Building the Culture and Infrastructure for Research Computing in the Liberal Arts

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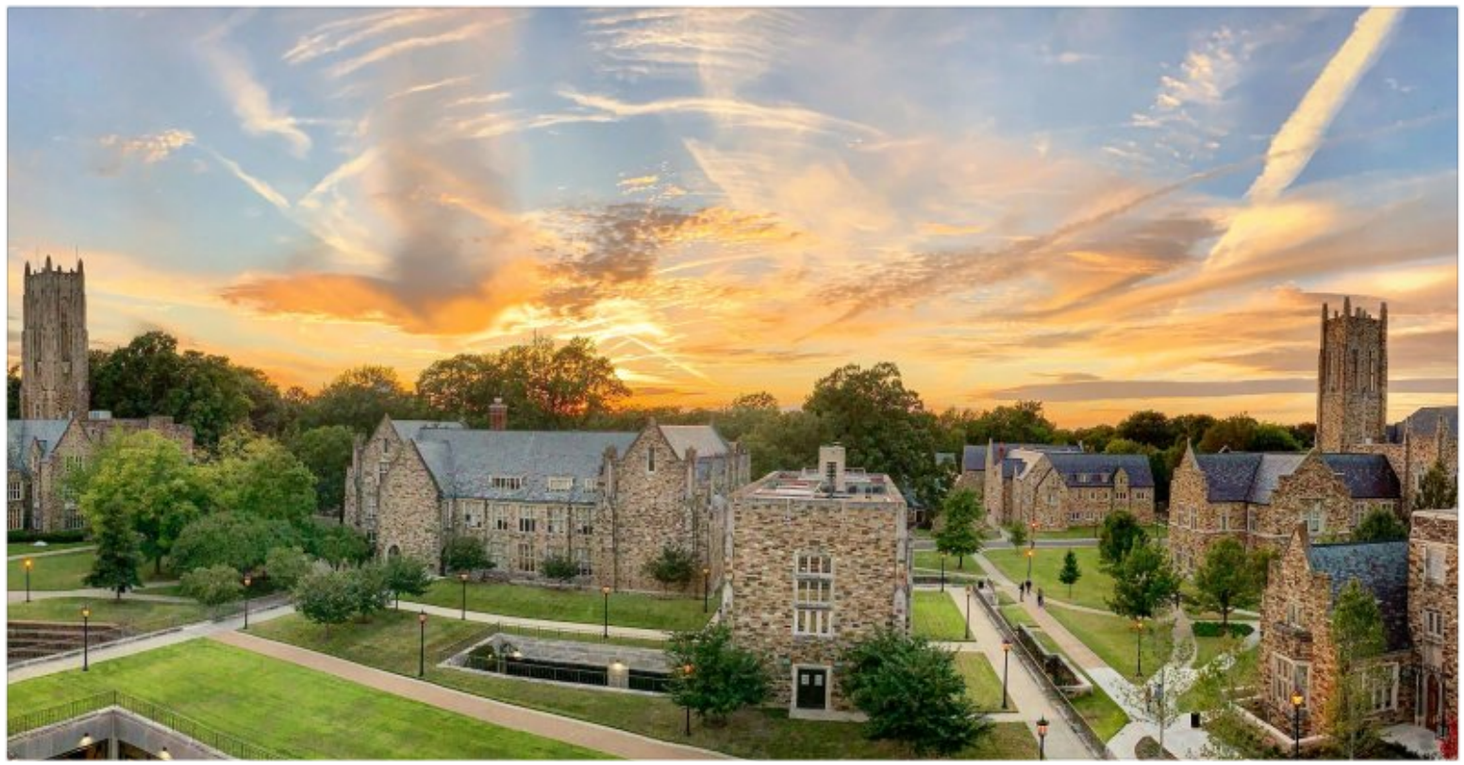
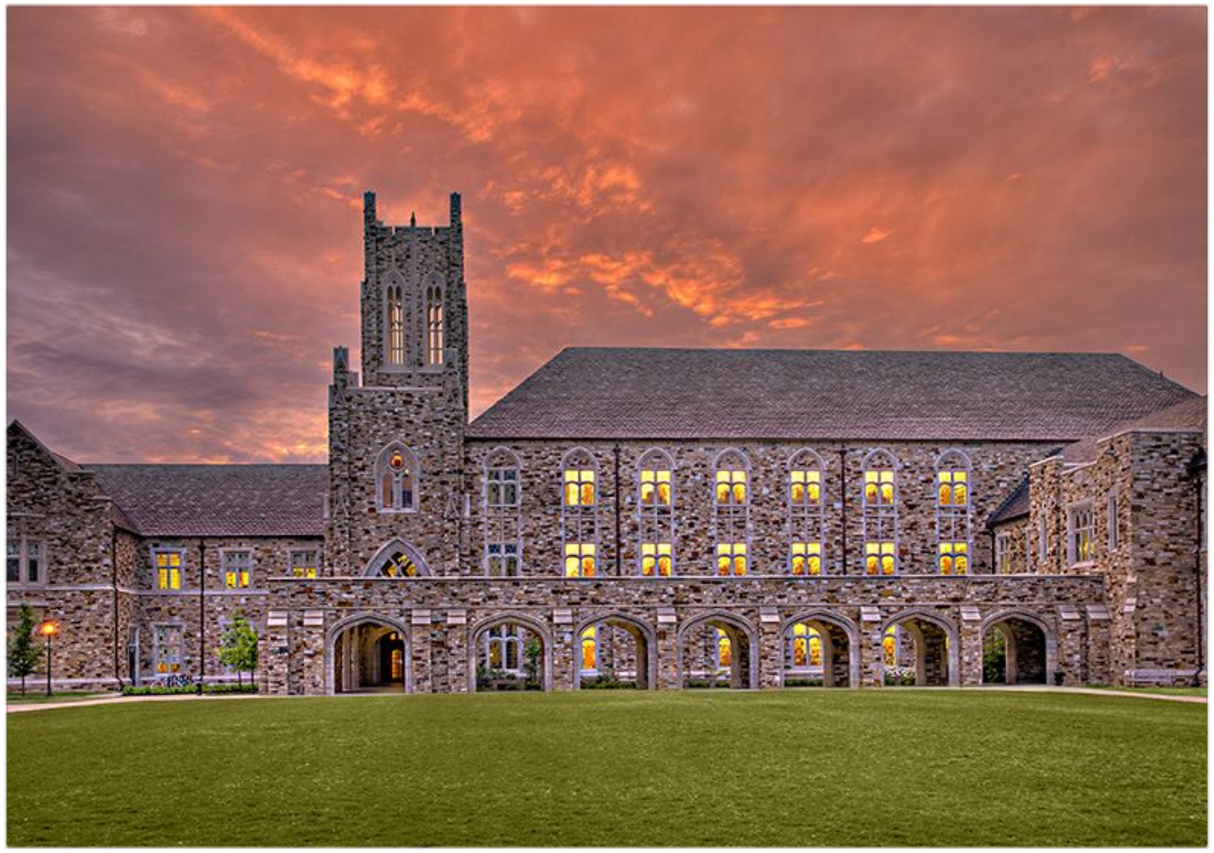
Rhodes College
—1848—

