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Host: McCammon

# Using Spin-Stable Neutron Stars to Detect Nano-Hertz Gravitational Waves from Cosmological Sources

Department of Physics Colloquium

**D**iscoveries of spin-stable pulsars with millisecond periods combined with new algorithms for determining arrival times of pulses have greatly increased the likelihood of detecting long-wavelength gravitational waves using an array of such objects. I will discuss gravitational wave sources, which include merging supermassive black holes and cosmic strings. Processes within the neutron star and its magnetosphere along with plasma propagation effects from the interstellar medium limit our ability to time-tag pulses as do instrumental effects. I will discuss these issues and assess the minimum requirements for pulsar-timing arrays to be successful. This will also involve a summary of how existing radio telescopes are being used, the most important of which are the Arecibo Observatory and the Green Bank Telescope, and a discussion of how future array telescopes, including the Square Kilometer Array and precursor arrays, are required.

