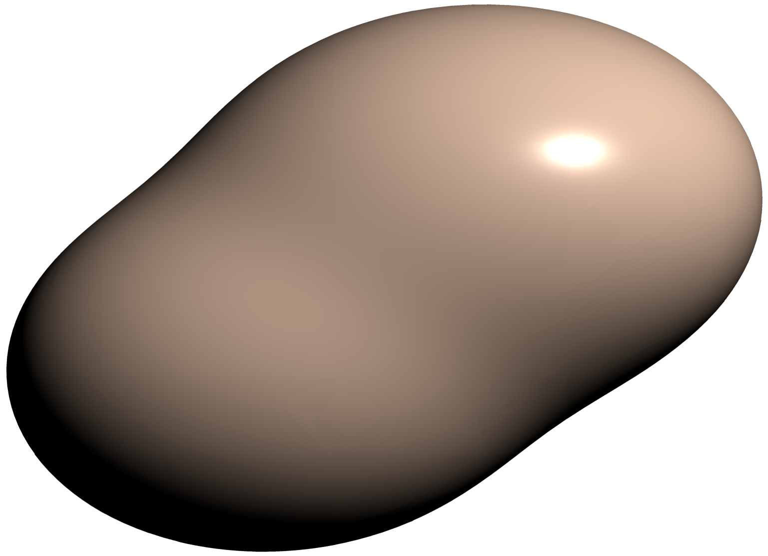
Eletromagnetismo

18 de abril
Eletrostática

Energia de distribuição de cargas

$$W = \frac{1}{2}\int_{\mathcal{V}} \rho(\vec{\mathbf{r}})\, V(\vec{\mathbf{r}})\, \mathrm{d}\tau$$



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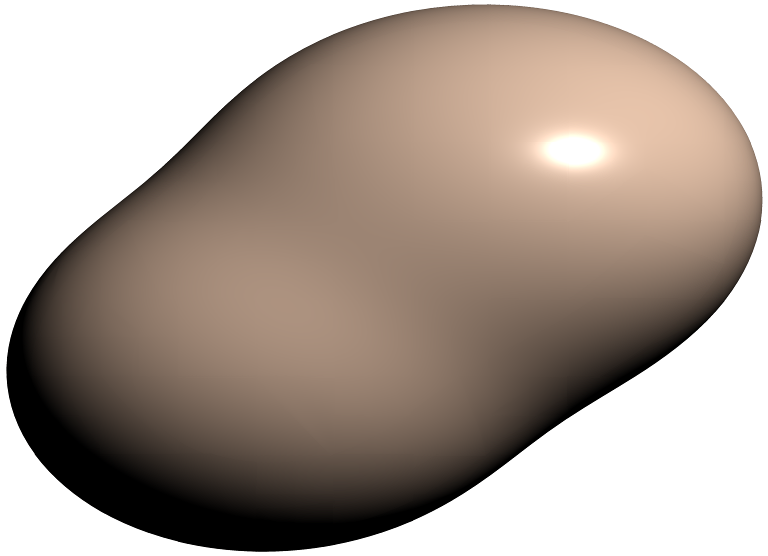

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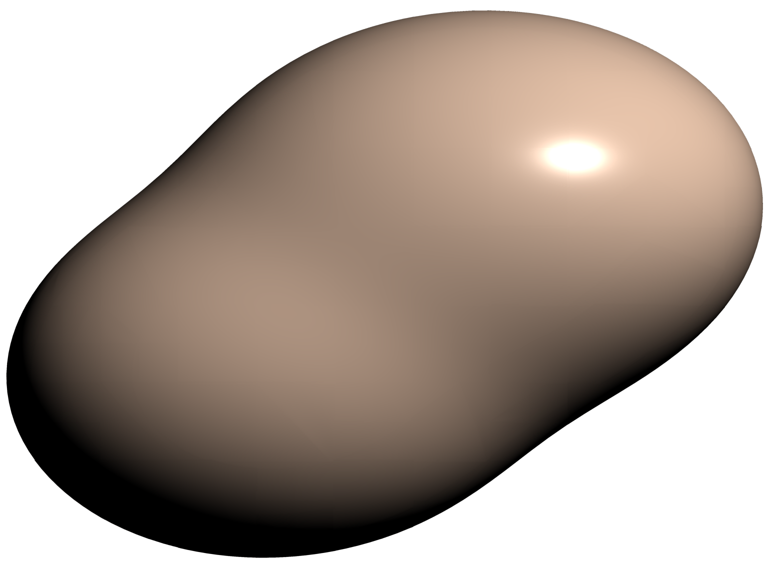

