Inleiding

Dit boek zal een verzameling worden voor alle kennis over de kwantum wereld

Daarnaast zal ik proberen om Elektromagnetisme met Generale Relativiteit te fuseren door er 1 geheel van te bouwen

Dit zal dan ook resulteren in een klassieke uitleg van zwaartekracht

En hoe we anti zwaartekracht bergen

Hoe we $E=mc^2$ het beste kunnen gebruiken als War against War

gezen olie #1 is in 2013

En de potentie van onevenredig volgens dit West

Wat is de Unified field theory?

Albert Einstein had het gevoel dat hij bijna begreep hoe deze wereld werkt, en hoe het stops gewoon ontzettend logisch is dat er een fusie moet komen tussen Maxwell's Elektromagnetisme Relativiteit & Kwantum Mechanica

om de velden te fuseren moet Kwantum Mechanica eerst aangepast worden zodat het een onderdeel van klassieke natuurkunde wordt

MicHIO KoeKie over Unified Field

* 1 paragraaf Samenvatting
* Physics Journal
* Bouw op oudere theorieën
* Relativiteit moet toegepast op atoom
* gebruik alleen formules met een betekenis... Klasieke Natuurkunde
* alles moet Logisch zijn
* Tensors uit Relativiteit koppelen aan Kwantum Natuurkunde
* Een vorm voor tijdruimte dat het donkere energie probleem oplost

Schrödinger zocht naar de constante
"de snelheid van Elektromagnetische golven wanneer de Golffunctie inklopt"

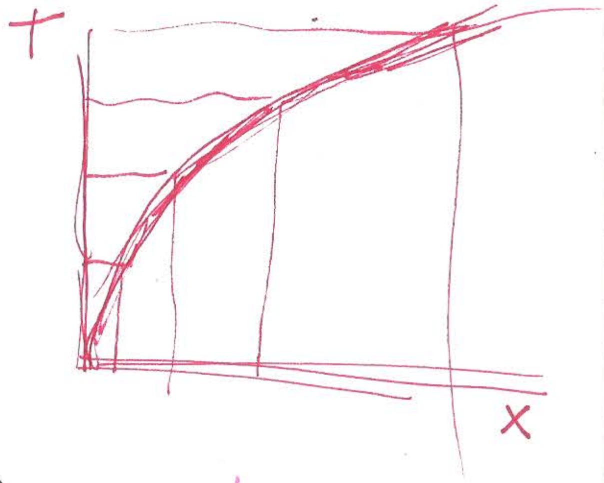
Basis

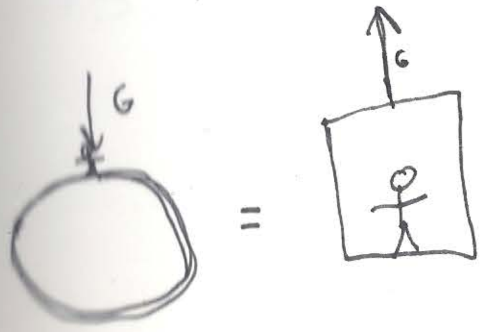
Generale relativiteit

$F = mA$

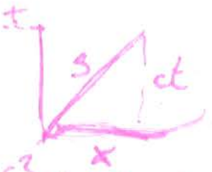
$F = \frac{mMG}{R^2}$

$A = \frac{MG}{r^2}$



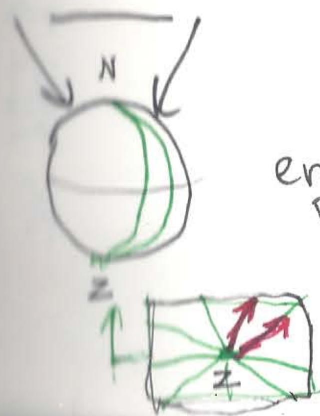


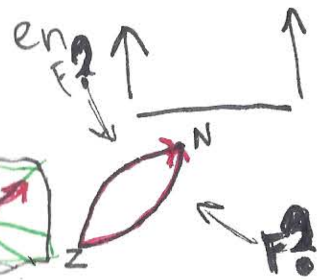
$s^2 = (ct)^2 - x^2$

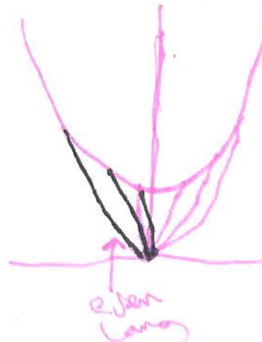


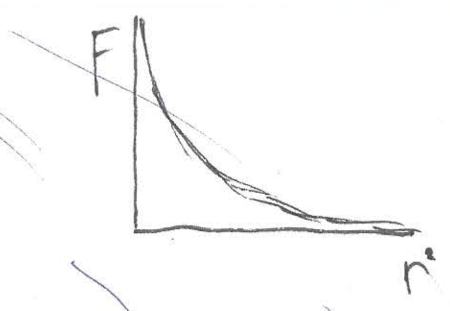
$s^2 = (ct)^2 + x^2$

Wanneer weet je verschil?









R	F
1	1,868 E-64
2	4,67 E-65
3	2,07 E-65
4	1,17 E-65
5	7,5 E-66

Proton Massa: $1,673 \cdot 10^{-27}$ Kg
electron Mass: $9,11 \cdot 10^{-30}$ Kg
$G = 6,674 \cdot 10^{-11}$ m/Kg/sec

Temp -272°C

$$F = \frac{G\, m_1 m_2}{r^2}$$

Massa elektron is er

$$A = \frac{G m}{r^2}$$

$$\frac{6,674E^{-11} \cdot 1,673E^{-27}}{r^2}$$

R = 1 Gdl sec

Snelheid Zonon

$$f_c = \left(\frac{R_c}{\pi}\right)\sqrt{\frac{F_{max}}{2R_{proton} m_{proton}}}$$

Proton

$x = \text{diameter} = 2R_c$

$v = f x$

$f = \frac{1}{2}\pi\omega$

$\omega = \sqrt{\frac{k}{m}}$

Foto elektrisch effect

$v = f \cdot \lambda$

$C = \frac{\varepsilon_0 \cdot A}{d}$

$F = \frac{Q^2}{2C}$

$$E = \frac{e^2}{4\varepsilon_0 V} f \qquad \frac{e^2}{4\varepsilon_0 V} = h$$

Elektron Radius

$$R_x = N^2\left[\frac{F_{max} R_c^2}{M_e V^2 Z}\right]$$

$f = \frac{M_e C^2}{h}$

$\omega_c = 2\pi f_c$

$V = \omega_c R_c$

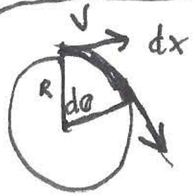
$\omega_c = \sqrt{\frac{K}{m}}$

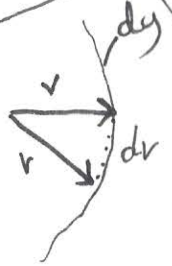
$K = \frac{F_{max}}{R}$

Circulair

$F = mA$

$v = \frac{2\pi R}{t}$





$d\theta = \frac{dx}{r}$

$d\theta = \frac{dy}{dv}$

$V = \frac{dx}{dt}$

$\boxed{V = \omega R}$

$\boxed{a = \omega^2 R}$

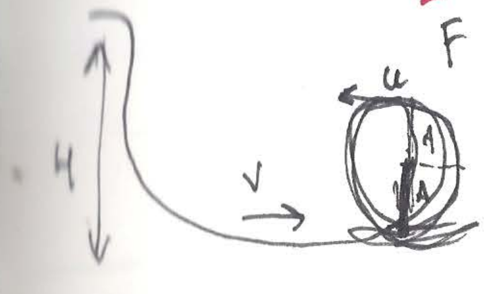
$\Delta x = r\Delta\theta = V\Delta T$

$\Delta x = r\frac{\Delta V}{V} = V\Delta T$

$\frac{r\Delta V}{\Delta T} = V^2$

$\frac{\Delta V}{\Delta x} = \frac{V^2}{r} = a$

1 $F = mgh = \frac{1}{2}mv^2$



2 $F = mg2A + \frac{1}{2}mu^2$

3 $F = \frac{mu^2}{a} = mg$

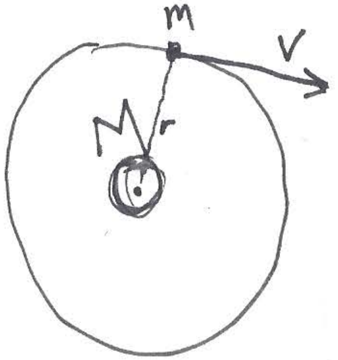
5 $u^2 = ga$

5 $mgh = mg2A + \frac{1}{2}mga$

6 $h = 2{,}5a$ (of meer om te overleven)

$\boxed{\begin{array}{ll} DE & 73\% \\ Dm & 23\% \\ M & 4\% \end{array}}$

WTF momentje

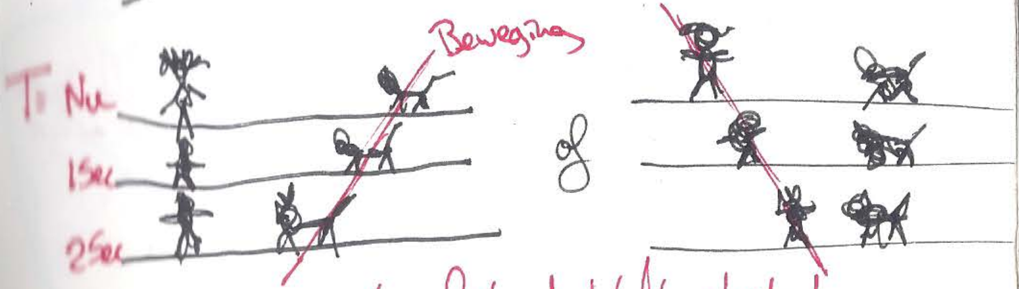


Centrifugaal Kracht

$$F = \frac{GMm}{r^2} = \frac{mv^2}{r}$$

$$v^2 = \frac{GM}{r}$$

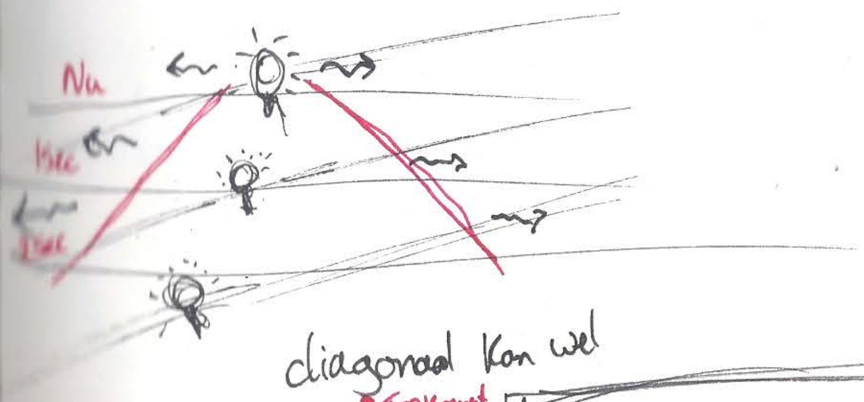
Speciale Relativiteit



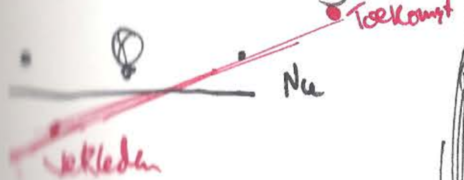
de afstand blijft absolut

snelheid van het licht = constant

dus de lijnen mogen niet Horizontaal schuiven



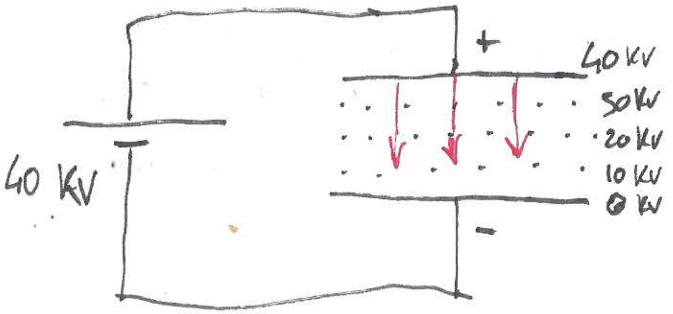
diagonaal kan wel



Wetten

* Behoud Energie
* Behoud Momentum
* Entropy wordt niet minder

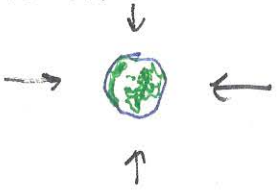
~~Tijd = speciaal~~

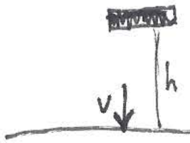


Elektrisch Veld Sterkte is overal gelijk

$$E = \frac{\text{Volt}}{\text{afstand}} \quad \frac{(V)}{(m)}$$

Zwaarte kracht





PE = mgh

$KE = \frac{1}{2}mv^2$

$$E = \frac{\text{Volt}}{\text{dist}} = \frac{\text{Force}}{\text{Q charge}}$$

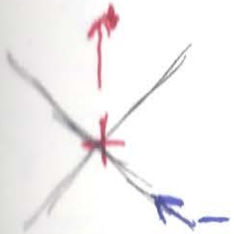
$Vq = Fd$

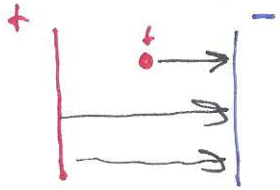
Work = Force distance

$$\text{Power} = \frac{E}{T}$$

$$\frac{Vq}{t} = VI$$

Elektromagnetische Velden





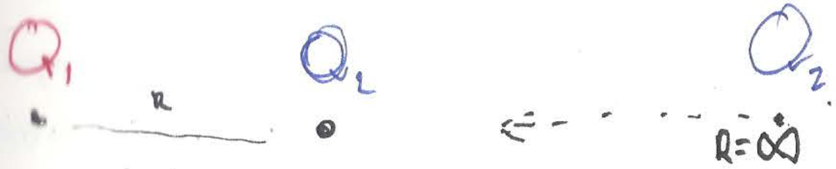
$Q_1 \xleftrightarrow{R} Q_2$

$$F = \frac{Q_1 Q_2}{4\pi\varepsilon_0 r^2}$$

$$\text{Elektris Veld Sterkte} = \frac{F}{q}$$

r = ∞ Bij E = 0

$$E = \frac{Q_1}{4\pi\varepsilon_0 r^2}$$

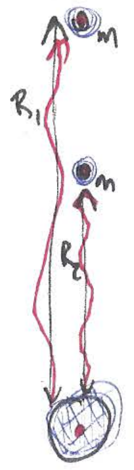


$$E = \frac{Q_1 Q_2}{4\pi\varepsilon_0 r}$$

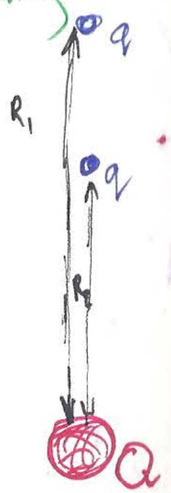
$$\frac{\text{Potentiele Energie}}{\text{unit charge}} = \text{Volt}$$

$$V = \frac{E_p}{q} = \frac{Q_1}{4\pi\varepsilon_0 r} = \text{Volts}$$

Verband Massa - Lading



Gravito Magnetisme
Elektro Magnetisme



$$\Delta PE = G m_m \left(\frac{1}{R_1^2} - \frac{1}{R_2^2}\right) \qquad \Delta PE = \frac{Qq}{4\pi\varepsilon_0}\left(\frac{1}{R_1^2} - \frac{1}{R_2^2}\right)$$

atomen die Neutraal zijn (geladen atoom = ion)
Hebben altijd een Negatieve Lading Vanwege de elektronen wolk
Tijdens de Kwantum Excitatie wissett de Elektromagnetische golf zijn Magnetische Polen... MaW. ~~Rotatie~~ wisselt

↺ word ↻

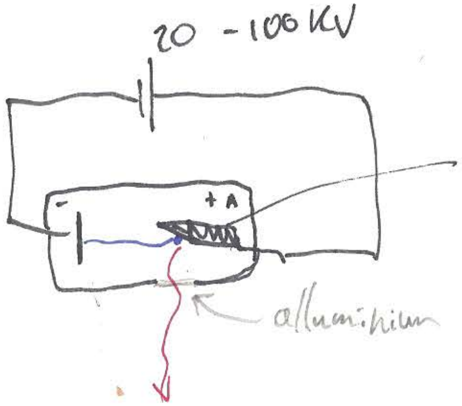
$$F = G\frac{m_1 m_2}{R^2}$$

$$F = K\frac{q_1 q_2}{R^2}$$

Gravitoelektomagnetisme Einstein	Elektromagnetisme Maxwell
$\nabla \cdot E_g = -4\pi G \rho_g$	$\nabla \cdot E = \frac{\rho}{\varepsilon_0}$
$\nabla \cdot B_g = 0$	$\nabla \cdot B = 0$
$\nabla \times E_g = -\frac{\partial B_g}{\partial t}$	$\nabla \times E = \frac{\partial B}{\partial t}$
$\nabla \times B_g = \left(-\frac{4\pi G}{c^2} J_g + \frac{1}{c^2}\frac{\partial E_g}{\partial t}\right)$	$\nabla \times B = \frac{1}{\varepsilon_0 c^2} J + \frac{1}{c^2}\frac{\partial E}{\partial t}$

$$-4\pi G = \frac{1}{\varepsilon_0}$$

X Ray



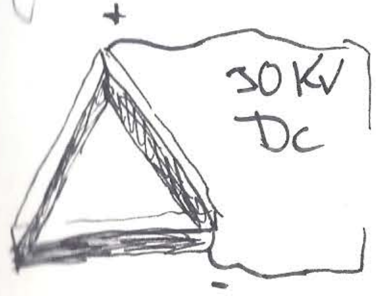
Volt is energie / frequentie

Amp is intensiteit

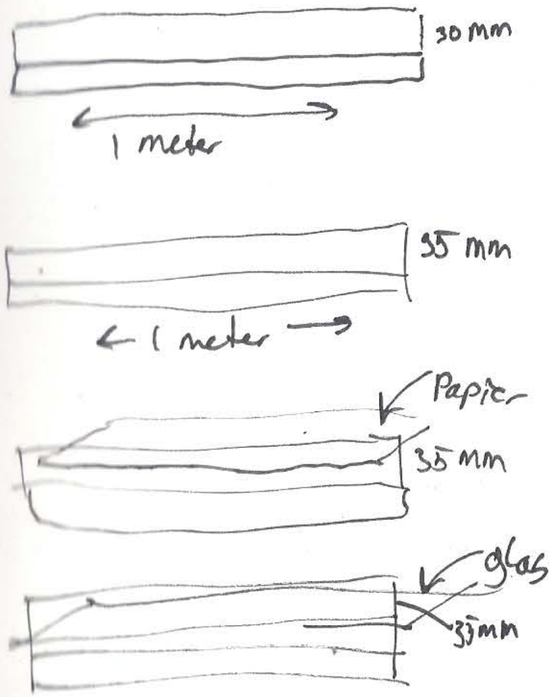
$$V_{dt} = \frac{\text{Work}}{\text{Charge}} = \frac{W}{Q} = \frac{\text{Joule}}{\text{Coulomb}}$$

Biefield Brown effect

Lifter 2 gram



stroom omdraaien
zelfde effect



25 000 V
6 gram lift

30 000 V
10 gram lift

30 000 V
27 gram lift

30 000 V
33 gr lift

22 000 V
20 G
100 μA

20 G/W

Waarscheinlijkheid van Excitatie en Intensiviteit van Uitstralen

Hoeveel energie om Elekton te verplaatsen?
Waarom de frequentie de Energie bepald.
Afmetingen atoom Na absorbatie
Hoe Vaak straalt een Atoom uit?
Wat is de Intensiteit van Spesefiek Frequentie

een atoom doet Niet veel meer dan Licht absorberen en Uitstralen

Foton $\rightarrow \omega R = \omega R \leftarrow$ Electron

$$(2\pi f)R = \sqrt{\frac{K_e}{m_e}}\, R_c$$

$$(2\pi f)R = \sqrt{\frac{F_{max}}{m_e n R_c}}\,(n R_c)$$

$$R = \sqrt{\frac{F_{max}}{m_e n R_c}}\left(\frac{n R_c}{2\pi f}\right)$$

$$R^2 = \left(\frac{F_{max}}{m_e n R_c}\right)\left(\frac{n^2 R_c^2}{4\pi^2 f^2}\right)$$

$$R^2 = \frac{F_{max}\, n R_c}{4\pi^2 f^2\, m_e}$$

$$\boxed{f_e = \frac{c_e}{2\pi R_c}}$$

$$\boxed{R^2 = \frac{F_{max}\, n R_c^2}{2\pi c_e f\, m_e}}$$

→ Kans excitatie aan de hand van frequentie

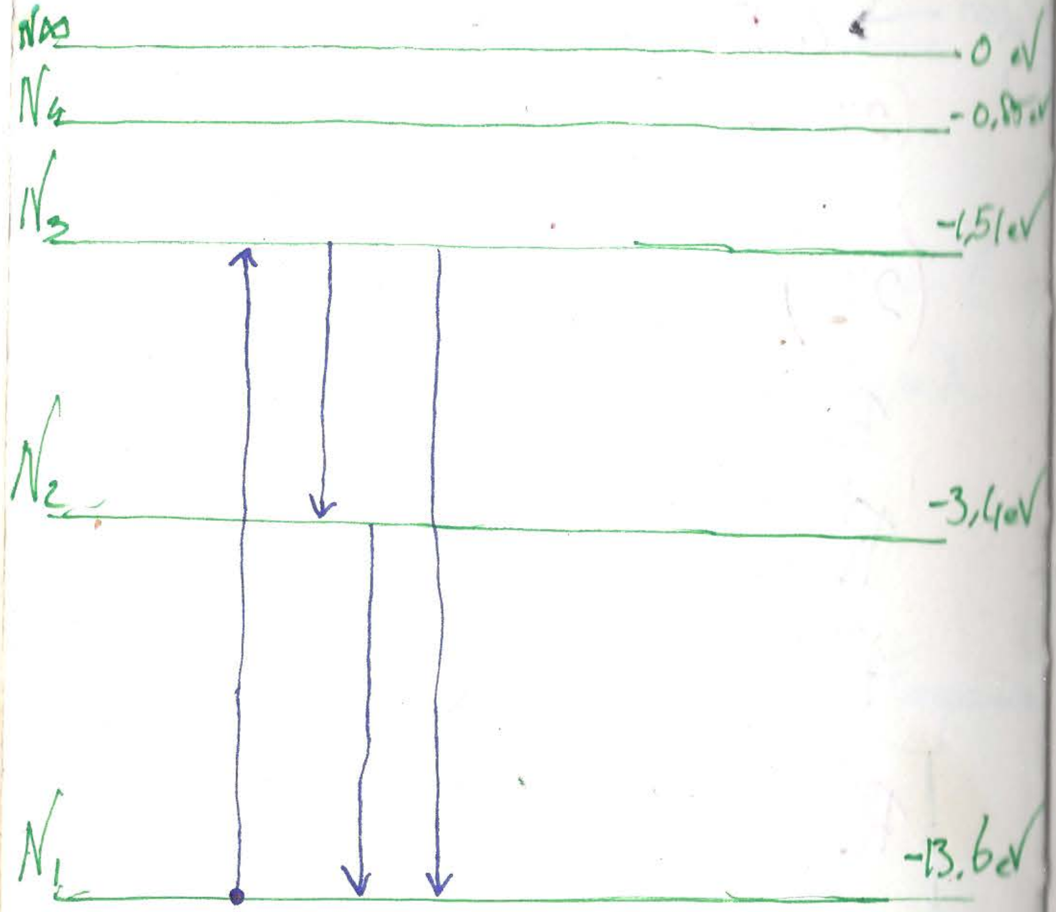
$$\boxed{R^2 = \left[\frac{4\pi F_{max} R_c^2}{c_e}\right]\left(\frac{n}{8\pi^2 m_e f}\right)}$$

