1090-60-234 **Jing Wang*** (jingw@iastate.edu), 396 Carver Hall, Department of Mathematics, Ames, IA 50011, and **David Michael Ackerman** and **James W Evans**. *Generalized hydrodynamic treatment of the interplay between single-file diffusion and conversion reaction in nanopores.*

Behavior of conversion reactions (A converts to B) in narrow pores is controlled by a delicate interplay between fluctuations in adsorption-desorption at pore openings, single-file diffusion of A and B, and reaction. This behavior is captured by a generalized hydrodynamic formulation of appropriate reaction-diffusion equations (RDE). These RDE incorporate an unconventional description of chemical diffusion in mixed-component single-file systems based on a refined picture of tracer diffusion for finite-length pores. The RDE elucidate the non-exponential decay of the steady-state reactant concentration into the pore and unusual scaling of the reactant penetration depth.

Reference: Ackerman et al. Phys. Rev. Lett. 108 (2012) 228301. (Received March 02, 2013)