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Observations of binary black holes in the pair-instability mass gap.

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Most observed binary black hole (BBH) mergers belong to the stellar-mass BBH population produced by the collapse of isolated stars. A pair-instability supernova (PISN) mechanism prevents the formation of black holes from the stellar collapse with mass greater than 50 and less than 120 solar masses. Any BBH merger with a component black hole in the PISN mass gap is likely to originate from an alternative formation channel. In this talk, we discuss detections of the high-mass BBH systems and present the observational evidence for BBH events in the PISN gap, including the GW190521 event, which was firmly established as an outlier to the stellar-mass BBH population if the PI mass gap begins at or below 65 solar masses.

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Session Classification: Black hole formation, evolution and the black hole mass gap

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