ELECTRODYNAMICS

*PROBLEM SET 6*

*due March $9^{th}$, before class*

**Problem 1: Two conducting hemispheres**

A conducting sphere is divided into two hemispheres. The bottom one is kept at potential V, the top one is grounded.

a) Using separation of variables and matching the boundary conditions, find the electric potential inside of the sphere

b) Repeat the problem but now using the Green's function for the sphere derived in class.

**Problem 2: Put yourself between two mirrors and see what you get**

Two infinite parallel planes separated by the distance $L$ are grounded. A point charge $q$ is located at a distance $d$ from one of the planes. Find the potential between the planes using the "general method to find Green's functions". Interpret your solution as a superposition of an infinite number of image charges. *Hint: there will be a non-trivial sum to be evaluated. One of of doing it is to rewrite the sum as an integral with the help of $\delta$ functions and then using the Poisson summation formula. Or maybe there's an easier way, I don't know.*

**Problem 3: One more sphere**

A point charge $q$ is a distance $b$ from the center of two concentric grounded conducting spheres of raddi $a$ and $c$ ($a < b < c$). Find the potential between the spheres.