studies, philosophy, political sciences, psychology, sociology.
4. **Environment and Sustainability**, climate research, agricultural & food sciences, earth sciences, environmental sciences, ecology, energy, logistics, water management

Applicants should select one research area in which they believe their research proposal should fall for the purpose of the assessment. Experts in the indicated research area will be involved in assessment of the proposal. Proposals in different research areas are not in competition with each other.



## 1.4 Available budget

The eScience Center's in-kind contribution is €224.000,- per project for a project duration between 2,5 and 3 years. For this in-kind contribution the eScience Center awards approximately 2,3 person years of hours per project.<sup>2</sup> There is budget for 8 projects in total, 2 per research area.

Only proposals that are assessed as 'excellent' or 'very good' will be eligible for awarding. Proposals of insufficient quality will not be eligible for awarding.

## 1.5 Validity of this call

This call for proposals is valid for proposals submitted before the deadline of the Project Proposition, until the Board of the Netherlands eScience Center has taken the final decision, as specified in the assessment procedure.

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<sup>2</sup> The project will be awarded in euros, which means that the total amount of person years might fluctuate due to inflation and salary increases.



## 2 Guidelines for applicants

### 2.1 Who can apply?

Each proposal is to be formally submitted by a single named researcher (henceforth the 'Lead Applicant' or LA), employed by a Dutch research performing organization. An overview of all eligible organizations is included in Appendix A. The LA will act as primary contact for the eScience Center.

A proposal is submitted by the LA on behalf of a group of researchers (the 'Research Team') that will carry out the project. To encourage the practice of open science and collaboration across organizations, at least one member of the Research Team should be an active researcher working at a Dutch research performing organization other than that of the LA. Team members may also be employed by research organizations not mentioned in Appendix A.<sup>3</sup> The Research Team does not have to be final for submitting the project proposition, but it should be final for submitting the full proposal.

The LA must

- be in possession of a PhD;
- hold a contract for at least the duration of the requested project;
- have demonstrable knowledge and experience (relative to the LA's academic seniority) in applying digital methodologies to research;
- ensure a minimal personal commitment to the project work for half a day per week on average for the duration of the project.

The activities of the Research Team, including the LA and the RSE(s), should be integral to the proposed project structure. Public-private collaborations are possible, but the inclusion of industrial partners is not a requirement.

The LA is allowed to submit only one proposal in that capacity in this call. Moreover, researchers who are involved in a project awarded under the eScience Center OEC 2022 or OEC 2023 Calls in the capacity of Lead Applicant are not allowed to submit as LA in this call.

Researchers of all levels of seniority (from postdoc level to full professor level) that meet the conditions above are welcome to apply.

### 2.2 What can be applied for?

This call offers an in-kind contribution of RSE time to work with the Research Team. Applicants can find more information about what working with the eScience Center entails on our [website](#).

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<sup>3</sup> Employees of institutes for higher education ([verenighogescholen.nl/hogescholen](https://verenighogescholen.nl/hogescholen)) may also participate in a research team.



LAs can apply for projects with a maximum in-kind investment of 2.3 PYR (person years) of RSE expertise. The project duration should be between 2.5 and 3 years.<sup>4</sup> There is funding available for 2 projects per research area and thus for 8 projects in total.

A project must include one or more workshops. Workshops in the context of this call are defined as focused, participatory events with the specific aim of creating or fostering a community of researchers, research software engineers, developers and (potential) users, around the digital technologies and research software produced within the project. Workshop expenses, to a total of €14.000, will be reimbursed by the eScience Center.

## 2.3 When can applications be submitted?

### *Project Proposition phase*

Applicants are required to submit a Project Proposition before they can submit a Full Proposal. The closing date for the submission of Project Propositions is **27 February 2024, 14:00 CET**.

### *Full Proposal phase*

The closing date for the submission of Full Proposals is **30 May 2024, 14:00 CET**.

