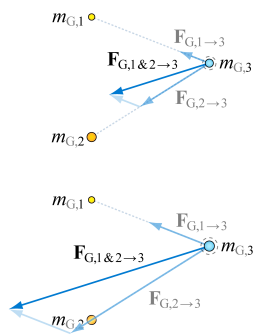
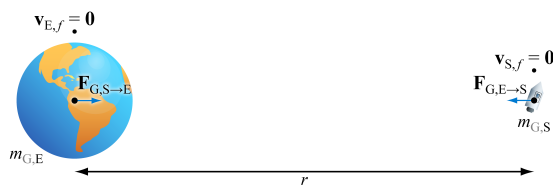
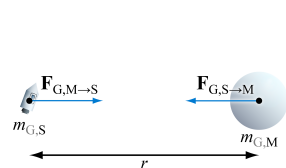
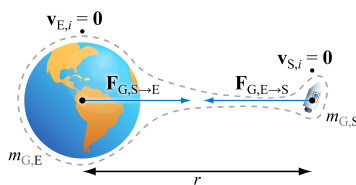
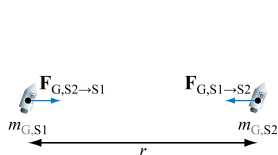
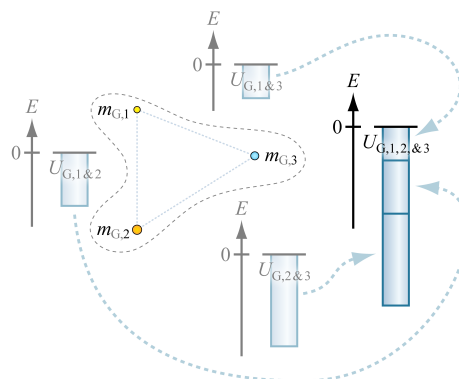


Newton's law of universal gravitation



$$0 \quad \begin{array}{c} E \\ \uparrow \\ \overline{K_{E,i}} + \overline{K_{S,i}} + \overline{U_{G,E \& S,i}} + \Delta W_{\text{HANDS}} = \overline{K_{E,f}} + \overline{K_{S,f}} + \overline{U_{G,E \& S,f}} \end{array}$$



Force		Potential energy	
Magnitude	$ \vec{F}_{G,1\rightarrow 2} = G \frac{m_{G,1}m_{G,2}}{r^2}$	$U_{G,1\&2} = -G \frac{m_{G,1}m_{G,2}}{r}$	(relative to infinite separation)
Direction	Attractive		
Universal constant	$G = 6.67 \times 10^{-11} \text{ N} \cdot \frac{\text{m}^2}{\text{kg}^2}$		
Superposition $\vec{F}_{G,1\&2\rightarrow 3} = \vec{F}_{G,1\rightarrow 3} + \vec{F}_{G,2\rightarrow 3}$ Gravitational field $\vec{F}_G = m_{G,\text{TEST}}\vec{g}$		Superposition $U_{G,\text{PARTICLES}} = \Sigma_{\text{PAIRS}} U_{G,i\&j}$	