Optimising gravitational wave searches for unknown isolated neutron stars SINEAD WALSH, University of Wisconsin - Milwaukee, THE LIGO SCIENTIFIC COLLABORATION AND VIRGO COLLABORATION — All-sky searches for gravitational waves from isolated neutron stars must be highly sensitive over a large parameter space. This requirement presents a significant computational challenge. Computing power is amassed with the support of the public via the Einstein@Home project. Semi-coherent search methods seek to maximise sensitivity to signals of unknown frequency over the whole sky. Parameter space coverage in each dimension, and coherent integration time at each point in parameter space, impact the search sensitivity and the computing requirements. The optimal search design is a trade-off among these elements, with the best choice depending on the amount of LIGO data and the area in parameter space to be covered. Here I present efforts to address the multi-dimensional challenge of optimising all-sky searches for isolated neutron stars with Einstein@Home.

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