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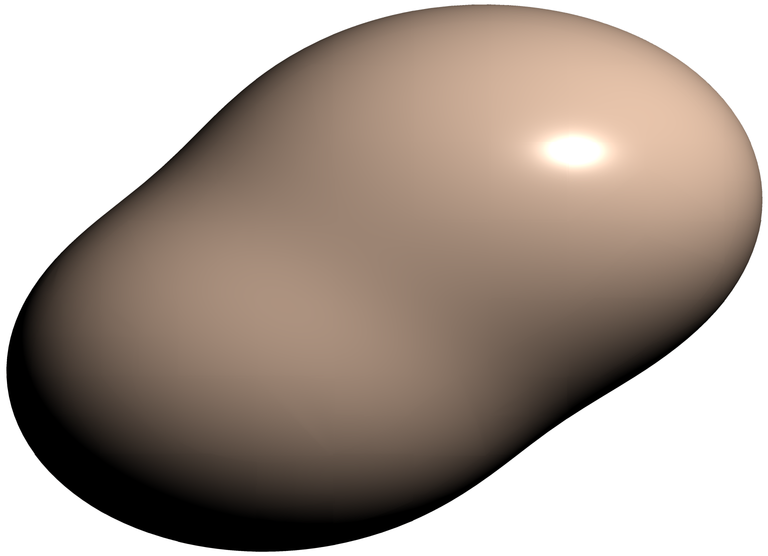

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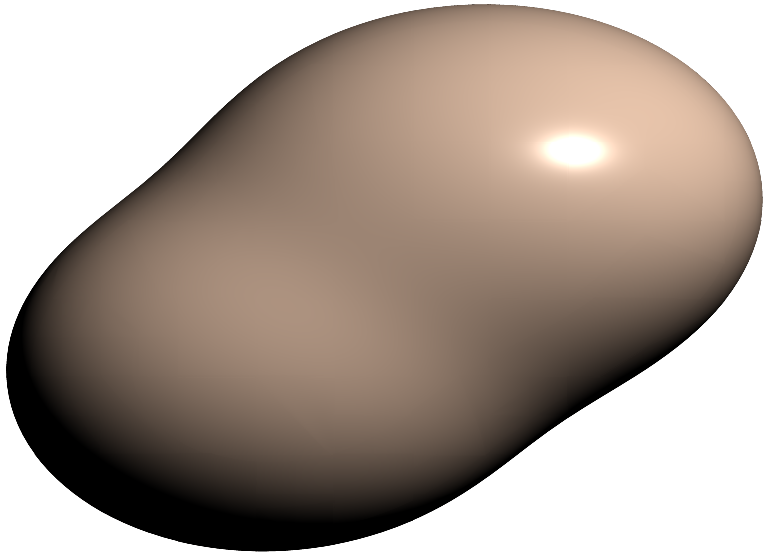

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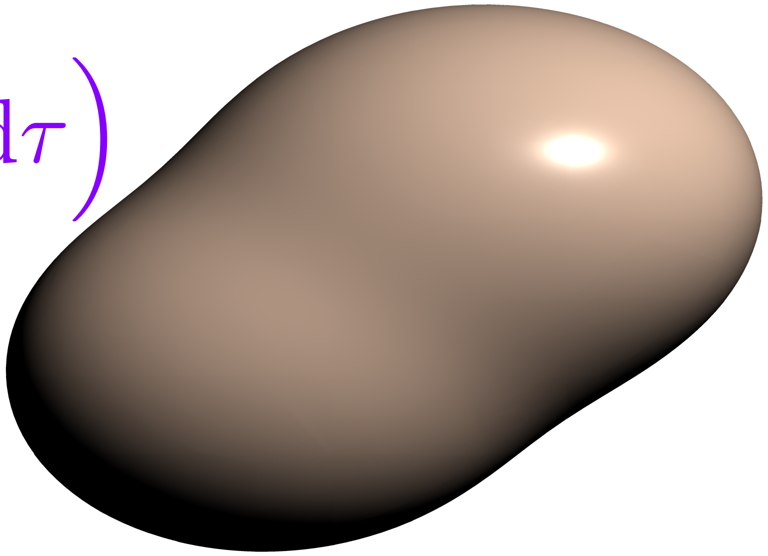