## 2.4 Specific conditions

The following conditions hold for all project propositions and full proposals:

- An identical proposal may not have been submitted or awarded elsewhere.
- Applications (covering the proposal itself and the Software Management Plan) must be completed in English.
- Use of the application forms (Project Proposition Template and Full Proposal Template) from the eScience Center website is obligatory.
- The proposal must be submitted in PDF format.
- Project Propositions and Full Proposals must be submitted no later than the deadlines set in Section 2.3.
- As part of the submission process in the ConfTool system, applicants may be requested to provide additional information. Please take this into account with regard to the set deadline.
- Possible letters of support or intent from, for example, software sustainability or private partners should be added to the ConfTool system in a separate PDF file as an attachment to the application form.
- A proposal must indicate one research area to which the proposal is submitted. The research areas are mentioned in Section 1.3. Only one research area can be selected. In case of doubt, the applicant can discuss this with the eScience Center.

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<sup>4</sup> See Section 1.4: The project will be awarded in euros, which means that the total amount of person years might fluctuate due to inflation and salary increases.



- All projects resulting from proposals submitted in this call must meet the Netherlands eScience Center's specific conditions for grants (['Bijzondere voorwaarden Netherlands eScience Center subsidies'](#)).
- All projects resulting from proposals submitted in this call must adhere to the [Netherlands eScience Center's Intellectual Property rules](#).
- All projects resulting from proposals submitted in this call must adhere to the [Policy concerning the use of Generative AI at the Netherlands eScience Center](#).
- LAs should inform their employing institute of their submission to this call by sending a copy of the Project Proposition and the Full Proposal to the director or dean of their department/institute. The Netherlands eScience Center will assume that the employing institute has been informed of, and accepts, this call's conditions.
- Should your application be awarded, the proposal summary and the summary for non-experts provided in the ConfTool system may be used and edited for publication purposes.

#### *Project management*

In operational and administrative terms, projects are overseen by the eScience Center's programme managers, who share responsibility with the applicant for monitoring progress and facilitating the delivery of project results.

Of the total granted project, 15% covers project management, as well as organizational and professional development activities of RSEs (training, work meetings, conferences, etc.).

#### *Software Management Plan*

A Software Management Plan must be submitted together with the Full Proposal. The Software Management Plan needs to specify how the sustainability (long-term storage, dissemination, use and re-use) of the research software during and after the project's completion will be ensured, and for which period.

There is no one-size-fits-all solution for software sustainability. Different possibilities and combinations are acceptable. For some examples of measures and strategies, please consult the Software Management Plan template; note that the list in that template is not exhaustive.

The Software Management Plan should be completed using the appropriate template available on the eScience Center website.

It is encouraged, though not required, to include one or more letters of support from software sustainability partners, such as an institute providing long term support for the software, or a research infrastructure in which the software will be integrated.

#### *Data Management Plan*

Concerning the management of research data, the eScience Center follows the [NWO data management policy](#). Responsible research data management is an essential component of good research practice. In addition to being safely stored and carefully curated, research data should be made available for reuse as





widely and as early as possible. The guiding principle in this respect is: ‘as open as possible, as closed as necessary’. In case data is collected, created, or processed during the project, the submitted proposal must make clear how they will be managed and curated, so that they can be made publicly available.

A formal Data Management Plan must be provided to the eScience Center within a maximum of 4 months after the project has started. The Data Management Plan can be adjusted during the project but in all cases requires the explicit consent of the eScience Center. The eScience Center requests the LA to use one of several approved *data management templates*,<sup>5</sup> to best match the details of the awarded project and/or any specific requirements of the LA’s research institute.

### *Open Science*

Open Science is central to the eScience Center. Open Science enables verification, reproducibility, and transparency in all phases in the research process, and maximizes the chance for adoption, reuse and impact of outputs resulting from the projects.<sup>6</sup> When writing the project proposal, the LA should be aware that:

- All source code will use permissive open-source licenses. Software will be published in publicly accessible repositories such as GitHub, allowing community contributions. Software also will be made available in the Research Software Directory, so as to make the software findable for search engines, provide citation options and add relevant metadata (such as documentation and related projects, tools and publications) Exceptions to this condition are possible, but only when discussed and agreed upon with the eScience Center *before* submission.
- Substantial effort is put into making software sustainable. Preference should be given to extending, improving, and strengthening existing research software supported by existing research communities. Developing new software should only be proposed when no other viable alternatives exist.
- Reproducible research is supported (e.g., by using workflow technologies, computational notebooks, virtual environments, container solutions) so that researchers with access to the data and software are able to reproduce the research results.
- All research data and academic publications resulting from research awarded under this call for proposals are to be freely publicly accessible, at the earliest possible stage (in open access) under open licences, at the time of publication.

