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GW170817B - THE FIRST DIRECT DETECTION OF GRAVITATIONAL WAVES ASSOCIATED WITH A GRB

Tuesday, 12 December 2023 14:00 (20 minutes)

On August 17, 2017, GW170817 showed the merger of a double neutron star system. Model-independent data analysis by butterfly-matched filtering, a novel time-symmetric data analysis method with sensitivity on par with CBC, reveals a continuation in GW170817B starting 0.92 ± 0.08 s after final coalescence. It signals the birth of the central engine of GRB170817A significant at 5.5σ (van Putten & Della Valle, 2023, A&A, 669, A36), emitting 3.5% M-Solar c^2 in gravitational radiation. GRB170817A is hereby identified with black hole spin-down following the delayed gravitational collapse of the initial post-merger remnant - a hypermassive neutron star. GW170817B provides the first evidence of Kerr black holes as objects in Nature by GW-calorimetry (van Putten & Levinson, 2002, Science, 295 1874).

Primary author: VAN PUTTEN, maurice (INAF-OAS, Sejong University)

Presenter: VAN PUTTEN, maurice (INAF-OAS, Sejong University)

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