FLOW PAST A CYLINDER

**CASE 1: LOW REYNOLDS NUMBER**

\[ \text{Re} = \frac{\rho U D}{\mu} = 0.1 \]

low \( \text{Re} \): no flow separation

flow patterns upstream and downstream of cylinder are similar

**CASE 2: MODERATE REYNOLDS NUMBER**

\[ \text{Re} = \frac{\rho U D}{\mu} = 50 \]

viscosity not important

separation point

viscosity effects important

high \( \text{Re} \): BL + wake

Loss of symmetry (viscous effects are convected downstream)
CASE 3: LARGE REYNOLDS NUMBER

$$Re = \frac{\rho U D}{\mu} = 10^3$$