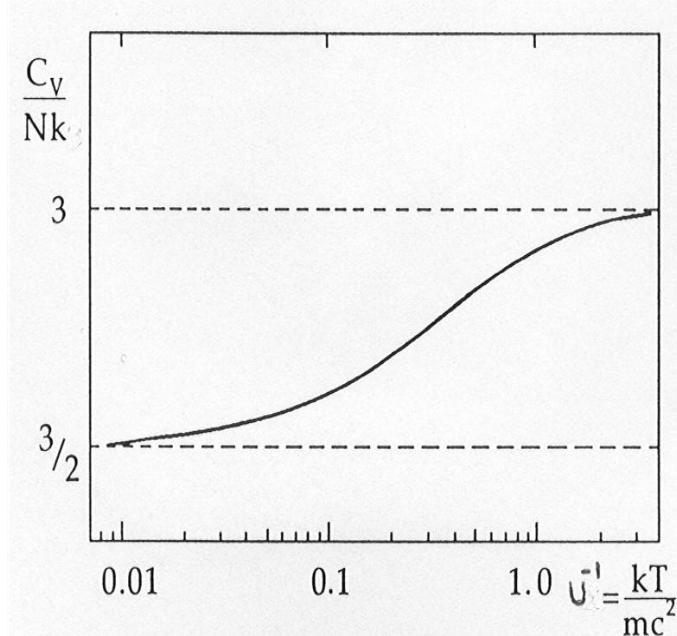


Relativistic classical ideal gas [ts134]

Heat capacity:

$$C_V = Nk_B u \left[u + \frac{3}{u} - \frac{K_1(u)}{K_2(u)} \left(3 + u \frac{K_1(u)}{K_2(u)} \right) \right]$$

$K_n(u)$: modified Bessel function; $u \equiv \beta mc^2$.



Nonrelativistic limit ($u \gg 1$): $\frac{K_1(u)}{K_2(u)} = 1 - \frac{3}{2u} + \frac{15}{8u^2} + \dots$

Ultrarelativistic limit ($u \ll 1$): $\frac{K_1(u)}{K_2(u)} = \frac{u}{2} + \dots$

[from Greiner et al. 1995]