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## **Applied Mathematics Research at Exascale**

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### Abstract

The pursue of exascale computing is based, to a large extent, on the premise that there are scientific discoveries that require much more computing resource than is available today. Implicit in this premise is the assumption that today's algorithms may be adapted for the exascale computing regime. However, it has been well documented that significant changes in computer architectures will be needed in order to achieve exascale computing. Consequently, substantial advances in applied mathematics and out-of-the-box thinking of how we will compute may be needed in order to cope with the changes in computer architectures and to fully realize the potential of exascale computing in modeling and simulation. In this talk, we will discuss challenges that we may face at exascale and present some ideas for overcoming these challenges.

