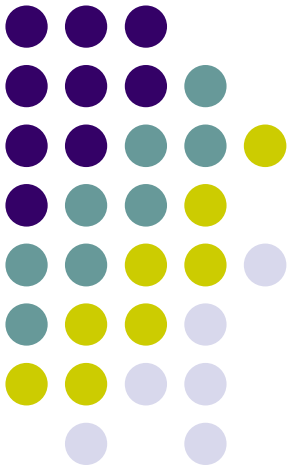
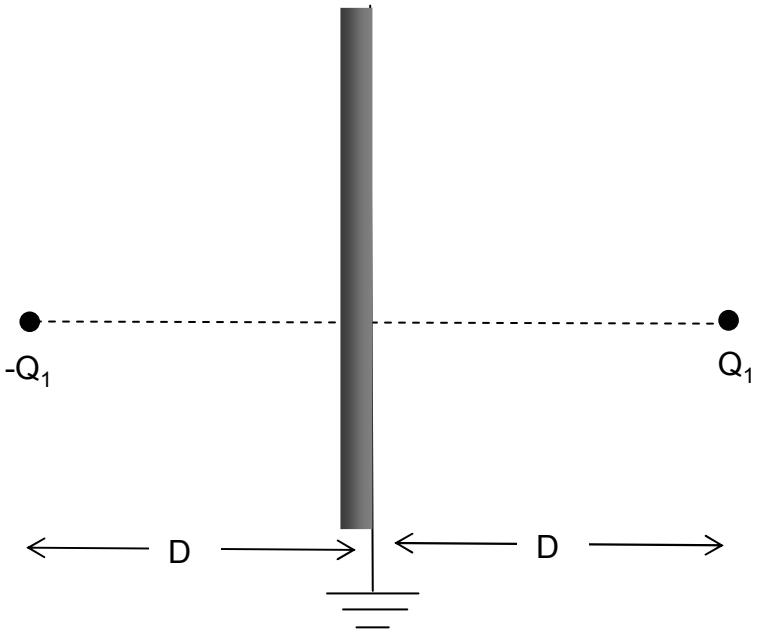
Image Charge

