

USEFUL RESOURCES

The updates, homework assignments, and useful links for APC can be found on SchoolNova's web page:
https://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2024

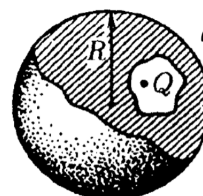
The practical information about the club and contacts can be found on the same web page.

TODAY'S MEETING

We finished solving problems on Gauss's law. The next topic is electrostatic potential.

HOMEWORK

- Four point charges q are located in the vertices of a square with a side of length l . Find the electrostatic potential at the center of the square.
- A hollow sphere of radius R has total charge Q . What is the electrostatic potential at the center of the sphere? Does the potential at the center depend on how the charge is distributed on the sphere? Does the potential at the surface of the sphere depend on how the charge is distributed?
- All the following questions are about electrostatics, namely we consider only static electric charge configurations, without an electric current flowing.* Why is the electric field inside a conductor equal to zero? Why the electric field right outside a conductor is perpendicular to its surface? Are these two conditions sufficient to prove that the electrostatic potential is the same at every point of a conductor? Find the surface density of charge on the surface of a conductor if the electric field outside the conductor at that location is E .
- A solid metal ball of charge q has a cavity. A point charge Q is placed in this cavity. What total charge is induced on the surface of the cavity? What is the electric field outside the ball at distance L from its' center? Does it depend on the shape of the cavity or its' location in the ball?



- Three concentric spheres made from conducting material have radii r , $2r$, $3r$ and charges q , $2q$ and $-3q$, respectively. Find the electrostatic potential of each sphere.
- There are two concentric hollow metal spheres of radii R_1 and R_2 ($R_2 > R_1$). The outer sphere has charge q while the inner sphere is grounded. Find the electric field and electrostatic potential at every point as functions of the distance from the common center of the spheres.

FOR THE NEXT MEETING

IMPORTANT: The next club's meeting is at **2:30pm, in person**, on Sunday, **April 6**.