We model the standard ΛCDM model of the universe by the spatially-flat Friedmann-Lemaître line element

\[ ds_{\Lambda\text{CDM}}^2 = -c^2 dt^2 + \left( \frac{8\pi G \rho_{m,0}}{3c^2} \right)^{2/3} \left( \sinh \left( \frac{3}{2} \sqrt{\frac{\Lambda}{3}} ct \right) \right)^{4/3} d\sigma_{\text{Euclid}}^2 \]

which we extend for all time \( t \in (-\infty, \infty) \). This line element is \( C^\infty \) and solves Friedmann’s equation for all \( t \neq 0 \) and is \( C^1 \) at \( t = 0 \). We use this extended line element to show that encoded into Friedmann’s equation is (1) the prediction that the universe existed before the big bang; (2) that the big bang was preceded by a negative time epoch \((-\infty, 0)\); (3) that the universe was asymptotically created out of nothing at \( t = -\infty \) from an unstable negative half de Sitter \( ds^2_{-dS} \) initial state; and (4) asymptotically dies at \( t = \infty \) as the stable positive half de Sitter \( ds^2_{+dS} \) final state. Since these two de Sitter states are vacuum states, our model shows that the universe was created de novo from nothing at \( t = -\infty \) and dies to nothing at \( t = \infty \), and is thus a variant of the zero energy universe, with our extended ΛCDM model interpolating between the initial and final state. (Received September 26, 2017)