

23rd Call for GCS Large-Scale Projects

Supercomputing at the leading edge

The Gauss Centre for Supercomputing (GCS) provides computing power and services of the highest performance class for computational sciences and engineering at its three member sites in Garching (Leibniz Supercomputing Centre, LRZ), Jülich (Jülich Supercomputing Centre, JSC), and Stuttgart (High Performance Computing Center Stuttgart, HLRS). To ensure a most efficient utilisation of these highly valuable resources, GCS provides its users with world-leading support, education, and dissemination of best practices and methods in simulation science. Here, the three members focus on different topics with some overlap on the subjects due to the centers' traditional user base or specific system requirements. While LRZ equally supports all scientific fields, JSC focusses on fundamental and applied sciences and HLRS specialises in engineering sciences and global system science. GCS aims, in particular, at innovative and scientifically challenging large-scale projects that cannot be carried out within smaller infrastructures. Such projects will also benefit most from the existing successful support structures within the GCS and from their continuous synchronisation and optimization. Please be aware of the different priorities of the GCS member sites when you apply for computing time.

State-of-the-art systems

The GCS offers a highest-level computing and networking infrastructure.

JSC provides computing time on the JUWELS (Jülich Wizard for European Leadership Science) Cluster. Its 2511 nodes are equipped with dual-socket Intel-Skylake Platinum 8168 CPUs. In addition, 56 Dual Intel Xeon Gold 6148 nodes are equipped with 4 additional NVIDIA Volta GPUs yielding a total performance of about 12 PF/s. In a further step, the JUWELS Cluster will be extended by a booster component in the summer of 2020. The technical specifications for the booster are not available yet.

LRZ provides the freshly installed SuperMUC-NG. It is equipped with 6480 dual-socket nodes with Intel Xeon 8174 processors (48 cores/node) consisting of 6336 thin nodes with a main memory of 96 GByte and 144 additional fat nodes with a main memory of 768 GByte. SuperMUC-NG delivers a peak performance of 26.9 PF/s.

HLRS will provide the brand new Hawk system. Hawk provides 5632 nodes, each one equipped with next generation AMD processors, code name Rome, offering 128 cores per node. 5432 nodes have 128 GByte of main memory, 200 nodes provide 256 GByte. Applicants shall port their applications to the new system as soon as possible. HLRS support is available and required support should be outlined in the project application.

The systems within the GCS are continuously upgraded in a round robin fashion.

Large-Scale Projects

Large-scale projects and highly scalable parallel applications are characterised by large computing time requirements, not only for short time frames, but often for longer time periods. Projects are classified as "Large-Scale" if they require

- ≥ 100 million core-hours on HAWK or
- ≥ 15 million core-hours on JUWELS or
- ≥ 45 million core-hours on SUPERMUC-NG

per year. Please note that the architecture and sustainable performance of a core of each system may widely differ and that the "core-hours" of the systems are not comparable or interchangeable.

For these large-scale projects a competitive review and resource allocation process is established by the GCS. Requests above these limits will be processed according to joint procedures of the GCS and will be reviewed in a national context. Requests below these limits and requests for test projects will be directly processed by the individual member centres.

Call for Large-Scale Projects

A "Call for Large-Scale Projects" is published by the Gauss Centre twice a year. Dates for closure of calls are usually at the end of winter and at the end of summer. The current 23rd call will be open

January 13th to February 10th 2020, 17:00 o'clock CET (strict deadline)

Eligible are applications from **German** universities and publicly funded **German** research institutions, e.g., Max-Planck Society, and Helmholtz Association¹.

Answering the Call

Leading, ground-breaking projects should deal with complex, demanding, innovative simulations that would not be possible without the GCS infrastructure, and which can benefit from the exceptional resources provided by GCS.

Application for a large-scale project must be done by filling in the appropriate electronic application form that can be accessed from the GCS web page

<https://www.gauss-centre.eu/for-users/hpc-access/>

Please use the template for the project description of your GCS large-scale application which can be reached from the above web page and are provided in [pdf](#), [docx](#), and [LaTeX](#) format. Note that also the regular application forms of the GCS member centres can be reached from there.

Please note:

- Projects with a running large-scale grant must **clearly indicate and justify this**.
- Projects targeting multiple GCS platforms must **clearly indicate and justify this**.
- Projects applying for an extension **must clearly indicate the differences to the previous applications** in the project description and must have submitted their reports of the previous application.
- Accepted large-scale projects **must fulfil their [reporting obligations](#)**.
- Project descriptions must not exceed 18 pages.
- **Grants from or applications to all German computing centres and PRACE have to be reported in the online application forms.**

The proposals for large-scale projects will be reviewed with respect to their technical feasibility and peer-reviewed for a comparative scientific evaluation. On the basis of this evaluation by a GCS committee the projects will be approved for a period of one year and given their allocations.

Criteria for decision

Applications for compute resources are evaluated only according to their scientific excellence and technical feasibility.

- The proposed scientific tasks must be scientifically challenging, and their treatment must

¹ Researchers from outside Germany may apply through PRACE (<http://www.prace-ri.eu/call-announcements/>).

- be of substantial interest.
- Clear scientific goals and verifiable milestones on the way to reach these goals must be specified.
 - The implementation of the project must be technically feasible on the available computing systems, and must be in reasonable proportion to the performance characteristics of these systems.
 - The Principal Investigator must have a proven scientific record, and she/he must be able to successfully accomplish the proposed tasks. In particular, applicants must possess the necessary specialized know-how for the effective use of high-end computing systems. This has to be proven in the application for compute resources, e.g. by presenting work done on smaller computing system, scaling studies etc.
 - The specific features of the high-end computers should be optimally exploited by the program implementations. This will be checked regularly during the course of the project.

Further help:

For further help please contact the member sites via <https://www.gauss-centre.eu/service/contact/>.