

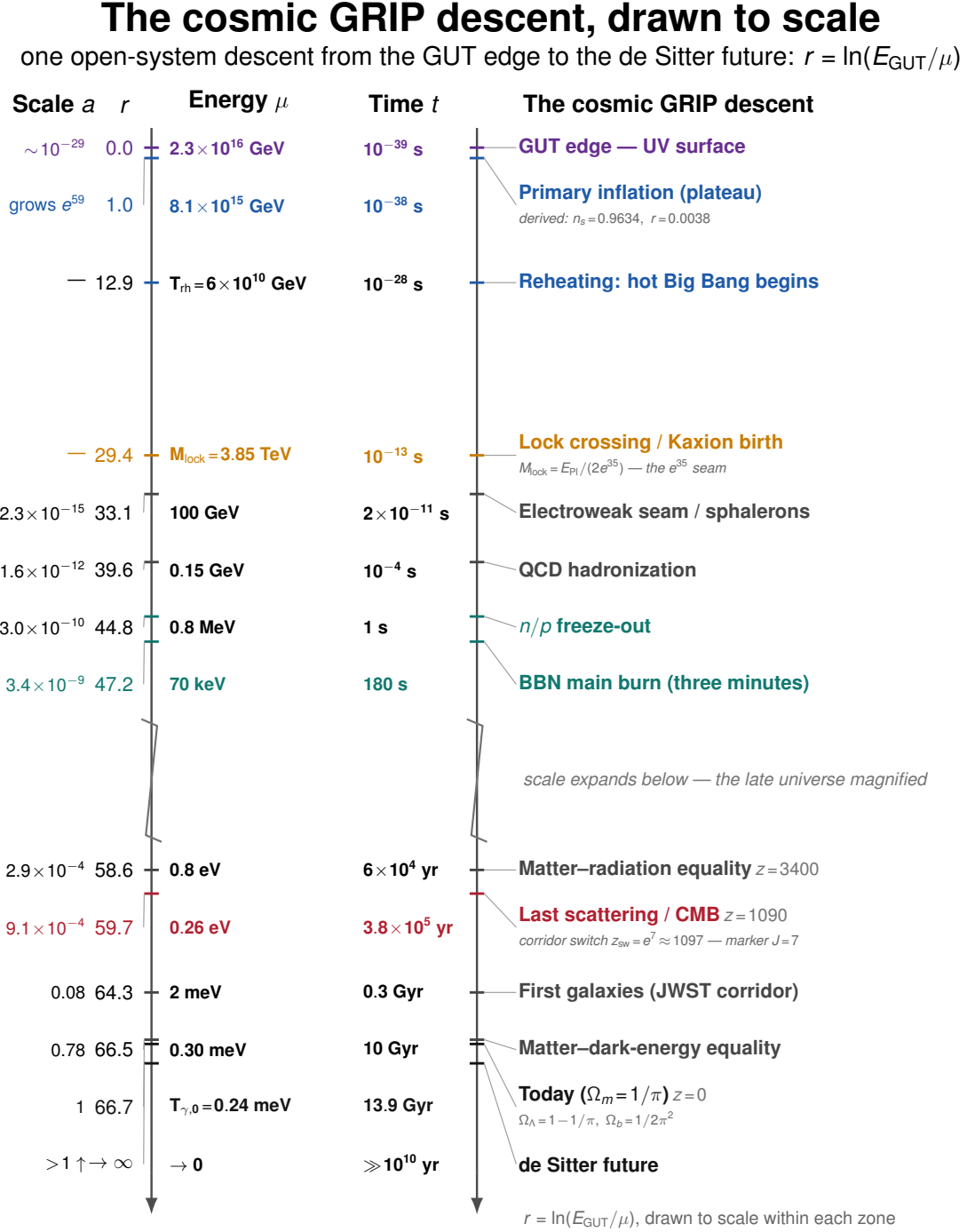


Figure 5: The cosmic GRIP descent, drawn to scale on $r = \ln(E_{\text{GUT}}/\mu)$: one open-system descent from the GUT edge ($r = 0$) to the de Sitter future, read simultaneously in energy μ , time t , and the scale factor a . The key epochs are drawn to scale and colored; the late universe is magnified below the break so that recombination, structure, and the present epoch stay legible. Every value is the standard cosmological reading of the master chronology (Table 36); nothing on the axis is fitted.