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# Quark nova imprint in the extreme supernova explosion SN 2006gy: the advent of the Quark Star

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The existence of quark stars has until now been purely hypothetical. In this work, we uncover undeniable evidence of these exotic objects with far reaching implications to various branches of physics and astrophysics. The extremely luminous supernova 2006gy (SN 2006gy) has provided photometric and spectroscopic evidence of a new explosion mechanism which signals the birth of a quark star. This supernova is among the most energetic ever observed and spent an unheard of 250 days at magnitude -19 or brighter. This analysis considers the supernova explosion of a massive star followed by the quark nova detonation of a neutron star. Our model naturally explains many aspects of SN 2006gy including the late stage light curve plateau, the broad H alpha line, and the peculiar blue H alpha absorption. In addition, we find that cooling of the re-shocked supernova envelope leads to an explanation for the diminished X-ray production observed by CHANDRA.

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