Clustering and Visualization Lab

At the heart of the center is the Black-Hole Lab (located in 74-2060) and its advanced computer clusters NewHorizons and BlueSky, and gravitySimulator. The facility showcases the center’s research and its commitment to green computing. OptiCool Technologies, an in-rack green cooling solution installed in 2012, has a 60-ton cooling capacity. It is more efficient than traditional HVAC solutions and safer than water-based solutions that could develop faulty cooling lines, Campanelli noted.

BlueSky Linux is a 1040 processor cluster with more than four terabytes of onboard DDR3 RAM and 200 terabytes of high-speed Lustre-based storage interconnected with a QDR InfiniBand network. NewHorizons is a 736 processor Linux cluster with 3 TB of onboard RAM and over 100 TB of storage.

Scientists at the center supplement the Black Hole Lab with supercomputing resources at the National Center for Supercomputer Applications. Some of their largest simulations are done at the peta-scale Blue Waters system at the Illinois–National Center for Supercomputer Applications (NCSA) and XSEDE resources. “This is one of the most powerful supercomputers in the world available for open scientific research,” said Campanelli. “Our resources, combined with CCRG’s key experts in the field, are why we are one of the main contributors to the rapid growth of gravitational physics.”

Two large displays continually show presentations on gravitational waves and black holes. A mirror from LIGO Hanford is on permanent display in front of the lab.