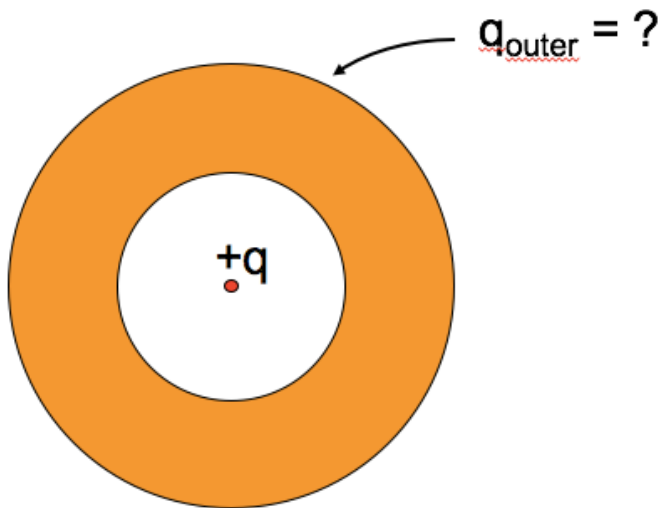A neutral copper sphere has a spherical hollow in the center. A charge $+q$ is placed in the center of the hollow. What is the total charge on the outside surface of the copper sphere? (Assume Electrostatic equilibrium.)

q_{outer} = ?

+q

A. Zero

B. $-q$

C. $+q$

D. $0 < q_{outer} < +q$

E. $-q < q_{outer} < 0$

ANNOUNCEMENTS

- Exam 1 TONIGHT (7pm-9pm)
  - A149 PSS; Across from FRIB (Wilson side)
- Homework 6 is posted (Due next Wed.)

PHYSICS COLLOQUIUM

BREAKING THE MYTH OF THE "NON-TRADITIONAL" PHYSICIST

THE REAL STORY ABOUT EMPLOYMENT FOR PHYSICS GRADUATES
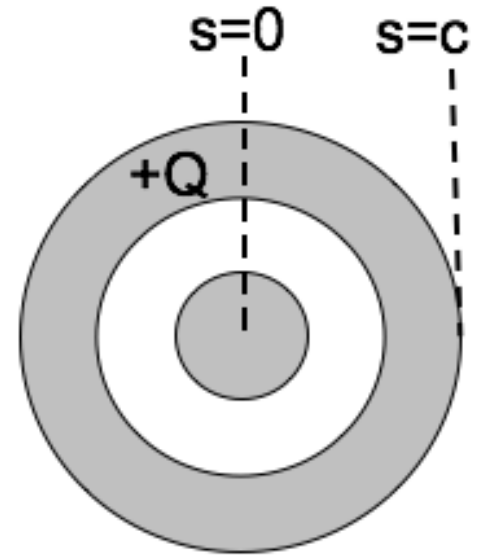
Crystal Bailey

Careers Program Manager

American Physical Society

In this room, tomorrow 4:10pm-5pm

A long coax has total charge $+Q$ on the OUTER conductor. The INNER conductor is neutral.

What is the sign of the potential difference, $\Delta V = V(c) - V(0)$, between the center of the inner conductor ($s = 0$) and the outside of the outer conductor?


s=0   s=c

+Q

A. Positive
B. Negative
C. Zero

Given a pair of very large, flat, conducting capacitor plates with total charges $+Q$ and $-Q$. Ignoring edges, what is the equilibrium distribution of the charge?

+Q

-Q
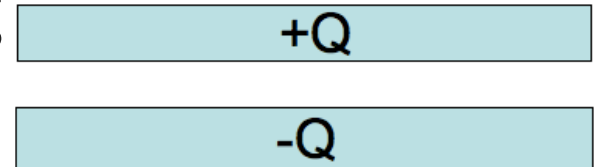
A. Throughout each plate
B. Uniformly on both side of each plate
C. Uniformly on top of $+Q$ plate and bottom of $-Q$ plate
D. Uniformly on bottom of $+Q$ plate and top of $-Q$ plate
E. Something else

Given a pair of very large, flat, conducting capacitor plates with surface charge densities $+/-\sigma$, what is the E field in the region between the plates?
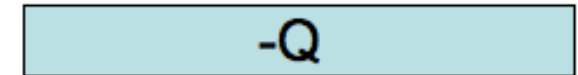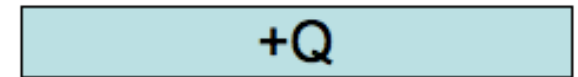
+Q

