

**Title:** Toward Smart HPC via Intelligent Scheduling

**Presenter:** Zhiling Lan, Illinois Institute of Technology

**Abstract:**

As high-performance computing (HPC) continues to grow in scale and complexity, technical challenges, e.g., heterogeneous resources, diverse workloads, reliability, energy efficiency, communication, become critical concerns. These concerns demand significant changes in many aspects of the system software stack, especially the workload management system (aka job scheduler or batch scheduler). Over the past fifteen years, I have worked in a close collaboration with the Cobalt team at Argonne Leadership Computing Facility. Cobalt is an open-source scheduler and resource manager for supercomputers. It has been deployed on several production supercomputers including the 48-rack IBM Blue Gene/Q system Mira and the 11.69 petaflop Cray XC40 system Theta at Argonne. In this talk, I will present my research projects aimed to address various scheduling challenges. Being analogous to smart grids, we envision that future HPC will become smart HPC in which information about resources and applications will be automatically gathered, analyzed, and acted on for high productivity. My work intends to explore important advances in job scheduling essential toward this vision. I will introduce our recent work on power aware scheduling and multi-resource scheduling. Finally, I will talk about open issues in this area.

**Bio:**

Zhiling Lan received her PhD degree in Computer Engineering from Northwestern University in 2002. She has since joined the faculty of Illinois Institute of Technology and is currently a Professor at the Department of Computer Science. She is also a Guest Research Faculty at Argonne National Laboratory. Her research interests are in the areas of high-performance computing, with particular emphasis on resource management and job scheduling, power and energy efficiency, interconnect networking, and performance modeling. She has co-authored 100+ publications in these areas. She was the recipient of Dean's Excellence Award in Research/Scholarship from College of Science at the Illinois Institute of Technology in 2014. She has served in the Technical Program Committees (TPC) for ~100 international conferences and workshops, including the premier conferences such as IEEE/ACM SC, ACM HPDC, ACM ICS, IEEE Cluster, IEEE/ACM CCGrid, etc.