1099-42-130   **Stephen D. Casey*** (`scasey.american@gmail.com`), Math/Stat Dept., American University, 4400 Massachusetts Ave., NW, Washington, DC 20016-8050. *The Analysis of Periodic Point Processes.* Preliminary report.

Our talk addresses the problems of extracting information from periodic point processes. These problems arise in numerous situations, from radar PRI analysis to bit synchronization. We divide our analysis into two cases – periodic processes created by a single source, and those processes created by several sources. We wish to extract the fundamental period of the generators, and, in the second case, to deinterleave the processes.

We first present very efficient algorithm for extracting the fundamental period from a set of sparse and noisy observations of a single source periodic process. The procedure is computationally straightforward and converges quickly. Its use is justified by a probabilistic interpretation of the Riemann zeta function. We then build upon this procedure to deinterleave and then analyze data from multiple source periodic processes. This relies both on the the probabilistic interpretation of the Riemann zeta function, the equidistribution theorem of Weyl, and Wiener's periodogram. We close by demonstrating simulations of the procedures, which were developed jointly by the speaker and Kevin Duke of American University. (Received February 04, 2014)