h

$$\rightarrow R^2 = \frac{nh}{8\pi^2 m_e f}$$

$$m_e \frac{2 F_{max} R_c}{c^2}$$

$$R^2 = \frac{n c^2 R_c}{4\pi c_e f}$$



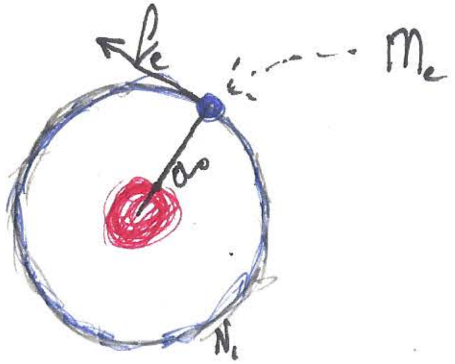
$$f = \frac{E}{h} = \frac{(E_2 - E_1)}{h} = \frac{c}{\lambda}$$

$$h = 4\pi m_e v_e a_0 = 6{,}62606957 \cdot 10^{-34}\ J$$

Constante van Max Planck

h = Hoek moment van de elektron

Hoekmoment = mVR



h bij de ω_e

ħ bij de frequentie

hoekmoment

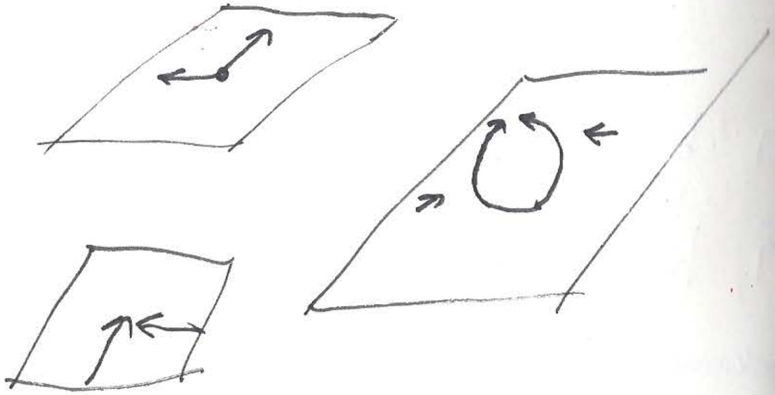
$h = 2\pi R \cdot 2C_e m_e$

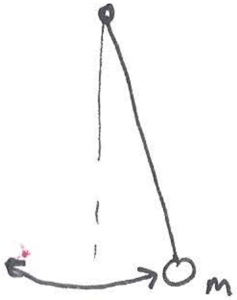
Hoek Moment

$$J = I\omega$$

I = Moment Inertia

$$E_{kin} = \frac{I\omega^2}{2}$$





$V = \omega R_c$

$\frac{\omega R_e}{c} = \alpha$

$$T = 2\pi\sqrt{\frac{L}{A}}$$

$$T = 2\pi\sqrt{\frac{m}{K}}$$

Hedendaags Standaard Model

Quarcks

Up	Charge	top
Down	Strange	bottom

e	Muon	Tau
ν_e	ν_m	ν_t

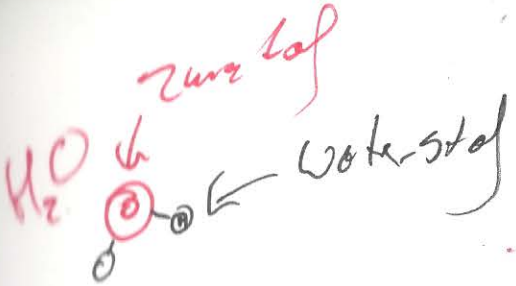
Leptons

Bosonen

γfoton
Gluon
$W^{\pm}$ foton
Z boson

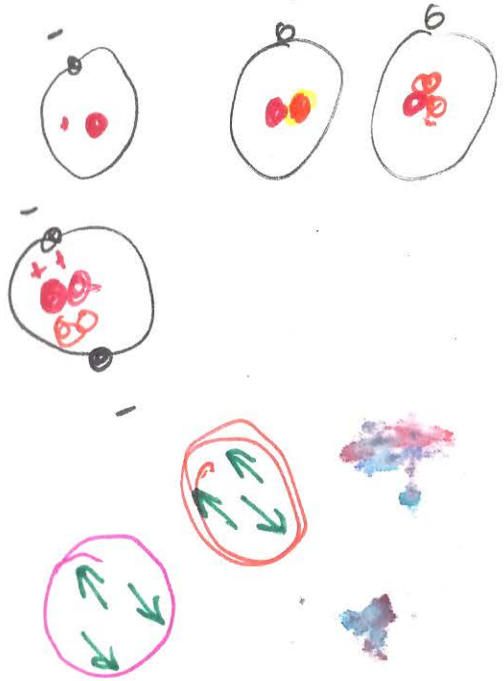
? Higgs Boson ?

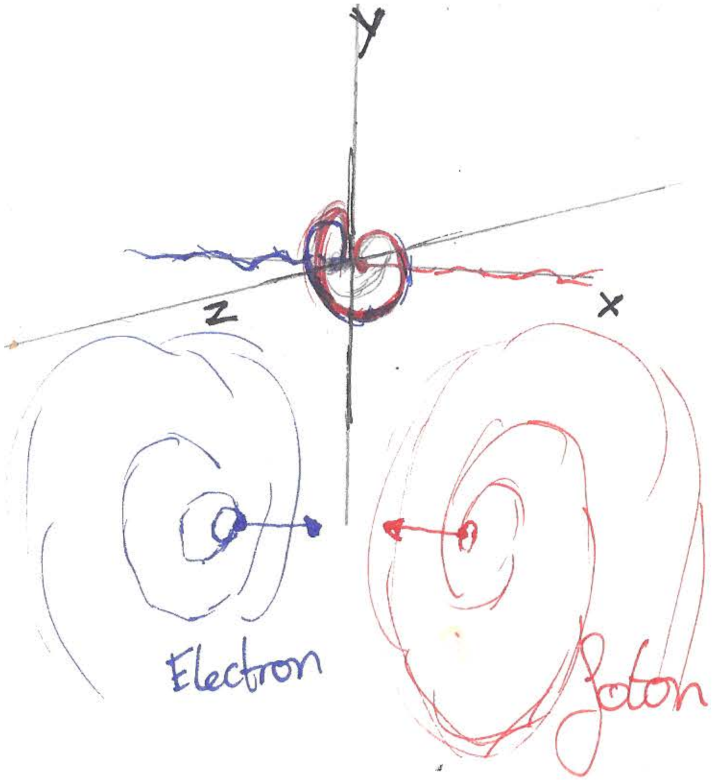
Kwantum Mechanica kent twee fundementele deeltjes

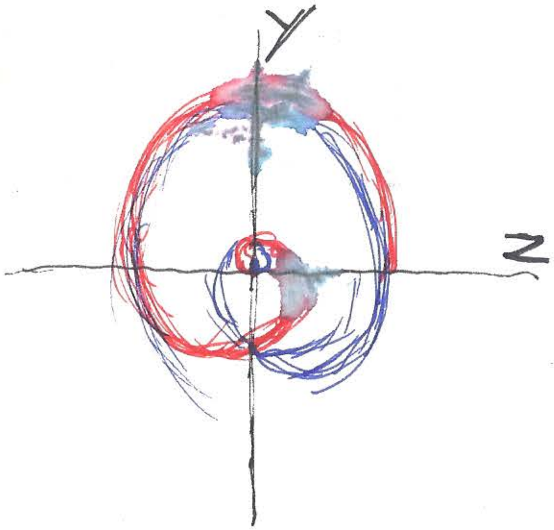


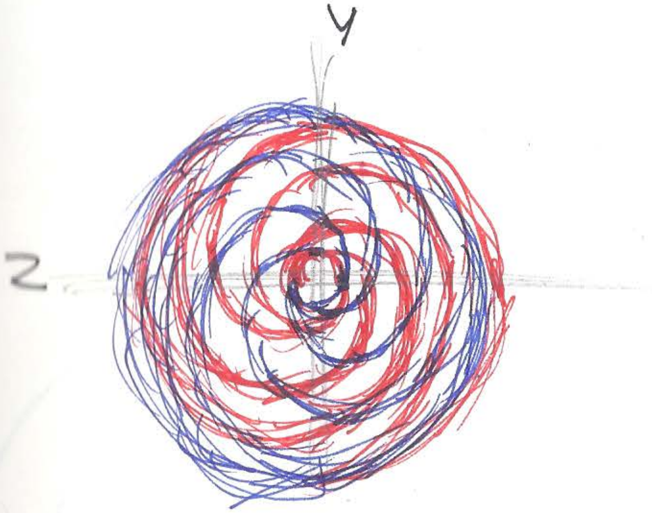
O^{2-}

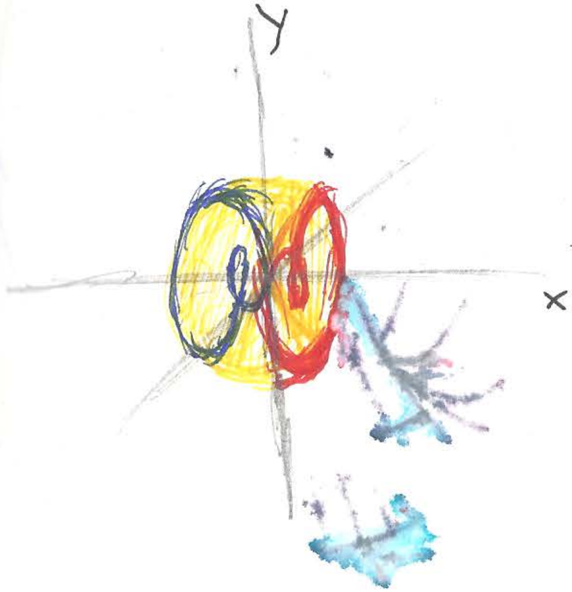
H^+

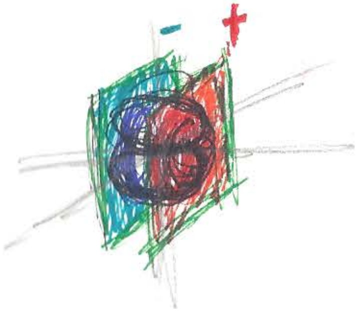


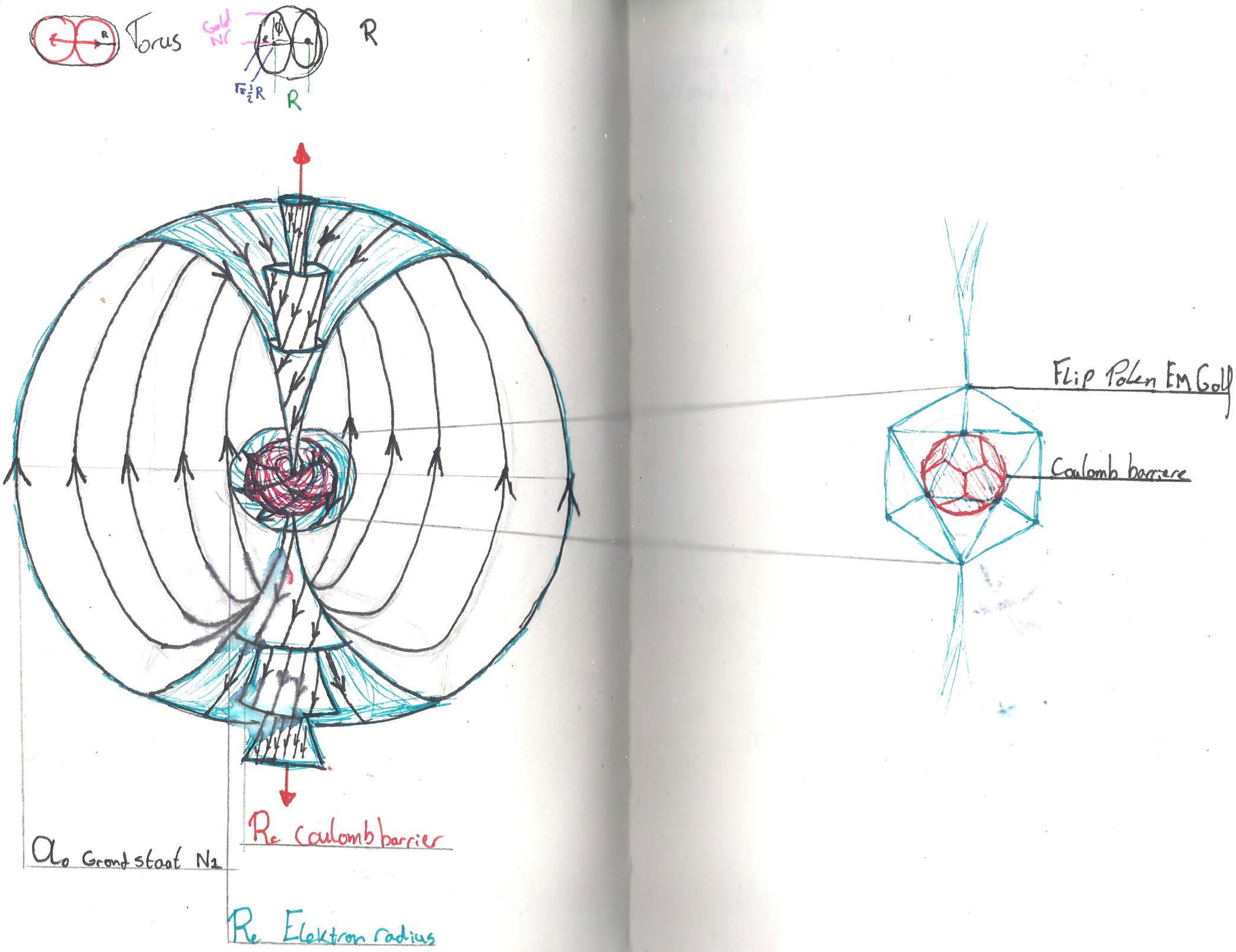

y
z
x
Electron
Foton


Y
Z


Y
Z


Y
x


-
+


Torus
R
R
Flip Polen EM Golf
Coulomb barriere
Rc Coulomb barrier
a0 Grondstaat N1
Re Elektron radius

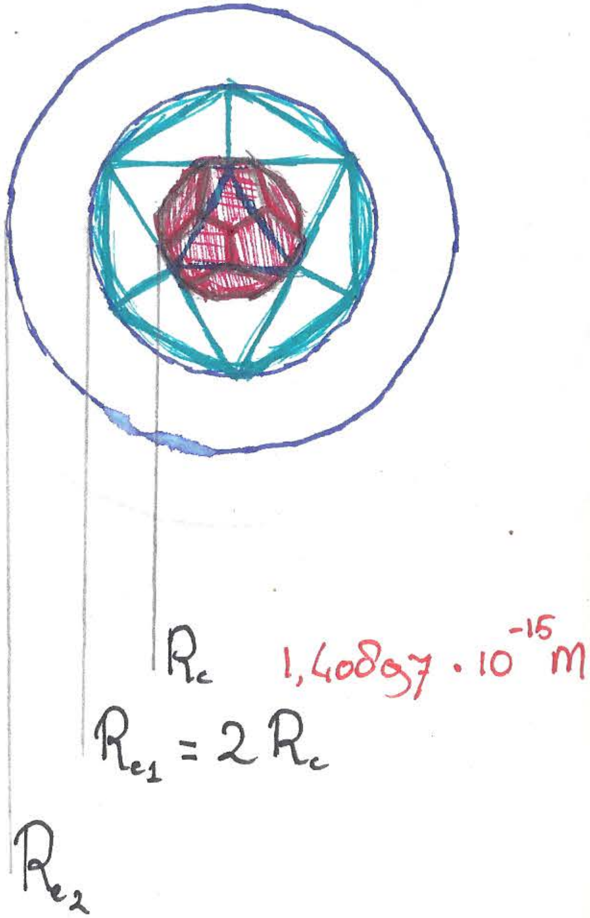
Statisch atoom

Klassieke Elektron Radius

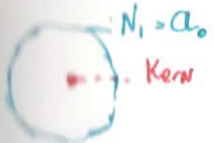
$$R_e = \frac{e^2}{4\pi \varepsilon_0 m_e C^2} = \frac{e^2}{8\pi \varepsilon_0 F_{max} R_c}$$

$$R_e = 2 R_c$$

$$E_e = 2 F_{max} R_c$$

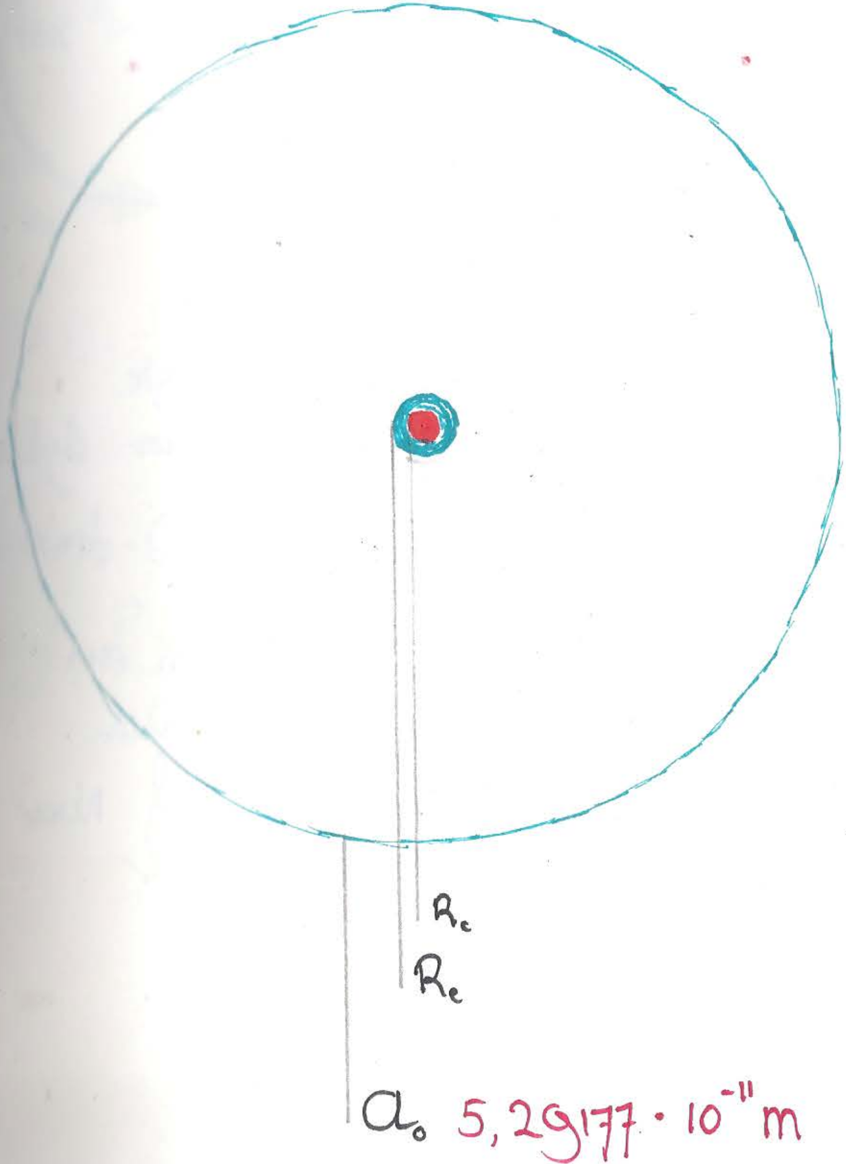


exciterend atoom

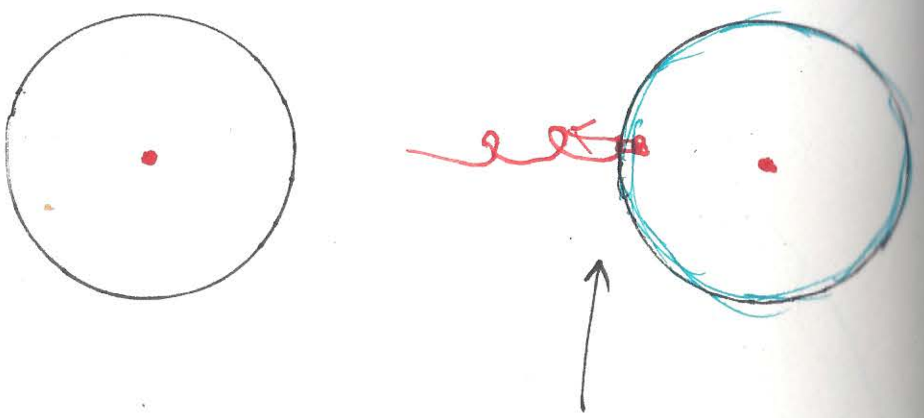


$$a_0 = \frac{F_{max} R_c^2}{m_e C_e^2}$$

$$R_x = n^2 \left(\frac{F_{max} R_c^2}{Z m_e C_e^2} \right)$$



Zwaarte Kracht Concept Paginas



de energie
Word doorgegeven tydens
de excitatie

Wanneer de foton en
elektron elkaar raken
remt het licht af naar
een constante voor
1 t_{planck}

Vortex Physics

$\vec{\omega}$ vorticity

Vaste Vortex $\Rightarrow \frac{V}{R}\frac{dV}{dr} = 2\,\vec{\omega}_{velocity}$

Vrije Vortex $\Rightarrow \frac{V}{R}\frac{dV}{dr} = 0\,\vec{\omega}_{velocity}$

$$V_\theta(R,t) = \frac{\Gamma}{2\pi R}\left(1-\exp\left(\frac{-R^2}{R_c^2(t)}\right)\right)$$

$$V_\theta = \left(1-\exp\left(\frac{-R^2}{4\nu t}\right)\right)\frac{\Gamma}{2\pi R}$$

