1125-37-161 **Aminur Rahman*** (ar276@njit.edu), Culimore Hall, University Avenue, Department of Mathematical Sciences, New Jersey Institute of Technology, Newark, NJ 07103. *The Chaotic Ballet of Walking Droplets.*

Pilot wave theory in quantum mechanics, specifically the works of de Broglie and later Bohm, initially showed great potential, but was later abandoned in favor of the Copenhagen interpretation. However, in recent years the idea of particle trajectories driving the statistics seen in quantum-like experiments has made a resurgence due to the study of quantum analogs in hydrodynamic pilot wave theory through the works of Couder *et al.* and Bush *et al.*

In 2010, Bush and collaborators developed hydrodynamic models for a bouncing droplet experiencing propulsion from its own waves. They observed indications of chaos, however due to the complexity of the models, mathematical analysis proved to be extremely difficult. Recently, Gilet developed a model for straight-line walking with the droplets exciting a single eigenmode at each impact. He observed by numerical means, evidence of a Neimark-Sacker bifurcations (N-S) and chaotic dynamics.

This talk discusses the pioneering experiments of Couder and Bush, and some of the early models. It is shown how the reduced models were developed and possible connections with previous integro-differential model and experiments. The main results in the talk prove the existence of (N-S) and a new global bifurcation leading to chaos. (Received August 05, 2016)