Answer on Question #45036, Physics, Other

Task: Consider two plastic spheres, 1 meter apart: a little sphere with a mass of 1 kg and an electric charge of +1 nC, and a big sphere with a mass of 11 kg and an electric charge of +11 μC. Find the electric force and the gravitational force between these spheres. Which force is stronger? (k0 = 9 x 10^9 N-m^2/C^2, G = 6.7 x 10^-11 N-m^2/kg^2)

Solution:

the electric force between these spheres is :

$$F_e = k_0 \frac{q_1 \cdot q_2}{R^2} = 9 \cdot 10^9 \frac{10^{-9} \cdot 10^{-6}}{1^2} = 9 \cdot 10^{-6} N = 9 \mu N$$,where k_0 - Coulomb's constant.

the gravitational force between these spheres is:

$$F_g = G \frac{m_1 \cdot m_2}{R^2} = 6.7 \cdot 10^{-11} \frac{1 \cdot 11}{1^2} = 73.7 \cdot 10^{-11} N .$$

Answer: the electric force between these spheres is stronger.