1084-60-294 **Barbara Margolius*** (b.margolius@csuohio.edu), Dept Mathematics, RT1515, 2121 Euclid Ave, Cleveland, OH 44115-2214. *Quasi-Birth-and-Death-Processes with time-varying periodic rates.*

Queues with time-varying rates have been considered in the literature at least since Kolmogorov considered the waiting problem in a paper in 1931 [Sur le probleme d'attente, On the Problem of Waiting]. Motivating applications for queues with time-varying parameters have included airport congestion, police calls for service, call centers, streaming and data traffic in a multiserver network, traffic congestion, demand for health care and many others. In this talk, we focus on systems with time-varying periodic parameters. We consider quasi-birth-and-death processes (QBD) with time-varying periodic rates. These results put the time-varying periodic QBD in the context of matrix analytic methods. We follow the approach laid out in LaTouche and Ramaswami's *Introduction to Matrix Analytic Methods in Stochastic Modeling* (the red book), generalizing it to the time-varying case. The approach requires the numerical solution of an integral equation over one time period. (Received September 04, 2012)