Today, we will:

- Continue our discussion about dimensional analysis with pumps
- Do an example problem – dimensional analysis with pumps; the affinity laws
- Discuss turbines

From previous lecture…dimensional analysis of pump parameters:

$$C_H = \text{function}\left(C_Q, \text{Re}, \varepsilon/D\right) \qquad \text{and} \qquad C_P = \text{function}\left(C_Q, \text{Re}, \varepsilon/D\right)$$

where $C_Q = \dfrac{\dot{V}}{\omega D^3}$ $C_H = \dfrac{gH}{\omega^2 D^2}$ $C_P = \dfrac{bhp}{\rho \omega^3 D^5}$

Capacity coefficient Head coefficient Power coefficient

But for many pumps, effects of Re and roughness are small at high Re, and thus,

$$C_H \approx \text{function}\left(C_Q\right) \qquad \text{and} \qquad C_P \approx \text{function}\left(C_Q\right)$$