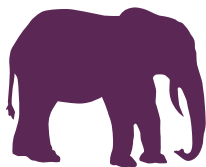


FNR
CORE MULTI-ANNUAL
THEMATIC RESEARCH
PROGRAMME

FONDS NATIONAL DE LA RECHERCHE

*Programme
description*



www.fnr.lu/core

PROGRAMME DESCRIPTION

CORE 2020 CALL

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Changes to the previous call:

- The **CORE 2020 call is linked to the revised [National Research Priorities](#) for Luxembourg as retained by the Government on 20th December 2019.**
- The **call deadlines of CORE and OPEN are both on 22nd April 2020.** The PI(s) and the host institution(s) are responsible in selecting the appropriate funding programme. Please contact FNR upfront in case of questions. If a same project is submitted in both programmes, it will not be reviewed and excluded from the selection process.

Note

Please carefully read the [CORE call documents](#). They give indications about any call specific modifications, the submission and selection process. Please do not hesitate to contact the FNR staff for any further explanation.

1. General Principles of the CORE Programme

1.1. Objectives

CORE is a **multi-annual thematic research programme** and is the central programme of the FNR. The prime objective of CORE is to strengthen the scientific quality of Luxembourg's **public research** in the [National Research Priorities](#) (section 1.2).

In the eyes of the FNR, high quality research capacities form the essential pool of knowledge and expertise from which **social, environmental and economic impact** emanate. CORE projects should directly contribute to the **strengthening of the research competences** in the priority fields and be of **international competitiveness**. CORE aspires to create strategic national resources and an increased visibility in the international research community.

The CORE programme should contribute to the

- Funding of **high quality scientific research**, leading to the generation of new knowledge and **scientific publications** in the leading international peer-reviewed outlets of the respective fields;
- Development of a strong research basis in Luxembourg which can be exploited for sustainable long-term socio-economic and environmental benefits;
- Advancement of the research group or institution in view of **international visibility** and critical mass;
- **Training** of doctoral students and advancement of the involved researchers in general.

Disciplinary, interdisciplinary, collaborative and cross-institutional projects will be fostered by the FNR. Researchers are encouraged to link methods, concepts and approaches from various disciplines to solve joint research questions that lead to new scientific insights and solutions that are beyond the scope of a single discipline.

Research activities under the CORE programme should fulfil the general FNR principles which are described in the CORE application guidelines available on the [CORE webpage](#).

1.2. National Research Priorities in CORE

With CORE the FNR provides funding for high quality research projects within the revised National Research Priorities for public research and retained by the Government as of 20th December 2019.

The revised National Research Priorities for Luxembourg have been developed in close cooperation with the Ministry of Higher Education and Research (MESR) during 2018 and 2019. This follows a recommendation made by the OECD in its 2016 report on the Luxembourg innovation system.

Four interdisciplinary research priority areas to prepare Luxembourg for the future¹

At the top-level, the national research and innovation strategy defines four research priority areas, which have emerged to be of particular importance for the societal, ecological and economic development of the country.

- Industrial and Service Transformation
- Personalised Healthcare
- Sustainable and Responsible Development
- 21st Century Education

These areas are not considered as being distinct and independent from each other, but as areas that mutually influence each other, so that the sub-themes that define each area can also have ramifications into other areas.

Please refer to the document [National Research Priorities](#) for a detailed description.

Area: Industrial and Service Transformation

Integrative materials science and technology

Multiscale modelling in materials science and physics
Materials discovery through machine reinforced learning
Fundamental phenomena defining materials function and devices
Interface-dominated materials
Advanced manufacturing: multifunctional, multiclass, and multiscale materials, and their implementation
Physics of active and living matter
Materials life cycle
Scientific instrumentation and characterization

Trusted data-driven economy and critical systems

Security and cybersecurity, reliability and trust
Cyber-physical systems

Future computer & communication systems

Autonomous and intelligent systems and robotics for earth and space

Space telecommunications, earth observation and space resources

Resources in space
Remote sensing and combination with multiscale data

Fintech/RegTech and transformative applications of distributed ledger technologies

Fundamental tools and data-driven modelling and simulation

Area: Personalised Healthcare

Complex biomedical systems – data and models

Effective collection and deconvolution of complex biomedical data
Multi-scale and mechanistic models

¹ source: "National Research and Innovation Strategy for Luxembourg", published by the Ministère de l'Enseignement supérieur et de la Recherche, 12/2019

Precision medicine, including environmental, lifestyle and socio-economic factors

- Innovative molecular disease models
- Common mechanisms between diseases – mechanism-based stratification
- Environmental, lifestyle, and socio-economic impact on mechanisms of diseases

Understanding, preventing, and treating the health-disease transition

- Longitudinal dynamics of diseases
- Multifactorial intervention strategies
- Innovative clinical trials

Data-driven healthcare.