Lamb-Oseen Vortex

$$\vec{\omega} = \frac{\vec{r}\times\vec{V}}{r^2}$$

Spelen met de formules Zwaartekracht

$$\alpha_g = \frac{G\,m_e^2}{\hbar c} = \left(\frac{m_e}{m_p}\right)^2 = (t_p\,\omega_e)^2$$

$$G = \frac{m_e^2}{\hbar c\,\alpha_g}$$

$G = 6{,}673 \cdot 10^{-11}$ Newton

$F_{max} = 29{,}0535$ Newton

$M_{elekt} = 9{,}109 \cdot 10^{-31}$ Kg

$t_{plank} = 5{,}39 \cdot 10^{-44}$ sec

$C = 299792458$ m/s

$\omega_e = 1{,}093845 \cdot 10^{6}$ m/s

$$F = G\,\frac{M_1 M_2}{R^2}$$

F = Newton

G = Zwaartekracht in $\frac{N m^2}{Kg^2}$

M = Kg

R = Meters

$CT_p = 1{,}61699$

$C_e T_p = 5{,}8969$

G = Newtons Constant

$$\alpha = \left(\frac{e}{q_p}\right)^2 = \frac{e^2}{4\pi\varepsilon\hbar c}$$

$$e = \sqrt{\frac{2\alpha h}{\mu_0 C_0}}$$

$$L_p = \lambda_e \sqrt{\frac{\alpha_g}{2\pi}}$$

$$L_p^2 = \lambda_e^2\,\frac{\alpha_g}{2\pi}$$

$$\alpha_g = 2\pi\left(\frac{\lambda_e^2}{L_p^2}\right)$$

$$a = -\omega^2 x$$

$$a = -4\pi^2 f^2 x$$

$$\alpha_g = t_p^2 \omega_e^2$$

$$\frac{\lambda_e}{2\pi} = \frac{C R_e}{C_e} = \frac{2\pi C R_e}{2\pi C_e}$$

$$\cancel{\alpha_g = \frac{2\ldots}{G}}$$

$$G = \frac{F_{max}\,\alpha\,(c\,t_p)^2}{M_e^2}$$

$$\alpha_g = \frac{G\,m_e^2}{\hbar c}$$

$$\alpha_g = \frac{\frac{F_{max}\,\alpha\,(c\,t_p)^2}{M_e^2}\,\cancel{M_e^2}}{\hbar c}$$

$$\alpha_g = \frac{F_{max}\,\alpha\,(c\,t_p)^2}{\hbar c}$$

$$\alpha_g = \frac{F_{max}\,\frac{\hbar c}{2 c_e}\,c^2 t_p^2}{\hbar c}$$

$$\alpha_g = \frac{F_{max}\,2 c_e\,t_p^2}{\hbar}$$

$$G = \frac{F_{max}\,\alpha\,(ct_p)^2}{M_e^2}$$

$$ct_p = 1{,}61619913 \cdot 10^{-35}$$

$$(ct_p)^2 = 2{,}61209962 \cdot 10^{-70}$$

$$\frac{(ct_p)^2}{M_e^2} = 3{,}14783399 \cdot 10^{-10}$$

$$\frac{(ct_p)^2}{M_e^2} F_{max} = 9{,}145561796 \cdot 10^{-9}$$

$$\frac{(ct_p)^2}{M_e^2} F_{max}\,\alpha = 6{,}6738392 \cdot 10^{-11}$$

Ik heb de formule... Maar wat Betekend het?

$$G = \frac{F_{max}\,\frac{2C_e}{c}\,(ct_p)^2}{M_e^2}$$

$$G = \frac{F_{max}\,2C_e\,c^{\cancel{2}}\,t_p^2}{M_e^2\,\cancel{c}}$$

$$G = \frac{F_{max}\,2C_e\,c\,t_p^2}{M_e^2} = \frac{M_e^2}{\hbar c\,\alpha_g}$$

$$\cancel{G^2 = \frac{F_{max}\,2C_e\,\cancel{c}\,t_p^2\,\cancel{M_e^2}}{\hbar\,\cancel{c}\,\alpha_g\,\cancel{M_e^2}}}$$

$$\alpha = \frac{C_e e^2}{8\pi \varepsilon_0 R_c^2 c F_{max}} \qquad \hbar = \frac{h}{2\pi}$$

$$a_0 = \frac{4\pi \varepsilon_0 h^2}{4\pi^2 m_e e^2}$$

$$r_e = \frac{e^2}{4\pi \varepsilon_0 m_e c^2} = \frac{e^2}{8\pi \varepsilon_0 F_{max} R_e} = 2R_e$$

$$m_e = \frac{2 F_{max} R_e}{c^2}$$

$$E_e = 2 F_{max} R_c$$

$$\alpha_g = \frac{F_{max}\, 2 C_e\, t_p^2}{\hbar}$$

$$\alpha_g = \frac{F_{max}\, \alpha\, L_p^2\, m_e^2}{\hbar c\, m_e^2}$$

$$\cancel{\alpha_g = \frac{F_{max}\left(\frac{2C_e}{c}\right)\lambda^2\left(\frac{\alpha_g}{2\pi}\right) m_e^2}{\hbar c\, m_e^2}}$$

$$\cancel{\alpha_g = \frac{F_{max}\, 2C_e\, \lambda_e^2\, \alpha_g\, m_e^2}{2\pi \hbar c^2 m_e^2}}$$

$$m_e c \lambda_e = h \qquad h = \frac{e^2}{4\varepsilon_0 C_e}$$

$$m_e c \lambda_e = \frac{4\pi F_{max} R_e^2}{C_e}$$

$$\lambda_e = \frac{4\pi F_{max} R_e^2}{C_e\, c\, m_e} = \frac{2\pi c R_e}{C_e}$$

$$m_e = \frac{2 F_{max} R_e}{c^2}$$

$$G = 6{,}67384 \cdot 10^{-11}$$

$$\frac{2 C_e F_{max} L_p^2}{m_e^2 c} = 6{,}6738592 \cdot 10^{-11}$$

$$L_p = \lambda_e \sqrt{\frac{\alpha_g}{2\pi}}$$

$$L_p^2 = \lambda_e^2 \frac{\alpha_g}{2\pi}$$

$$\frac{8\pi G}{c^4} = 2{,}07650407 \cdot 10^{-43}$$

$$\frac{8\pi\left(\frac{2 C_e F_{max} L_p^2}{m_e^2 c}\right)}{c^4} = 2{,}07650364 \cdot 10^{-43}$$

$$\frac{16\pi C_e F_{max} L_p^2}{m_e^2 c^5}$$

$$G = \frac{\alpha F_{max} L_p^2}{m_e^2} = \frac{2 C_e F_{max} L_p^2}{m_e^2 c}$$

$$\frac{\alpha F_{max} (c t_p)^2}{m_e^2} = \frac{F_{max}\, 2C_e\, c\, t_p^2}{m_e^2}$$

Einstein's Veld formules

$$\boxed{R_{\mu\nu} - \frac{1}{2} g_{\mu\nu} R + g_{\mu\nu} \Lambda = \frac{8\pi G}{c^4} T_{\mu\nu}}$$

Curvature Spacetime

Massa Energ

$R_{\mu\nu}$ Ricci Curvature tensor

$g_{\mu\nu}$ Metric tensor

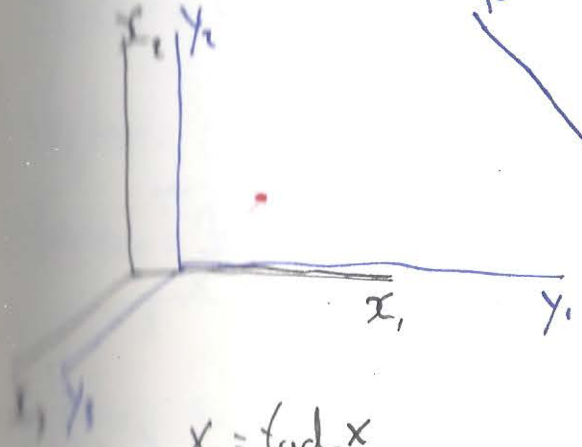
R Curvature Scalar

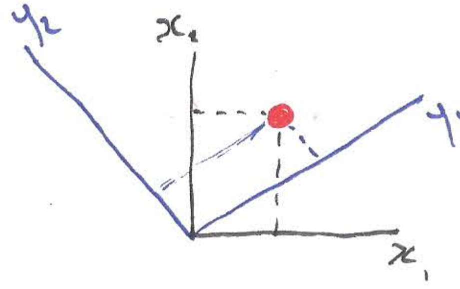
Λ Comological Constante

$T_{\mu\nu}$ Stress Energy Momentum Tensor

$\mu\nu$ gebruik je voor tijd ruimte
μ kan 0, 1, 2 of 3 zijn

Metric Tensor





x_0 = tyd x

y_0 = tyd y

$$d\phi = \frac{\partial \phi}{\partial x_1} dx_1 + \frac{\partial \phi}{\partial x_2} dx_2 + \frac{\partial \phi}{\partial x_3} dx_3$$

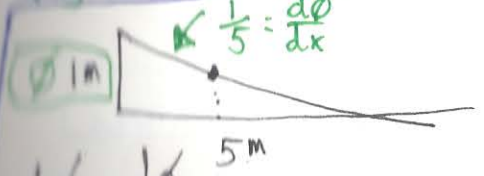
1 $$\boxed{d\phi = \sum_n \frac{\partial \phi}{\partial x_n} dx_n}$$

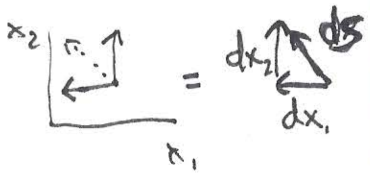
∂ = gedeelde differentie

d = volledige differentie

gradients

Tip



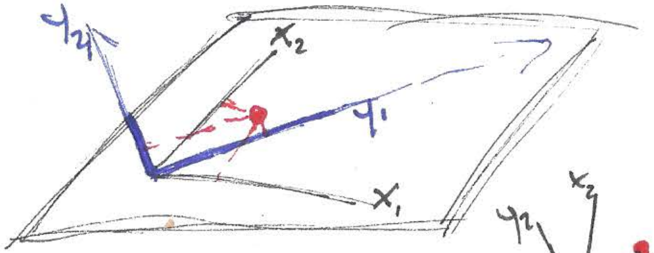


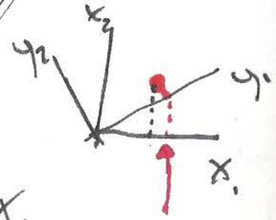
$$d\phi = \frac{d\phi}{dx} dx$$

$$d\phi = \frac{1}{5} \cdot 2.5 = \frac{1}{2} m$$

ds = Result Vector

2D coordinaten transformati





ds

dx_2

dx_1

$ds^2 = dx_1^2 + dx_2^2$

$\vec{ds} = \vec{dx_1} + \vec{dx_2}$

$d\phi_s = d\phi_{x_1} + d\phi_{x_2}$

$$d\phi_{x_1} = \frac{d\phi}{dx_1} dx_1$$

$$d\phi_{x_2} = \frac{d\phi}{dx_2} dx_2$$

$$\frac{\partial\phi}{\partial y^1} = \frac{\partial\phi}{\partial x_1}\frac{\partial x_1}{\partial y_1} + \frac{\partial\phi}{\partial x_2}\frac{\partial x_2}{\partial y_1} + \frac{\partial\phi}{\partial x_3}\frac{\partial x_3}{\partial y_1}$$

$$\boxed{\frac{\partial\phi}{\partial y_N} = \sum_m \frac{\partial\phi}{\partial x_m}\frac{\partial x_m}{\partial y_N}} \quad (2)$$

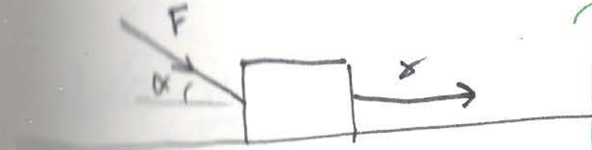
Tensors ?

Scaler = bijv temp en is een Rang 0 Tensor

Vector = lengte en directie Rang 1 Tensor

Tensor = Relatie tussen 2 Vectors Rang 2 Tensor

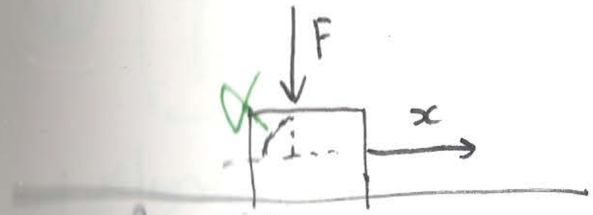
$$\boxed{\text{Vector}_{y} = \sum_m^N \frac{\partial y_n}{\partial x_m} V_{x_m}} \quad - (3)$$



Wanneer Vector is 0 Dan is de Tensor ook 0

Work = F x

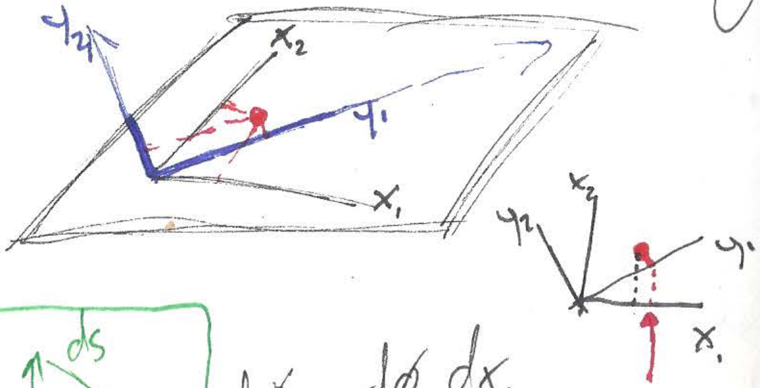
$W = \vec{F} \cos\alpha\, \vec{x}$

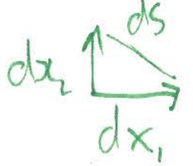


Work = F cos 90° x = 0

In elk Referentie frame

2D coordinaten transformati





$ds^2 = dx_1^2 + dx_2^2$

$\vec{ds} = \vec{dx_1} + \vec{dx_2}$

$d\phi_s = d\phi_{x_1} + d\phi_{x_2}$

$$d\phi_{x_1} = \frac{d\phi}{dx_1} dx_1$$

$$d\phi_{x_2} = \frac{d\phi}{dx_2} dx_2$$

$$\frac{\partial\phi}{\partial y^1} = \frac{\partial\phi}{\partial x_1}\frac{\partial x_1}{\partial y_1} + \frac{\partial\phi}{\partial x_2}\frac{\partial x_2}{\partial y_1} + \frac{\partial\phi}{\partial x_3}\frac{\partial x_3}{\partial y_1}$$

$$\boxed{\frac{\partial\phi}{\partial y_N} = \sum_m \frac{\partial\phi}{\partial x_m}\frac{\partial x_m}{\partial y_N}} \quad (2)$$

Tensors?

Scaler = bijv temp en iseen Rang 0 Tensor

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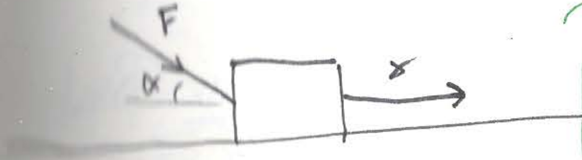
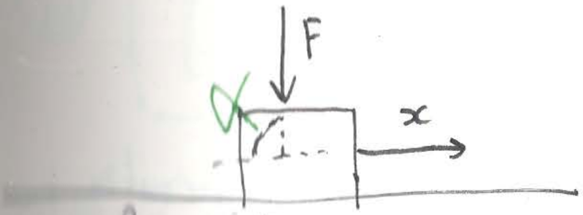


Wanneer Vector is 0 Dan is de Tensor ook 0

Work = F x

$W = \vec{F}\cos\alpha\,\vec{x}$



Work = F cos 90° x = 0

In elk Referentie frame

Vector AB worden Tensor T

$$T^{MN} = A^m B^n$$

m, N = de nummering van dimenties

$M\,N$ Kunnen van 1 tot 4

totaal mogelijkheden $4 \times 4 = 16$ variaties

$$\boxed{\text{Vector}\; y_n = \sum_m \frac{\partial y_n}{\partial x_m} V x_m} \quad (3)$$

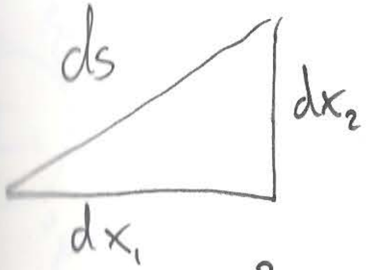
$$A_y^m B_y^n = \sum_r \frac{\partial y_m}{\partial x_r} A_{x_r} \sum_s \frac{\partial y_N}{\partial x_s} B_{x_s}$$

$$\boxed{T_y^{mN} = \sum_{rs} \frac{\partial y_m}{\partial x_r} \frac{\partial y_N}{\partial x_s} \underbrace{A_{x_r} B_{x_s}}_{T_x^{rs}}} \quad (4)$$

Contra veriant Transformatie
van y naar X Coordinaten

$$\boxed{T_{mN}^{(y)} = \sum_{rs} \frac{\partial x_r}{\partial y_m} \frac{\partial x_s}{\partial y_n} T_{rs}^{(x)}} \quad (5)$$

coverent transformatie



$$ds^2 = dx_1^2 \; dx_2^2 \; \ldots\ldots$$

$$= \sum_m dx^m dx^N$$

$$ds^2 = \sum_{MN} dx^m dx^n \quad \delta_{MN}$$

δ_{MN} = Kronecker delta

als $m = N = 1$

als $m \neq N = 0$

$$d\phi = \sum_N \frac{\partial \phi}{dx^n} dx^n \Rightarrow dx^m = \frac{\partial x^m}{\partial y^r} dy^r$$

$$ds^2 = \delta_{MN} \sum_{MN} dx^M dx^N$$

$$dx^M = \frac{\partial x^M}{\partial y^r} dy^r$$

$$ds^2 = \delta_{MN} \frac{\partial x^M}{\partial y^r} dy^r \frac{\partial x^N}{\partial y^s} dy^s$$

$$ds^2 = \boxed{\delta_{MN} \frac{\partial x^M}{\partial y^r} \frac{\partial x^N}{\partial y^s}} dy^r dy^s$$

Metric Tensor
g_{MN}

$$ds^2 = g_{MN} dy^r dy^s$$

By Platte ruimte is $g_{MN} = \delta_{MN}$

$$ds^2 = dx_1^2 dx_2^2$$

Phytagoras Klopt

By een bol klopt dit niet meer
de metric tensor past dit
aan zodat ds juist is

53 min vande video

Christoffel Symbol: Γ

Tensor: representeren de relaties tussen Vector

$$W_{nm}(x) = V_{nm}(x)$$

$$\boxed{T_{mn}(x)} = \frac{\partial V_m}{\partial x^n}(x)$$

$$\boxed{T_{mn}(y)} = \frac{\partial V_m}{\partial y^n}(y)$$

$$\boxed{T_{mn}(y) = \frac{\partial x^r}{\partial y^m}\frac{\partial x^s}{\partial y^n}\boxed{T_{rs}(x)}} \quad 5$$

$$T_{mn}(y) = \frac{\partial x^r}{\partial y^m}\frac{\cancel{\partial x^s}}{\partial y^n}\frac{\partial V_r(x)}{\cancel{\partial x^s}}$$

$$T_{mn}(y) = \boxed{\frac{\partial x^r}{\partial y^m}\frac{\partial V_r(x)}{\partial y^n}} \overset{?}{=} \boxed{\frac{\partial V_m}{\partial y^n}(y)}$$

$$\frac{\partial V_m}{\partial y^n} = \frac{\partial}{\partial y^n}\left(\frac{\partial x^r}{\partial y^m}V_r(x)\right)$$

$$\boxed{\partial AB = A\,\partial B + B\,\partial A}$$

$$\frac{\partial V_m(y)}{\partial y^n} = \frac{\partial}{\partial y^n}\left(\frac{\partial x^r}{\partial y^m}V_r\,x\right)$$

$$\frac{\partial V_m(y)}{\partial y^n} = \boxed{\frac{\partial x^r}{\partial y^m}\frac{\partial V_r\,x}{\partial y^n}} + \underbrace{\boxed{\frac{d}{\partial y^n}\frac{d x^r}{\partial y^m}}}_{\Gamma^r_{nm}} V_r(x)$$

$$T_{mn}(y) \neq \frac{\partial V_m}{\partial y^n}$$

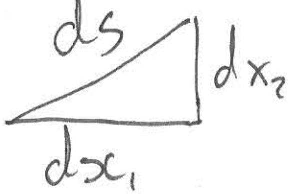
$$\boxed{T_{mn}(y) = \nabla_n V_m = \frac{\partial V_m}{\partial y^n} + \Gamma^r_{nm}V_r(x)} \quad 7$$

Coveriant dirivative
is de normale dirivative
plus de Corectie Christofolsymbol

$$\nabla_p T_{mN} = \frac{\partial T_{mn}}{\partial y^p} + \boxed{\Gamma^r_{pm} T_{rn}} + \Gamma^r_{pn} T_{mr}$$

Coveriant dirivative of Tensor T_{MN}

transformatie van tensors tussen referentie frames



$$ds^2 = dx_1^2 + dx_2^2$$
$$= dx^n + dx^n$$
$$= dx^m + dx^n \boxed{\delta_{mN}}$$

g_{mN} Flat Space

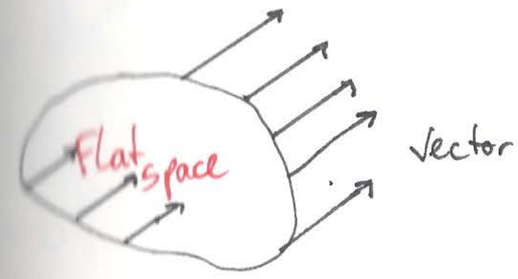
$$\nabla_r g_{mn}(x) = 0$$

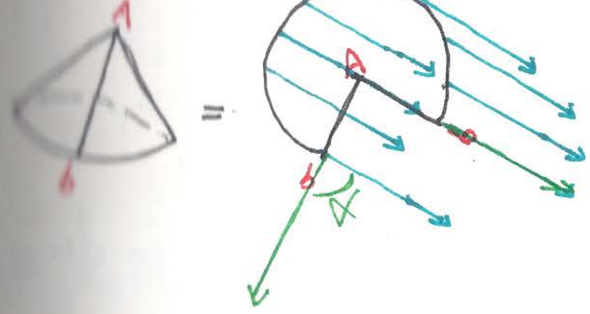
$$\nabla_p g_{mn}(x) = \frac{\partial g_{mn}}{\partial y^p} + \Gamma^r_{pm} g_{mn} + \Gamma^r_{pN} g_{mr} = 0$$

$$\boxed{\Gamma^a_{bc}(x) = \frac{1}{2} g^{ad} \left\{ \frac{\partial g_{dc}}{\partial x^b} + \frac{\partial g_{ab}}{\partial x^c} - \frac{\partial g_{bc}}{\partial x^d} \right\}}$$