+ + + + + + + + + + + + + + +

- - - - - - - - - - - - - - -

-Q

A. $\sigma/2\varepsilon_0$
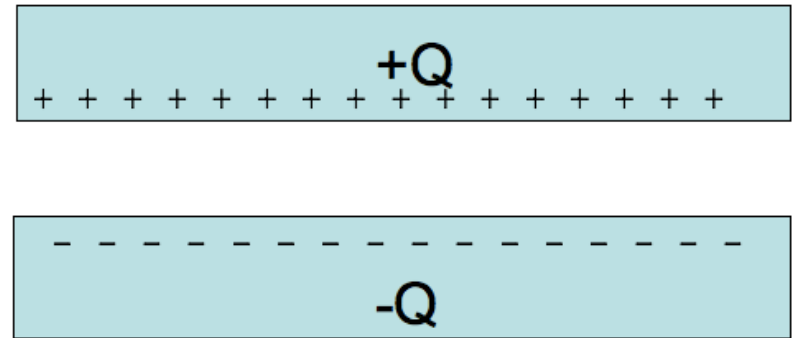
B. σ/ε_0

C. $2\sigma/\varepsilon_0$

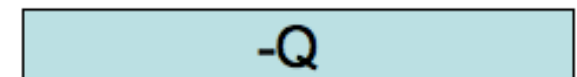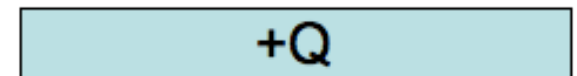D. $4\sigma/\varepsilon_0$

E. Something else

You have two very large parallel plate capacitors, both with the same area and the same charge Q. Capacitor #1 has twice the gap of Capacitor #2. Which has more stored potential energy?
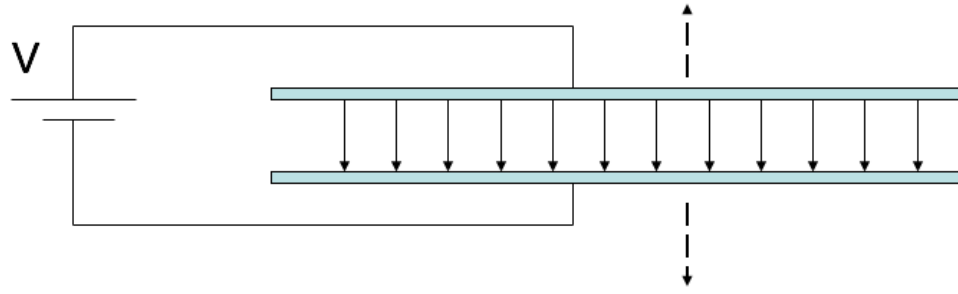
A. #1 has twice the stored energy
B. #1 has more than twice
C. They both have the same
D. #2 has twice the stored energy
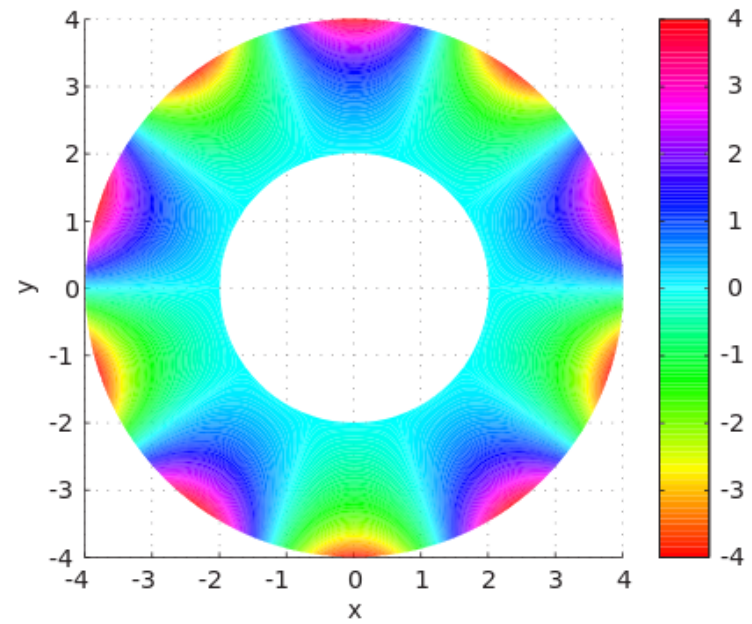E. #2 has more than twice.
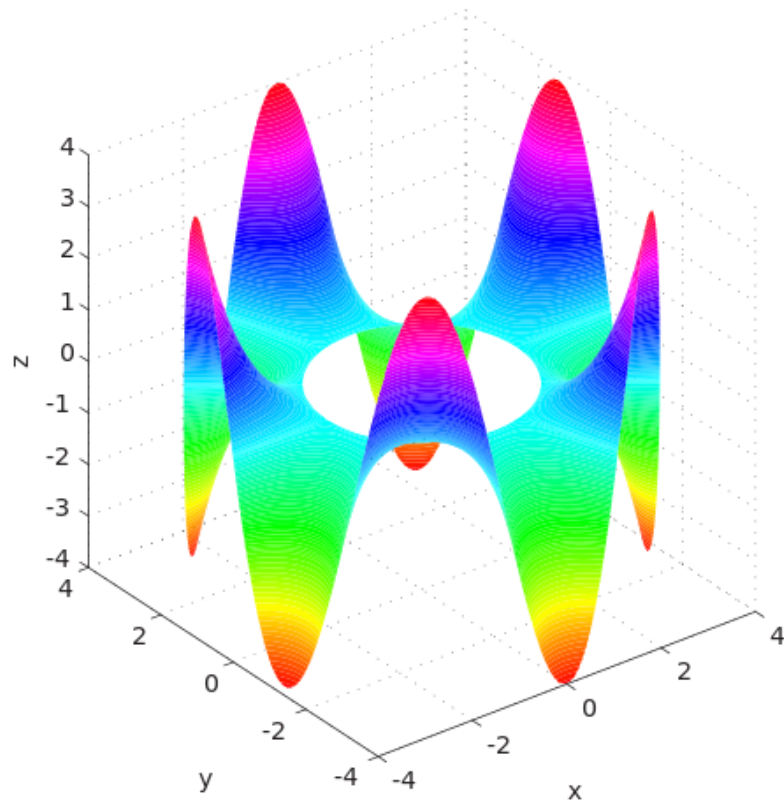
#1

