

MSI Facilities Statement

The Minnesota Supercomputing Institute (MSI) is the University of Minnesota's principal center for computational research. Its main data center is located in the basement of Walter Library (room B40) on the U of M Twin Cities campus. It has an IT raised floor surface of approximately 3700 sq.ft. and over 1 MW of available power. The Institute HPC systems are composed of over 90,000 x86 64-bit compute cores, NVIDIA GPUs, and 500 TB of RAM, which can support over 6 double-precision PFLOPS of peak performance. HPC nodes are connected via Infiniband and are equipped with between 64 GB and 2 TB of RAM to support applications that require small and large amounts of memory, all nodes have local scratch drives, and 83 nodes include various configurations of the NVIDIA general purpose GPU accelerators (V100, A100), from 2- to 8-way.

In addition to the supercomputing systems, MSI also supports on-premise cloud platforms for specialized data use agreements, prototyping, and customizable software environments, interfaces and systems for advanced scientific visualization, and interactive computing 80 GPUs dedicated for interactive use. MSI manages three active storage systems: a high-performance all-flash file system (2 PB), a hybrid ssd/hdd high performance parallel file system (9 PB), and a CEPH-based object storage system (12 PB). MSI also partners with other campus providers to support disaster recovery and cold storage using a SpectraLogic Tfinity tape library with expansion capabilities for over 100 PB of storage. The data center is connected to the 100 Gbps campus research network via multiple 40 GbE connections. The University maintains 100 Gbps connections to our regional optical network, which in turn is connected to Internet2 and beyond. MSI provides the infrastructure and expertise to the greater University of Minnesota System. In addition to the diverse systems, more than half of the MSI staff are available to provide expert consulting in areas such as research informatics, software development, and algorithm optimization.

MSI is home to 31 research informatics staff (25 Ph.D. level) who work to foster and accelerate computational research across the University of Minnesota System in all scholarly pursuits by providing informatics services and consultations. Some consultation services are conducted in close collaboration with U of M-based high-throughput core facilities including genomics, metagenomics, optical and electron microscopy, small animal imaging, neuroimaging, material science and mass spectrometry. Informatics staff also provide consulting services and tutorials in the areas of high-performance computing, high-throughput computing, data management, and specific application support. In addition to the general support, many of the informatics staff are associated with long-term partnerships to provide dedicated informatics consulting services to specific departments.