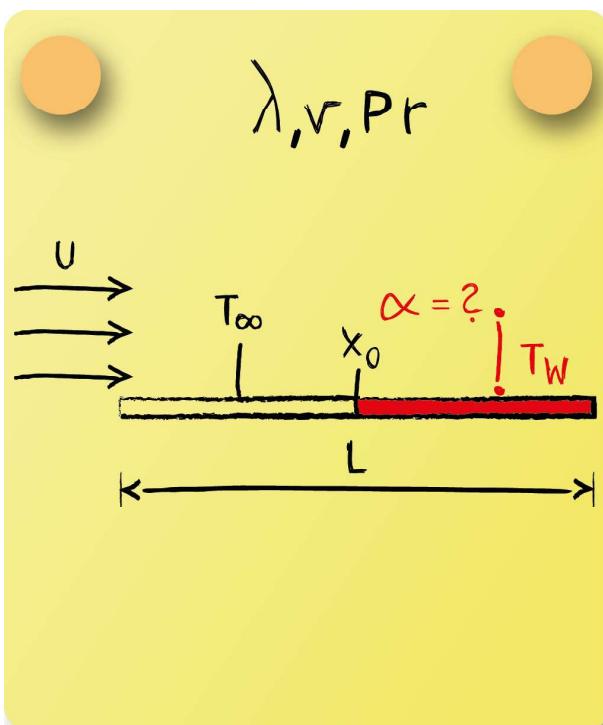


## Heat Transfer Correlation 3.5



A fluid streams over a flat plate. The plate is heated from  $x_0$ . Calculate the mean heat transfer coefficient  $\bar{\alpha}$ .

Reynolds number:

$$\text{Re}_L = \frac{u \cdot L}{\nu} = 6.52 \cdot 10^4$$

Nusselt number:



$$\text{Nu}_L = 0.664 \cdot \text{Re}_L^{\frac{1}{2}} \cdot \text{Pr}^{\frac{1}{3}} \frac{\left[1 - \left(\frac{x_0}{L}\right)^{\frac{3}{4}}\right]^{\frac{2}{3}}}{\left[1 - \frac{x_0}{L}\right]} = 166.01$$

Heat transfer coefficient:

$$\bar{\alpha} = \frac{\text{Nu}_L \cdot \lambda_f}{L} = 0.85 \text{ W/m}^2\text{K}$$