### *Requirements regarding digital infrastructure*

Applicants are asked to indicate the project’s infrastructural needs (if any), in terms of computing power, data storage capacity, fast data transfers or otherwise, and explain how they expect to fulfil those needs. Proposals may suggest the use of local, national, international and/or commercial (e.g., web, cloud, etc.) hardware and services. In all cases a brief explanation of the choice for specific infrastructures is required.

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<sup>5</sup> [nwo.nl/en/research-data-management](https://nwo.nl/en/research-data-management)

<sup>6</sup> [nwo.nl/en/open-science](https://nwo.nl/en/open-science)



The Dutch national infrastructure includes among others facilities offered by SURF and DANS. For more information, it is advisable to contact the organizations and institutes responsible for these resources directly, in particular [SURF](#) and [DANS](#).

In case the project is awarded, any required access to the infrastructure needs to be arranged by the LA after the start of the project using the relevant procedures. The eScience Center can assist, if necessary.

## 2.5 Submitting the application

For this call all applications (project propositions and full proposals) need to be submitted through the eScience Center submission system. Please follow these steps:

- Download the format for the correct stage of the proposal (project proposition or full proposal) at <https://www.esciencecenter.nl/calls-for-proposals/>
- Fill the format using the guidelines on the format and the conditions stated in this call for proposals.
- Save the format as PDF.
- Submit the proposal through <https://www.conftool.org/escience/>
- Select "Open eScience Call 2024 (Proposition stage)" or "Open eScience Call 2024 (Full proposal stage)" depending on the stage of your application.
- As part of the submission process in ConfTool, applicants may be requested to register (for the first-time use) and provide additional information. Please take this into account with regard to the set deadline.
- Please take into account that the proposal summary and the summary for non-experts provided in the ConfTool system may be used and edited for publication purposes, should your application be awarded.
- Please note that applicants should inform their employing institute of the submission by sending a copy of the Project Proposition and the Full Proposal to the director or dean of the department/institute. The Netherlands eScience Center will assume that the employing institute has been informed of, and accepts, this call's conditions.
- Possible letters of support or intent from, for example, not directly involved but supporting partners should be added in a separate PDF file in ConfTool as an attachment to the application form in the full proposal stage.
- A proposal must be submitted to one of the research areas mentioned in Section 1.3: 1) Life Sciences, 2) Physical Sciences and Engineering, 3) Social Sciences and Humanities, 4) Environment and Sustainability. In case of doubt, please contact the eScience Center.



## 3 Assessment procedure

### 3.1 Procedure

The evaluation and selection procedure consists of three main steps. The procedure is intended to be as lightweight as possible. To ensure a fair and objective call procedure, the eScience Center is advised and supported by NWO.

#### *Information Event*

To inform interested applicants of the specific aims of this call for proposals, and of the role and expertise of the eScience Center RSEs, an Information Event will be organized on **1 February 2024**. For applicants which are new to the eScience Center, we strongly recommend attending the Information Event. More information can be found on our [website](#).

#### **Step 1: Project Proposition phase**

The Project Proposition stage is intended to select propositions that may proceed to Step 2 (the Full Proposal stage). The propositions will first be checked for eligibility based on the criteria listed in Section 2. Please bear in mind that within two weeks after the submission deadline, we may approach applicants with possible administrative corrections that need to be made so that your pre-proposal can (still) meet the conditions for submission. Applicants will be given one opportunity to make the corrections, and applicants will be given five working days to do this.