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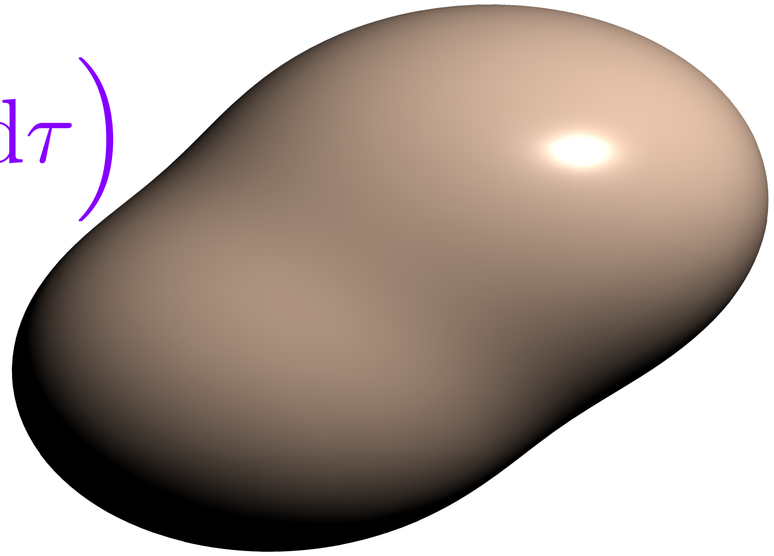

$$W = \frac{1}{2}\epsilon_0 \Big(\int_{\mathcal{V}} \vec{\boldsymbol{\nabla}} \cdot \Big(V\vec{\mathbf{E}} \Big)\, \mathrm{d}\tau + \int_{\mathcal{V}} \vec{\mathbf{E}} \cdot \vec{\mathbf{E}}\, \mathrm{d}\tau \Big)$$

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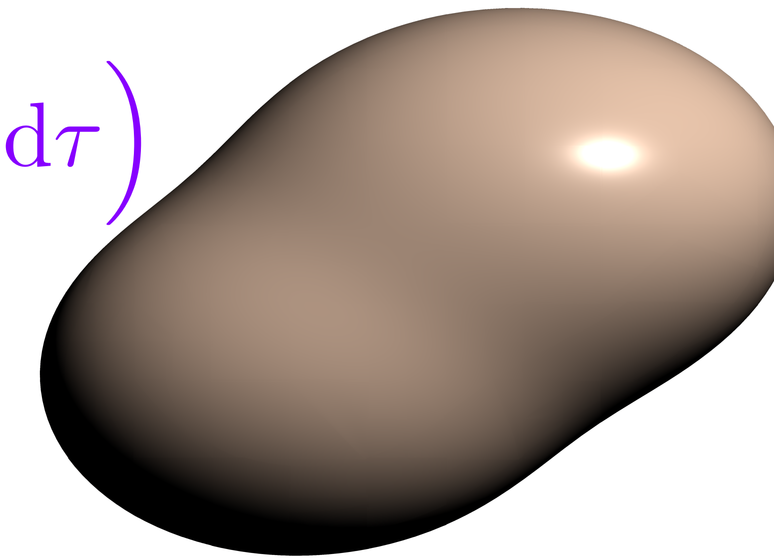

$$W = \frac{1}{2}\epsilon_0\Big(\int_{\mathcal{V}}$$

$$\mathrm{d}\tau + \int_{\mathcal{V}}\vec{\mathbf{E}}\cdot\vec{\mathbf{E}}\,\mathrm{d}\tau\Big)$$

