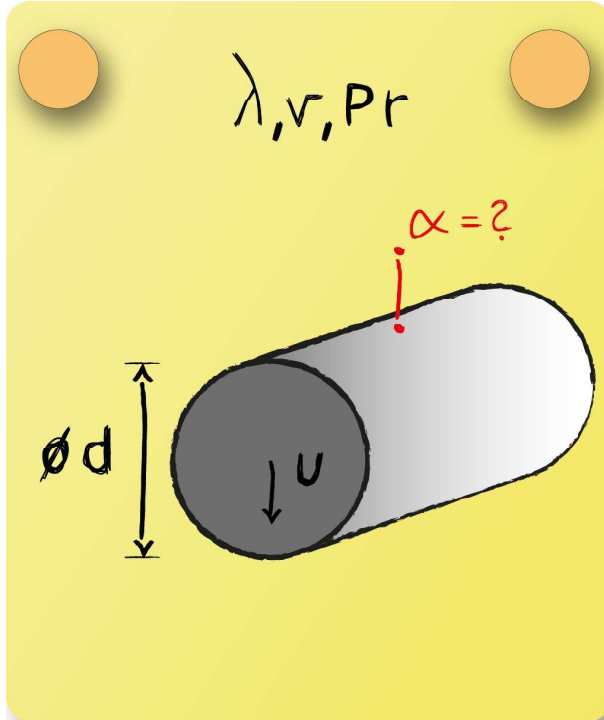# Heat Transfer Correlation 5.3

A cylinder falls through a non-moving fluid. Calculate the mean heat transfer coefficient $\bar{\alpha}$.

Reynolds number:

$$\mathrm{Re_d} = \frac{u \cdot d}{\nu} = 2.94 \cdot 10^4$$

Nusselt number:

$$\mathrm{Nu_d} = 0.193 \cdot \mathrm{Re_d}^{0.618} \cdot \mathrm{Pr}^{0.4} = 242.74$$

Heat transfer coefficient:

$$\bar{\alpha} = \frac{\mathrm{Nu_d} \cdot \lambda_\mathrm{f}}{d} = 1238.0 \ \mathrm{W/m^2K}$$