1125-35-3146 **Robert Strain*** (strain@math.upenn.edu), Department of Mathematics University of Penns, David Rittenhouse Lab, 209 South 33rd Street, Philadelphia, PA 19104. *On the Musket problem.*

The Muskat problem models the dynamics of an interface between two in- compressible immiscible fluids with different characteristics, in porous me- dia. The phenomena have been described using the experimental Darcy's law. Saffman and Taylor (1958) related this problem with the evolution of an interface in a Hele-Shaw cell since both physical scenarios can be modeled analogously. In this talk we will discuss existence results, singularity results, and long time decay behavior of the Muskat problem in 2D and in 3D. (Received September 21, 2016)