

## Facilities

### UFIT Research Computing

In 2011, University made a 5-year commitment to build out the facility into a comprehensive cyber infrastructure for research computing, creating the department of Research Computing (RC) as a part of UF Information Technology (UFIT). UFIT RC operates HiPerGator, UF's supercomputer since 2013. The commitment from the University has been renewed because of the success in supporting research computing activities of the faculty, their students, and collaborators. UF Research Computing has grown to a staff of 32 FTE, supporting the work of over 1,00 faculty-led research groups, with over 7,000 users, of which 500 are active every week.

Further details on UF Research Computing can be found at <https://it.ufl.edu/resources/researcher-resources/> and <http://www.rc.ufl.edu>.

### Network infrastructure and Florida Lambda Rail (FLR) regional network

The computer systems are located in the University of Florida data center. The machine room is connected to other campus resources by the 400 Gigabit per second campus network and Science DMZ. The network connects HiPerGator to the FLR, from which the public Internet, Internet2 (the national research and education network), ES.net (Department of Energy research network) and other national and international networks are accessible.

The Florida Lambda Rail (FLR) provides the underlying fiber optic network and network connectivity between these institutions and many others. The University of Florida is connected to this backbone with two full speed of 400 Gbps links. The FLR backbone completed the upgrade to 400 Gbps in April 2023. FLR has had a 400 Gbps path to the Internet2 backbone since Feb 2022 (<https://flrnet.org>).

Universities in the state of Florida joined forces in the Sunshine State Education & Research Computing Alliance (SSERCA), a part of FLR, to share expertise in research facilitation and to support collaborations among researchers in the state of Florida and with researchers everywhere (<http://sserca.org>).

### High-performance computing and big-data analytics

UFIT RC is upgrading its HiPerGator supercomputer to its 4<sup>th</sup> Generation in 2025, with an expected start of production in September 2025. The new system, replacing most of the existing system, is a cluster-based system with a combined capacity of about 70,000 cores, 600 NVIDIA L4 GPUs with 24 GB of RAM and it will include an NVIDIA DGX B200 SuperPOD with 506 Blackwell B200 GPUs with 180 GB of RAM. The Blackwell GPU is the newest technology from NVIDIA designed for the next phase of innovation and discovery in artificial intelligence (AI) research, development and deployment.

The HiPerGator systems are connected by an integrated InfiniBand fabric. HiPerGator systems shares over 60 PetaBytes of distributed storage via the Lustre parallel file system. UF HJiPerGator houses about

3.9 PB of storage for the High Energy Physics collaboration of the Compact Muon Solenoid (CMS) experiment.

HiPerGator is used for training workshops and teaching classes, engineering and physical simulations, gene sequencing, and for simulation, machine learning (ML), deep learning (DL), artificial intelligence (AI), and simulation and modeling, available for exploration and production research.

The benchmarks performance numbers for HiPerGator 4<sup>th</sup> Generation as of Nov 2025 are documented in the Dec 2025 press release <https://news.ufl.edu/2025/12/hipergator/>.

## Restricted data storage, analysis, computing, and development

Research projects may involve storing and processing restricted data, including intellectual property (IP), protected health information (PHI), Research Health Information (RHI) and Controlled Unclassified Information (CUI), which are regulated by Health Insurance Portability and Accountability Act (HIPAA), International Trade in Arms Regulation (ITAR), Export Administration Regulation (EAR), Family Educational Rights and Privacy Act (FERPA) and various state laws and regulations, as well as contractual requirements.

Since March 17, 2023, HiPerGator has been certified by HITRUST against the CSF v9.6 risk-based, 2-year (r2) certification criteria, so that researchers can use the full power of HiPerGator for work with various types of regulated data. The certification was being renewed at version 11.3 for 2025-2027. HiPerGator now also meets NIST 800-171r3 which allows NIH GDS data to be stored and processed.

For ITRA/EAR projects, a special enclave environment on the HiPerGator platform <https://www.rc.ufl.edu/documentation/hipergator-rv/> has been operated since Dec 2017. The HiPerGator-RV/ResVault system is approved for NIST 800-53r5 “moderate” and NIST 800-171r3. Currently, review is underway to obtain CMMCv2 Level 2 certification by the time that is expected to be required, likely in 2026.

## Services

Further details on the services, including the subsidized and the full-cost-recovery price, can be found at the Research Computing web site <https://www.rc.ufl.edu> under Services. HiPerGator is available for research and teaching by all faculty at universities in Florida under the same conditions and cost as for UF faculty.

Support for proposal development can be found under Get Support -> Proposal Support.

## Virtual network environments

By the end of 2014, the campus network infrastructure was upgraded to support virtual network environments. These virtual environments enable extending physical networks beyond their physical boundaries that traditionally coincide with individual buildings. There are two connected physical networks:

1. The Academic network,

2. The Health network that allows protected health information to be stored and accessed,

With virtual network environments, it is possible to connect instruments in any enabled building to the Science DMZ virtual environment, even if the instrument resides in a building that is served by the physical Health network. Similarly, researchers can choose to be connected to the Academic virtual network even if their offices are in a Health network building. Virtual environments allow deployment of the correct policies and security measures on a fine-grained scale to meet the needs of the activities of the people using the network. Further virtual network environments include

1. Administrative virtual network environment, with a level of security in between academic and health.
2. Industrial building control network environment will allow separating traffic for monitoring and controlling building systems from the networks used by the occupants of the buildings.
3. Payment Card Industry virtual environment.
4. CUI and ITAR virtual environment to connect that compliant data storage and processing system ResVault in a compliant and secure way to some of the engineering labs where the restricted data is used to create and test export-controlled devices.

## Space, Power and Cooling

The funding model for Research Computing includes the commitment from the Provost, the VP for Research, and the VP and CIO to provide machine-room facilities with electrical power and cooling and professional staff. The University has a substantial investment in research computing infrastructure including a data center completed in 2013 on the East Campus that provides 10,000 sq. ft. of machine room space, of which 5,000 sq. ft. is dedicated to house HiPerGator. The power and cooling capacity was expanded from 1.6 MW to 3.2 MW in 2020.

## Staffing

The University pays the salaries of the 34 highly qualified staff members, including several with a PhD or master's degree in science or engineering. Staff members, in addition to contributing to the system design, installation, and administration duties, provide application support and consulting services to faculty members, their research associates, and their graduate students. This support ranges from assistance with job flow management and installation of open-source software to teaching students how to improve the MPI performance of their programs.

The staff also includes a team of 5 Research Software Engineers (RSE) created in 2024 to provide advanced software engineering and programming support for projects.

## Training and Outreach

UFIT Research Computing provides advanced support and training to the user community. Many training materials are now available online. The schedule can be found at <https://help.rc.ufl.edu/doc/Training>.

In addition, user feedback meetings are held as well as periodic training workshops are organized every semester. In 2025 over 50 courses leveraged HiPerGator.