Advanced Research Computing

Advanced Research Computing (ARC) provides centralized support for research computing at Virginia Tech, offering high-performance computing systems, large-scale data storage, visualization facilities, software, and consulting services. By fostering collaborations and reducing barriers to access, ARC enhances research productivity and enables researchers of all experience levels to leverage advanced computing and data-driven opportunities.

Resources:

- Linux-based high-performance computing (HPC) and high-throughput computing (HTC) research computing clusters
- Permanent and temporary data storage
- Training in advanced research computing and related topics
- Consulting and computational workflow development
- Participating and collaborating in research projects (co-author publications, co-PI on sponsored projects)
- Visualization and hypercube in the visionarium lab

HPC systems:

- 600+ compute nodes, 59k+ CPU cores, 275TB+ RAM, and 500+ GPUs
- 11PB+ storage capacity for research

ARC support:

- ARC documentation website: https://docs.arc.vt.edu
- ARC helpdesk: https://arc.vt.edu/help
- ARC office hours daily: https://arc.vt.edu/office-hours
- Offices: Torgersen Hall 3050
  620 Drillfield Dr., Blacksburg VA 24061

TRAINING WORKSHOPS

Spring 2025: Every Friday noon to 1 PM
Spring Break Bootcamp: 3/10 to 3/14 10 AM & 2 PM

Every Friday Series: noon to 1 PM

- Introduction to Advanced Research Computing (1/24)
- Create and Use SSH Keys for Authentication (1/31)
- Connect to ARC Systems and Run your First jobs (2/7)
- Unix Shell Basics, Part 1 (2/14)
- Unix Shell Basics, Part 2 (2/21)
- Introduction to Slurm (2/28)
- vi for Text Editing (3/7)
- VSCode on ARC Systems (3/14)
- Virtual Environments with Python on ARC (3/21)
- Launching Jobs in Parallel on ARC Clusters, Part 1 (3/28)
- Launching Jobs in Parallel on ARC Clusters, Part 2 (4/4)
- Monitoring Resource Utilization and Job Efficiency (4/11)
- Data Wrangling Basics: tar and Globus (4/18)
- Apptainer on ARC (4/25)
- Virtual Environments with Python on ARC (5/2)

Spring Bootcamp Series: 10 AM to noon & 2 PM to 4 PM

- HPC for Materials Modeling and Simulations (3/10)
- Introduction to Advanced Research Computing (3/10)
- Graph Analytics on HPC (graph libraries) (3/11)
- Bash Scripting, Part 1 (3/11)
- Hands-On HPC Access and Application with Open OnDemand (3/12)
- Bash Scripting, Part 2 (3/12)
- Different Paradigms of Parallel Computing (3/13)
- Scalable Job Submissions (3/13)
- Best Practices for Visualization (3/14)
- Data Wrangling Basics: tar and Globus (3/14)

Check https://profdev.tlos.vt.edu/ for more information on the training workshops, including a detailed schedule for each semester and registration instructions.

INFORMATION TECHNOLOGY
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RESEARCH COMPUTING
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