

APR12-2012-000844

Abstract for an Invited Paper  
for the APR12 Meeting of  
the American Physical Society

**Pulsar Timing Arrays: No longer a Blunt Instrument for Gravitational Wave Detection<sup>1</sup>**

ANDREA LOMMEN, Franklin and Marshall

Pulsar timing now has a rich history in placing limits on the stochastic background of gravitational waves, and we plan soon to reach the sensitivity where we can detect, not just place limits on, the stochastic background. However, the capability of pulsar timing goes beyond the detection of a background. Herein I review efforts that include single source detection, localization, waveform recovery, a clever use of a “time-machine” effect, alternate theories of gravity, and finally studies of the noise in our “detector” that will allow us to tune and optimize the experiment. Pulsar timing arrays are no longer “blunt” instruments for gravitational-wave detection limited to only detecting an amplitude of the background. Rather they are shrewd and tunable detectors, capable of a rich and dynamic variety of astrophysical measurements.

<sup>1</sup>The author acknowledges the support of an NSF CAREER Award and is also supported by NSF PIRE 0968296.