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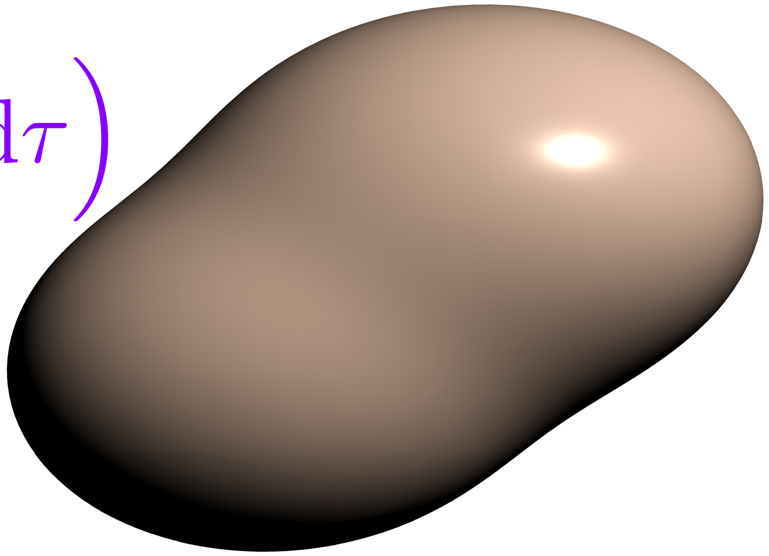

$$W = \frac{1}{2}\epsilon_0 \Big(\int_{\mathcal{S}} V\vec{\mathbf{E}} \cdot \hat{\mathbf{n}}\, \mathrm{d}A + \int_{\mathcal{V}} \vec{\mathbf{E}} \cdot \vec{\mathbf{E}}\, \mathrm{d}\tau \Big)$$

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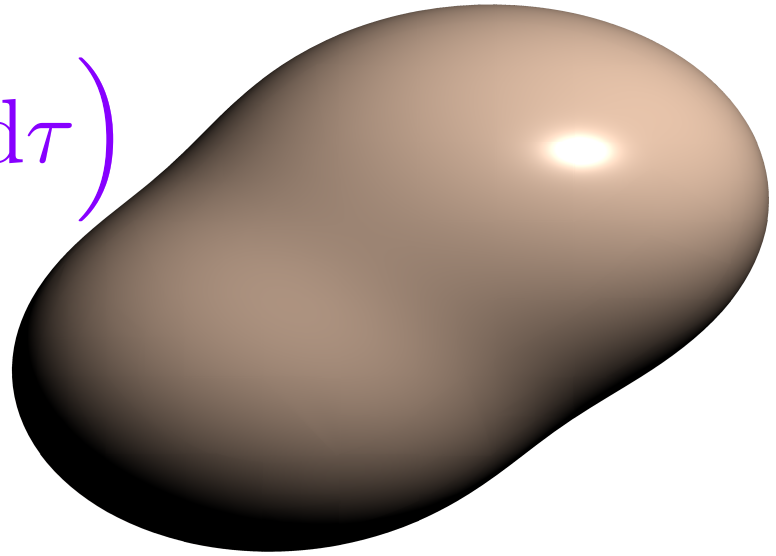
$$W = \frac{1}{2}\epsilon_0\left(\int_{\mathcal{V}} \vec{\boldsymbol{\nabla}}\cdot\left(V\vec{\mathbf{E}}\right)\mathrm{d}\tau - \int_{\mathcal{V}}(\vec{\boldsymbol{\nabla}}V)\cdot\vec{\mathbf{E}}\,\mathrm{d}\tau\right)$$



$$W = \frac{1}{2}\epsilon_0\left(\int_{\mathcal{S}} V\vec{\mathbf{E}}\cdot\hat{\mathbf{n}}\,\mathrm{d}A + \int_{\mathcal{V}}\vec{\mathbf{E}}\cdot\vec{\mathbf{E}}\,\mathrm{d}\tau\right)$$

