1121-35-158 **Peter V Gordon*** (pgordon@uakron.edu), Department of Mathematics, The University of Akron, Akron, OH 44325. *Gelfand type problem for co-flow jets.*

In this talk I will discuss a model for autoignition of laminar co-flow jets. Such jets consist of two parts: an inner part with oxidizer that is surrounded by an outer part with fuel or reverse. The derivation of the model is based on combination of Burke-Schumann theory of diffusion flames and Semenov-Frank-Kamenerskii theory of thermal explosion. The main advantage of this model is that it gives a sharp characterization for autoignition of a jet as blow up of solution of underlying PDE. This model falls into a general class of Gelfand type problems which were studied in mathematical literature since early 1960's. I will also discuss analysis of the model that reveals dependency of the autoignition position on principal physical and geometric parameters involved. Moreover, explicit expressions for autoignition position in asymptotic regimes relevant to applications will be given. This a joint work with U.G. Hegde, M.C. Hicks and M.J. Kulis of NASA Glenn Research Center. (Received July 17, 2016)