



## STAFF

TEAM **118 employees**

NATIONALITY **23 different countries**

OFFICIAL LANGUAGE **English**

The centre's activities are carried out by an international team. The backgrounds of the employees range from technical and administrative fields to information technology and science.



## BUDGET

OPERATING BUDGET **30 Mio. CHF**

INVESTMENT BUDGET **20 Mio. CHF**

PASC INITIATIVE BUDGET **3 Mio. CHF**

The Swiss Confederation funds the centre through the Board of the Federal Institutes of Technology and ETH Zurich. Important investments in computing infrastructure are possible by carrying the investment budget over different years. A specific budget for the development of applications and libraries is managed by the PASC initiative. About 8 Mio. CHF are financed through third party funding.

CSCS – Swiss National Supercomputing Centre

# AN ENGINE FOR INNOVATION AND CUTTING-EDGE RESEARCH IN SWITZERLAND



## CSCS

FOUNDING YEAR **1991**

LOCATION **Lugano**

OPERATOR **ETH Zurich**

ACTIVITY **Supercomputing**

The Swiss National Supercomputing Centre (CSCS) develops and provides high-performance computing (HPC) services essential to solving complex scientific and social problems.

Operating as a User Lab, CSCS promotes and fosters world-class leading-edge research. Its main task is to provide scientists with the computing infrastructure and the technical and scientific skills needed to best support their research.

CSCS's resources are available to national and international academia, as well as users from industry and the private sector.



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## CSCS

Centro Svizzero di Calcolo Scientifico  
Swiss National Supercomputing Centre



## USER LAB

USERS **2 318**

PROJECTS **153**

COMPUTING TIME (2021) **56 321 000** node h

CSCS's computing resources are made available to Swiss and international researchers free of charge via the User Lab. Projects are evaluated by external experts and selected on the basis of scientific merit.

### USAGE BY INSTITUTION

27%	International
19%	ETH Zurich
18%	EPF Lausanne
13%	University of Zurich
11%	Other Swiss
7%	University of Bern
3%	University of Geneva
2%	University of Basel

### USAGE BY RESEARCH FIELD

35%	Chemistry & Materials
18%	Life Science
15%	Others
12%	Earth & Environmental Science
11%	Physics
9%	Mechanics & Engineering



## SERVICES FOR THIRD PARTIES

**Blue Brain Project, CHIPP, Empa, ETH Zurich, MeteoSwiss, NCCR MARVEL, PSI, SDSC, University of Geneva, USI, UZH**

CSCS also provides supercomputing and storage services for Swiss scientific institutions and national projects. For example, it runs the weather-forecasting computers of MeteoSwiss, as well as the grid services used by the Swiss particle physics community (CHIPP) to analyse data from CERN's Large Hadron Collider in Geneva, and it manages an archiving system for the scientific data produced at PSI.



## SUPERCOMPUTER

NAME OF MAIN SUPERCOMPUTER **Piz Daint**

MACHINE TYPE **Cray XC40 / XC50**

PROCESSING SPEED **29.3 PFLOPS**

CSCS operates various leading-edge supercomputers and works with renowned computing centres and worldwide hardware manufacturers on the development of new supercomputing technologies. The centre's highest-performing supercomputer is Piz Daint, one of the most powerful supercomputers in the world.

COMPUTE NODES 5 704 hybrid compute nodes  
1 813 multicore compute nodes

RAM 446 TB + 153 TB

LOCAL DISK 11.5 PB



## STORAGE

ONLINE **20 PB**

OFFLINE **160 PB on tape**

CSCS provides researchers with 20 PB of online storage, the equivalent of half a billion DVDs, for the analysis of data from scientific experiments and simulations. In addition, a tape library of 160 PB provides long-term archiving and backup.



## BUILDING

OFFICE SPACE **2 600 m<sup>2</sup>**

MACHINE ROOM **2 000 m<sup>2</sup>**

OFFICE BUILDING **Minergie Standard**

The office building with its double-shell glass façade houses the offices and a conference room. The computer building has three floors: a resource deck, a distribution deck, and a 2 000 m<sup>2</sup> machine room.

The modular construction ensures maximum flexibility for expansion and adaptation to future technologies. CSCS is one of the most energy-efficient and sustainable supercomputer centres in the world.



## INTERNET

CONNECTION SPEED **2 x 100 Gbit/s**

NETWORK PROVIDER **SWITCH**

DATA CENTRE BACKBONE **400 Gbit/s**

Thanks to optical connections running via the Sempione, San Gottardo and San Bernardino, the SWITCH network provider ensures connection to the various Swiss research institutes and the rest of the world with two connections of 100 Gigabits per second.

A 400 Gbit/s data centre backbone provides data exchange within the centre between the supercomputers and the storage.



## COOLING SYSTEM

SYSTEM TYPE **Free cooling**

RESOURCE **Lake water**

The supercomputers and buildings are cooled by water extracted from Lake Lugano at the mouth of the River Cassarate, thereby appreciably reducing energy consumption and environmental impact.

LENGTH OF PIPELINE	2.8 km
HEIGHT DIFFERENCE	30 m
MAXIMUM FLOW RATE	760 l/s
EXTRACTION DEPTH	45 m
EXTRACTION TEMPERATURE	6 °C, max. 25 °C return



## ELECTRICITY

AVAILABLE POWER **11 Megawatts**

UPGRADABLE **To 25 Megawatts**

The present electricity supply allows operation of up to 11 Megawatts. This capacity can be increased to a maximum of 25 Megawatts. In an emergency, 960 batteries provide power to ensure the operation of key systems.