$$W = \frac{\epsilon_0}{2}\int_{\mathcal{V}} E^2\,\mathrm{d}\tau$$

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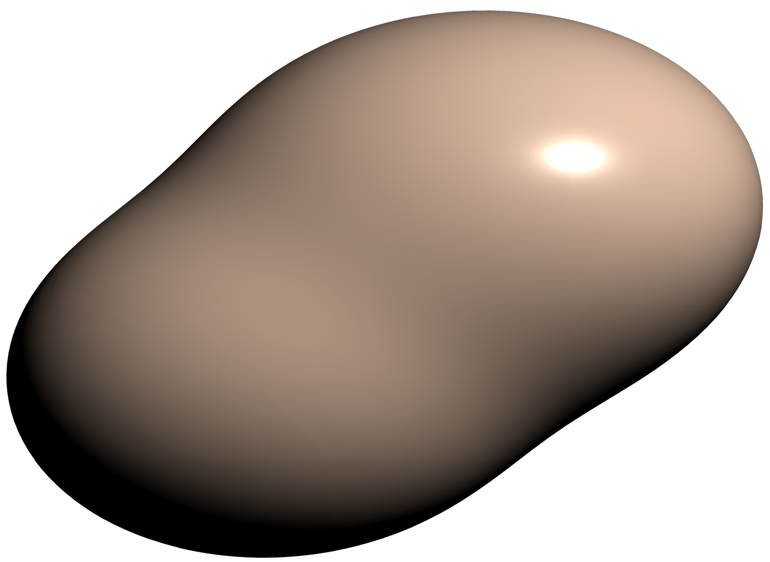
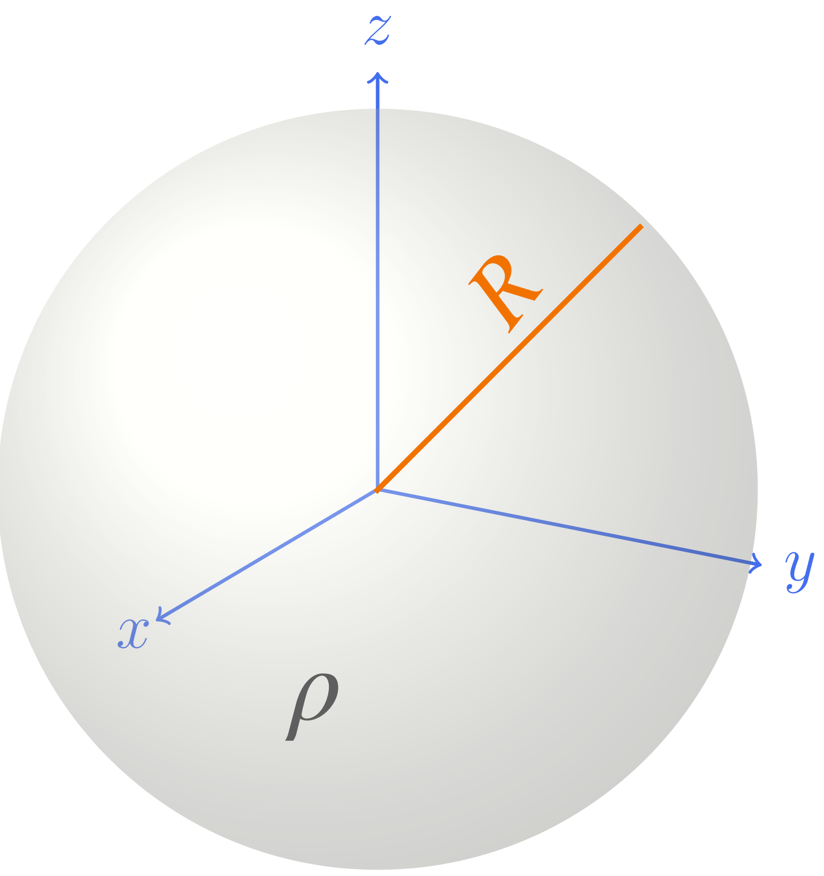