About Rhodes College

- Liberal arts college in Memphis, TN (est. 1848)
- ~2000 students, all undergraduate
- ~200 instructional staff, about 160 tenure / tenure-track
- “research-intensive” focus





About Me

- Faculty member in CS at Rhodes
- grad school at Ohio State, OSC
- landed at Rhodes in 2015
- previously at Coastal Carolina University
- research focus on HPC programming models, NIC offload, one-sided communications
- CCU had small research HPC cluster, not a centralized resource

Research Computing Timeline

- XSEDE Campus Champion at CCU (2013)
- Rhodes joined XSEDE in 2016
- New president in 2017, new CIO in 2018
- CC role facilitated conversations with computational faculty
- helped researchers with allocation requests on XSEDE resources

HPC/HTC Research Domains at Rhodes

- CS (HPC, distributed systems, bioinformatics, computational geometry)
- Math (modeling and simulation)
- Biology (genetic analysis, genome protein-protein assays)
- Chemistry (GAUSSIAN)
- Economics (statistical analysis of census data)

Developing Local Computing Resources

- traditionally, all research was “on your own” with respect to computing
- IT budget (tragically) underfunded under prior administration
- looked at NSF MRI to fund cluster
- talked to computational researchers about needs (13 faculty)
- found CC* program in 2019, better fit

CC*:Compute Award

- 44-node Intel-based cluster rack (1,584 cores)
- Mellanox Infiniband EDR interconnect
- ~500TB storage
- still in procurement phase, site build-out
- expect a blend of HPC and HTC workloads

Challenges

- awareness & education about alternate research workflows
- institutional support for investing in centralized research computing resources
- time - staffing / training (e.g. OSG, HPC storage, scheduler)

Working with OSG

- OSG contribution
  - local cluster will connect to OSG via hosted CE
  - 20% cluster utilization by OSG jobs
- Rhodes' use of OSG resources
  - identify new potential HTC workloads amongst Rhodes researchers
  - expand research scope/breadth by using OSG in addition to existing or local resources

The future!

- Local cluster installation in 1Q21
- External communications about award and new centralized research computing resources
- Training / collaborate with existing faculty
- Recruiting tool for faculty and students
- Teaching / training tool for undergraduates, K-12 outreach
  - CS classes (parallel, distributed systems, bioinformatics)
  - Math Modeling
  - Computatational Biology
  - Introductory Bio w/ sequencer

Questions

- Thanks to NSF, XSEDE and Open Science Grid

- Questions?

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