

**Talk Title:** NASA Supercomputing and Its Impact on Agency Missions  
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**Abstract:**

High-fidelity modeling, simulation, and analysis, enabled by supercomputing, are becoming increasingly important to NASA's mission to pioneer the future in space exploration, scientific discovery, and aeronautics research. While scientific and engineering advancements used to rely primarily on theoretical studies and physical experiments, today computational science is an equal partner in such achievements. In addition, computational modeling and simulation serves as a predictive tool that is not otherwise available. As a result, the use of high performance computing is now integral to the space agency's work in all mission areas. The NASA Advanced Supercomputing (NAS) Division at Ames Research Center is the Agency's primary supercomputing facility, consisting of 1.2 petaflops of computational capability, more than 7 petabytes of filesystem, 45 petabytes of tape archive, a 245-megapixel visualization wall, and high-bandwidth connectivity to other NASA centers and partners. The NAS facility also provides full-service support to scientists and engineers in the areas of application porting, performance optimization, large-scale data analysis and rendering, and multi-terabyte data transfers. In my talk, I will briefly describe our fully-integrated supercomputing environment, focus on its impact in several NASA mission areas, and discuss some pacing challenges to be overcome to make the next revolutionary advances in this field.