Elettromagnetismo

$F = K \cdot \frac{q_1 \cdot q_2}{r^2}$	$K = \frac{1}{4 \cdot \pi \cdot \varepsilon}$	$\varepsilon_r = \frac{\varepsilon}{\varepsilon_0} = \frac{K_0}{K} = \frac{F_0}{F}$	$K_0 = 9 \cdot 10^9 \frac{N \cdot m^2}{C^2}$	$\varepsilon_0 = 8.85 \cdot 10^{-12} \frac{F}{m}$
$\vec{E} = \frac{\vec{F}}{q}$	$E = K \cdot \frac{q}{r^2}$	$\vec{E} = \vec{E}_1 + \vec{E}_2 + \vec{E}_3 + ...$	$e = 1{,}6 \cdot 10^{-19} C$	$\mu_0 = 4\pi \cdot 10^{-7} \frac{T \cdot m}{A}$
$V = \frac{U}{q}$	$V = K \cdot \frac{q}{r}$	$V = V_1 + V_2 + V_3 + ...$	$L = q \cdot \Delta V$	$E = -\frac{\Delta V}{d}$
$\Phi_E = \int_A \vec{E} \cdot d\vec{A}$	$\oint_A \vec{E} \cdot d\vec{A} = \frac{\sum_i q_i}{\varepsilon_0}$	$E = \frac{\sigma}{\varepsilon_0}$	$E = \frac{\sigma}{2\varepsilon_0}$	$\sigma = \frac{Q}{A}$
$C = \frac{Q}{V}$	$C = \varepsilon \cdot \frac{A}{d}$	$C = 4\pi\varepsilon \cdot R$	$C_P = C_1 + C_2 + ...$	$\frac{1}{C_S} = \frac{1}{C_1} + \frac{1}{C_2} + ...$
$V = R \cdot I$	$R = \rho \cdot \frac{l}{A}$	$\rho = \rho_0 \cdot (1 + \alpha t)$	$R_S = R_1 + R_2 + ...$	$\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} + ...$
$I = I_1 + I_2 + I_3 + ...$ $V_{AB} + V_{BC} + ... + V_{EF} + V_{FA} = 0$	$P = V \cdot I = R \cdot I^2 = \frac{V^2}{R}$	$V = E - R_i \cdot i$ (E = f.e.m.)	$\varepsilon_r = \frac{\varepsilon}{\varepsilon_0} \quad \mu_r = \frac{\mu}{\mu_0}$	$k_m = \frac{\mu_0}{2\pi} = 2 \cdot 10^{-7} \frac{T \cdot m}{A}$
$\vec{F} = i \cdot \vec{L} \times \vec{B}$ $\left\|\vec{F}\right\| = \left\|i \cdot L \cdot B \cdot \operatorname{sen}\alpha\right\|$	$\vec{F} = q \cdot \vec{v} \times \vec{B}$ $\left\|\vec{F}\right\| = \left\|q \cdot v \cdot B \cdot \operatorname{sen}\alpha\right\|$	$F = \frac{\mu_0}{2\pi} \cdot \frac{i_1 \cdot i_2 \cdot l}{d}$	$\vec{M} = \vec{\mu} \times \vec{B}$ $\vec{\mu} = i \cdot \vec{A}$	$c = \frac{1}{\sqrt{\varepsilon_0 \mu_0}} =$ 299792458 m/s
$\oint \vec{B} \cdot d\vec{l} \cdot = \mu_0 \cdot i$	$B = \frac{\mu_0}{2\pi} \cdot \frac{i}{r}$	$B = \frac{\mu_0 \cdot i \cdot N}{l}$	$B = \frac{\mu_0 \cdot i \cdot R^2}{2 \cdot \sqrt{(R^2 + z^2)^3}}$	f.e.m. = B · l · v
$\Phi_B = \int_A \vec{B} \cdot d\vec{A}$	$v = -\frac{d\Phi_B}{dt} = \oint_A \vec{E} \cdot d\vec{l}$	$L = \frac{\Phi_B}{i}$	$L = \frac{\mu_0 \cdot N^2 \cdot A}{l}$	$v_L = -L \cdot \frac{di}{dt}$
Maxwell:	$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0}$	$\oint \vec{B} \cdot d\vec{A} = 0$	$\oint \vec{E} \cdot d\vec{l} = -\frac{d\Phi_B}{dt}$	$\oint \vec{B} \cdot d\vec{l} = \mu_0 i + \mu_0 \varepsilon_0 \frac{d\Phi_E}{dt}$
Circuito RC	$\tau = RC$	$i_C = i_0 \cdot e^{-\frac{t}{\tau}}$	$v_C = V\infty \cdot (1 - e^{-\frac{t}{\tau}})$	$v_C = V_0 \cdot e^{-\frac{t}{\tau}}$
Circuito RL	$\tau = \frac{L}{R}$	$i_L = i_0 e^{-\frac{t}{\tau}}$	$i_L = i_\infty \cdot (1 - e^{-\frac{t}{\tau}})$	$v_L = V_0 \cdot e^{-\frac{t}{\tau}}$
Energia e densità Del campo Elettrico o magnetico	$U = \frac{1}{2} C \cdot V^2$	$u = \frac{1}{2} \varepsilon_0 \cdot E^2$	$U = \frac{1}{2} L \cdot i^2$	$u = \frac{1}{2\mu_0} \cdot B^2$
ONDE- OTTICA $v = \lambda \cdot f = \frac{\lambda}{T}$	$y = y_M \operatorname{sen}(\omega t - kx) =$ $y = y_M \operatorname{sen} \cdot 2\pi\left(\frac{t}{T} - \frac{x}{\lambda}\right)$	$\frac{\operatorname{sen}\hat{i}}{\operatorname{sen}\hat{r}} = \frac{n_2}{n_1} = n_{12}$	Young: $\lambda : d = x : L$	$\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$

