1082-65-309 **John T Whelan*** (john.whelan@astro.rit.edu), School of Mathematical Sciences, Rochester Institute of Technology, 85 Lomb Memorial Drive, Rochester, NY 14623. *Gravitational Wave Data Analysis: a Mathematical and Statistical Challenge.*

Efforts are currently underway to make the first direct detection of gravitational waves and initiate the field of gravitational wave astronomy. Analysis of data from gravitational wave detectors involves several challenging problems in mathematics, statistics and signal processing. These include detection of weak signals in much louder instrumental noise, estimation of background rates in the presence of non-Gaussian data, and detection and parameter estimation of signals described by multi-dimensional parameter spaces. I will describe some techniques used to address the challenges of gravitational wave data analysis, which include statistical inference (Bayesian and frequentist), singular value decomposition, and time-frequency analysis. (Received July 10, 2012)