Speaker: Begoña Cano, Universidad de Valladolid, Spain

Title: How to avoid order reduction when explicit Runge-Kutta exponential methods integrate nonlinear initial boundary value problems

Abstract: A technique will be shown to recover the classical order of the method when explicit exponential Runge-Kutta methods integrate reaction-diffusion problems. In the literature, methods of high enough stiff order for problems with vanishing boundary conditions can be constructed, but that implies restricting the coefficients and thus, the number of stages and the computational cost may significantly increase with respect to other methods without those restrictions. In contrast, the technique which will be suggested is cheaper because it just needs, for any method, to add some terms with information only on the boundaries. Moreover, time-dependent boundary conditions will be directly tackled.