Chistoffel symbol is geen Tensor maar een correctie term, is bij platte grond 0, Maar bij hoek liniair is het geen 0

Curvature





Curved Space

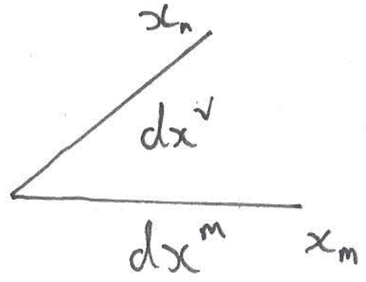
$$[A, B] = AB - BA$$

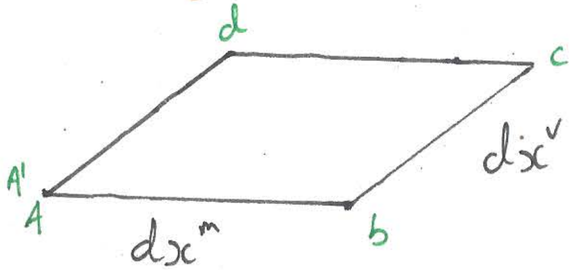
$$\left[\frac{\partial}{\partial x}, f(x)\right] = \frac{\partial f(x)}{\partial x}$$

$$\boxed{\frac{\partial}{\partial x} f(x) V} - f(x) \frac{\partial V}{\partial x}$$

$$\boxed{\partial AB = B\partial a + A\, dB}$$

$$V \frac{\partial f(x)}{\partial x} + \cancel{f x \frac{dV}{dx}} - \cancel{f(x) \frac{dV}{dx}}$$





$(V_c - V_d) - (V_B - V_A) =$ Verschil in dx_m

$(V_c - V_b) - (V_d - V_{A'}) =$ Verschil in dx_v

$V_A - V_{A'} = \partial V$

Verschil in Vector als je parralel rond de vorm gaat

$$V_c - V_d = \frac{\partial V}{\partial x^m} dx^m V \Rightarrow \nabla_m dx^m V$$

$$(V_c - V_d) - (V_B - V_A) = \nabla_v dx^v \nabla_m dx^m V$$

$$(V_c - V_B) - (V_d - V_{a'}) = \nabla_m dx^m \nabla_v dx^v V$$

$$\partial V = \nabla_v \nabla_m dx^v dx^m V - \nabla_m \nabla_v dx^m dx^v V$$

$$= dx^m dx^v V (\nabla_v \nabla_m - \nabla_m \nabla_v)$$

$$[\nabla_v - \nabla_m]$$

$$\frac{\partial}{\partial x^v}$$

$$\nabla_v = \partial_v + \Gamma_v$$

$$[\nabla_v, \nabla_m] =$$

$$(\partial_v + \Gamma_v)(\partial_m + \Gamma_m) - (\partial_m + \Gamma_m)(\partial_v + \Gamma_v)$$

$$(\partial_v \partial_m + \Gamma_v \partial_m + \partial_v \Gamma_m + \Gamma_v \Gamma_m)$$

$$-(\partial_m \partial_v + \partial_m \Gamma_v + \Gamma_m \partial_v + \Gamma_m \Gamma_v)$$

$$= 0 \quad - [\partial_m, \Gamma_v] + [\partial_v, \Gamma_m] + [\Gamma_v + \Gamma_m]$$

$$\frac{\partial \Gamma_v}{\partial x^m} \qquad \frac{\partial \Gamma_m}{\partial x^v}$$

$$\partial V = \partial x^m \partial^v V \underbrace{[\nabla_v, \nabla_m]}_{R_{mv}}$$

Riemann Tensor

Ricci Tensor

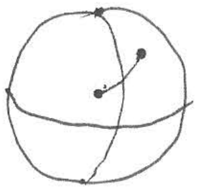
$$R_{mv} \rightarrow R$$

Scalar

1:38

Stress Energy Momentum Tensor

τ = eigen tijd



geodecic

$$\frac{dx^m}{d\tau}$$

$$\nabla \frac{dx^m}{d\tau} = \frac{\partial}{\partial\tau}\frac{\partial x^m}{\partial\tau} + \Gamma(\quad) = 0$$

$$\frac{\partial^2 x^m}{\partial\tau^2} = -\Gamma$$

$F = ma \qquad a = \frac{F}{m}$

$\Gamma = F$

$$\boxed{\Gamma = \frac{1}{2} g^{ad}\left(\frac{\partial g_{dc}}{\partial x^b} + \frac{\partial g_{Ab}}{\partial x^c} \quad \frac{\partial g_{bc}}{\partial x^d}\right)}$$

$\frac{\partial g_{00}}{\partial x}$ – Tijd

$$\Gamma = \frac{1}{2}\frac{\partial g_{00}}{\partial x} \equiv F$$

$$\boxed{F = -\frac{\partial\phi}{\partial x} \qquad \phi = -mgx \qquad F = \frac{-d\phi}{\partial x} = mg}$$

Newtonian

$g_{00} = 2\phi + \text{Constant}$

$F = \frac{-\partial\phi}{\partial x} \Rightarrow -\nabla\phi \qquad \nabla = \frac{\partial}{\partial x_1} + \frac{\partial}{\partial x_2} + \frac{\partial}{\partial x_3}$

$F = -\frac{GM_m}{r^2}$

$F = \frac{-Gm}{r^2}$

Divergence theorem

$\int_{area} F.\partial A = \int_{vol} \nabla F \partial V$

↑ Flux door buiten door area

↑ inhoud integraal ∇ Force ∂ Vector

$\int F.\partial A$

$\int -\frac{Gm}{r^2} = \frac{-Gm}{\cancel{r^2}} 4\pi \cancel{r^2}$

$= -Gm4\pi$

$\rho = \frac{m}{V}$

$m = \int \rho \partial V \quad -4\pi G \quad \int \rho \partial V = \int \nabla F \partial V$

$\nabla F = -4\pi G\rho$

$$F = -\nabla \emptyset$$

$$\nabla F = -4\pi G\rho$$

$$\nabla - \nabla\emptyset = -4\pi G\rho$$

$$\nabla^2 \emptyset = 4\pi G\rho$$

$$g_{00} = 2\emptyset + \text{Constant}$$

$$\emptyset = \frac{1}{2} g_{00}$$

$$\nabla^2 \frac{1}{2} g_{00} = 4\pi G\rho$$

$$\nabla^2 g_{00} = 8\pi G\rho$$

$$G_{MV} = 8\pi G\, T_{MV}$$

$$p = m\left(\underset{\downarrow\, mc^2}{\frac{x_0}{T}}\ \underset{\downarrow\, mv_x}{\frac{x_1}{T}}\ \underset{\downarrow\, mv_y}{\frac{x_2}{T}}\ \underset{\downarrow\, mv_z}{\frac{x_3}{T}}\right)$$

T_{MV}

T_{00}	T_{01}	T_{02}	T_{03}
T_{10}	T_{11}	T_{12}	T_{13}
T_{20}	T_{21}	T_{22}	T_{23}
T_{30}	T_{31}	T_{32}	T_{33}

Tyd	Energie flow		
Momentum dichtheid	Momentum Flux Stress druk		

$$\frac{E}{Vol} = \frac{Wk}{Vol} = \frac{F \times L}{L^3} = \frac{F}{L^2} = \frac{F}{A}$$

$$R_{mv} = \boxed{8\pi G T_{mv}}$$

Mass

$$\partial T_{mv} = 0$$

$$\partial R_{mv} \neq 0$$

$$\boxed{\nabla T_{mv} = 0}$$

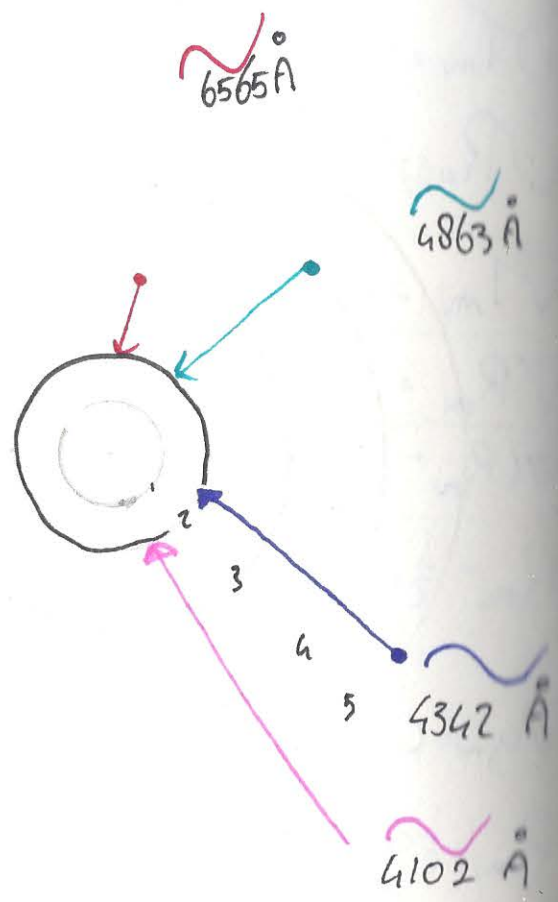
$$\nabla R_{mv} = \frac{1}{2} \nabla g_{mv} R$$

$$\boxed{\nabla\left(R_{mv} - \frac{1}{2} g_{mv} R\right) = 0}$$

$$R_{mv} - \frac{1}{2} g_{mv} R = \frac{8\pi G T_{mv}}{c^4}$$

$$\nabla g_{mv} = 0$$

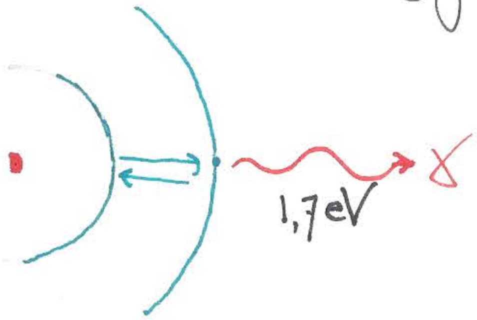
$$\underbrace{R_{mv} - \frac{1}{2} g_{mv} R}_{G_{MV}} + \underbrace{\Lambda g_{mv}}_{\text{Cosmological Constant}} = \frac{8\pi G T_{mv}}{c^4}$$



6565 Å
4863 Å
1
2
3
4
5
4342 Å
4102 Å

Led met 1.7 Volt

Wat is de golflengte



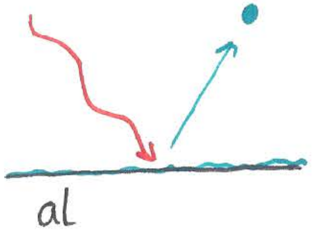
$E = 1{,}7 \times 1{,}6 \cdot 10^{-19} = 2{,}72 \cdot 10^{-19}$ Joule

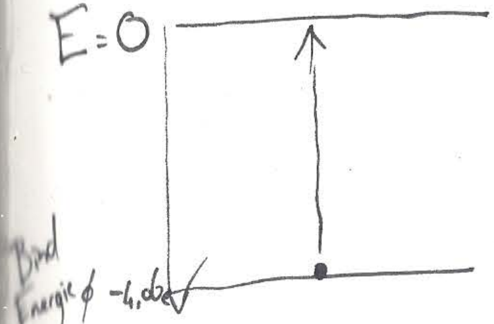
$E = hf = \frac{hc}{\lambda} \Longrightarrow h = \frac{E\lambda}{c} \quad \lambda = \frac{E}{hc}$

$\lambda \approx 7 \cdot 10^{-7}$

Aluminium $\varphi = 4{,}06$ eV

Wat is de frequentie die voor fotoelektrisch effect zorgt





$E = hf$

$E = 4{,}06 \times 1{,}6 \cdot 10^{-19}$ J

$f = \frac{E}{h}$

$f = 10{,}3 \cdot 10^{14}$ Hz

Hogere frequentie maakt de elektron los van de rest van het atoom

De rest energie word Kinetische Energie

Mooie formules

$$h = \frac{4\pi F_{max} R_c^2}{l_e} = \frac{e^2}{4\varepsilon_0 l_e} \qquad \varepsilon_0 = \frac{1}{\mu_0 C^2}$$

$$e^2 = 16\pi F_{max} \varepsilon_0 R_c^2 \qquad \hbar = \frac{2 F_{max} R_c^2}{l_e}$$

$$\varepsilon_0 = \frac{e^2}{16\pi F_{max} R_c^2}$$

$$R_e = 2R_c = a_0 \alpha^2 = \frac{\lambda_e}{2\pi}\alpha = \frac{e^2}{4\pi \varepsilon_0 M_e C^2} = \frac{e^2}{8\pi \varepsilon_0 F_{max} R_c}$$

$$E_e = 2 F_{max} R_c$$

$$G = \frac{m_e^2}{\hbar c \alpha_g} = \frac{\alpha F_{max} l_p^2}{m_e^2} \qquad q_p = \frac{e^2}{\alpha}$$

$$\alpha = \frac{l_e e^2}{8\pi \varepsilon_0 R_c^2 c F_{max}}$$

$$\alpha_g = t_p^2 \omega_c^2$$

$$\alpha_g = \frac{m_e^2}{m_p^2}$$

$$K_j = \frac{2e}{h} = \frac{f}{U} \qquad l_p = \sqrt{\frac{\hbar G}{c^3}} = \lambda_e \frac{\sqrt{\alpha_g}}{2\pi}$$

$$h = \frac{8\alpha}{\mu_0 c K_j^2} \qquad T_p = \sqrt{\frac{\hbar G}{c^5}} \qquad M_p = \sqrt{\frac{\hbar c}{G}}$$

$$\lambda_e = \frac{2\pi c R_c}{l_e} = \frac{4\pi F_{max} R_c^2}{l_e M_e C}$$

$$e = \sqrt{\frac{2\alpha h}{\mu_0 c}} \Rightarrow e = \sqrt{\frac{4 l_e h}{\mu_0 C^2}} + h = \frac{4\pi F_{max} R_c^2}{l_e}$$

$$\to e = \sqrt{\frac{16\pi F_{max} R_c^2}{\mu_0 C^2}} \qquad \alpha_g = \frac{l_e^2 t_p^2}{R_c^2}$$

$$\alpha = \frac{\lambda_e}{4\pi R_c} = \frac{\omega_c R_c}{c} \qquad c = \frac{1}{\sqrt{\varepsilon_0 \mu_0}}$$

$$l_p = \frac{\lambda_e l_e t_p}{2\pi R_c} \qquad \alpha_g = \frac{F_{max} t_p^2}{a_0 M_e}$$

duidelyk uit te leggen

$$G = \frac{c_e C^3 t_p^2}{R_c M_e}$$

$$l_p = \lambda_e \frac{\sqrt{\alpha_g}}{2\pi}$$

Klassiek Atoom model

$$E = \frac{Q^2}{4\pi\varepsilon_0}\left(\frac{1}{x}\right) \qquad E_e = m_e c^2 = F_{max} R_e$$

$$m_e c^2 = \frac{e^2}{4\pi\varepsilon_0 R_e}$$

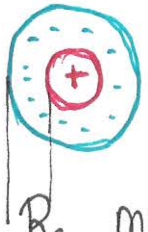
$$R_e = \frac{e^2}{4\pi\varepsilon_0 m_e c^2}$$

$$\boxed{\begin{aligned} r_e &= f \cdot \lambda \\ c &= \frac{\varepsilon_0 A}{} \\ E &= \frac{\hbar\omega}{2c} \end{aligned}} \Rightarrow \boxed{\begin{aligned} C &= \frac{\varepsilon_0 \lambda^2}{0{,}5\lambda} \\ E &= \frac{e^2}{4\varepsilon_0 r_e} \cdot f \end{aligned}}$$

$$A = \frac{I}{4\pi}\mu A V \qquad \frac{h}{2\pi} =$$

$\frac{F_{max}}{c^2}$ = de factor tussen R_e en M_e

$V = \omega R$



R_e met $\omega_c = 2 f_e$

R_c met $\omega_c = f_e$

$\psi = e^{i(kx-\omega t)}$

$i = \sqrt{-1}$ $i^2 = -1$

$\cancel{\psi} e^{i\alpha x} = \cos\alpha x + i \sin \alpha x$

$\cos(0) = 1$

$\psi = \cos(Kx - \omega t)$ ← als 0 is is mog

$K = \frac{2\pi}{\lambda_e}$ $Kx = \omega t$ $\frac{x}{t} = \frac{\omega}{K} = V$

$\cos\left(\frac{2\pi}{\lambda_e}\right)$

$\omega = 2\pi f$ $K = \frac{2\pi}{\lambda}$

$\frac{\omega}{K} = \frac{2\pi f \lambda}{2\pi} = f\lambda = V$

$\lambda = \frac{h}{p}$

$P = mV$

$K = \frac{2\pi}{\lambda} = \frac{2\pi p}{h} = \frac{p}{\hbar}$

$P = K\hbar$

$\psi = e^{i(kx-\omega t)}$

ψ: Wave function

$\psi = e^{i(kx-\omega t)}$

K =

x

ω

t

potentiele Energie

$E\psi = \frac{-\hbar^2}{2m}\frac{d^2\psi}{dx^2} + \boxed{V\psi}$

$E\psi = \frac{-\hbar^2}{2m}\boxed{\frac{\partial^2\psi}{\partial x_1^2} + \frac{\partial^2\psi}{\partial x_2^2} + \frac{\partial^2\psi}{\partial x_3^2}} +$

xyz

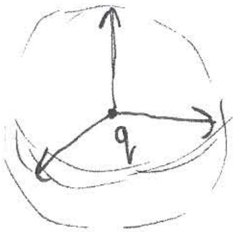
$\boxed{\frac{-Ze^2}{4\pi\varepsilon_0 R}}$ ← pdar

$e = 2{,}71828$ $e^x = 1 + \frac{x}{1} + \frac{x^2}{2} + \frac{x^3}{3} + \ldots$

$\frac{\partial}{\partial x}(e^{Ax}) = Ae^{ax}$ $\int e^{ax}\,\partial x = \frac{1}{A}e^{Ax} + C$

Maxwell

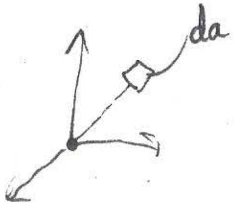
$$F_{orce} = \frac{Qq}{4\pi\varepsilon_0 r^2}$$



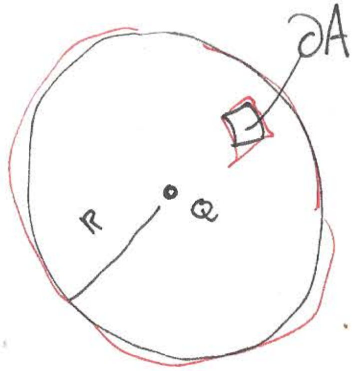
$$E_{Field} = \frac{Q}{4\pi\varepsilon_0 r^2}$$

$$F = Eq$$

E = Newton/coulomb



$$d\phi = E\,dA$$
$$= E \cdot dA \cos\theta$$



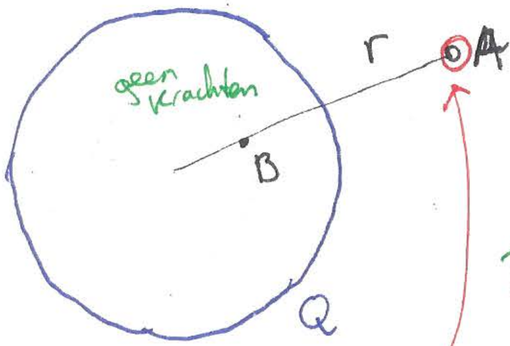
$$\partial\phi = E\,dA$$
$$\phi = \int E \cdot dA$$
$$= E\,4\pi R^2$$
$$\phi = \frac{Q}{4\pi\varepsilon_0 r^2}\; 4\pi r^2$$
$$\phi = \frac{\Sigma Q}{\varepsilon_0}$$

$$\boxed{\phi = \oint E \cdot \partial A = \frac{\Sigma Q}{\varepsilon_0}}$$

Hele opp van bal

1

Gouse Wet



B ⇒ E = 0

$$\phi = \oint E \cdot \partial A = \frac{\Sigma Q}{\varepsilon_0} = \frac{Q}{\varepsilon_0}$$

$$E\,4\pi r^2 = \frac{Q}{\varepsilon_0}$$

$$\boxed{E = \frac{Q}{4\pi r^2 \varepsilon_0}}$$

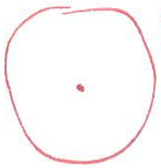
① $E = KE + PE$

$$E = \frac{1}{2}mv^2 - \frac{Ze^2}{4\pi\varepsilon_0 R}$$

② $\frac{mv^2}{r} = \frac{Ze^2}{4\pi\varepsilon_0 r^2}$

centrifugaal

③



$$\psi = e^{ik\cancel{x}}$$

$$\psi = e^{ik(x+L)}$$

$$v^2 = \frac{n^2h^2}{4\pi^2 M^2 R^2}$$

$$\frac{m}{r}\,\frac{n^2h^2}{4\pi^2 m^2 R^2} = \frac{Ze^2}{4\pi\varepsilon_0 r^2}$$

a_0

$$r = \frac{mN^2h^2}{4\pi^2 m^2}\,\frac{4\pi\varepsilon_0}{Ze^2} = \left[\frac{\varepsilon_0 h^2}{\pi m e^2}\right]\frac{n^2}{Z}$$

$$\times\frac{R}{2} \longrightarrow \frac{1}{2}mv^2 = \frac{Ze^2}{8\pi\varepsilon_0 r}$$

$$E_e = \frac{Ze^2}{8\pi\varepsilon_0 r} - \frac{Ze^2}{4\pi\varepsilon_0 r} = \frac{-Ze^2}{8\pi\varepsilon_0 r}$$

