A ball with charge $-50e$ is placed at the center of a hollow spherical shell has a net charge of $-50e$. What is the charge on the shell's outer space?

Solution:
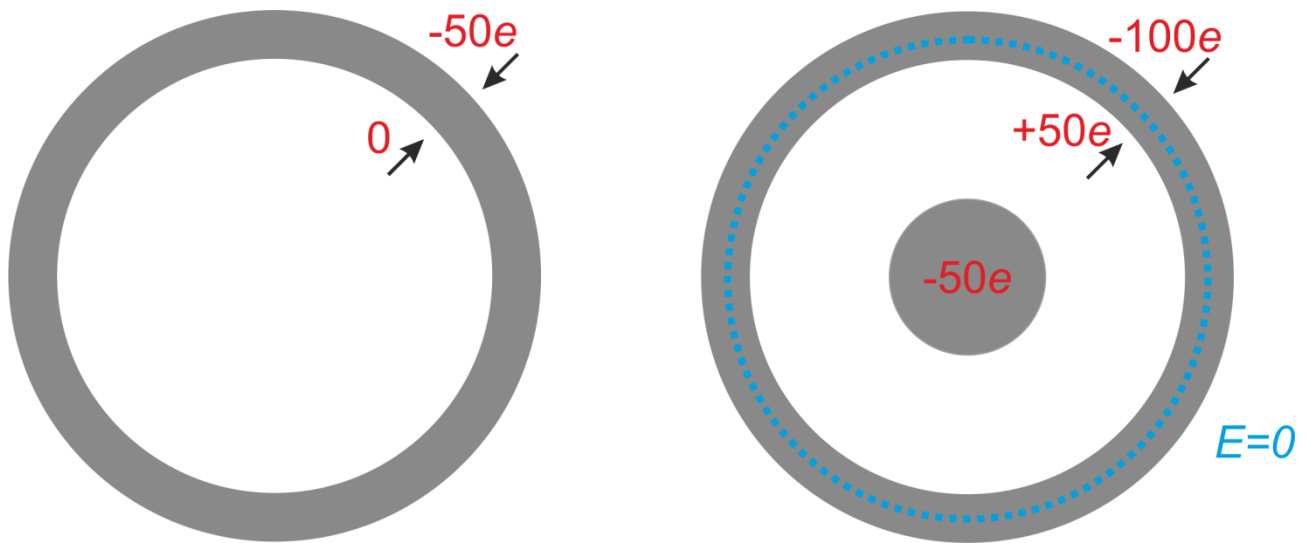
Since the spherical shell is a conductor, the electric field inside shell is equal to zero. So the net charge inside spherical shell must be zero too. Thus the charge on the shell's inner space is $+50e$. Because the total charge of the shell is $-50e$, the charge on the shell's outer space is $-100e$.

Answer: $-100e$