Title: Fast and flexible linear algebra in Julia

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Applied scientists often develop computer programs exploratively, where data examination, manipulation, visualization and code development are tightly coupled. The traditional programming languages supporting this workflow are relatively slow and, in consequence, performance critical computations are delegated to library code written in faster languages infeasible for interactive development.

In this talk, I introduce the Julia programming language and briefly describe its core design. I shall argue that the language is well suited for computational linear algebra. Julia provides features for exploratory program development, but the language itself can be almost as fast as C and Fortran. Furthermore, Julia’s rich type system makes it possible to extend linear algebra functions with user defined element types, such as finite fields or exotic algebras. I will show examples of Julia programs that are relatively simple, yet fast and flexible.