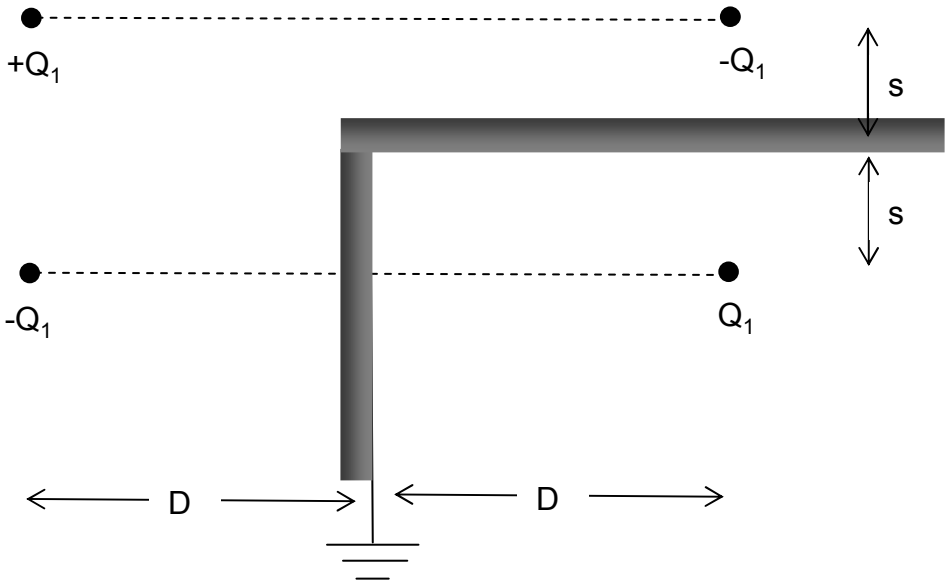
Dr. Ray Kwok
SJSU



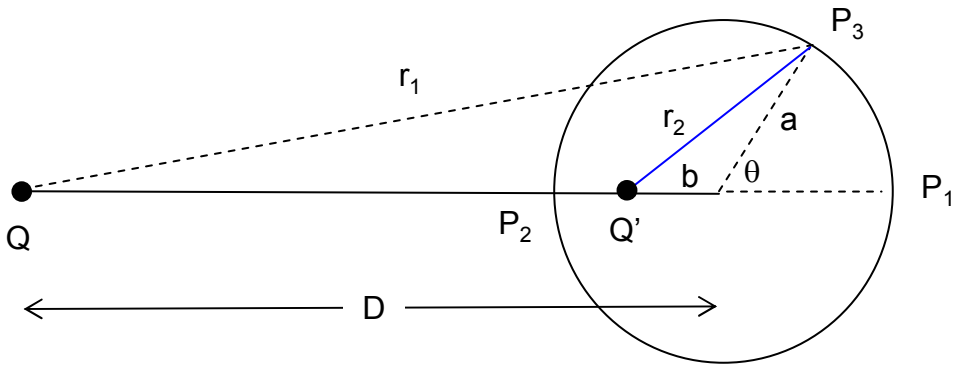
Pt. Charge / grounded plane



Pt. Charge / grounded plane



Pt. Charge / grounded sphere



At P_1 $$\frac{Q}{D+a}+\frac{Q'}{a+b}=0$$

At P_2 $$\frac{Q}{D-a}+\frac{Q'}{a-b}=0$$

$$Q'=-\frac{a}{D}Q$$

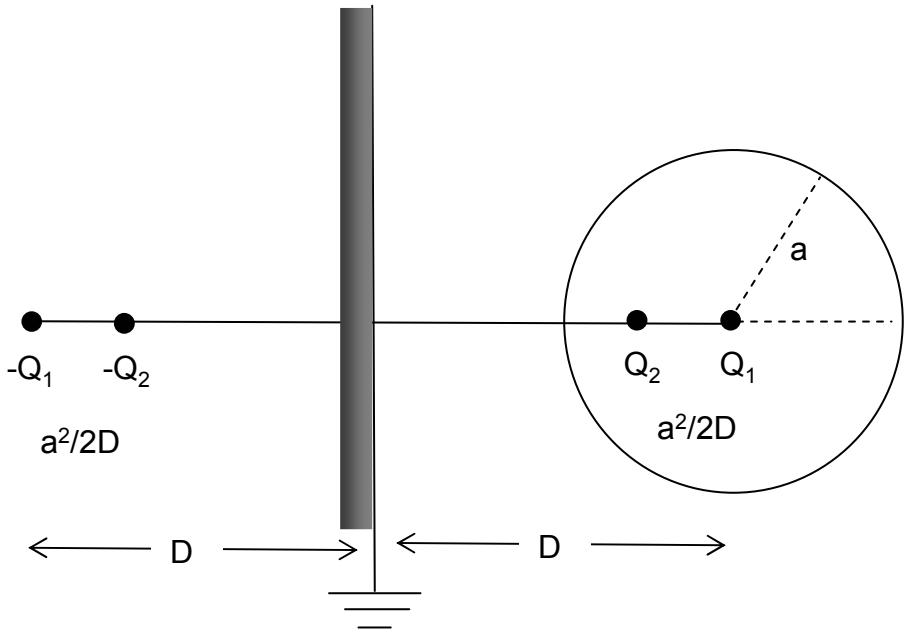
$$b=\frac{a^2}{D}$$

At P_3 $$4\pi\varepsilon_o V=\frac{Q}{r_1}+\frac{Q'}{r_2}$$

$$r_1=\sqrt{D^2+a^2+2Da\cos\theta}$$

$$r_2=\sqrt{b^2+a^2+2ba\cos\theta}$$

Chg sphere / grounded plane



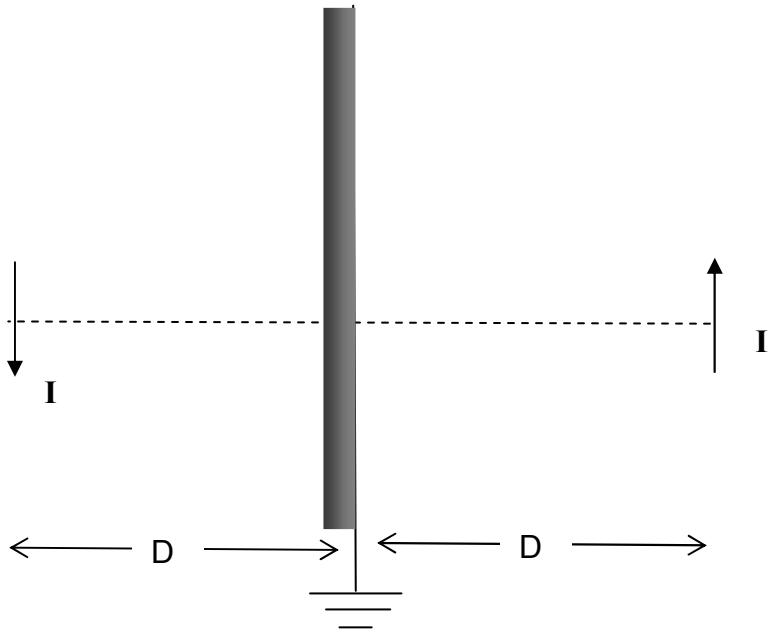
$$r = \frac{a}{2D}$$

$$Q_2 = rQ_1$$

$$Q_3 = \frac{r^2}{1-r^2}Q_1$$

$$Q_4 = \frac{r^3}{\left(1-r^2\right)\left(1-\frac{r^2}{1-r^2}\right)}Q_1$$

Current / grounded plane



Current / grounded plane