Abstract Submitted
for the APR21 Meeting of
The American Physical Society

The Logic of Detection: Statistics and Systematics in the Search for Gravitational Waves with Pulsar-Timing Arrays MICHELE VALLISNERI, Caltech — The first detection of gravitational waves by LIGO was graced by overwhelming statistical confidence, setting a challenging but (I argue) misleading precedent for ongoing analysis with pulsar-timing-array data: in fact the general acceptance of LIGO's claim relied on crucial lines of evidence beyond statistics, and fewer "sigmas" would have sufficed. I outline a defensible standard for future claims that pulsar timing arrays have observed the stochastic gravitational-wave background from supermassive black-hole binaries, addressing the peculiarities of pulsar-timing campaigns, including the formulation of a detection hypothesis, the difficulty of establishing a null background, the possibility of confounding systematics, and more.

Michele Vallisneri
Caltech

Date submitted: 08 Jan 2021 Electronic form version 1.4