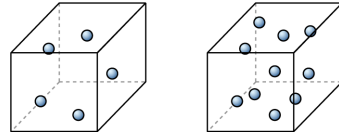


# Fluid mechanics

## Hydrostatics

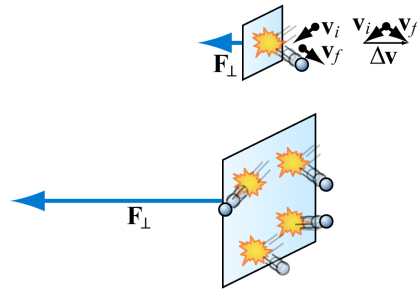
$$\rho = \frac{m}{V}$$



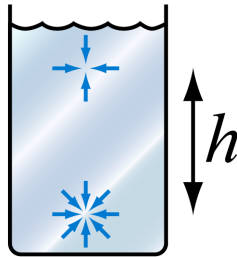
$$F_{\text{ON SIDE 1,}\perp} = P_1 A$$

$$1 \text{ atm} = 1.0 \times 10^5 \frac{\text{N}}{\text{m}^2} = 1.0 \times 10^5 \text{ Pa}$$

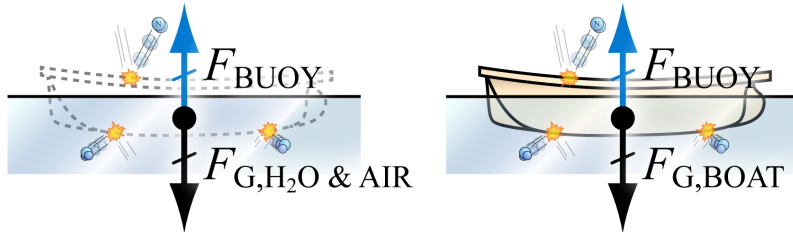
$$\Delta P_{\text{GAUGE}} = |P_1 - P_2|$$



$$P_T + \rho g \underbrace{(h_T - h_B)}_{\Delta h} = P_B$$

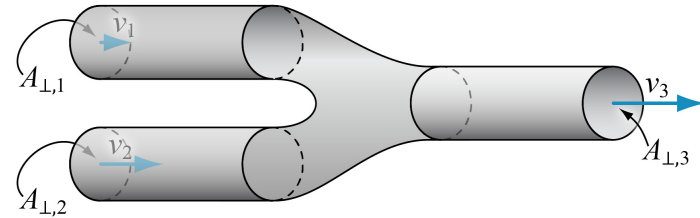


$$F_{\text{BUOY}} = M_{\text{DISPL}} g$$



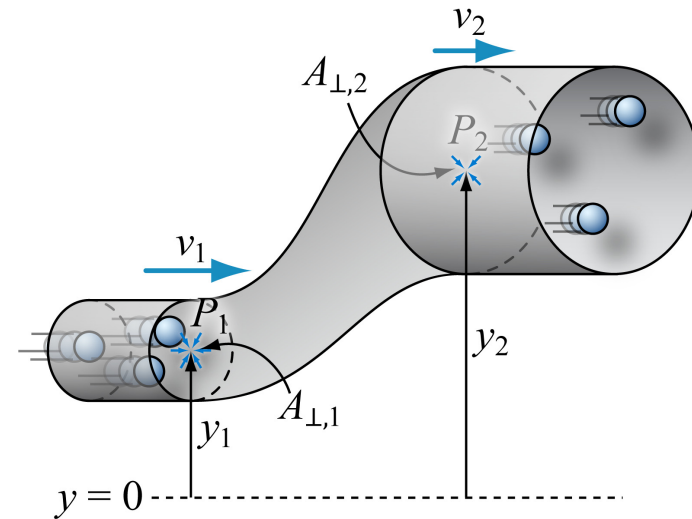
## Steady flow

### Continuity for incompressible fluids



$$\sum_{\text{IN}} A_{\perp} v = \sum_{\text{OUT}} A_{\perp} v$$

### Energy conservation (Bernoulli equation)



$$U_{G,1} + KE_1 + W_{\text{EXT}} = U_{G,2} + KE_2$$

$$\rho g y_1 + \frac{1}{2} \rho v_1^2 + (P_1 - P_2) = \rho g y_2 + \frac{1}{2} \rho v_2^2$$