All eligible propositions will then be assessed on the criteria listed in Section 3.2 by a committee of experts employed by the eScience Center. They will be scored and ranked within their own research areas. Only propositions that are assessed as 'excellent' or 'very good' or 'good' can be selected for proceeding to the full proposal stage.<sup>7</sup>

If the number of propositions assessed as 'excellent' or 'very good' or 'good' is higher than two times the number of projects that can be awarded within a research area, the eScience Center may decide to select based on the ranking, to reduce the number of full proposals.

After the first assessment, all applicants will be notified of the outcome of the selection process. Only selected applicants can submit a full proposal.

#### **Step 2: Full Proposal phase**

Only LAs / Research Teams selected during the previous stage will be invited for a personal consultation session with eScience Center experts. In this meeting, applicants are given advice on how to best exploit the competences of the eScience Center in full, and how to best cover all eScience-specific review criteria. After submission the full proposals will first be checked for eligibility based on the criteria listed in Section 2.

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<sup>7</sup> The eScience Center follows the [qualifications of NWO](#).



An assessment committee will assess the full proposals and annexes (SMP and others). The assessment will be based on the criteria outlined in Section 3.2. The assessment panel will rank the proposals based on their scores. Proposals submitted to a research area are assessed by experts from that area (as defined in Section 1.3). Only proposals that are assessed as 'excellent' or 'very good' can be selected for awarding. The ranking will be submitted, together with a recommendation, to the Board of the Netherlands eScience Center.

### **Step 3: Awarding decision**

The Board of the Netherlands eScience Center formally decides on awarding of projects based on the assessment panel recommendations. The findings of the assessment panel will be sent to the applicants.

#### **Timetable**

1 February 2024	Information Event
27 February 2024, 14:00 CET	Deadline Project Proposition
March 2024	Eligibility check, selection, and notification
April-May 2024	Consultation meetings
30 May 2024, 14:00 CET	Deadline Full Proposal
June 2024	Eligibility check
September 2024	Panel assessment
October 2024	Board decisions
November 2024	Applicants informed of final decision



## 3.2 Assessment criteria

### **Project Proposition phase**

Project propositions will be assessed by an eScience Center assessment committee based on the following criteria. The weights of the respective criteria are reflected in the percentages.

#### *Research idea (30%)*

- The proposition convincingly shows that the broader research community will benefit from the proposed work relative to the current state of research.
- The proposed research is connected with efforts within the broader research community to address the methodological issue at hand.

#### *eScience and technological challenge (70%)*

- The proposition convincingly states the technological and/or methodological challenges that need to be overcome.
- The proposition clearly indicates the proposed role of the eScience Center in the project in a way that fits the eScience Center's way of working.
- The proposition proposes a realistic match with eScience Center expertise areas.
- If specific existing data and software are central to the proposed research, they are suitable for the suggested work in the proposition.

### **Full Proposal phase**

Full Proposals will be assessed by the assessment panel based on the following criteria. The weights of the respective criteria are reflected in the percentages.

#### *Research Idea (25%)*

- The proposed research aims to solve a specific research challenge in the selected research area, based on a clear outline of the research problem and an explicit research question.
- The proposed research is connected with efforts within the broader research community to address the methodological issue at hand.

#### *eScience and technological challenge (25%)*

- The proposal convincingly states
  - o why relevant existing technologies and/or methodologies (if any) do not suffice for the stated research aims.
  - o the technological and/or methodological challenges that need to be overcome to achieve the stated research aims.
  - o which research outcomes the projected software solution(s) are expected to lead to.

#### *Software sustainability and impact (25%)*

- The proposal convincingly states



- how the technology and software will find use beyond the proposed work itself, preferably across institutional, national, or disciplinary borders, both during and after the finalization of the project.
- how long-term maintenance and sustainability of project results (in particular software and data) will be secured and managed.
- which efforts will be made to promote the results of the project, in terms of both academic publication and of research community (demonstrations, posters, presentations, workshops, training, etc.).
- how the project will build further collaborations, in research, or beyond.
- The technological, software and/or data deliverables are open source/open access and permit (re)use and/or interpretation by other researchers.
- The composition of the Research Team supports building a research software community.

