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|  | Homepage |

# **Project Scope and Plan - Leonardo Early Access Program (LEAP)**

Call for Leonardo Early Access Program

Ver. 1.0

November 2022

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| **Project title** |  |
| Research field |  |

**Principal Investigator (PI)**

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| Title (Dr., Prof., etc.) |  |
| First (given) name |  |
| Last (family) name |  |
| Organisation name |  |
| Department |  |
| Group |  |
| Country |  |

## Co-PIs (same information)

Provide the details of any Co-PIs in the project, including Title, First (given) name, Last (family) name, Organisation, Department, Group and Country.

**Co-Principal Investigator (Co-PI) – If Any**

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| --- | --- |
| Title (Dr., Prof., etc.) |  |
| First (given) name |  |
| Last (family) name |  |
| Organisation name |  |
| Department |  |
| Group |  |
| Country |  |

## Collaborators

Provide the details of any Co-PIs in the project, including Title, First (given) name, Last (family) name, Organisation, Department, Group and Country.

**Collaborators – If Any**

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| --- | --- | --- | --- | --- | --- |
| Title | Name | Surname | Institution | Role | Institutional Email |
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## IMPORTANT NOTICE

All the sections and subsections below MUST BE COMPLETED (unless stated otherwise). In case you wish to leave a section empty, please provide a reason.

**The structure and formatting settings of this template must be preserved and respected** (change in font size or margin and spacing settings are not allowed). The maximum number of pages allowed is **7 pages starting from page 5 of the template**, including graphs, tables and references, but not counting the cover page and the appendix. Reviewers will be instructed not to consider any pages out of the limit. **Instruction paragraphs (in gray in the template) can be removed from the proposal text.**

**Send a single document**, based on the present template, in PDF format **without exceeding 8 MB**.

**Proposals that do not follow the template or that are incomplete will be administratively rejected and will not be further evaluated.**

## ERC (European Research Council) research fields

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| Please put here the ERC research field relevant for the project (e.g. PE6: Computer science and Informatics, PE9: Universe Science, …) |

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## 1: Executive Summary

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| Maximum 2000 characters (~1page)Please provide an executive summary that accurately describes your proposed research, focusing on the following topics:* project objectives;
* scientific rationale;
* innovation potential;

outcomes and high-impact scientific advances expected. |

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## 2: Description of the scientific case

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| Maximum 4000 characters (~2 pages).This section, including references, is expected to detail the scientific case object of this project.The provided information should be sufficient for the reviewers to provide a scientific evaluation of the proposal and to understand if the computational methodology is suitable to reach the project’s goals.The list of the topics that MUST be detailed/included follows (please notice that incomplete descriptions will lead to the project rejection):* Scientific objectives;
* List of the applications to be used and their performance on parallel architectures (short description, since they will be described in the next section);
* Related Publications;
* Detailed workplan
* Any relevant figure and image.
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| Research objectives P.2 |

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## 3: Computational Approach

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| Maximum 4000 characters (~2 pages).Discuss the computational approach, with particular attention to the exploitation of the resources (large scale run, high-throughput, etc). Provide quantitative evidence of the HPC performances of the application(s) you will adopt in the project (scalability, efficiency, I/O performances). Parallel performances (in either strong or weak scaling mode) or evidence of the optimal exploitation of the Leonardo system should be provided. The readiness of the proposed codes should be showed. Benchmark data should be provided in either tabular or graphical form, or both; the speedup curve should be supplied as well for strong scaling examples. Where appropriate, characterize the application’s single-node performance.The codes must run on modern Nvidia GPUs (e.g. Volta and Ampère family GPUs). Please give evidence that the code is reasonably suitable for Leonardo. |

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| Computational Approach P.2 |

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## 4: Exploitation workplan

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| Maximum 4000 characters (~2 pages).Report in this section the plan for the exploitation of the resources, discussing the number of runs, the number of requested resources (nodes, GPUs, memory) per each run. If appliable, report and discuss the structure of the workflow to be deployed. Report the required compilers, libraries and tools for the planned calculations. Furthermore, a tentative estimation of the requested resources must be provided. Please find here also an example of the table reporting the run to be performed and corresponding resources to be used.

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| **Run Type** | **Code(s)** | **No. of runs** | **No. of nodes (or GPUs)** | **No. of steps per run** | **Time per step(s)** | **Total node hours (GPU hours)** |
| A (init. condition prep.) | Code 1 | 10 | 1 (4) | 100 | 36 | 10 (40) |
| B (low resolution) | Code 2 | 20 | 20 (80) | 216 | 200 | 4’800 |
| C (mid resolution) | Code 2 | 4 | 160 (640) | 432 | 400 | 30’720 (122’800) |
| D (high resolution) | Code 3 | 1 | 2560 | 864 | 200 | 122’880 (491’520) |
| **TOTAL** |  |  |  |  |  | **527’050 (2’108’200)** |

 Also provide the simulation plan in production indicating job sizes and scheduling of computing tasks.  |

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| Exploitation Workplan P.2 |

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