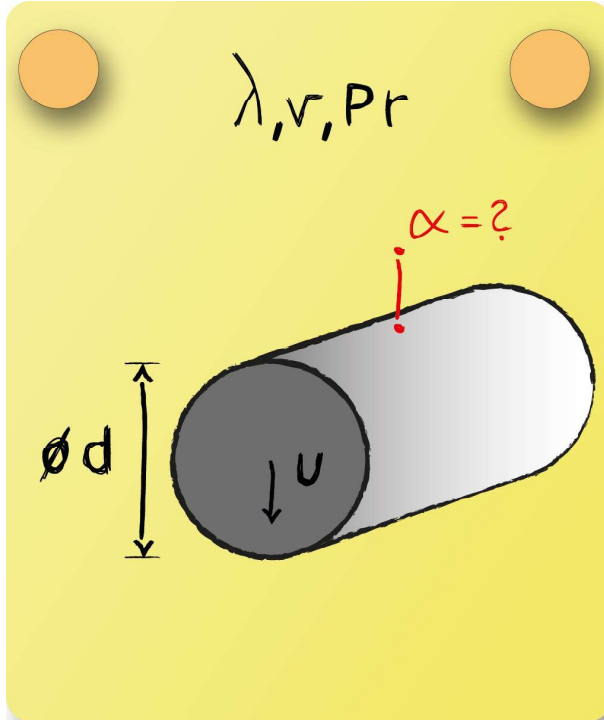# Heat Transfer Correlation 5.2

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

Reynolds number:

$$\mathrm{Re_d} = \frac{u \cdot d}{\nu} = 3.33 \cdot 10^3$$

Nusselt number:

$$\overline{\mathrm{Nu_d}} = 0.683 \cdot \mathrm{Re_d}^{0.466} \cdot \mathrm{Pr}^{0.4} = 28.95$$

Heat transfer coefficient:

$$\bar{\alpha} = \frac{\overline{\mathrm{Nu_d}} \cdot \lambda_\mathrm{f}}{d} = 156.31 \ \mathrm{W/m^2K}$$