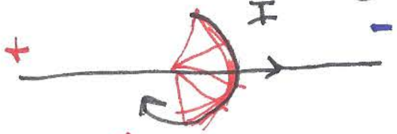
$$E_e = \frac{-Ze^2}{8\pi\varepsilon_0}\,\frac{\pi mc^2}{\varepsilon_0 h^2}\,\frac{Z}{n^2}$$

$$E_e = -\left(\frac{M_e e^4}{8\varepsilon_0^2 h^2}\right)\frac{Z^2}{N^2}$$

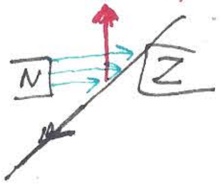
R_∞

Elektromagnetisme

Magnetisch Veld = flux dichtheid in tesla



schroeven draaier



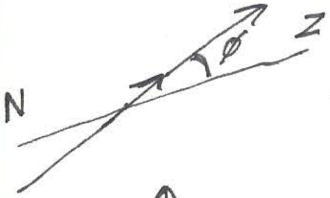
Flemings Linkerhand regel

↑ motion
↗ Field
↘ Lading

Veld Van Noord Naar Zuid

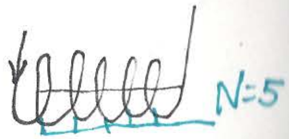
Force = BIL

B = magnetisch Veld Sterkte
I = Lading
L = Lengte in Magnetish Veld

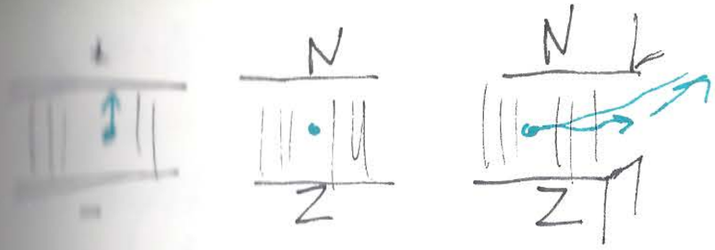


$F = BIL \cos \varnothing$

$B = \frac{\mu_0 I}{2\pi R}$



$B = \mu_0 N I$



$F = BIL$ $\quad I = \frac{Q}{t}$

$I = \frac{QV}{L}$ $\quad F = BQV$

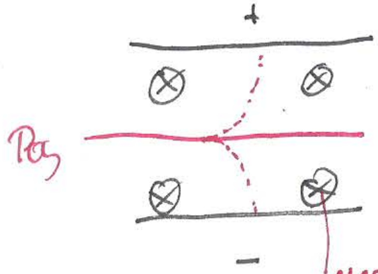
Mag Veld | Lading | Snelheid

$F = BqV$

$F = \frac{mv^2}{R}$

$BqV = \frac{mv^2}{r}$

$r = \frac{mv}{Bq}$



Magnetis Veld in papier

Golfvergelijking

$$\frac{\partial^2 \phi}{\partial t^2} = c^2 \left(\frac{\partial^2 \phi}{\partial x_1^2} + \frac{\partial^2 \phi}{\partial x_2^2} + \frac{\partial^2 \phi}{\partial x_3^2} \right)$$

Standaard golfvergelijking

Simpel versie

$$\frac{\partial^2 \phi}{\partial t^2} = \frac{1}{c^2} \left(\frac{\partial^2 \phi}{\partial x^2} \right)$$

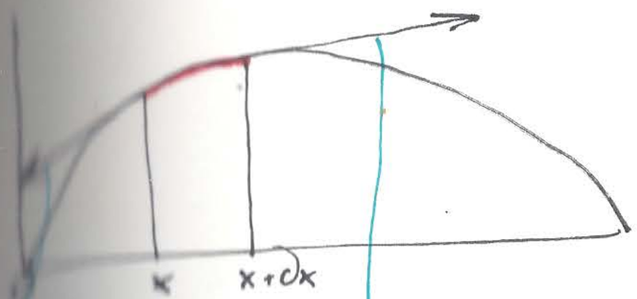
$F = m \cdot A$

$m = \rho \, \partial x$

Massa = dichtheid × verschil(x)

Spanning = T in Newtons

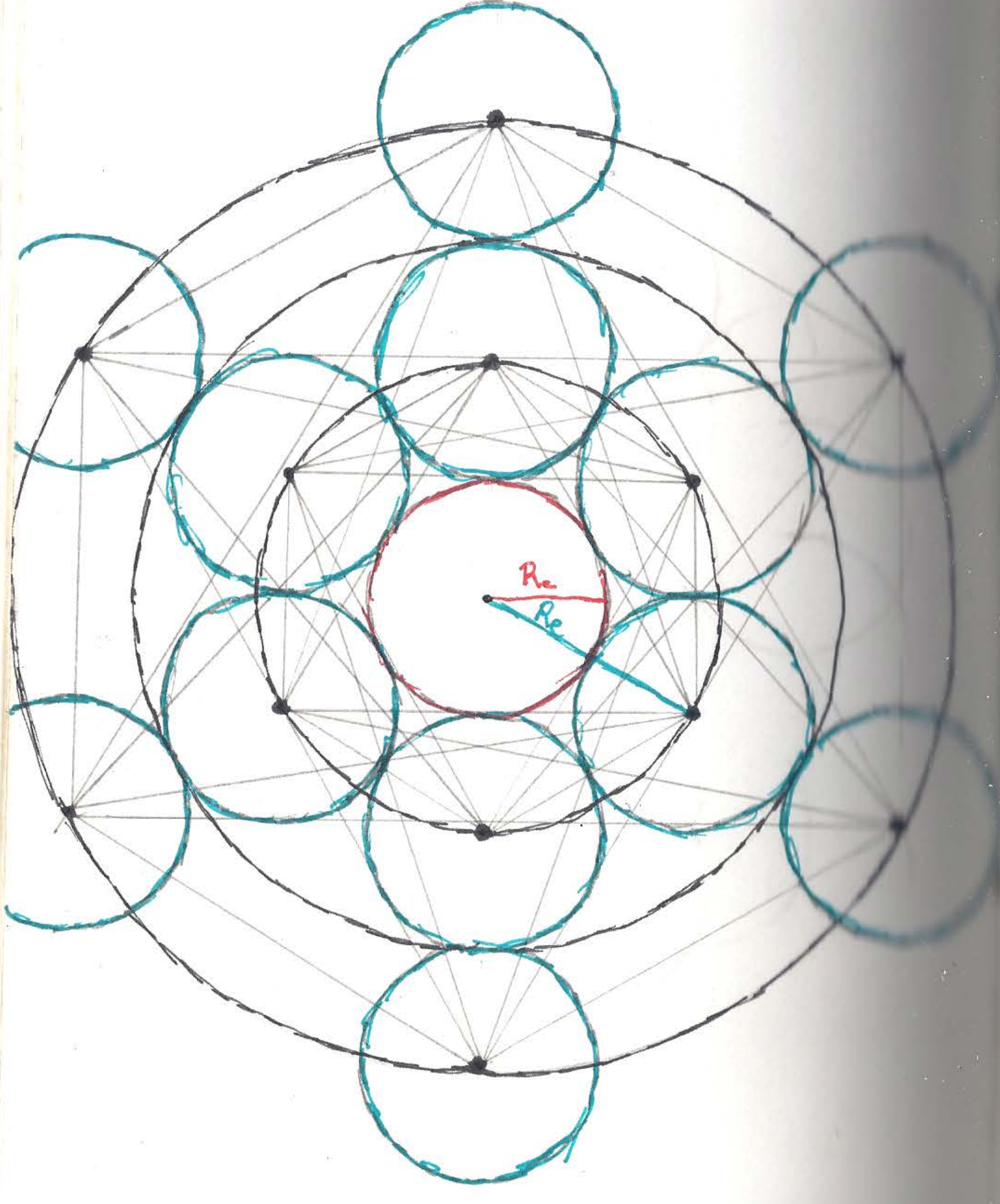
dichtheid = ρ in Kg/meter



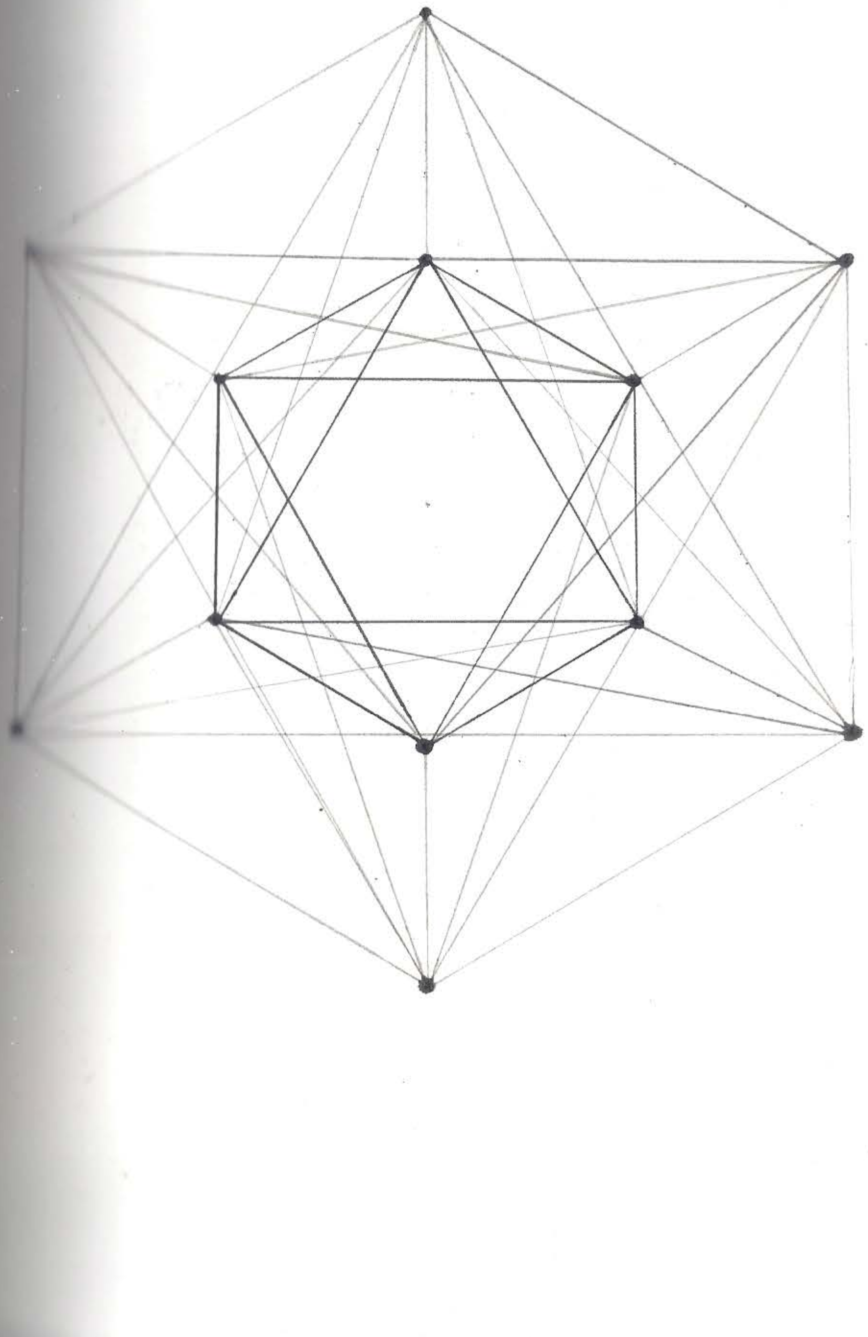
$$\frac{T \, d f(x)}{\partial x} \qquad \frac{T \, \partial f(x+\partial x)}{\partial x}$$

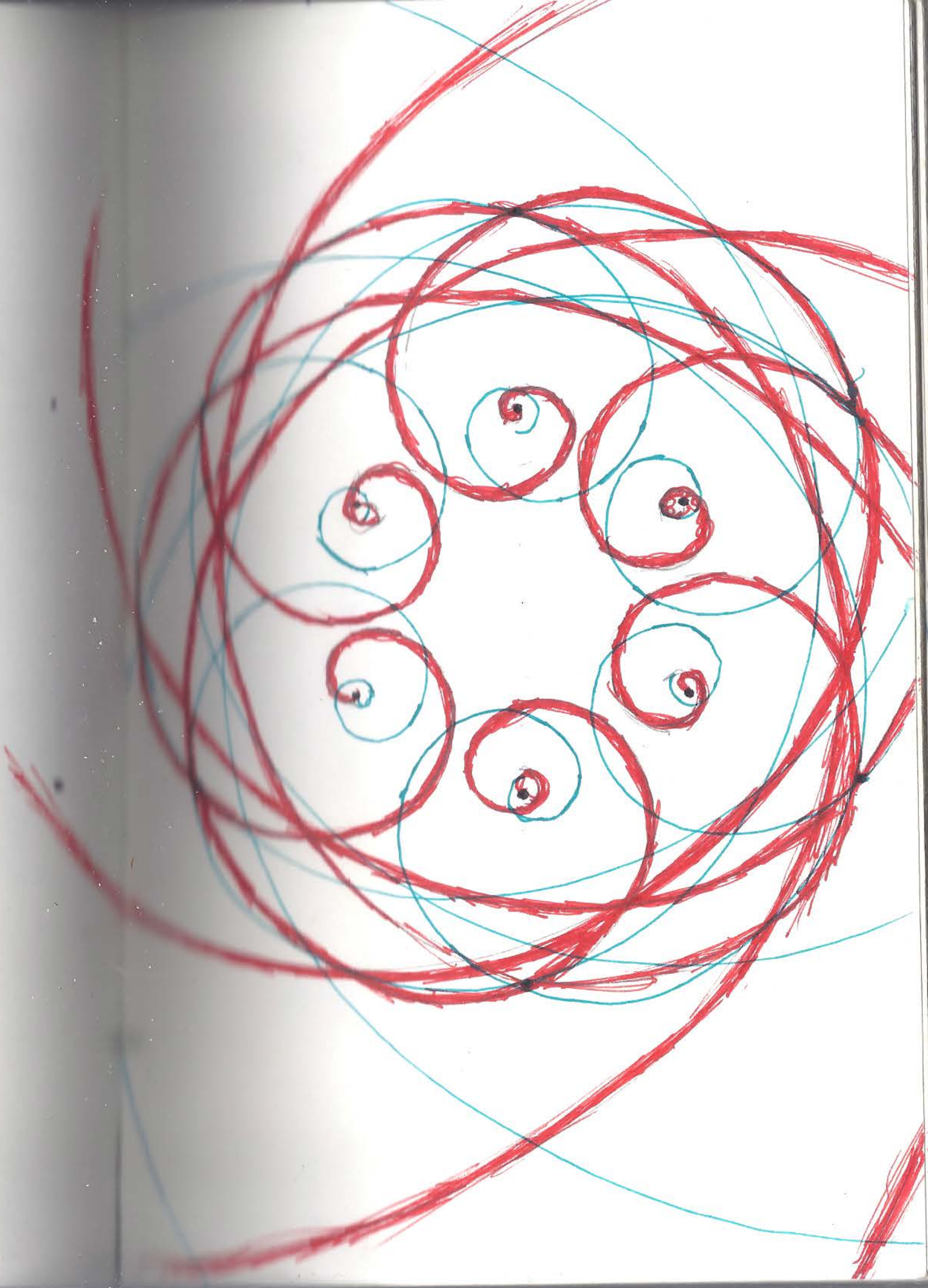
ϕ

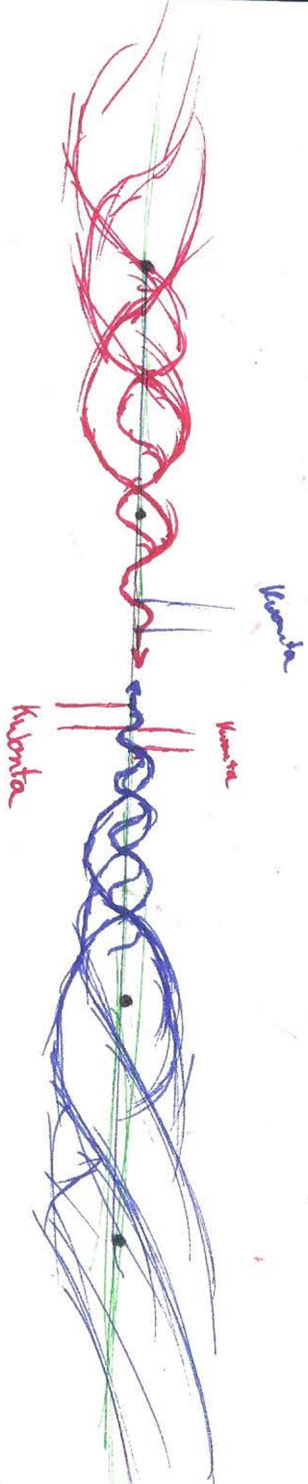
$$F = \frac{\partial^2 f(x,t)}{\partial x^2} \partial x = \rho \, \partial x \frac{\partial^2 \cancel{\phi}}{\partial t^2}$$

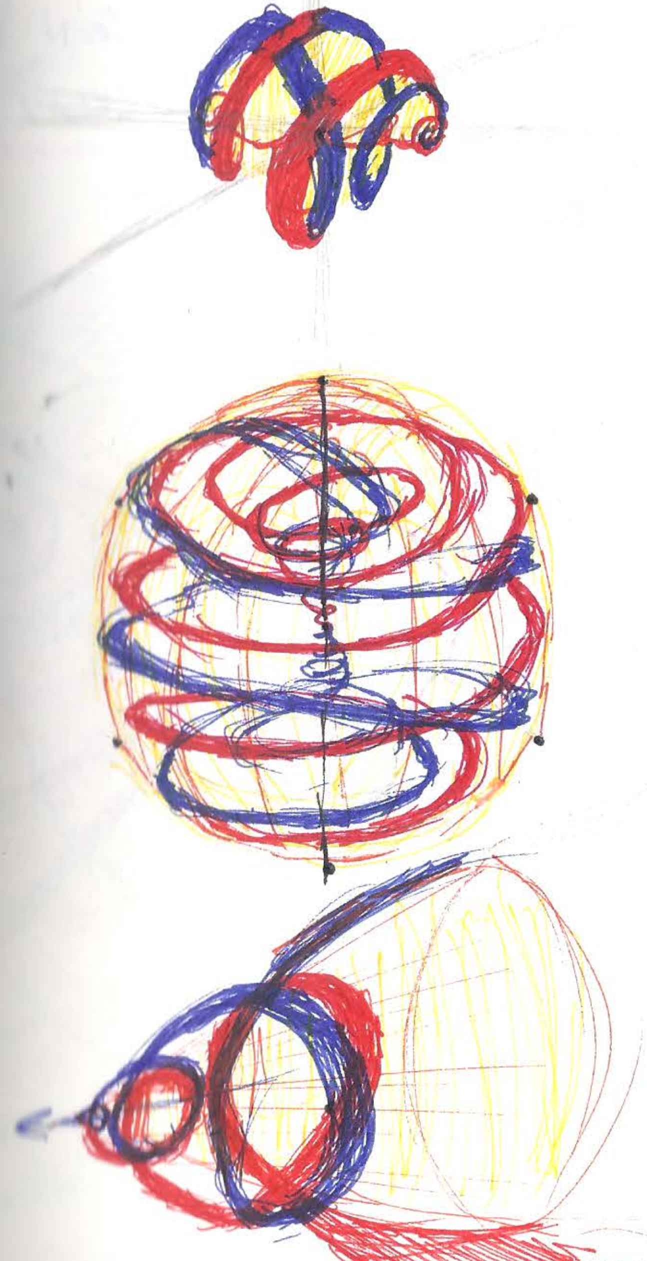


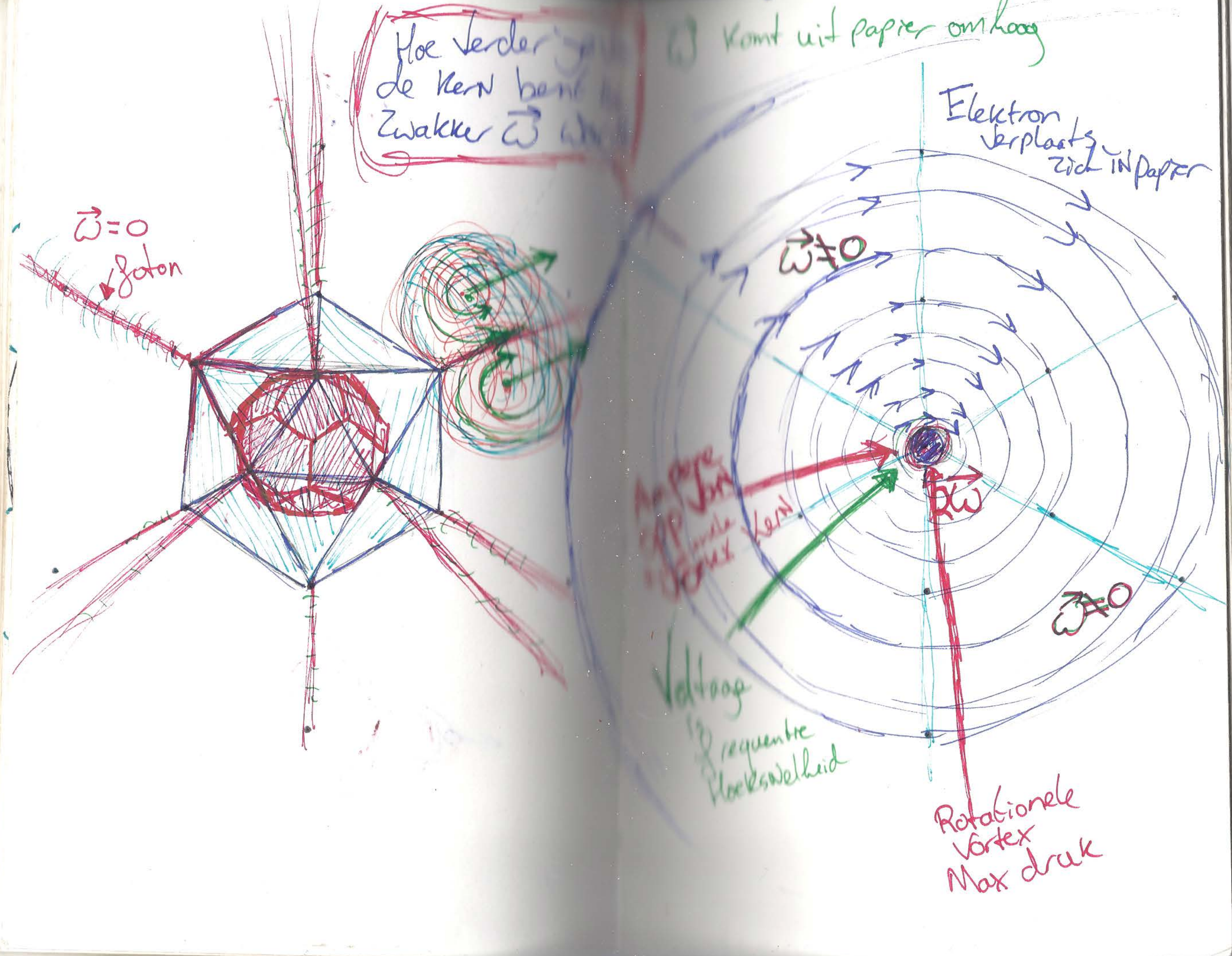
Kubus Van Metatron



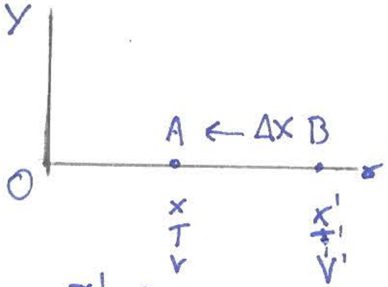



Kubonta





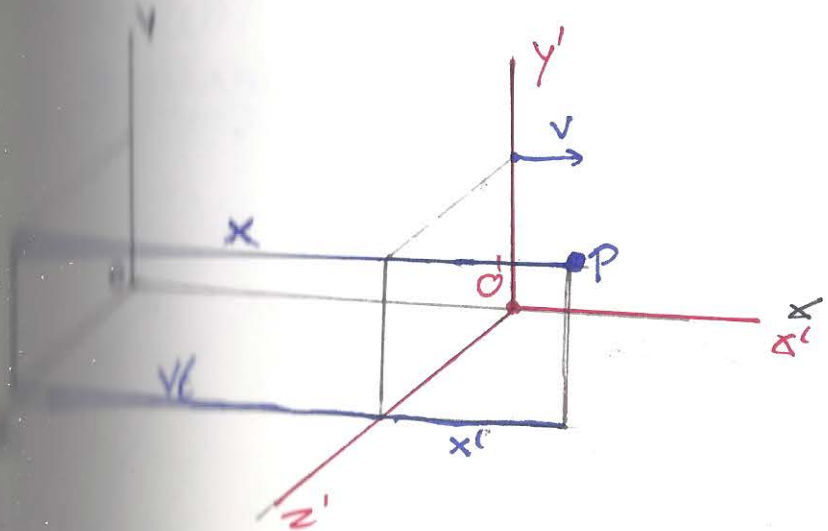
Hoe verder je
de kern bent
Zwakker ω
ω = 0
foton
ω komt uit papier omhoog
Elektron verplaatst zich IN papier
ω≠0
ω≠0
Veltooge frequentie Hoeksnelheid
Rotationele Vortex Max druk



