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Hyper-fast gravitational wave parameter estimation using machine learning

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Gravitational wave detection is now commonplace and as the sensitivity of the global network of GW detectors improves, we will observe $O(100)$ s of transient GW events per year. The current methods used to estimate their source parameters employ optimally sensitive but computationally costly Bayesian inference approaches where typical analyses have taken between 6 hours and 5 days. Here we show that a conditional variational autoencoder pre-trained on binary black hole signals can return Bayesian posterior probability estimates 6 orders of magnitude faster than existing techniques.

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Session Classification: Talks