- Trusted digital health systems
- Health informatics and implementation in the healthcare system

Area: Sustainable and Responsible Development

Climate change: energy efficiency and smart energy management; resilient eco- and agrosystems

- Resilient water systems
- Environmental monitoring
- Transition towards sustainability: energy efficiency
- Sustainable urban development and smart cities
- Smart energy systems

Economic: green sustainable finance / circular and shared economy

- From waste to product
- Sustainable behaviours

Social: migration and social cohesion / cultural identities, cultural heritage and nationhood

- Social cohesion and inequalities
- Societal transformation and labour market dynamics
- Household finance and risk management
- Migration and integration
- Cultural identities and nationhood
- Contemporary history, memories studies and public history
- Digital humanities

Responsible development: regulations and ethics for a data-driven society

- Regulation and supervision of markets
- Ethics and sustainability

Area: 21st Century Education

Innovative digitally enhanced learning and assessment environments

- Efficient learning environments
- Digital learning and human-machine interaction

Learning in a multilingual and diverse society

Equality of educational opportunity

Adult education, up/re-skilling and lifelong learning

1.3. Duration and Funding

CORE projects have a lifespan of **two to three years** and funding is allocated on a **competitive** basis. All projects are peer reviewed by international reviewers. CORE calls are launched on an **annual basis**.

The FNR allocates a maximum financial contribution of 21 Mio € for the CORE 2020 Call.

CORE funding may cover research projects of **PhD candidates** who are involved in the project **full-time** and from the beginning.

1.4. CORE Junior Track

The Luxembourg research environment is characterised by the youth of the research institutions and by a large number of researchers at an early career stage. The FNR considers that supporting young promising principal investigators (PIs) at the start of their independent career is of benefit for the national innovation system. The 'CORE Junior Track' **provides an opportunity for non-established PIs to obtain their own funding and start their independent career**.

FNR expectations of CORE Junior Track projects

- CORE Junior Track projects should help PIs to establish own independent research lines; the CORE Junior project should be seen as the PI's first project at FNR;
- The research has to be conducted by the Junior PI him/herself with limited additional human resources and collaborations;
- The project is initiated by the Junior PI and is hosted within an existing research group. The project is accompanied by an experienced internal group leader who provides sufficient freedom to the Junior PI to pursue his/her own research ideas;
- Additional independent advice on the scientific orientation of the project, career development and networking is the role of the mandatory mentor abroad.

CORE Junior Track applications are subject to the same rigorous peer review as the standard CORE proposals but it is acknowledged that the Junior Track applicants generally have short track records in terms of project management experience, and little preliminary work directly related to the proposed project. By providing a submission scheme more suited to the track record of the applicant and requiring support by supervisor and mentor, the FNR expects that applications by Junior PIs to the CORE Junior Track will have increased chances of success. Ambitious projects, especially the ones involving the management of a consortium require experienced project management, and should therefore be avoided by Junior PIs.

1.5. International and National Co-funding within CORE

The FNR has signed **cooperation agreements** with the following funding agencies:

- Deutsche Forschungsgemeinschaft (DFG, Germany);
- Schweizerischer Nationalfonds (SNF, Switzerland);
- Fonds zur Förderung der wissenschaftlichen Forschung (FWF, Austria)
- European Molecular Biology Laboratory (EMBL);

- Fundação para a Ciência e a Tecnologia (FCT, Portugal)
- National Centre for Research and Development of Poland (NCBR, Poland);

DFG, SNF and FWF

Collaborative projects requesting funding from these three agencies may be submitted to any National Research Priority Area. Projects where the main research effort lies in Germany, Switzerland or Austria have to apply to the FNR [INTER scheme](#) (i.e. the joint project should be submitted to the respective funding agency abroad who will be the lead agency in the evaluation then).

EMBL and FCT

The cooperation with EMBL and FNR is open to all National Research Priority Areas, and the FNR will always be the evaluating agency i.e. the Lead Agency.

NCBR

In the cooperation with NCBR the FNR is always the lead agency, i.e. joint proposals have to be submitted to the FNR CORE scheme. Only proposals fitting in the [National Research Priority Area “Industrial and Service Transformation”](#) and therein to the following subdomains are eligible for funding:

- Trusted data-driven economy and critical systems
 - Security and cybersecurity, reliability and trust
 - Cyber-physical systems
- Future computer & communication systems
- Autonomous and intelligent systems and robotics for earth and space
- Fintech/RegTech and transformative applications of distributed ledger technologies
- Fundamental tools and data-driven modelling and simulation

Specific rules for researchers co-funded by the above agencies may apply. Applicants are advised to check with their respective agencies.

