1026-35-180 **Peter Gordon*** (peterg@oak.njit.edu), Department of Mathematical Sciences, New Jersey Institute of Technology, University Heights, Newark, NJ 07102. *Propagation of pressure driven flames in porous media.*

Gaseous detonation is a phenomenon with very complicated dynamics which has been studied extensively by physicists, mathematicians and engineers for many years. Despite many efforts the problem is far from a complete resolution. Recently Sivashinsky proposed the theory of subsonic detonation that occurs in a hydraulically resistant porous media. This theory provides a model which is realistic, rich and suitable for a mathematical study. In particular, the model is capable of describing the transition from a slowly propagating deflagration wave to a fast detonation wave. This phenomena is known as a deflagration to detonation transition and is one of the most challenging issues in combustion theory. I will present some recent mathematical results concerning the model. In particular, it will be shown that, under assumption that the reaction rate is of the ignition type, the model admits traveling wave solutions. Moreover, uniqueness of the solution for small thermal diffusivity will be established. I will also present some results on propagation of traveling fronts in case when the reaction rate is of the KPP type. This is a joint work with A. Ghazaryan, C.Jones and L.Ryzhik. (Received February 26, 2007)