

18th 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. 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.

State-of-the-art systems

The GCS offers a highest-level computing and networking infrastructure. At JSC an IBM Blue Gene/Q system JUQUEEN with about 5.9 PetaFlop/s peak performance is available for highly scalable applications. JUQUEEN is to be shut down by the end of March 2018 due to a system change and will therefore be available for five months only. After the shutdown of JUQUEEN, approved projects will be transferred to its successor, the remaining computing time will be appropriately converted with respect to the capacity of the upcoming system. The technical specifications of the new system are not yet determined by the time of writing. LRZ's SuperMUC System provides two system partitions, which share the same programming environment and file systems. Phase 1, an IBM System X iDataPlex consisting of 155,656 cores delivers a peak performance of 3.2 Petaflop/s. Phase 2, an IBM/Lenovo NeXtScale WCT system delivers an additional peak performance of 3.6 Petaflop/s with 86,016 cores. HLRS offers its Cray System Hazel Hen, an XC40 based on Intel Processors and the Aries interconnect, with 7.4 PetaFlop/s peak performance. The architectures of these machines are complementary and can accommodate a broad spectrum of applications. 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 35 million core-hours or more per year. For these large-scale projects a competitive review and resource allocation process is established by the GCS. Requests above this limit will be processed according to joint procedures of the GCS and will be reviewed in a national context. Requests below this limit 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 18th call will be open

July 10th to August 14th 2017, 17:00 o'clock CEST (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 should be performed by filling in the appropriate electronic application form that can be accessed from the GCS web page

<http://www.gauss-centre.eu/large-scale-application>

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 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 <http://www.gauss-centre.eu/contacts>.

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