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Thermonuclear bursts *longer* than *usual*

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Thermonuclear bursts from neutron stars in low-mass X-ray binaries are the subject of advanced research on accretion and nuclear burning processes. Depending on the accretion rate and composition of the stellar material, bursts lasting tens of minutes can be explained by the ignition of an unusually thick pure helium layer, though the role of hydrogen remains uncertain in some systems. Besides, hour-long superbursts are thought to be powered by explosive carbon burning from a thicker deeper layer produced by H/He burning, thus probing the thermal profile of the neutron star crust.

This talk will review fifty years of observations revealing that about 1% only of thermonuclear bursts last more than 10 minutes. These are most generally recorded at very low accretion rates, providing an opportunity to study the transition from a hydrogen-rich bursting regime to a pure helium regime. A unique sequence of an intermediate long burst leading a superburst will also be presented as the former possibly being the firestarter of the latter.