$$V_{gem} = \frac{x'-x}{t'-t} = \frac{\Delta x}{\Delta t} \qquad V = \frac{dx}{dt}$$

$$a_{gem} = \frac{V'-V}{t'-t} = \frac{\Delta V}{\Delta t} \qquad a = \frac{dv}{dt}$$

$$a = \frac{dv}{dt} = \frac{d}{dt}\left(\frac{dx}{dt}\right) = \frac{d^2x}{dt^2}$$



$$x' = x - vt$$
$$y' = y$$
$$z' = z$$

$$t' = t - \frac{vx}{c^2}$$

$$x' = \frac{x - vt}{\sqrt{1 - v^2/c^2}}$$

$$t' = \frac{t - \frac{v}{c^2}x}{\sqrt{1 - v^2/c^2}}$$

$$\beta = \frac{v}{c} \qquad \tau = ct$$

$$x' = \gamma(x\,\beta\tau)$$

$$t' = \gamma(t\,\beta x)$$

$$\gamma = \frac{1}{\sqrt{1-\beta^2}}$$

Wat betekendt α_g

$$\alpha_g = \frac{G M_e^2}{\hbar c} \qquad G = \frac{F_{max}\, \alpha\, (c t_p)^2}{M_e^2}$$

uit de boeken — uit mijn fantasie

$$\alpha_g = \frac{F_{max}\left(\frac{2\Gamma_e}{c}\right) c^2 t_p^2 M_e^2}{M_e^2\, \hbar c} = \frac{2F_{max}\,\Gamma_e\, t_p^2}{\hbar}$$

$$\hbar = \frac{2F_{max} R_c^2}{\Gamma_e}$$

$$\alpha_g = \frac{2F_{max}\,\Gamma_e\, t_p^2}{\left(\frac{2F_{max} R_c^2}{\Gamma_e}\right)} = \frac{\Gamma_e^2\, t_p^2}{R_c^2} = \omega^2 t_p^2$$

Γ_e^2 = omwentelingsnelheid

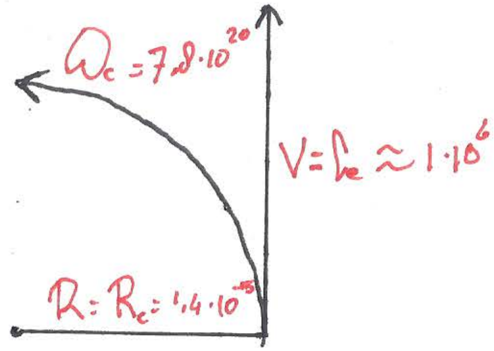
$$\alpha_g = \frac{F_{max}}{a_0 M_e} t_p^2$$

R_c^2 = Radius

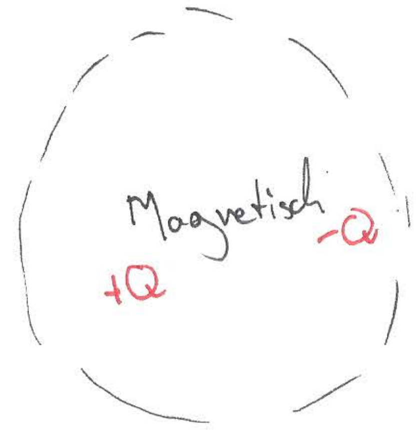
t_p^2 = tijd

$V = \omega R$ Rotatie Snelheid = Hoeksnelheid · Radius

α_g is het ontstaan van massa op een bepaalde Radius in de geëxiteerde staat voor $1\, t_p$



$\text{Tijd} = T_p = 5{,}3 \cdot 10^{-44}$



1

$$\boxed{\phi = \oint E \cdot \partial A = \frac{\Sigma Q}{\varepsilon_0}}$$

$$\phi_b = \oint B \cdot \partial A = \Sigma_{mag}$$

Konstant

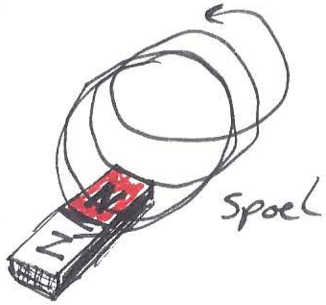
magneet: 0

Noord en Zuid blijven op

$$\boxed{\phi_b = \oint B \cdot \partial A = 0}$$

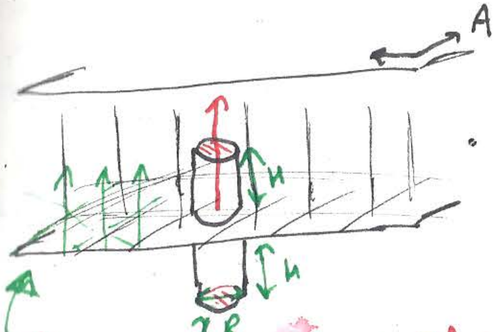
2

Voltage oftewel Emf is afhankelijk van de hoeveelheid flux verschil



$$\mathcal{E}_{mf} \quad \frac{\partial B}{\partial t} A_{rea}$$

$$\mathcal{E}_{mf} = \frac{\partial \phi}{\partial t} = \frac{\partial}{\partial t} B \cdot \partial A$$



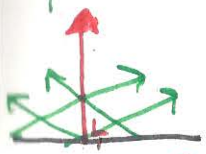
σ = dichtheid Lading

Lading per oppervlakte

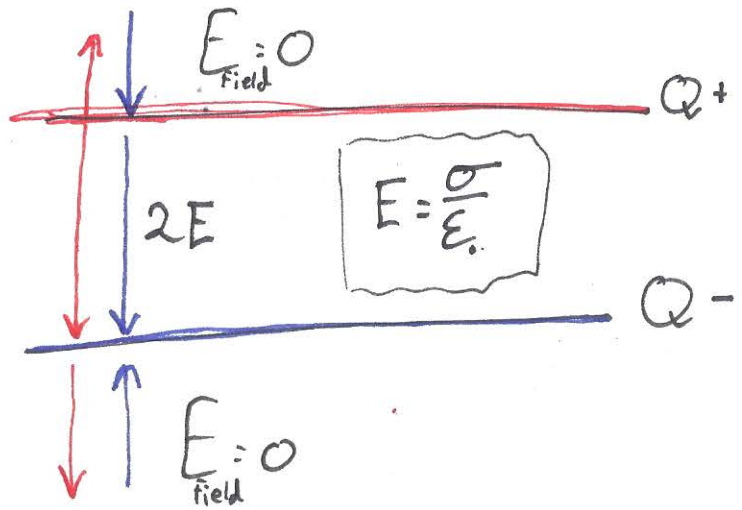
$$E \cdot \partial A = \frac{\Sigma Q}{\varepsilon_0} \qquad \text{Totaal Lading} = \sigma A$$

$$E \cdot 2\pi R^2 = \frac{\sigma \pi r^2}{\varepsilon_0}$$

$$E = \frac{\sigma}{2\varepsilon_0}$$



altijd op



Wat is voltage?

Potential energie op een lading om de lading te verplaatsen van een plek naar andere

Work om vanaf oneindig q naar R te gaan

$PE = Work = Force \cdot distance$

$PE_{\infty} = 0$ $F = \frac{Qq}{4\pi\varepsilon_0 r^2} \cdot R$

$Voltage = \frac{PE}{q} = \frac{Q}{4\pi\varepsilon_0 R}$

Electric field

$E = \frac{Newton}{Coulomb}$

$E = \frac{Voltage}{meter}$

$E_{field} = \frac{Q}{4\pi\varepsilon_0 R^2}$

$V = Er$ of $E = \frac{V}{r}$

$$\boxed{\varepsilon_{emf} = \frac{\partial \phi}{\partial t} = \frac{\partial}{\partial t} \int B \cdot \partial A = \oint E \cdot \partial A}$$

3

n-dimentionale torus

$2N+1 \approx \pm 7$ 3dimentionale torus

Een Vortextorus heeft geen remm als de spannings lijn gelijk loopt met de kern

di Bartini ontdekte dat de meest waarschijnlijke configuratie voor een Vortextorus

$$E = \frac{D}{r} = \frac{1}{4} e^{(6.9996968)} = 274,074996$$

$$E = \frac{R}{r} = \frac{1}{8} e^{(6.9996968)} = 137,0375887 = \alpha$$

D= diameter torus

r = radius torus

$$\vec{V} = c\,\frac{R}{r} = \frac{2c}{E} = 2.187671 \cdot 10^{6}\ m/s$$

De twee Vortex Soorten

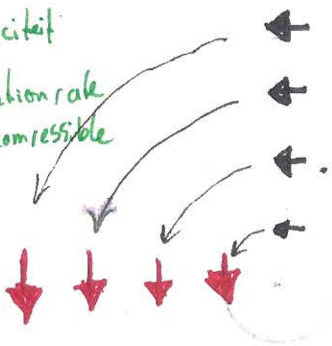
$\nabla \times \vec{V}$ = Vorticiteit   curl of velocity

$\omega_{spin} = \frac{1}{2}$ Vorticiteit

$\nabla \cdot \vec{V}$ = dialation rate

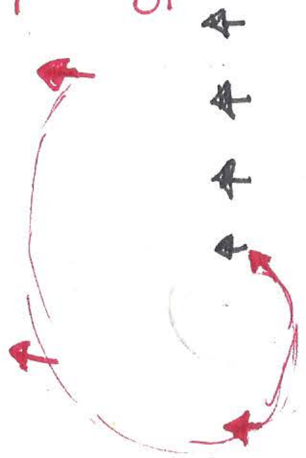
$\nabla \cdot \vec{V} = 0$ = incompressible

$\nabla \times \vec{V}$ = Kruis Vector



Rotational Vortex (vast lichaam)

$$\vec{\omega}_{vorticiteit} = \frac{V_\theta}{r} + \frac{\partial V_\theta}{\partial r} = 2\vec{V}_{omwentelsnelheid}$$



Irrotational Vortex (Vrije Vortex)

$$\vec{\omega} = \frac{V_\theta}{r} + \frac{\partial V_\theta}{\partial r} = 0$$

geen hoek ~~acceleratie~~ rotatie

Flow Velocity in Lamb-Oseen Vortex

$$V_\phi(r,t) = \frac{\Gamma}{2\pi r}\left(1 - e^{\left(\frac{-r^2}{r_c^2(t)}\right)}\right)$$

Velocity

Radiaal

Functie radius tyd

circulatie

Functie Radius Core tyd

$$r_c(t) = \sqrt{4\nu t}$$

viscosity

alternatief

$$V_\phi(r) = V_{\phi max}\left(1 + \frac{0{,}5}{\alpha}\right)\frac{r_c}{r}\left[1 - e^{\left(-\alpha \frac{r^2}{r_c^2}\right)}\right)$$

$\alpha = 1{,}25643$

$$\frac{\partial p}{\partial r} = \rho \frac{v^2}{r}$$

Woodsaxen model

$$V_0(r) = -\frac{V_0}{1 + e\left[\frac{R-r}{a}\right]}$$

$r = 1{,}25A^{\frac{1}{3}}$

$a \approx 0{,}65$ Fm

$R = X$

$$V_\phi = \frac{\Gamma\left(1 - e^{-r^2/(4\nu t)}\right)}{2\pi r}$$

$(\nabla \times \vec{V})$ $\quad \vec{V} = -xy^3\hat{i} + y^4\hat{j}$

$V_x = -xy^3$

$V_y = y^4$

$V_z = 0$

Irrotational Vortex $(\nabla \times \vec{V} = 0)$

$$\vec{\omega} = \frac{1}{2}(\nabla \times \vec{V})$$

ζ = Vorticiteit $= \nabla \times \vec{V}$

$$\nabla \times \vec{V} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ -xy^3 & y^4 & 0 \end{vmatrix} = \left(\frac{\partial V_z}{\partial y} - \frac{\partial V_y}{\partial z}\right)\hat{i} + \left(\frac{\partial V_x}{\partial z} - \frac{\partial V_z}{\partial x}\right)\hat{j} + \left(\frac{\partial V_y}{\partial x} - \frac{\partial V_x}{\partial y}\right)\hat{k}$$

$$= \left(\frac{\partial}{\partial y}(0) - \frac{\partial}{\partial z}(y^4)\right)\hat{i} + \left(\frac{\partial}{\partial z}(-xy^3) - \frac{\partial}{\partial x}(0)\right)\hat{j} + \left(\frac{\partial}{\partial x}(y^4) - \frac{\partial}{\partial y}(-xy^3)\right)\hat{k}$$

$$= (0-0)\hat{i} + (0-0)\hat{j} + (0 - (-3xy^2))\hat{k}$$

$$= \boxed{3xy^2\,\hat{k}}$$ Vorticiteit is niet 0

flow Velocity in Lamb-Oseen Vortex

$$V_\phi(r,t) = \frac{\Gamma}{2\pi r}\left(1 - e^{\left(\frac{-r^2}{r_c^2(t)}\right)}\right)$$

Velocity — Radiaal; Functie radius tyd; circulatie; Functie Radius Core tyd

$$r_c(t) = \sqrt{4\nu t}$$

viscosity

$$V_\phi(r) = V_{\phi max}\left(1 + \frac{0,5}{\alpha}\right)\frac{r_c}{r}\left[1 - e^{\left(-\alpha\frac{r^2}{r_c^2}\right)}\right]$$

alternatief

$\alpha = 1,25643$

Woodsaxen model

$$\frac{\partial p}{\partial r} = \rho\frac{v^2}{r}$$

$$V_0(r) = -\frac{V_0}{1 + e\left[\frac{R - r}{a}\right]}$$

$r = 1,25A^{\frac{1}{3}}$

$a \approx 0,65$ Fm

$R = X$

$$V_\phi = \frac{\Gamma\left(1 - e^{-r^2/(4\nu t)}\right)}{2\pi r}$$

$(\nabla \times \vec{V})$ $\quad \vec{V} = -xy^3\hat{\imath} + y^4\hat{\jmath}$

$V_x = -xy^3$

$V_y = y^4$

$V_z = 0$

Irrotational Vortex ($\nabla \times \vec{V} = 0$)

$\vec{\omega} = \frac{1}{2}(\nabla \times \vec{V})$

ζ = Vorticiteit = $\nabla \times \vec{V}$

$$\nabla \times \vec{V} = \begin{vmatrix} \hat{\imath} & \hat{\jmath} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ -xy^3 & y^4 & 0 \end{vmatrix} = \left(\frac{\partial V_z}{\partial y} - \frac{\partial V_y}{\partial z}\right)\hat{\imath} + \left(\frac{\partial V_x}{\partial z} - \frac{\partial V_z}{\partial x}\right)\hat{\jmath} + \left(\frac{\partial V_y}{\partial x} - \frac{\partial V_x}{\partial y}\right)\hat{k}$$

$$= \left(\frac{\partial}{\partial y}(0) - \frac{\partial}{\partial z}(y^4)\right)\hat{\imath} + \left(\frac{\partial}{\partial z}(-xy^3) - \frac{\partial}{\partial x}(0)\right)\hat{\jmath} + \left(\frac{\partial}{\partial x}(y^4) - \frac{\partial}{\partial y}(-xy^3)\right)\hat{k}$$

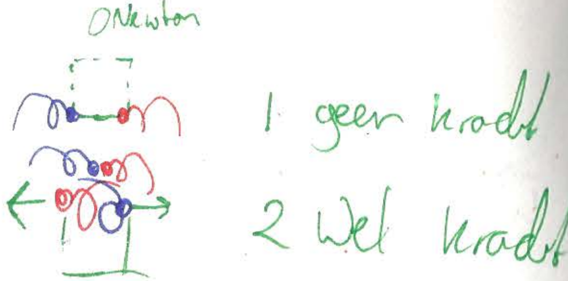
$$= (0-0)\hat{\imath} + (0-0)\hat{\jmath} + (0 - (-3xy^2))\hat{k}$$

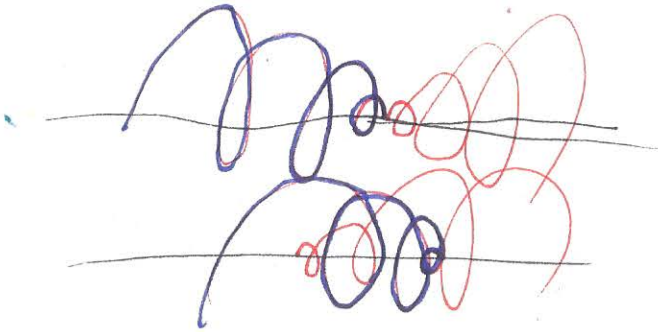
$$= \boxed{3xy^2\,\hat{k}}$$

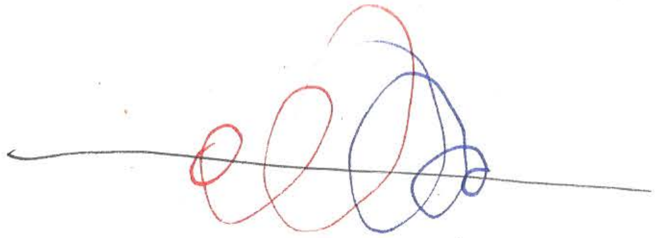
Vorticiteit is niet 0

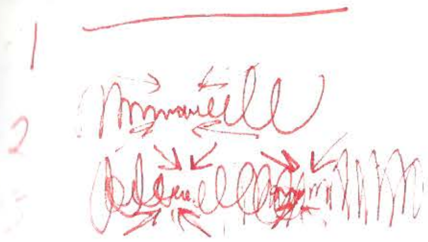
Uit waardse = Radiatie
Inwaards = Magnetisme

Tegengestelde Vortexen stoten elkaar af
Wat wij zien als aantrekking







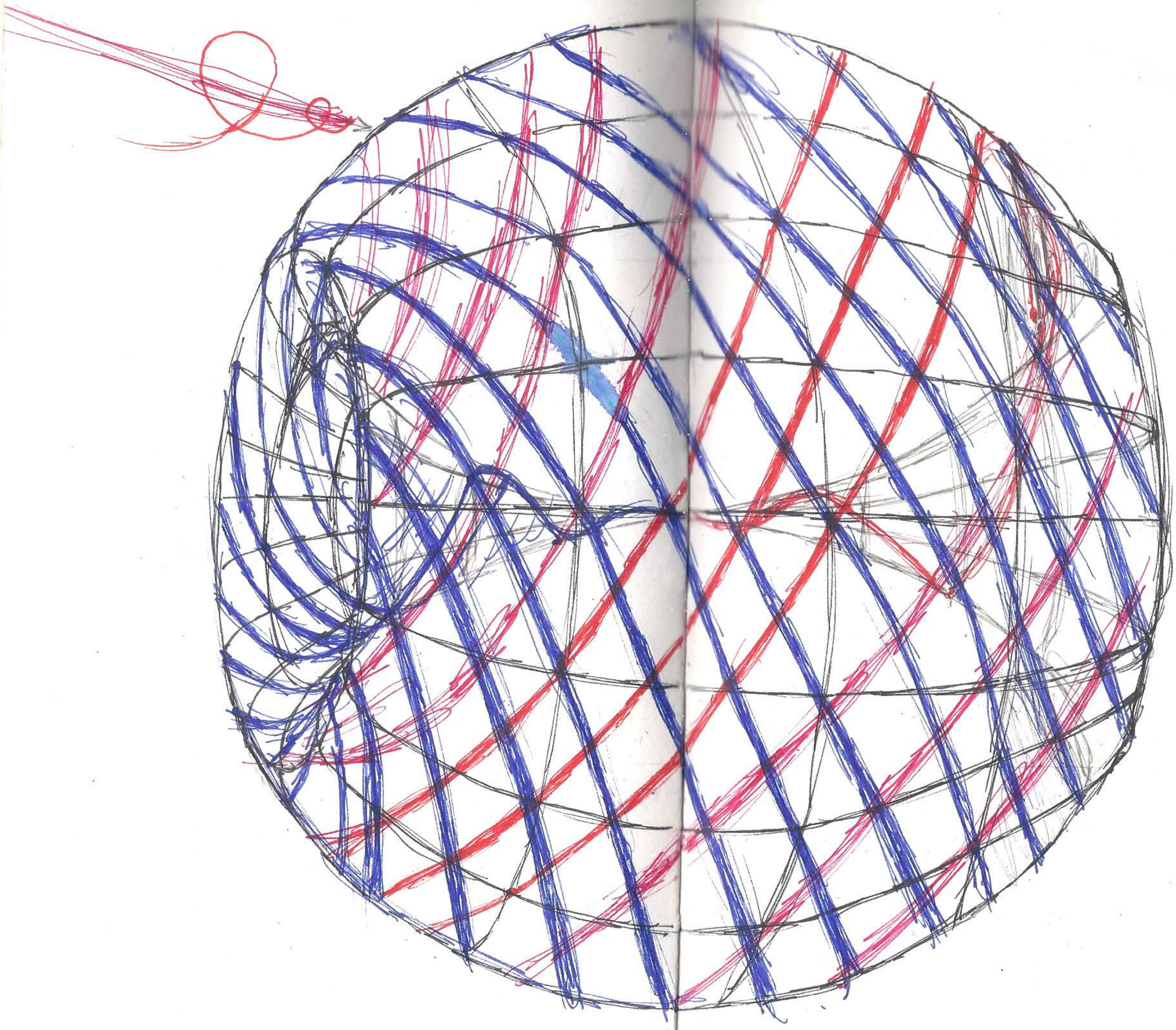


Echte Zwaartekracht is de aantrekking tot Licht

Licht reist niet

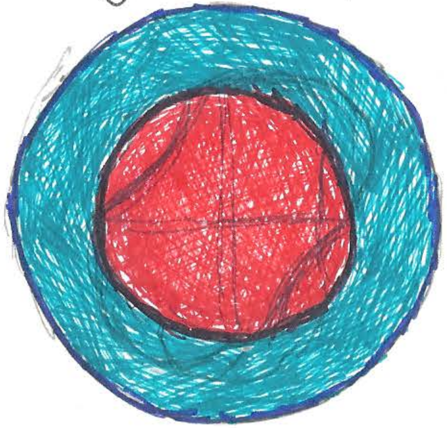
Wij reizen	Wij zijn materie
alle materie beweegt	alles in beweging probeert rust te behalen

