1046-41-747　　　　　　**William A. Massey*** (`wmassey@princeton.edu`), Department of Operations Research, and Financial Engineering, Princeton University, Princeton, NJ 08544. *Fluid limits, diffusion limits, and event horizons for the response times of processor sharing queues with time varying rates.*

We can determine the asymptotic behavior of the response time for a processor sharing queue when appropriately scaled. This is achieved by using the theory of strong approximations to do an asymptotic analysis of the random sample path behavior for the underlying queueing process. This analysis extends to queueing systems with time varying arrival rates. Finally new phenomena is discovered for such systems that we call the "event horizon" for a processor sharing queue. All these results are based on joint work with Robert Hampshire and Mor Harchol-Balter. (Received September 10, 2008)