Further international co-funding with funding agencies other than the above can be applied for through the FNR [INTER programme](#). Application and review processes will though differ from the CORE process.

Fondation Cancer Luxembourg

The FNR is continuing its co-funding collaboration with the Fondation Cancer. Applicants have to provide evidence that these cancer projects are in line with the topics of the Plan Cancer. All proposals subject to this collaboration will be evaluated within the normal CORE selection process, together with the other submitted proposals. The summary of the Plan Cancer topics are available on the [CORE website](#).

2. Requirements for Proposals

2.1. General Requirements

- Projects selected under the CORE Programme have a lifespan of **two to three years**.
- The projects should have the nature of a typical research project – funding of infrastructure or of data collection is not intended if this is not associated with the answering of a clear research question.
- The applicant has to ensure that the formal and personal requirements for submitting an application are met. Details are available here <http://bit.ly/PlandSupervision>
- In case of questions it is recommended to contact the FNR for guidance before submitting the proposal.

2.1. Domain Coverage

The CORE programme intends to support innovative research projects of high scientific quality within the revised [National Research Priorities](#).

Applicants should be aware that in case their proposal does not fall within the remit of the CORE programme, the proposal will be rejected.

2.2. Eligible Host Institutions, Principal Investigator and applicant team

The following organisations² established within Luxembourg are eligible for financial support from the FNR under the CORE programme:

1. Public institutions performing research in Luxembourg;
2. Non-profit associations, societal impact companies (SIS)³ and foundations⁴ performing research in Luxembourg and that have obtained a special authorization from the Ministry for Higher Education and Research.

Each entity has to be registered at the FNR in order to be able to submit proposals through the online submission system.

More information on eligibility of institutions is available in the CORE application guidelines and on the [FNR website](#).

For each proposal, project partners designate one ‘Principal Investigator’⁵ (PI) per project, who is the project leader responsible for submitting the proposal on their behalf. The formal submission of the proposal to the FNR is done by an official representative of the coordinating institution hosting the PI. The PI must be employed at an eligible organisation at the time of the start of the project and for the full duration of the research project. The FNR has specific requirements for principal investigators and supervisors within FNR funded projects <http://bit.ly/PlandSupervision>.

² FNR’s law dating May 31, 1999, art 3 (2).

³ <https://guichet.public.lu/en/entreprises/creation-developpement/forme-juridique/societe-capitiaux/societe-impact-societal.html>

⁴ To be eligible for FNR support, non-profit associations and foundations must be accredited by the Ministry in charge of public sector research. To obtain an accreditation, associations or foundations have to introduce a formal request at the Ministry of Higher Education and Research.

⁵ The PI is the researcher proposing the project idea and leading the project on a ‘daily basis’.

3. Submission and Selection Process

3.1. The Submission Process

The submission procedure is organised in a single full proposal stage. The proposals must be submitted in electronic format using the online submission system (FNR Grant Management System) <https://grants.fnr.lu> until the deadline. All proposals have to be written in English.

3.2. The Selection Process

The selection process is based on a Peer Review process that guarantees an independent state-of-the-art evaluation with the objective to select those research projects that reflect the highest **scientific quality**. All proposals undergo the following selection process:

- The proposals undergo an **eligibility check** based on the formal requirements. Submitted full proposals are **peer-reviewed** by independent, international experts;
- An **expert panel** ranks the proposals and recommends funding;
- **FNR decision bodies** select and approve the proposals to be funded;
- The detailed description of the review process and the selection criteria can be found in the publication '[CORE Peer Review Guidelines](#)' available on the FNR webpage.

3.3. The Selection Criteria

The **scientific merit** of the proposal is assessed based on:

1. Innovativeness of idea and scientific relevance;
2. Appropriateness of the approach;
3. Feasibility (competence of the PI and applicant team; research plan; institutional infrastructure, research environment);
4. Expected outcome and impact of results;
5. In addition for CORE Junior: Contribution to the advancement of career.

4. Time Schedule for the CORE 2020 Call

23 December 2019	Launch of the CORE Programme 2020 Call
22 April 2020 14:00 (CET)	Deadline for the submission of proposals (all domains)
26 October 2020	Funding decision communicated to the applicants
1 September 2021	Latest start of the project. Please note that for projects which are not able to start on 1 September 2021, the FNR may revise its funding approval.