Licht = rust

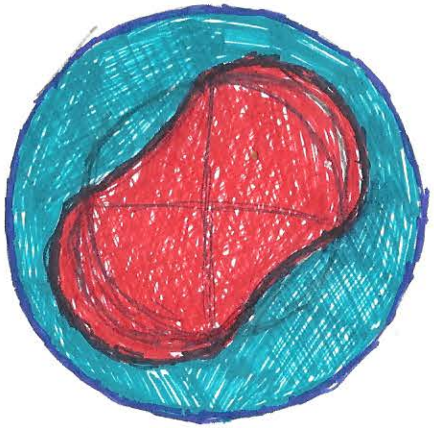


Oh yeah forgot the point

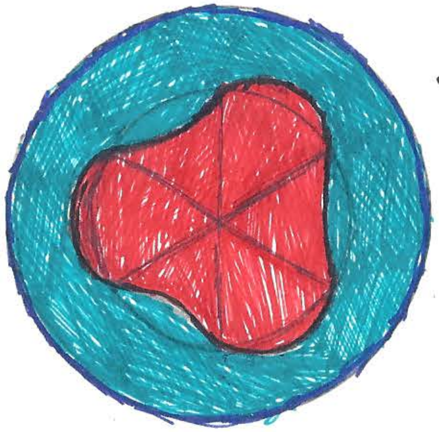
Waterstof Isotopen



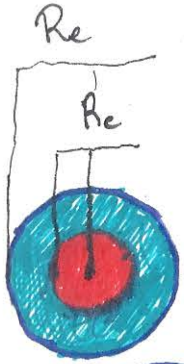
Waterstof



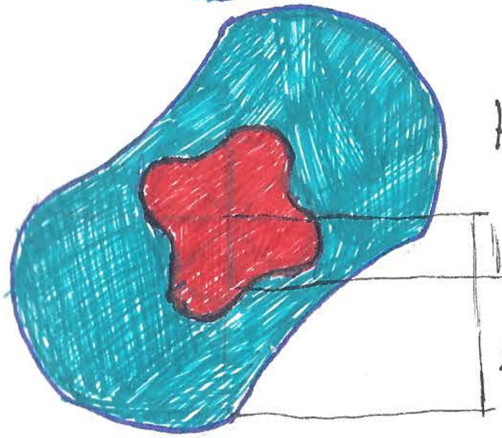
deuterium



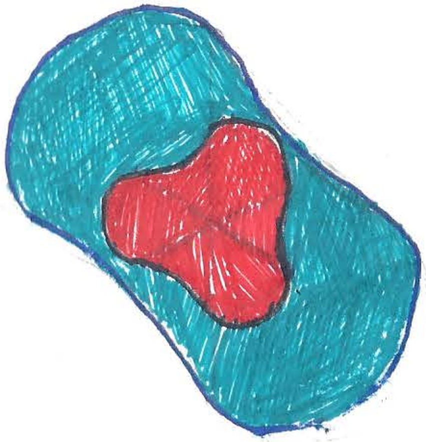
Tritrium



Waterstof



Helium 4



Helium 3

Oude Kwantum theorie Planck

$$E = \frac{R}{N} T$$

R = gasconstante
N = Nummers molecules
T = absolute Temp

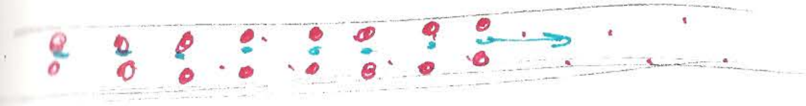
$$\bar{E}_\nu = \frac{L^3}{8\pi \nu^2} P_\nu$$

E_ν = Energie eigenfrequentie ν
L = Lichtsnelheid
ν = frequentie
$P_\nu \partial_\nu$ = Energie per unit volume tussen frequentie ν $\nu + \partial \nu$

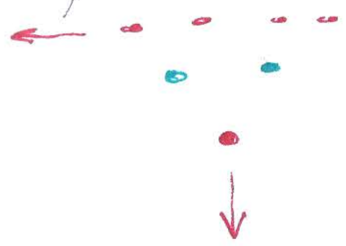
$$\frac{R}{N} T = E = \frac{L^3}{8\pi \nu^2} P_\nu$$

$$P_\nu = \frac{R}{N} \frac{8\pi \nu^2}{L^3} T$$

$$\int_0^\infty P_\nu \, \partial \nu = \frac{R}{N} \frac{8\pi}{L^3} T \int_0^\infty \nu^2 \partial \nu = \infty$$



als je referentieframe gelijk is
worden de afstanden groter en dus
de flux dichtheid kleiner



De Basis -

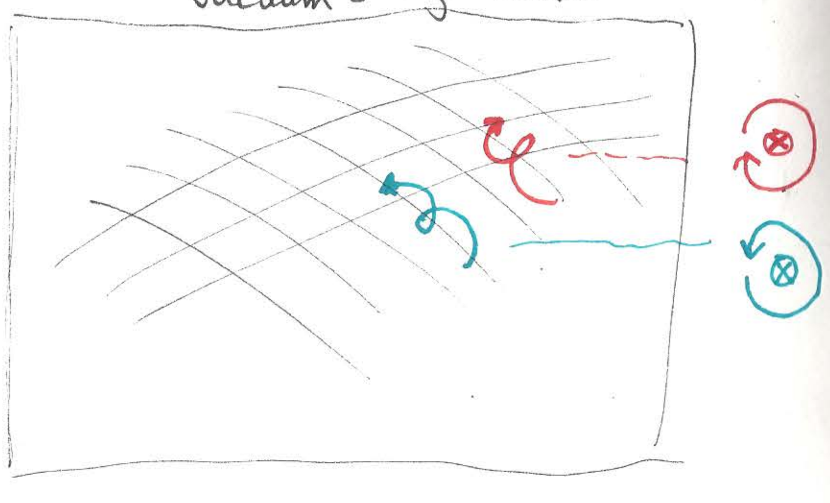
gedachte experiment
Foto-Elektrisch

1 doos Vacuum

2 Licht = golf tijdruimte

3 Stroom = Complementaire Golf tijdruimte

Vacuum = tijdruimte

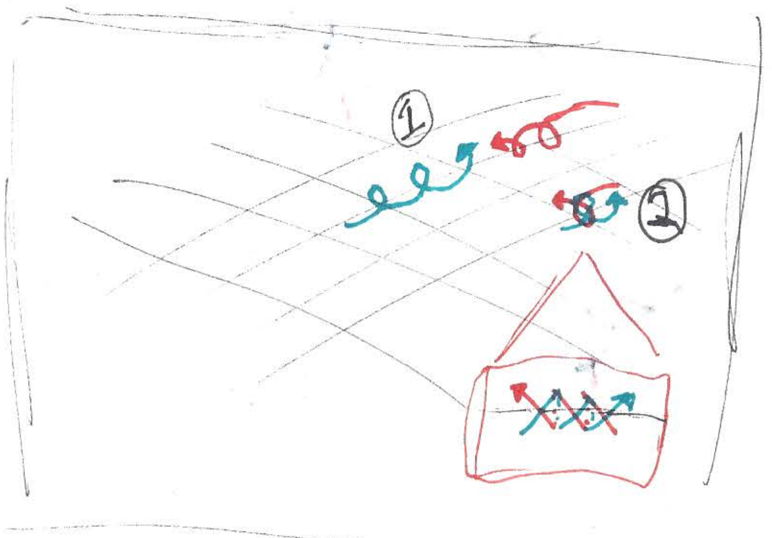


Massa -

Roteerende Lading

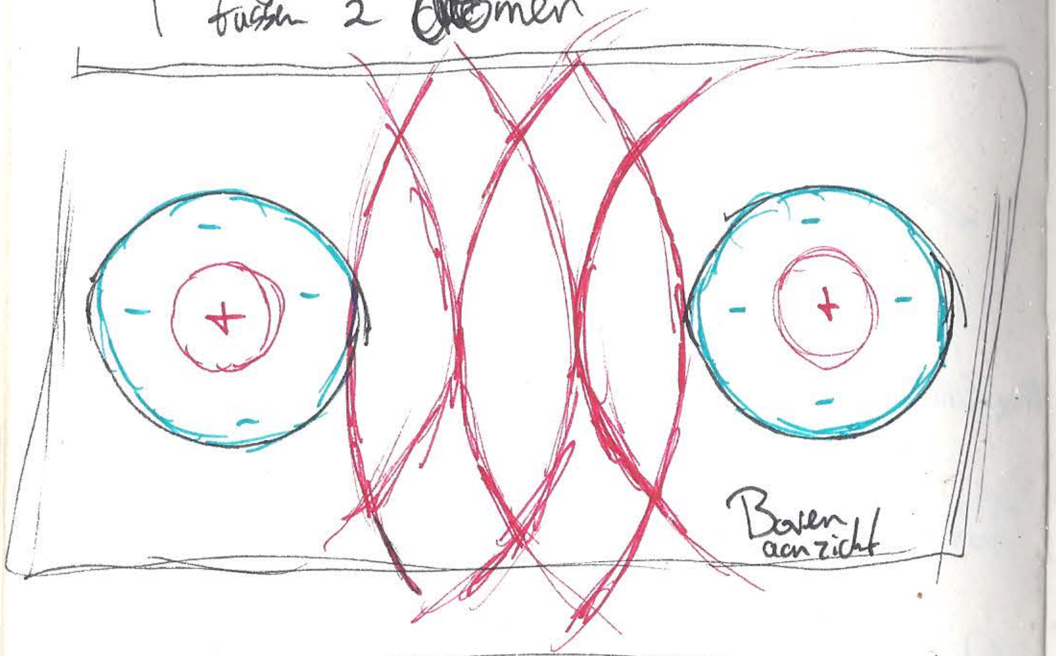
Massa ontstaat bij kruizing foton-elektron
is meestal onstabiel en leeft 1 Planck sec
Bij passeren

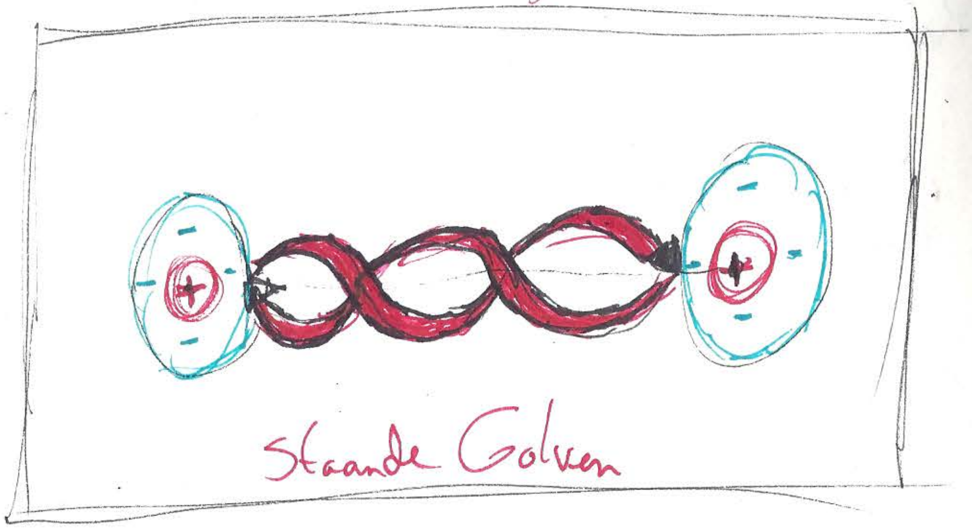
Massa op zich geeft nog geen
Zwaartekracht



Zwaarte kracht

Golf interferentie patroon
tussen 2 atomen

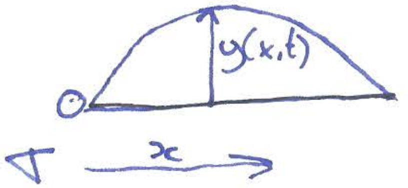


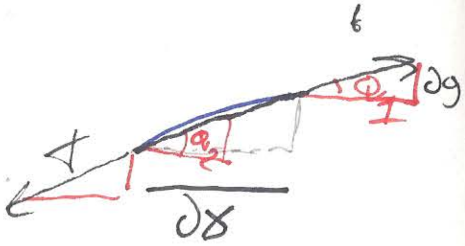


Max Well

$\oint\!\!\oint \bar{B}\cdot\partial\bar{A} = 0$ $\qquad$ $\oint\!\!\oint E\cdot\partial A = \frac{\Sigma}{\varepsilon_0} q_1 \cdots q_{\infty}$

$\oint B\cdot\partial l = \mu_0 I + \mu_0\varepsilon_0 \frac{\partial\Phi_E}{\partial t}$ $\qquad$ $\oint E\cdot\partial l = -\frac{\partial\Phi_B}{\partial t}$





T: Tension
Spanning

$T\sin\theta - T\sin\theta_2 =$

$T(\tan\theta_1 - \tan\theta_2) =$

als θ klein is

$\sin\theta = \theta - \frac{\theta^3}{2}$

$\cos\theta = 1$

$\tan\theta = \theta$

θ: Hoek

$T\left(\frac{\partial y}{\partial x}\Big|_{pos\ x+\partial x} - \frac{\partial y}{\partial x}\Big|_{pos\ x}\right) =$

$T\frac{\partial^2 y}{\partial x^2}\cancel{\Delta x} = (\mu\, \cancel{\partial x})\frac{\partial^2 y}{\partial t^2}$

$\frac{\partial^2 y}{\partial x^2} - \frac{\mu}{T}\frac{\partial^2 y}{\partial t^2} = 0$

$\frac{\partial^2 y}{\partial x^2} - \frac{1}{v^2}\frac{\partial^2 y}{\partial t^2} = 0$ $\qquad$ $v = \sqrt{\frac{T}{\mu}}$

v = snelheid voortgang in dit medium

$z = x - vt$

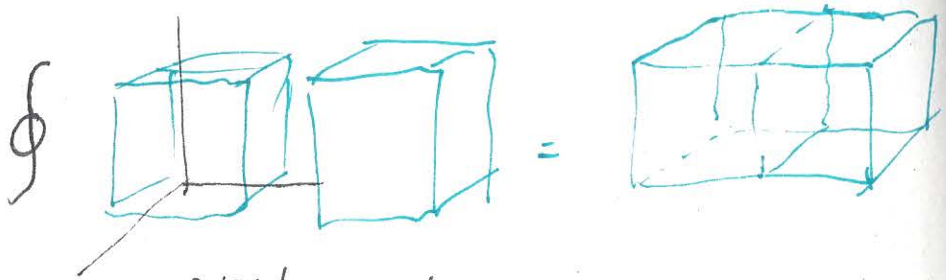
$y = f(z)$

$y = e^{-\frac{(x-vt)^2}{x_0^2}}$

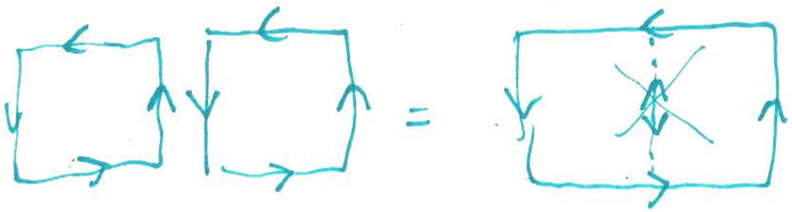
$\frac{\partial^2 y}{\partial x^2} = \frac{\partial y}{\partial z}\frac{\partial z}{\partial x} = \frac{\partial^2 F}{\partial z^2}$

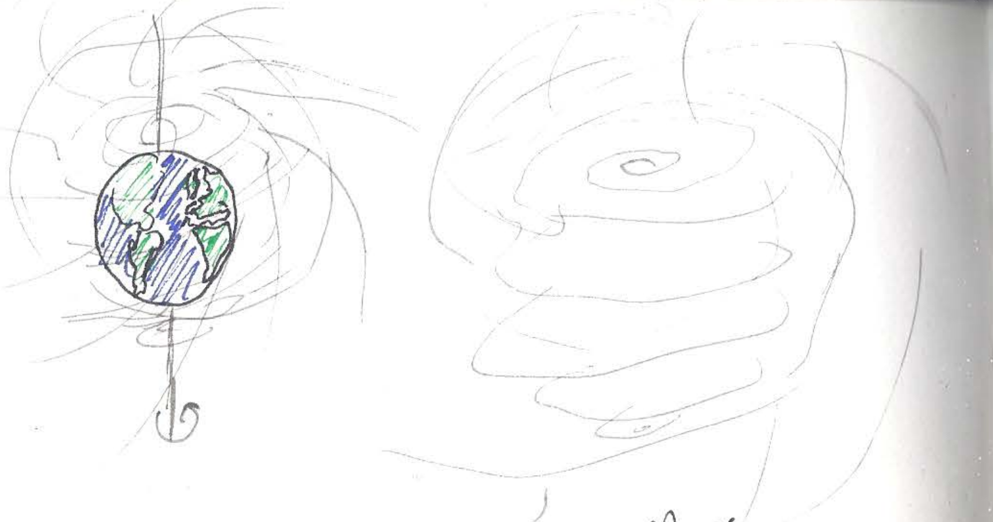
$$\frac{\partial y}{\partial t} = \frac{\partial F}{\partial z} \qquad \frac{\partial^2}{\partial t} = \frac{\partial f}{\partial z}(-v)$$

$$\frac{\partial^2 y}{\partial x^2} = \frac{1}{v^2}\frac{\partial^2 y}{\partial t^2}$$

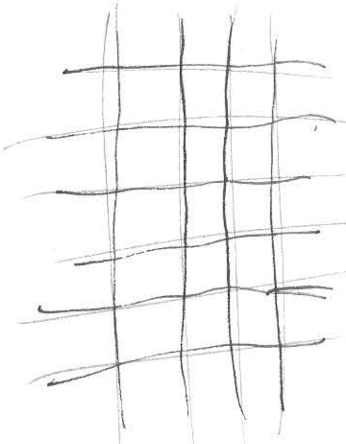


oppvlakt is gelyk aan



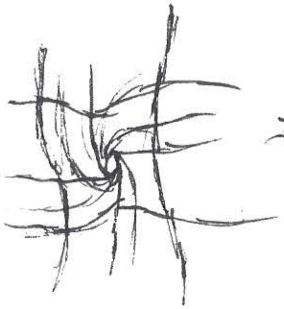


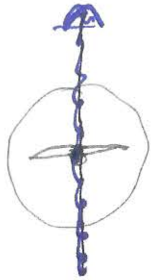
Normaal



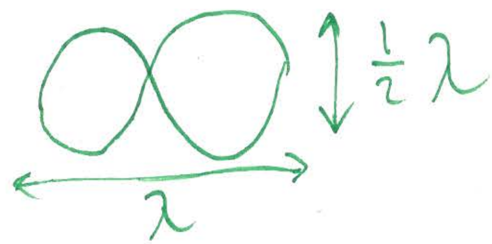
Massa

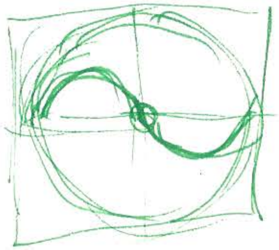
Met rotatie





Stroom en Magnetisme zijn 90°





Electro Magnetism

$$\oint E \cdot \partial A = \frac{\Sigma Q}{\varepsilon_0}$$

$$\oint B \cdot \partial A = 0$$

$$\oint E \cdot \partial L = -\frac{\partial \phi_b}{\partial t}$$

$$\oint B \cdot \partial L = \mu_0 I + \mu_0 \varepsilon_0 \frac{\partial \phi_e}{\partial t}$$

Divergence theorem

$$\int V \cdot dA = \int \nabla \cdot V \, dv$$

Stokes theorem

$$\int V \cdot dL = \int \nabla \times V$$

$$\nabla \cdot E = \frac{\rho}{\varepsilon_0}$$

$$\nabla \cdot B = 0$$

$$\nabla \times E = -\frac{dB}{dt}$$

$$\nabla \times B = \mu_0 \left(J + \varepsilon_0 \frac{dE}{dt}\right)$$

∇ is de DeltA

$\hat{x}$ = direction/Richting

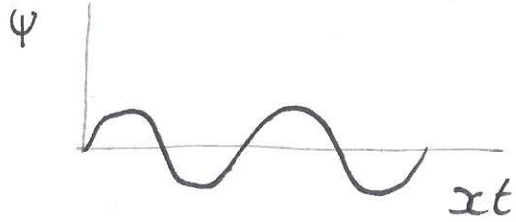
$$\nabla \cdot V = \frac{\partial V}{\partial x} + \frac{\partial V}{\partial y} + \frac{\partial V}{\partial z}$$

$$\nabla \times V = \left(\frac{\partial V_z}{\partial y} - \frac{\partial V_y}{\partial z}\right)\hat{x} + \left(\frac{\partial V_x}{\partial z} - \frac{\partial V_z}{\partial V_x}\right)\hat{y} + \left(\frac{\partial V_y}{\partial x} - \frac{\partial V_x}{\partial y}\right)\hat{z}$$

$$\nabla f = \frac{\partial f}{\partial x}\hat{x} + \frac{\partial f}{\partial y}\hat{y} + \frac{\partial f}{\partial z}\hat{z}$$

f = byv temp

$$\Delta V = \frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} + \frac{\partial^2 V}{\partial z^2} = \nabla^2 V$$



$\psi = \sin(kx - \omega t)$

$\psi = \cos(Kx - \omega t)$

$\psi = e^{i(kx - \omega t)}$

$K = \frac{2\pi}{\lambda}$ $\quad \omega = 2\pi f$ $\quad V = \lambda f$

Wave number

$V = \frac{\cancel{2\pi}}{K} \frac{\omega}{\cancel{2\pi}} = \frac{\omega}{K}$

$\frac{d\psi}{\partial x} = K\cos(Kx - \omega t)$

$\frac{d^2\psi}{dx^2} = -K^2 \sin(kx - \omega t) = -K^2\psi$

$\frac{d\psi}{dt} = -\omega \cos(Kx - \omega t)$

$\frac{d^2\psi}{dt^2} = -\omega^2 \sin(kx - \omega t) = -\omega^2 \psi$

$\psi = -\frac{1}{K^2}\frac{\partial^2\psi}{\partial x^2} = -\frac{1}{\omega^2}\frac{\partial^2\psi}{\partial t^2}$

