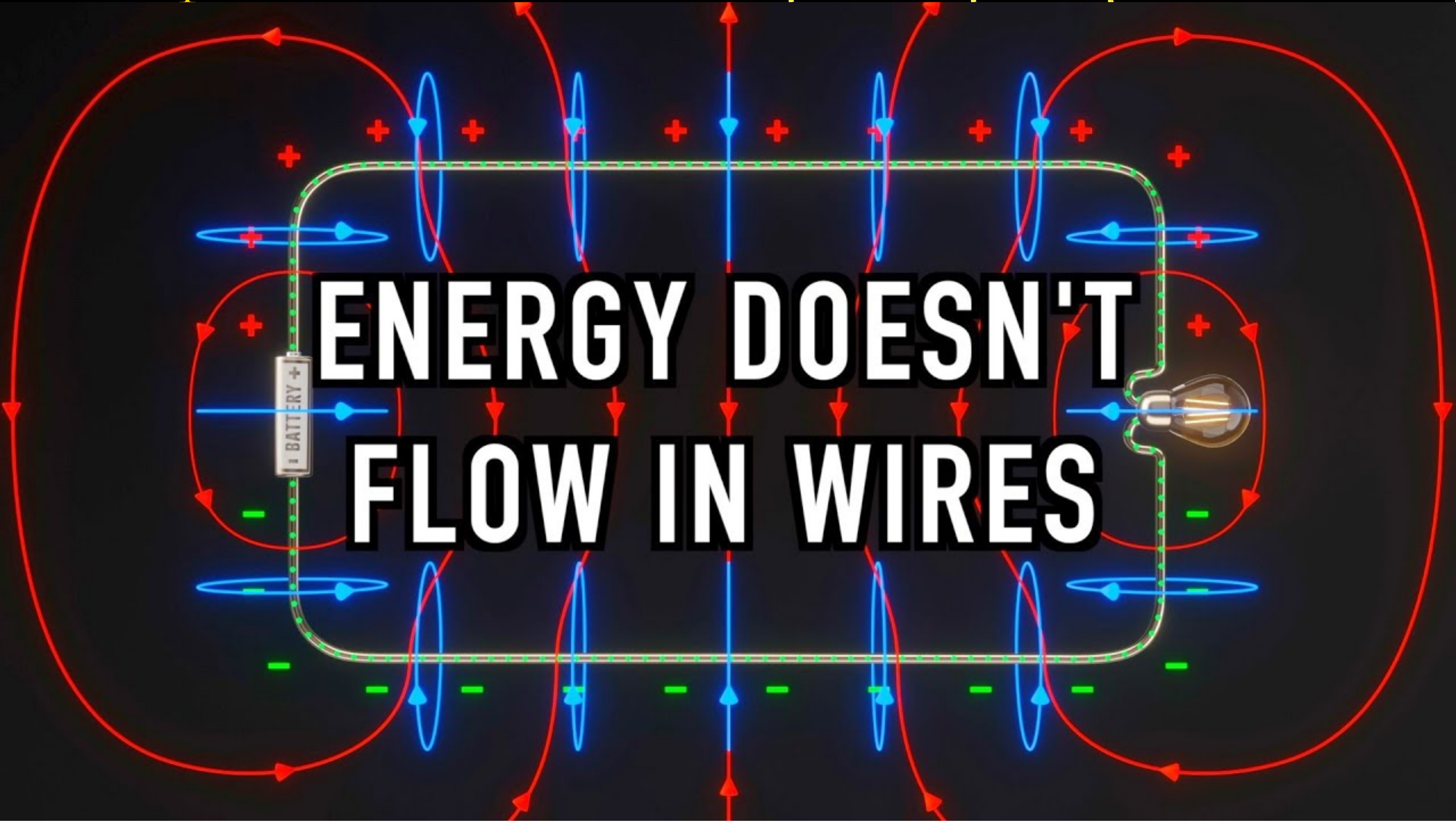
Eletromagnetismo Avançado

28 de agosto
Leis de conservação

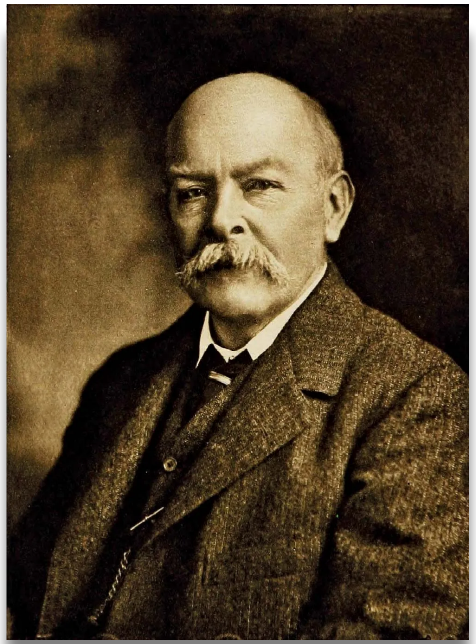
→ 1 → →

Pratique o que aprendeu



Conservação do momento

$$\frac{\partial}{\partial t}\left(\vec{\mathbf{E}} \times \vec{\mathbf{B}}\right) = \frac{\partial \vec{\mathbf{E}}}{\partial t} \times \vec{\mathbf{B}} + \vec{\mathbf{E}} \times \frac{\partial \vec{\mathbf{B}}}{\partial t}$$



