**Template Budget Justification for disk space, computational node buy-in, and ARCS services.**

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Note: ICER allows buy-in of computing hardware and disk space, as well as research software development or research consulting through the ARCS program. Costs and terms for the storage buy-in and computational hardware buy-in programs are available at <https://icer.msu.edu/hpcc/storage#Storage%20Buy-in> and <https://icer.msu.edu/users/buy-options>, respectively. The cost of the storage buy-in is unlikely to change substantially, and if it does the cost per terabyte will decrease, so use the quoted cost. New compute clusters are acquired roughly every two years and are purchased through a competitive process which is informed by the needs of ICER users – as a consequence, the details of the hardware and the exact node cost vary substantially. PIs are advised to choose the node cost from the last buy-in (linked above) and add 10% to the cost to account for inflation and price variability. Details about the Academic Research Consulting Services (ARCS; <https://icer.msu.edu/arcs>) program. Note that any ARCS programs will need to be discussed prior to grant submission; ICER will provide a quote that describes the scope of services, estimated cost, and terms of service.

TEMPLATE:

We request $xxxx per year ($xxxx total over the duration of the grant) to lease disk space at Michigan State University’s Institute for Cyber-Enabled Research (ICER) in support of the proposed research. This leased disk space is part of the computing clusters maintained by ICER and housed in the High Performance Computing Center located at MSU’s campus Data Center in East Lansing, MI, and is part of a high-speed parallel file system. As a disaster recovery mechanism, data is replicated on a nightly basis to an offsite location.

We request $xxxx <in the first year of the grant> to purchase computing equipment through the buy-in program offered by Michigan State University’s Institute for Cyber-Enabled Research (ICER). The proposed funds will be used to purchase <briefly describe compute node(s) you plan to purchase>. This hardware will be part of a computing cluster housed within the High Performance Computing Center located at MSU’s campus Data Center in East Lansing, MI. ICER purchases a new cluster approximately every two years; the proposed purchase will <be part of the most recently-purchased cluster/part of an upcoming purchase, and thus the estimated price is based on inflation-adjusted costs from the last compute buy-in>. As part of the buy-in program, the PIs and their collaborators will be provided priority access to these additional computational resources (guaranteed start of jobs in less than four hours), <directly improving the rate at which the research group can perform simulations and analyze data>. In addition to the purchased resources, PIs and their collaborators will also be granted access to the entire cluster for running jobs that require additional resources.

As part of the buy-in agreement, ICER provides the cyberinfrastructure for researchers to utilize their buy-in equipment. This includes replicated highspeed file systems, monitored redundant power and cooling, management nodes, and a comprehensive software stack. Additionally, ICER provides HPCC system administration and troubleshooting support, user training and user consultations.

We request $xxxx <in the first year of the grant> for extended research support through the Michigan State University Institute for Cyber-Enabled Research Academic Research Consulting Service program (ARCS; <https://icer.msu.edu/arcs>). Through this program, <an ICER Research Software Engineer/an ICER Research Consultant/a team of ICER staff> will <briefly describe scope of activities>. The full scope of work and cost breakdown is included in a quote provided by the ICER director, which is included with this proposal <as a supplemental document>. This service will facilitate the success of the proposed work through <brief justification>.