$$W = \frac{\epsilon_0}{2} \int_{\mathcal{V}} E^2 \, \mathrm{d}\tau$$

Pratique o que aprendeu

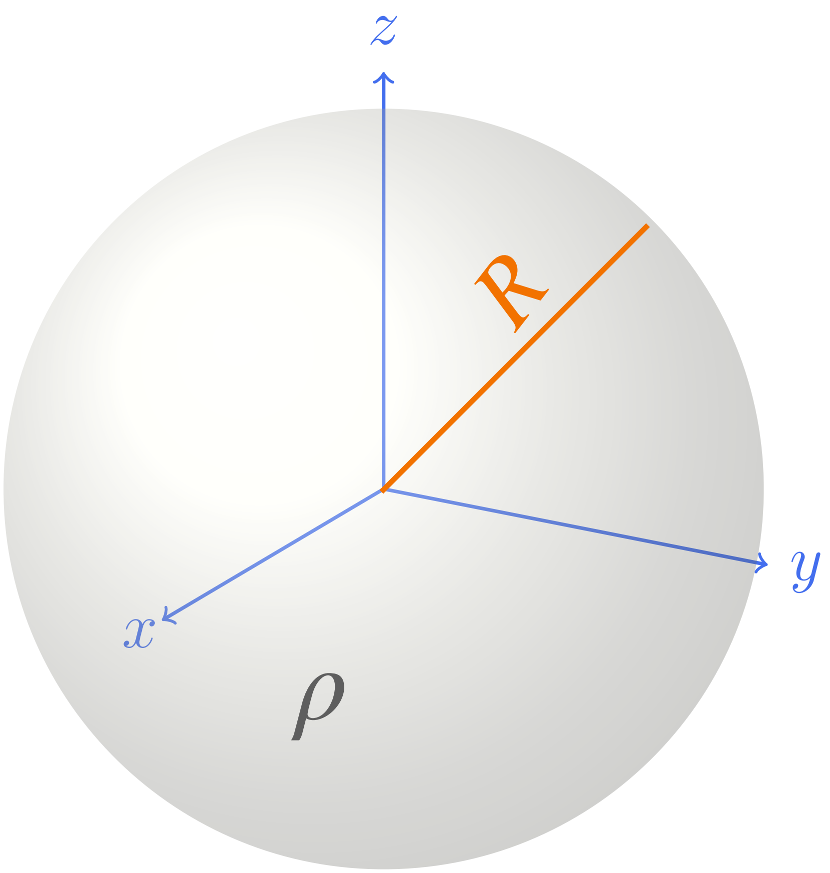
$$W = ?$$



$$W = \frac{\epsilon_0}{2} \int_{\mathcal{V}} E^2 \, \mathrm{d}\tau$$

Pratique o que aprendeu

$$W = \frac{4\pi}{15\epsilon_0} \rho^2 R^5$$



$$W = \frac{\epsilon_0}{2} \int_{\mathcal{V}} E^2 \, \mathrm{d}\tau$$

Pratique o que aprendeu

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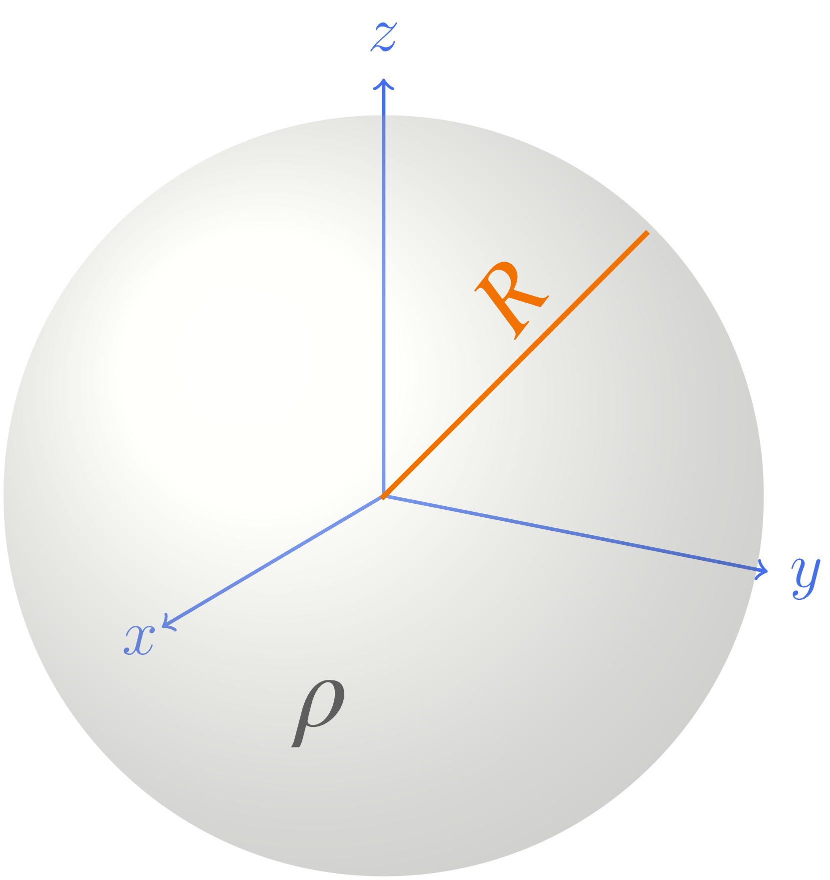
