2019 Vision
The University of Wyoming's Advanced Research Computing Center (ARCC) focuses strongly on providing elite capabilities and resources to the University of Wyoming community and its collaborators by offering high performance computing (HPC) capabilities, large-scale storage platforms, training, and consulting that continue to enhance research and education and foster a future of interdisciplinary knowledge.

ARCC is committed to research, education, and economies at both local and regional levels and to consistently improve operations and documentation to serve all levels of the community. Student workers provide a genuine capability to continue training and strengthen understanding in various capacities allowing the ARCC and UW to continuously evolve towards the future. State of the art and general purpose platforms for computing and storage facilitate top-tier research, broad education, and nurturing a competitive future.

ARCC is also committed to collaboration with other institutions, both regionally and nationally. ARCC is a member of the Rocky Mountain Advanced Computing Consortium (RMACC), and strives to partner with and learn from our peers. In 2018, ARCC participated in a Research Experience for Undergrads (REU) in partnership with the Pittsburgh Supercomputing Center that allowed two undergraduate students to get hands on experience with computational and data sciences. Additionally, UW & ARCC have a close partner with the National Center for Atmospheric Research which provides incredible access to additional computational resources and storage platforms beyond that facilitated at the University of Wyoming that enhances further collaborations.

UW has committed to becoming an open-access institution. ARCC is providing UW Libraries with infrastructure resources (Storage, networking, web servers) and technical personnel for the publication of such research.

State-wide and regional outreach is important to ARCC. Through providing access to external collaborators, compute and data storage access, and teaching HPC methodologies to prospective UW students, ARCC is viewed as an indispensable resource to Wyoming.

Finally, ARCC is committing time and resources into improving our support of UW and the region. This is being accomplished through a restructure of ARCC personnel, with a focus on improving our training curriculum, delivery methods, and documentation. The focus of these efforts is to ensure our services are easy to learn and use by varying levels of computational scientist or student.

Computational facilities
ARCC provides systems administration for the campus HPC condominium cluster, Teton, which is open to all facets of research. In addition, ARCC supports numerous specialty clusters used by different UW research organizations. ARCC also provides the petaLibrary (PL), an easily scalable research data storage system. The PL is available to all researchers at UW for short and archive long term data storage.
ARCC hosts a generously sized HPC compute cluster composed of more than 14,000 cores interconnected with Mellanox InfiniBand and providing various access to accelerated computing capability including NVIDIA graphics processing units (GPUs) and many core processors. The system is supported by an IBM Spectrum Scale global filesystem in a transparently-tiered configuration leveraging the speed of solid state drives and the capacity of traditional spinning hard drives which delivers more than 30 gigabytes / second bandwidth. The Slurm resource manager is configured to provide priority access to directly invested researchers as well as fairshare algorithms to balance research endeavors of various disciplines. Additionally, innovative and community driven and nationally supported package management solutions are used to install a wide variety of applications in numerous configurations supporting development tasks and production class studies.

A large collaborative storage platform is also accessible as research is a large supplier and consumer of data and will continue to grow at unprecedented rates. The data store is available from the HPC system as well as individual workstations and laptops. The system provides access to push data from field research where the data can be processed and prepared for additional computation as well as published. The system encourages collaboration and supplements the University's initiative for open data access. The University of Wyoming Libraries partners closely with the ARCC to publish data collections that are appropriately curated and indexed.

Each platform above is designed to be scalable and expand as the University of Wyoming succeeds in many research areas. To supplement these valuable systems, ARCC provides additional infrastructure in terms of web servers and high performance networking.