Fluidi

$$p = \frac{F}{S} \qquad \rho = \frac{m}{V} \qquad p = \rho \cdot h \cdot g \qquad F_A = \rho \cdot g \cdot V$$

$$\frac{1}{2}\rho v^2 + \rho \cdot h \cdot g + p = Kost \quad \text{(Bernoulli)}$$

$$\frac{1}{2}\rho \cdot v_1^{\,2} + \rho \cdot g \cdot h_1 + p_1 = \frac{1}{2}\rho \cdot v_2^{\,2} + \rho \cdot g \cdot h_2 + p_2$$

$$S \cdot v = kost \qquad S_1 \cdot v_1 = S_2 \cdot v_2 \quad \text{portata}$$

Ottica-Onde

Specchi e lenti $f = \frac{R}{2}$ $\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$ $G = -\frac{q}{p}$ *ingrandimento* $diottrie = \frac{1}{f}$

Indice di rifrazione $n = \frac{c}{V} = \frac{sen(i)}{sen(r)}$ $n_{12} = \frac{n_2}{n_1} = \frac{V_1}{V_2}$ n1*sen φ1 =n2*sen φ2

$V = \frac{\lambda}{T} = \frac{\omega}{k} = \lambda \upsilon$ $y(x,t) = y_M \sin(kx - \omega t)$ $\upsilon' = \upsilon \cdot \frac{V \pm V_O}{V \pm V_S}$ doppler $\lambda = \frac{dx}{L}$ Young

Fisica Moderna

$E = h \cdot f$ $c = \lambda \cdot f$	$p = \frac{h \cdot f}{c} = \frac{h}{\lambda}$	$E_C = h \cdot f - W_0$	$\Delta\lambda = \lambda_c(1 - \cos\varphi)$ $\lambda_c = 2{,}426 \cdot 10^{-12}\,m$	$N = N_0 \cdot e^{-\frac{t}{\tau}}$
$f = c \cdot R_H\left(\frac{1}{m^2} - \frac{1}{n^2}\right)$	$R_H = \frac{me^4}{8 \cdot \varepsilon_0^{\,2} h^3 c} =$ $1{,}0968 \cdot 10^7 m^{-1}$	$E_n = -\frac{1}{n^2} \cdot E_1$	$E_1 = \frac{me^4}{8\varepsilon_0^{\,2} h^2} = 13{,}6eV$	$r_n = n^2 \frac{\varepsilon_0 h^2}{\pi m e^2}$

Meccanica

$\vec{F} = m \cdot \vec{a}$	$\vec{V} = \frac{d\vec{S}}{dt}$	$\vec{a} = \frac{d\vec{V}}{dt}$	$V = V_0 + a \cdot t$	$S = S_0 + V_0 \cdot t + \frac{1}{2} a \cdot t^2$
$\vec{P} = m \cdot \vec{g}$	$f = \frac{1}{T}$	$V = \frac{2 \cdot \pi \cdot R}{T}$	$\omega = \frac{2 \cdot \pi}{T}$	$a = \frac{V^2}{R}$
$F = G \cdot \frac{m_1 \cdot m_2}{r^2}$	$\vec{Q} = m \cdot \vec{v}$	$\vec{L} = m\,\vec{r} \cdot \vec{v}$	$I = \Delta \vec{Q}$	$g = 9{,}81 \frac{m}{s^2}$
$U_G = m \cdot g \cdot h$	$E_C = \frac{1}{2} m \cdot V^2$	$U_E = \frac{1}{2} k \cdot x^2$	lavoro $W = \vec{F} \cdot \vec{S}$	$G = 6{,}673 \cdot 10^{-11} \frac{N \cdot m^2}{kg^2}$

Termologia

$Q = m \cdot c \cdot \Delta t$	Acqua: c= 4186J/kg K c= 1 kcal/kg °C	PV= n R T PV/T= cost	E=3/2 kT E=f/2 kT Umole=f/2 RT	ΔU = Q-L dL = p dV