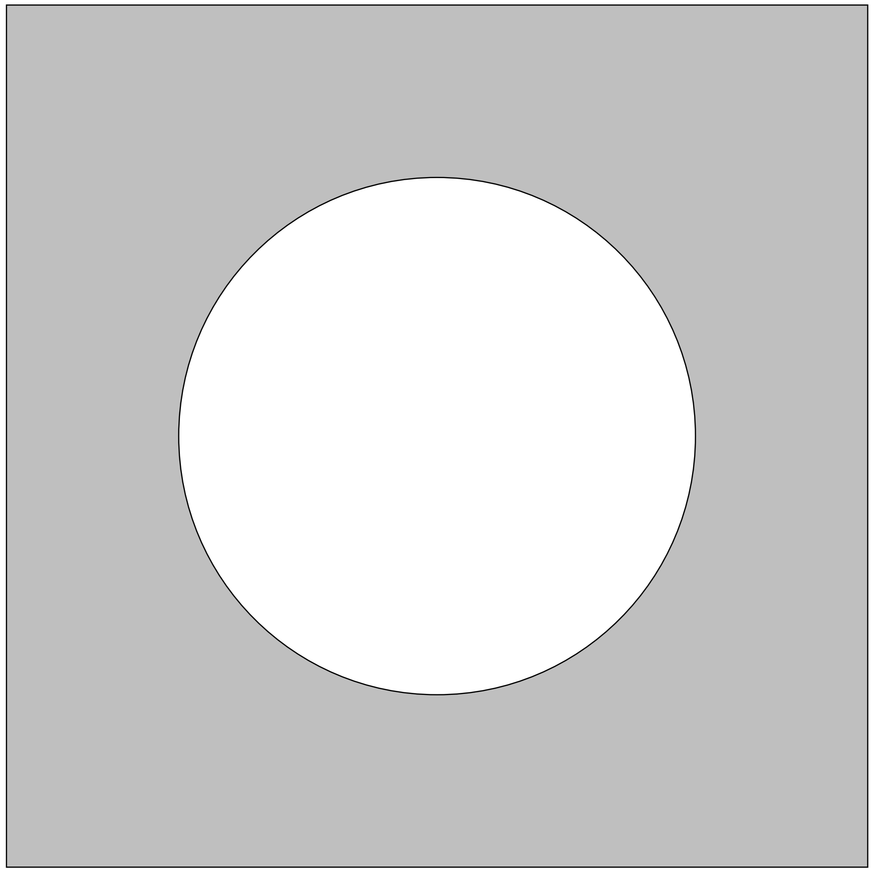
$$W = \frac{3}{5} \frac{1}{4\pi\epsilon_0} \frac{Q^2}{R}$$



Condutores

- no interior do material,

  $\overrightarrow{E} = 0$



Condutores

- No interior do material,

  $\vec{E} = 0$

  $\rho = 0$

  Potencial é constante

- No interior de uma cavidade,

  $\vec{E} = 0$

  $q = 0$

- Perto de uma superfície,

  $$\vec{E} = \frac{\sigma}{\epsilon_0}\hat{n}$$