***Exponential integrators for parabolic PDEs***

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Exponential integrators are methods for the solution of ordinary differential equations which use the matrix exponential in some form. As the solution to linear equations is given by the exponential, these methods are well suited for stiff ordinary differential equations where the stiffness is concentrated in the linear part. Such equations arise when semi-discretizing semi-linear differential equations. The biggest challenge for exponential integrators is that we need to compute the exponential of a matrix. If a spectral discretization is used, then the matrix can be diagonalized cheaply. In other cases, the computation of the matrix exponential is more tricky and an iterative method needs to be used. This talk will survey the various possibilities that have been proposed.