Conservação do momento

$$\overleftrightarrow{T} = \epsilon_0\left(\vec{\mathbf{E}} \otimes \vec{\mathbf{E}} - \frac{1}{2}E^2\mathbb{1}\right) + \frac{1}{\mu_0}\left(\vec{\mathbf{B}} \otimes \vec{\mathbf{B}} - \frac{1}{2}B^2\mathbb{1}\right)$$

$$\vec{\mathbf{f}} = \vec{\boldsymbol{\nabla}} \cdot \overleftrightarrow{T} - \epsilon_0\frac{\partial}{\partial t}\left(\vec{\mathbf{E}} \times \vec{\mathbf{B}}\right)$$

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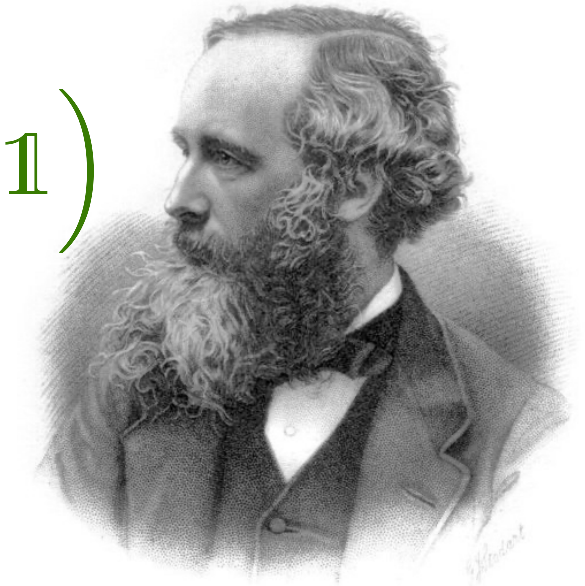

$$\vec{\mathbf{f}} = \vec{\boldsymbol{\nabla}}\cdot\overleftrightarrow{T} - \epsilon_0\frac{\partial}{\partial t}\left(\vec{\mathbf{E}}\times\vec{\mathbf{B}}\right)$$

$$\vec{\mathbf{F}} = \int_S \hat{\mathbf{n}}\cdot\overleftrightarrow{T}\mathrm{d}a - \epsilon_0\frac{\mathrm{d}}{\mathrm{d}t}\int_V \left(\vec{\mathbf{E}}\times\vec{\mathbf{B}}\right)\mathrm{d}\tau$$

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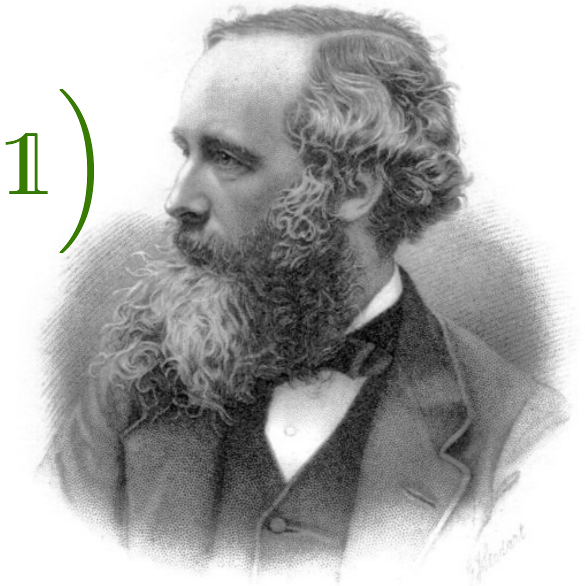

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$$\vec{\mathcal{P}}_{EM} = \epsilon_0 \vec{\mathbf{E}} \times \vec{\mathbf{B}} = \mu_0 \epsilon_0 \vec{\mathbf{S}}$$

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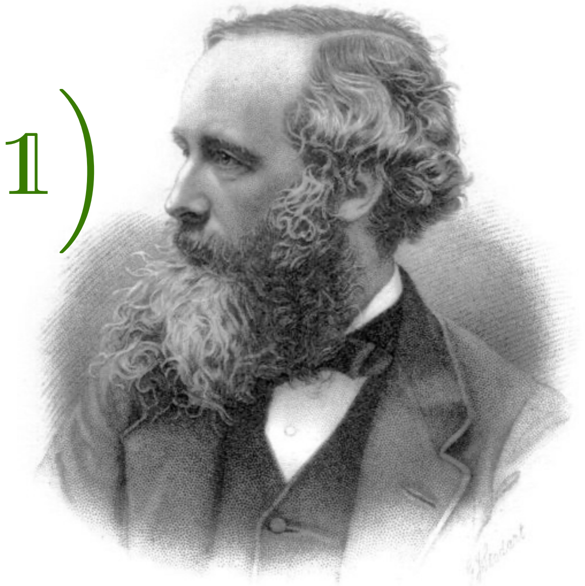

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$$\vec{\mathcal{P}}_{EM} = \epsilon_0\vec{\mathbf{E}}\times\vec{\mathbf{B}} = \mu_0\epsilon_0\vec{\mathbf{S}}$$

$$\frac{\partial\vec{\mathcal{P}}}{\partial t} = \vec{\boldsymbol{\nabla}}\cdot\overset{\leftrightarrow}{T}$$

Pratique o que aprendeu

$$\vec{\mathbf{F}} = \int_S \hat{\mathbf{n}} \cdot \overleftrightarrow{T} \mathrm{d}a - \epsilon_0 \frac{\mathrm{d}}{\mathrm{d}t} \int_V \left(\vec{\mathbf{E}} \times \vec{\mathbf{B}} \right) \mathrm{d}\tau$$