+Q

-Q

#2

+Q

-Q

A parallel plate capacitor is attached to a battery which maintains a constant voltage difference V between the capacitor plates. While the battery is attached, the plates are pulled apart. The electrostatic energy stored in the capacitor

A. increases.
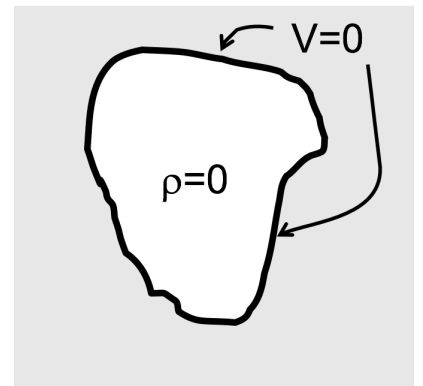
B. decreases.

C. stays constant.

LAPLACE'S EQUATION

A region of space contains no charges. What can I say about V in the interior?
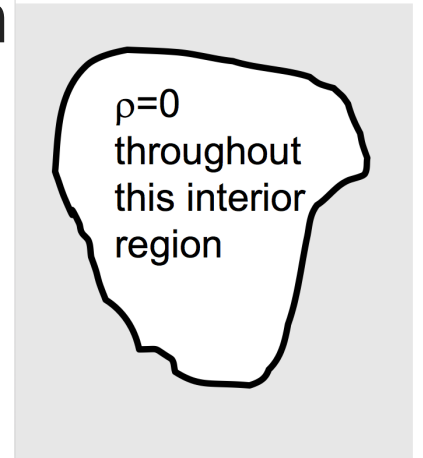
ρ=0 throughout this interior region

A. Not much, there are lots of possibilities for V(r) in there
B. V(r)=0 everywhere in the interior.
C. V(r)=constant everywhere in the interior

A region of space contains no charges. The boundary has V=0 everywhere. What can I say about V in the interior?

A. Not much, there are lots of possibilities for V(r) in there
B. V(r)=0 everywhere in the interior.
C. V(r)=constant everywhere in the interior