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Importance nested sampling with normalizing flows for gravitational-wave inference

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Nested sampling has become an important tool for inference in astronomical data analysis. However, it is often computationally expensive to run. This poses a challenge for certain applications, such as gravitational-wave inference. To address this, we previously introduced *nessai*, a nested sampling algorithm that incorporates normalizing flows to accelerate gravitational-wave inference by up to a factor of four compared to our baseline. However, we showed that it was limited by the underlying nested sampling algorithm.

In this talk, we present an improved version of nessai, called *i-nessai*, that addresses the main bottlenecks. To achieve this, we design a modified nested sampling algorithm based on importance nested sampling that tailors specifically to normalizing flows. We demonstrate that this approach eliminates the aforementioned bottlenecks and is an order of magnitude faster than our baseline.

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