*Feasibility (25%)*

- The Research Team including the LA logically matches the intended project and the contribution of each consortium partner to the project is convincingly substantiated.
- The project proposal has a realistic project structure outline.



## 4 Contact details

### **Specific questions about this call**

For questions about this call for proposals and the assessment procedure or ConfTool, please contact:

Programme Management Netherlands eScience Center

Tel.: +31 (0)20 460 4770

Email: [open-calls@esciencecenter.nl](mailto:open-calls@esciencecenter.nl)

The eScience Center adheres to [NWO's Code for Dealing with Personal Interests](#).



## Appendix A Eligible organizations

### ***Universities***

Erasmus Universiteit Rotterdam  
Open Universiteit Nederland  
Protestantse Theologische Universiteit  
Radboud Universiteit Nijmegen  
Rijksuniversiteit Groningen  
Technische Universiteit Delft  
Technische Universiteit Eindhoven  
Theologische Universiteit Apeldoorn  
Theologische Universiteit Kampen  
Universiteit Leiden  
Universiteit Maastricht  
Universiteit Twente  
Universiteit Utrecht  
Universiteit van Amsterdam  
Universiteit van Tilburg  
Universiteit voor Humanistiek  
Vrije Universiteit Amsterdam  
Wageningen Universiteit en Researchcentrum

### ***University Medical Centers***

Amsterdam UMC (locations: AMC and VUMC)  
Erasmus MC  
Leiden UMC  
Maastricht UMC+  
Radboud UMC  
UMC Groningen  
UMC Utrecht

### ***KNAW institutes***

Hubrecht Instituut voor Ontwikkelingsbiologie en Stamcelonderzoek  
Huygens ING  
Internationaal Instituut voor Sociale Geschiedenis (IISG)  
Koninklijk Instituut voor Taal-, Land- en Volkenkunde (KITLV)  
Meertens Instituut  
Nederlands Herseninstituut  
Nederlands Instituut voor Ecologie (NIOO)  
NIOD Instituut voor Oorlogs-, Holocaust- en Genocidestudies  
Nederlands Interdisciplinair Demografisch Instituut (NIDI)





Westerdijk Fungal Biodiversity Institute

***NWO institutes (NWO-I)***

AMOLF - Physics of Functional Complex Matter

ARCNL - Advanced Research Center for Nanolithography

ASTRON - Netherlands Institute for Radio Astronomy

CWI - Centrum Wiskunde & Informatica

DIFFER - Dutch Institute for Fundamental Energy Research

Nikhef - Nationaal instituut voor subatomaire fysica

NIOZ - Koninklijk Nederlands Instituut voor Onderzoek der Zee

NSCR - Nederlands Studiecentrum Criminaliteit en Rechtshandhaving

SRON - Netherlands Institute for Space Research



## Appendix B eScience Center expertise

The Netherlands eScience Center has advanced expertise in the following areas:

### *Software quality*

- developing workflow technologies: setting up an optimal and reproducible workflow
- improving software practices: robust programming to enable reuse
- advancing software sustainability: embedding software in the open science community
- optimization: identify bottlenecks, make the best use of resources

### *AI*

- machine learning: using data to train computer models
- AI image processing: AI-aided processing of digital images
- Natural Language Processing: machine understanding of text and spoken natural language
- responsible AI: making AI explainable and ethical

### *Analytics*

- big data analytics: exploring large volumes of complex data
- text analysis: understanding patterns in texts
- image analysis: digital image processing for extracting information from images
- visualization: creating images to drive interpretation

### *Data processing*

- databases: making data accessible and searchable
- real-time data analysis: processing sensor data ultra-fast
- interoperability and linked data: interconnecting data sets

### *Computing*

- exploiting hardware accelerators: increasing speed at lower cost
- high performance computing: increasing computational scale
- cloud computing: easily accessing computing power
- combining simulations: replicating complex systems

For more information, see also: <https://www.esciencecenter.nl/where-we-focus/>