Title: Dubious no more: evaluation of the matrix exponential by solving differential equations

In a well-known paper from 1976, Cleve Moler and Charles Van Loan identified 19 dubious ways to compute the exponential of a matrix. A paper updating the state of the art in computing the matrix exponential "25" years later appeared in 2003. One of these dubious methods involved the solution of a linear ordinary differential equation. Moler and Van Loan deemed this method to be too computationally expensive. However, times have changed in the world of computing, and now scalability is often a determining factor, especially when performing large simulations, such as those in numerical weather prediction. In this talk, I demonstrate how the evaluation of the matrix exponential and its related so-called phi functions by means of differential equations is no longer dubious.