1160-65-328 **Yuan Liu*** (yuan.liu@wichita.edu), 1845 Fairmount St., Wichita, KS 67260, and **Yingda Cheng**, **Shanqin Chen** and **Yong-Tao Zhang**. *Krylov implicit integration factor discontinuous Galerkin methods on sparse grids for high dimensional reaction-diffusion equations.*

Reaction diffusion system are most commonly used mathematical models for pattern formation in computational biology. In this talk, we will discuss a class of Krylov implicit integration factor (IIF) discontinuous Galerkin (DG) methods on sparse grids to solve reaction-diffusion equations on high spatial dimensions. The key ingredient of spatial DG discretization is the multiwavelet bases on nested sparse grids, which can significantly reduce the numbers of degrees of freedom. To deal with the stiffness of the DG spatial operator in discretizing reaction-diffusion equations, we apply the efficient IIF time discretization methods, which are a class of exponential integrators. Krylov subspace approximations are used to evaluate the large size matrix exponentials resulting from IIF schemes for solving PDEs on high spatial dimensions. (Received August 11, 2020)