

# Feature Article

## Supercomputers for Education

November 2005

### *Importance of ASA Supercomputers*

Alabama has a surprisingly large number of companies involved in modeling and simulation. According to a survey presented by Dr. Schroer of the University of Alabama in Huntsville at the [2005 Modeling and Simulation Society conference](#), there are about 6,080 modeling and simulation jobs in Alabama (4,600 in industry and 1,480 in federal government). One reason that these companies can be successful is the availability of skilled scientists and engineers that have received their college education in Alabama. **The Alabama Supercomputer Authority maintains a facility that gives students the chance to do computation intensive work as part of their degree.**

### *ASA Supercomputing Resources*

The Alabama Supercomputer Authority (ASA) is a state-funded corporation founded in 1989. It operates the Alabama Supercomputer Center, located in Huntsville, and the statewide Alabama Research and Education Network (AREN). Over the life of the center, the computing facilities have included a Cray X-MP, N-Cube, Cray C90, and a Cray SV1. **The Center currently has a 60 CPU SGI Altix 350, and a 144 CPU Cray XD1.** The current systems provide both shared memory and distributed memory computing environments.



Figure 1: Cray XD1 & SGI Altix 350 (left to right)

## ***ASA Supercomputing Upgrades and Upcoming Events***

**ASA recently completed an upgrade of the SGI Altix 350.** This upgrade included increasing the number of CPUs to 60, adding additional memory, and adding an additional 1.2 terabytes of disk space. In the coming months, additional disk space and memory will be added to the Cray XD1. There are also plans to add field-programmable gate arrays (FPGA) to the Cray. These upgrades are being funded through the ALL\*STARS educational outreach initiative from NASA. **This month, ASA will be promoting the expanded Alabama Supercomputer Center facility at the [Supercomputing 05 \(SC05\) convention](#) in Seattle.**

## ***ASA Supercomputer Uses***

**Students utilize ASA Supercomputers both for research and as part of the course curriculum at the research universities in Alabama.** The systems have been utilized to a lesser extent by teaching colleges and even by high school technology programs. Classes that have recently utilized this facility include courses in parallel programming, computational chemistry, computer networks, turbine design, numerical methods, and electrostatics. Research utilizing this facility is being done by faculty and students in departments as diverse as chemistry, physics, mathematics, biology, music, meteorology, medicine, and various branches of engineering.

## ***More About ASA***

The Alabama Supercomputer Authority has expanded its role in Alabama by taking the initiative in providing network services to schools, libraries and governmental offices. This is done through a statewide network, the Alabama Research and Education Network (AREN), run by ASA. AREN connects higher education institutions, K-12 school systems, libraries and more to one another, to the Internet, and to Internet2. **Network upgrades currently in progress will provide redundant links to allow network service to continue when primary network links are lost.**

Through these initiatives, the Alabama Supercomputer Authority and educational institutions are working together to provide Alabama students with a strong background in information technology. This in turn provides technology-oriented companies with a skilled workforce to staff their Alabama offices. For more information go to ASA's web site ([www.asc.edu](http://www.asc.edu)) or send email to Dr. David Young, HPC Computational Specialist at [dyoung@asc.edu](mailto:dyoung@asc.edu).