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Filling the gap between neutron star and black hole masses

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The lack of objects between 2 and 5 M_{\odot} enter code here in the joint mass distribution of compact objects has been termed “mass gap” and attributed to the characteristics of the supernova mechanism at their birth. However, recent observations show that a number of candidates reported to lie inside the “gap” may fill it, and the paucity may be the result of small number statistics. We quantify in this work the individual candidates and evaluate the joint probability of a mass gap, working in a frequentist and Bayesian approach. Our results show that a mass gap is not present, to a very high confidence level. It remains to be seen if a relative paucity of objects ensues and how this population can be related to the formation processes, which may include neutron star mergers, collapse of a neutron star to a black hole and others.

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