

Research and Education Enabled by a High Performance Computing Cluster at a Predominantly Undergraduate Institution

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Professor Lemley teaches thermo-fluid engineering and works with undergraduates to perform fluid dynamics research that is mostly focused on small scale flow problems. He is currently an Assistant Dean of Mathematics and Science and a Professor of Engineering and Physics at the University of Central Oklahoma, his home institution for more than fifteen years. Previously, Professor Lemley worked as a mechanical engineer in the power industry. His bachelor's degree is in physics from Hendrix College and his M.S.M.E. and Ph.D. were earned at the University of Arkansas.

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Poster: This is intended to be a poster that accompanies a paper for the Engineering Physics and Physics Division entitled *Deploying a High Performance Computing Cluster at a Predominantly Undergraduate Institution*

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This paper is focused on the deployment and use of a high performance computing HPC cluster at the University of Central Oklahoma (UCO), which is a predominantly undergraduate institution (PUI) and a Carnegie Master's Level - Larger Programs Classification. In January 2015 UCO received a National Science Foundation (NSF) Major Research Instrumentation (MRI) grant to fund an HPC cluster to enhance and extend computationally oriented research and education. By July of 2015 the *Buddy* Cluster (so-named for the school mascot) was deployed and ready for early users. In September 2015 there were only a handful of users compared to September 2016 when a total of over 60 users are registered on the system. The *Buddy* Cluster has been used for a wide range of engineering and other applications such as bioinformatics, computational fluid dynamics, heat transfer, biomedical applications, image processing, and statistical analysis.

This poster will present the following graphical results: impacts to computational research and the research infrastructure at UCO, examples of internet browser-based access to use certain cluster software (focused on common engineering software that has been installed), and visualization and other results from specific research and education projects will be displayed.