$\frac{\partial^2\psi}{\partial t^2} = \frac{\omega^2}{K^2}\frac{\partial^2\psi}{\partial x^2}$

$$\boxed{\frac{\partial^2\psi}{\partial t^2} = v^2 \frac{\partial^2\psi}{\partial x^2}}$$ Wave Equation

$\nabla \times E = -\frac{\partial B}{\partial t}$

$\nabla \times \nabla \times E = \nabla \times -\frac{\partial B}{\partial t}$

$\nabla \times \nabla \times E = -\frac{\partial}{\partial t} \nabla \times B$

$\nabla \times B = \mu_0 \varepsilon_0 \frac{\partial E}{\partial t}$

$-\frac{\partial}{\partial t}\nabla \times B = -\mu_0\varepsilon_0 \frac{\partial^2 E}{\partial t^2}$

$\nabla \times \nabla \times E = \nabla(\nabla \cdot E) - \nabla^2 E$

$-\nabla^2 E = -\mu_0\varepsilon_0 \frac{\partial^2 E}{\partial t^2}$

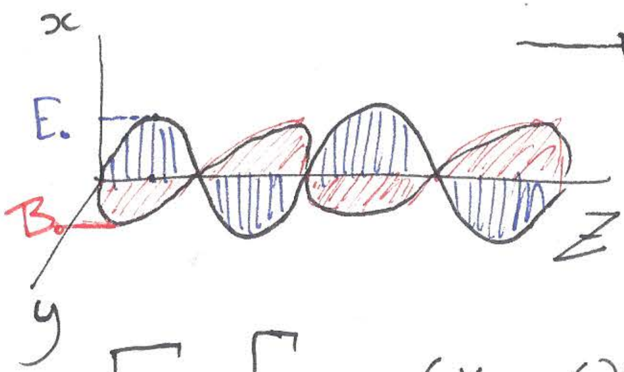
$\frac{\partial^2 E}{\partial x^2} + \frac{\partial^2 E}{\partial y^2} + \frac{\partial^2 E}{\partial z^2} = \mu_0 \varepsilon_0 \frac{\partial^2 E}{\partial t^2}$

$\nabla \times B = \mu_0 (J + \varepsilon_0 \frac{\partial E}{\partial t})$

Loding is 0 by Licht

TADA!

$$\boxed{\begin{gathered} v^2 = \frac{1}{\mu_0\varepsilon_0} \\ v = \frac{1}{\sqrt{\mu_0\varepsilon_0}} = c \end{gathered}}$$



$\longrightarrow V = \frac{1}{\sqrt{\mu_0 \varepsilon_0}} = c$

$$E_x = E_0 \sin(Kz - \omega t)$$

$$\frac{\partial^2 E_x}{\partial z^2} = \mu_0 \varepsilon_0 \frac{\partial^2 E_x}{\partial t^2}$$

$$\frac{E}{B} = c$$

$$\boxed{\nabla \times E = -\frac{\partial B}{dt}}$$ Maxwell 3e

$E \times B = \xrightarrow{\text{Richting}}$

$$\nabla \times E = -\cancel{\frac{\partial E_y}{\partial z}}\hat{x} + \frac{\partial E_x}{\partial z}\hat{y}$$

geen y

$$\nabla \times E = \frac{\partial E_x}{\partial z}\hat{y} = -\frac{\partial B}{\partial t}\hat{y}$$

$$\frac{\partial E_x}{\partial z}\hat{y} = \frac{\partial}{\partial z} E_0 \sin(Kz - \omega t)\hat{y}$$

$$= K E_0 \cos(Kz - \omega t)\hat{y}$$

$$= -\frac{dB}{\partial t}\hat{y}$$

$$\cancel{-}B\hat{y} = \cancel{-}\frac{K}{\omega} E_0 \sin(Kz - \omega t)\hat{y}$$

$$B(\hat{y}) = \frac{1}{c} E_x$$

$$B_0 \sin(Kz - \omega t) = \frac{1}{c} E_0 \sin(Kz - \omega t)$$

De Fresnel Equations

By deze shizz gaat het over Dielectrics

Dielectrics hebben geen vrye lading "Q"

ε_0 Permittiviteit $\longrightarrow K_e \varepsilon_0$

μ_0 Permeabiliteit $\longrightarrow K_m \mu_0$

$K_m \approx 1 \longrightarrow$ Byna altyd 1 in de meeste Dielectrics

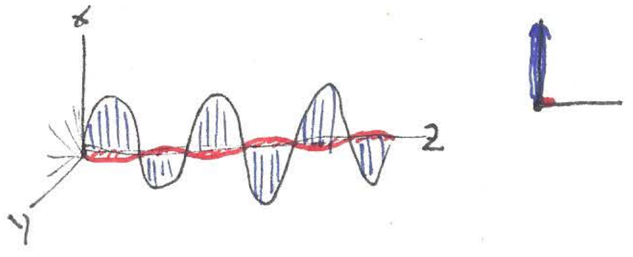
$$c = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$$

$$c_{media} = \frac{1}{\sqrt{K_m \mu_0 K_e \varepsilon_0}} = \frac{c}{\sqrt{\underbrace{K_m}_{1} K_e}}$$

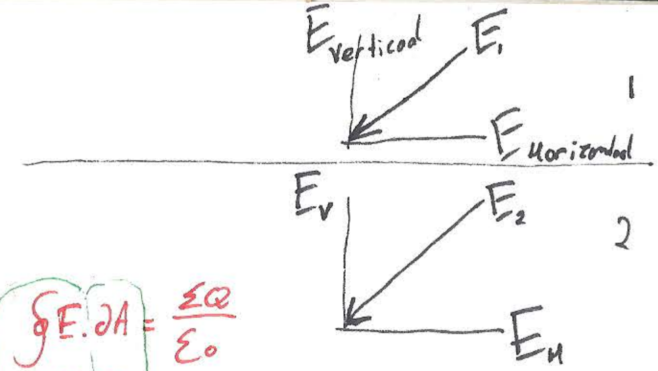
$$\frac{c_{vacuum}}{c_{media}} = \sqrt{K_e} = N \leftarrow$$ Refractie Index

$$K_{e\,water} = 1{,}77$$

$$N_{water} = \sqrt{1{,}77} = 1{,}33$$



$E \times B = \vec{Z}$



$K_{m_1}\ K_{e_1}\ N_1$

$K_{m_2}\ K_{e_2}\ N_2$

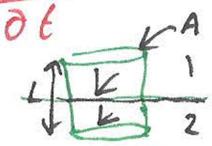
$\oint E.\partial A = \frac{\Sigma Q}{\varepsilon_0}$

$\oint B.\partial A = 0$

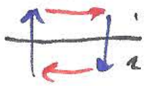
$\oint E.\partial L = \frac{-\partial \varnothing_B}{\partial t}$

$\oint B.\partial L = \mu_0 I + \mu_0 \varepsilon_0 \frac{\partial \varnothing_E}{\partial t}$

gebruik "Pilbox"



Rectangular Loop



$\oint E.\partial A = \frac{\Sigma Q}{K_e \varepsilon_0}$

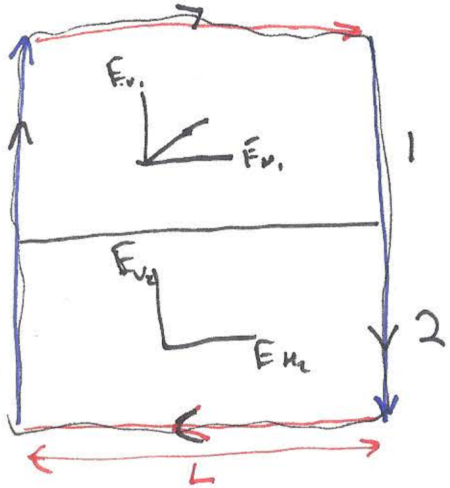
$K_e \varepsilon_0 \oint E.\partial A = \Sigma Q = 0$ voor Diëlectrict

$K_{e_1} \varepsilon_0 E_{v_1} A - K_{e_2} \varepsilon_0 E_{v_2} A + \gamma = 0$

je knijpt de cilinder tot een lengte 0

$$\boxed{K_{e_1} E_{v_1} = K_{e_2} E_{v_2}}$$

$\oint E.dL = -\frac{\partial \varnothing_b}{\partial t}$



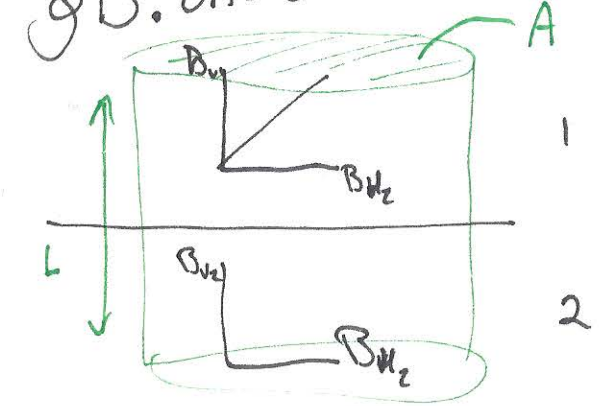
↑↓ heffen elkaar op

$E_{h_1} L - E_{h_2} L = -\frac{\partial \varnothing_b}{\partial t}$

$E_{h_1} \cancel{L} - E_{h_2} \cancel{L} = 0$

$$\boxed{E_{h_1} - E_{h_2} = 0}$$

$$\oint B \cdot \partial A = 0$$

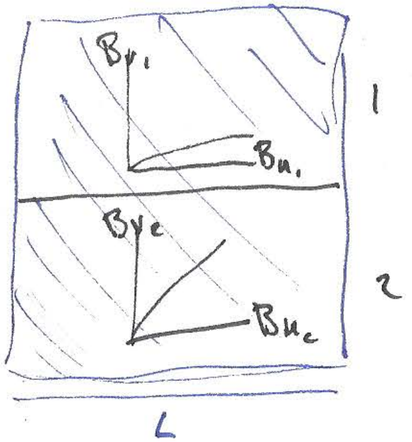


$$B_{v_1} \cancel{A} - B_{v_2} \cancel{A} + \cancel{X} = 0$$

$$\boxed{B_{v_1} = B_{v_2}}$$

$$\oint B \cdot \partial L = \mu_0 \cancel{I} + \mu_0 \varepsilon_0 \frac{\partial \phi_E}{\partial t}$$

$$\frac{1}{\mu_0} \oint B \cdot \partial L = \varepsilon_0 \frac{\partial \phi_E}{\partial t}$$



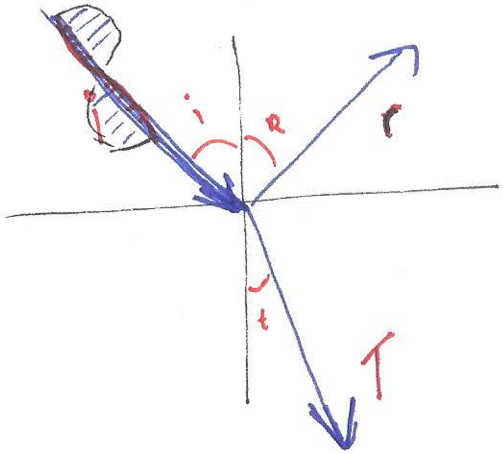
$$\frac{B_{H_1} \cancel{L}}{\cancel{K_{m_1}} \mu_0} - \frac{B_{H_2} \cancel{L}}{\cancel{K_{m_2}} \mu_0} = \cancel{\varepsilon_0 \frac{\partial \phi_E}{\partial t}} \; 0$$

$$\boxed{B_{H_1} = B_{H_2}}$$

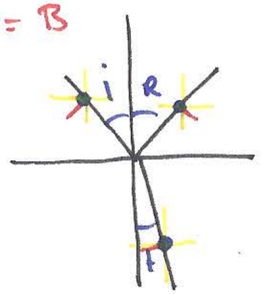
$$K_{e_1} E_{v_1} = K_{e_2} E_{v_2}$$

$$E_{h_1} - E_{h_2} = 0$$

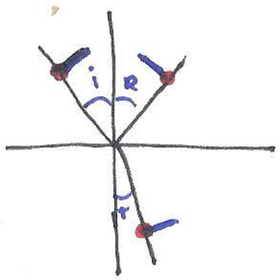
$$B_{v_1} = B_{v_2}$$



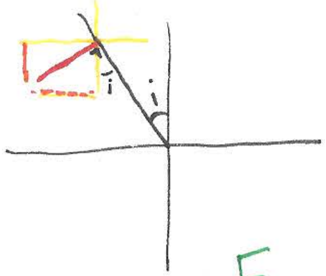
• = E
• = B



$E_{\perp r}$



$E_{//}$



$H = B \cos i$

$V = B \sin i$

$E_{1h} = E_{2h}$

$B_{1h} = B_{2h}$

Wat is Electron Spin?

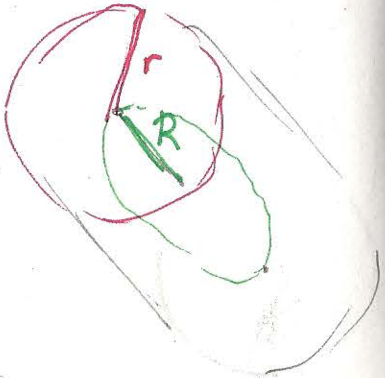
Vortex torus van Rodin
omschrijft Electron Spin

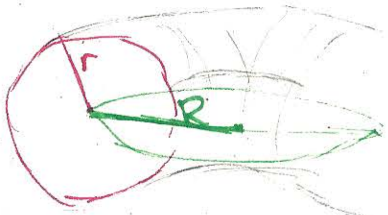
Torus Bestaat uit 2 Circels

R = Ring Radius
r = Pyr Radius

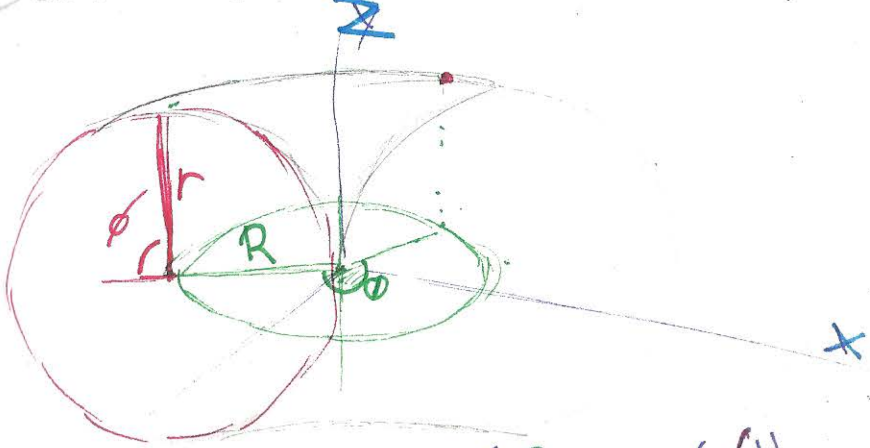
$R \neq r$ = chaos

$R = r$ = Harmonie





Zwarte Gaten, Universum, atoom

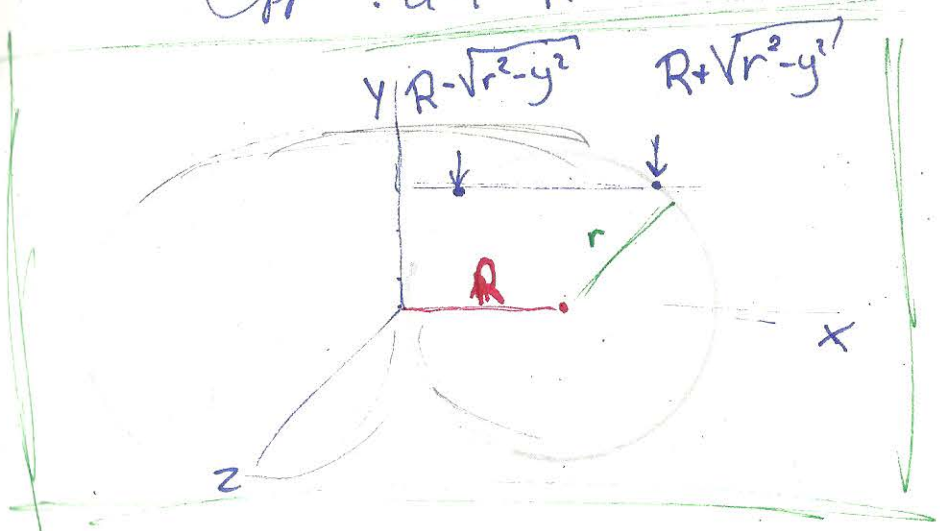


y

$$x = \cos(\theta)\,(R + r\cos(\phi))$$
$$y = \sin(\theta)\,(R + r\cos(\phi))$$
$$z = r\sin(\phi)$$

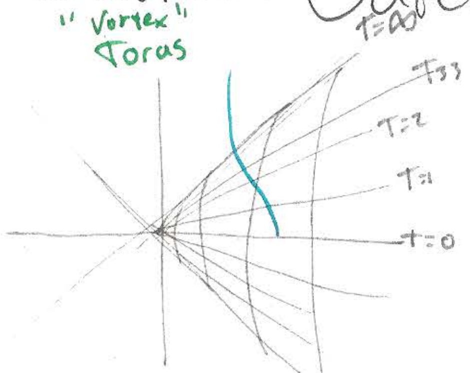
Volume: $2\pi^2 R r^2$

Opp : $4\pi^2 R \cdot r$

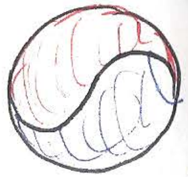


Zwarte Gaten

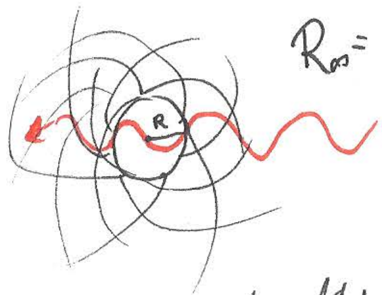
"Vortex"
Torus



Minkowsky Space



1 Bit info



$R_s = \frac{2MG}{c^2}$

R = Swartzschild Radius

Voor info over het zwarte gat stuur je 1 Bit info oftewel

$\boxed{\lambda = R}$

$\Delta E = \frac{\hbar c}{\lambda} = \frac{\hbar c}{R}$

$\Delta m = \frac{\hbar}{RC}$

$\Delta R = \frac{2G}{c^2} \times \frac{\hbar}{RC} = R \Delta R = \frac{2G\hbar}{c^3} = \Delta A$

$S_{entropie} = \frac{Ac^3}{4\hbar G}$ $\quad \frac{\text{opp} \times 3\text{dimenties}}{4\hbar G}$

Verschil Energie = T × verschil Entropie

$dE = T\,ds$

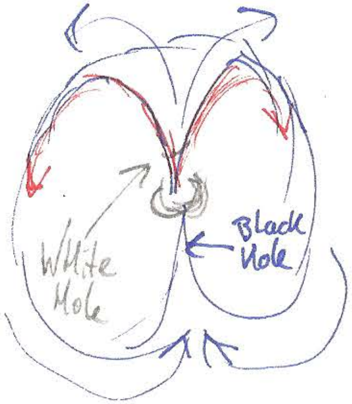
$T = \frac{\hbar}{8\pi MG}$

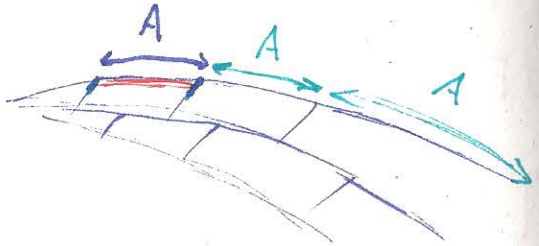
Zwarte gaten stralen $R = \lambda$ uit

Lore Davis: $R_s = \frac{c_c^3}{\pi R_c C^3}$

Donkere energie

Energie die acht de uitdying van universum zit





afstand: $\Delta x \; a(t)$

$$\frac{\partial Distance}{\partial Time} = \dot{D} = \Delta x \; \dot{a}(t)$$

$$V = \Delta x \; \dot{a}(t) \cdot \frac{a}{a}$$

D

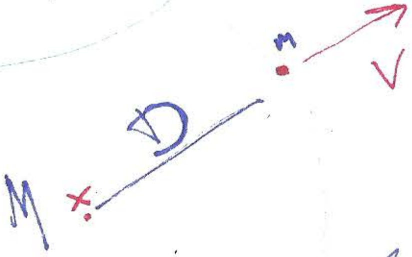
$$V = D \frac{\dot{a}}{a} = HD$$

H = Habble constante

allen voor ruimte Niet voor tyd

Massa = Volume x Dichtheid

$$m = \frac{4}{3}\pi R^3 \cdot \rho(t)$$



$V = HD$

$$F = G\frac{Mm}{D^2}$$

$$PE = -\frac{GMm}{D}$$

Totaal Energie = KE + PE

$$= \frac{1}{2}mv^2 - G\frac{Mm}{D} = K$$

$$mV^2 - 2G\frac{Mm}{D} = 2K$$

$$V^2 - \frac{2GM}{D} = \frac{2K}{m} = K$$

$$\Delta x^2 \dot{a}(t)^2 - \frac{2GM}{\Delta x \; a(t)} = K$$

Habble^2

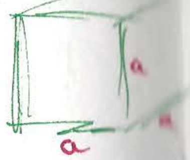
$$\boxed{\frac{\dot{a}(t)^2}{a(t)^2} = \frac{8\pi G}{3}\rho(t) - \frac{K}{a(t)^2}}$$

KE

PE

constante

$$\boxed{\frac{\dot{a}(t)^2}{a(t)^2} = \frac{8\pi G}{3}\frac{m}{a(t)^2} - \frac{K}{a(t)}}$$



$$\rho = \frac{m}{a^3}$$

$$a(t) = c t^{p}$$

$$\dot{a}(t) = p c t^{p-1}$$

$$\frac{\dot{a}(t)}{a(t)} = \frac{pct^{p-1}}{ct^{p}} = \frac{p}{t}$$

$$\frac{p^2}{t^2} = \frac{8\pi G}{3}\frac{m}{a(t)^3} \rightarrow c^2 t^{3p}$$

$$t^2 = t^{3p} \quad p = 2/3$$

$$a = c t^{2/3}$$

$$\boxed{\frac{\dot{a}(t)^2}{a(t)^2} = \frac{8\pi G \rho_0}{3} = \text{Cosmologische constante}}$$

$$\frac{\dot{a}(t)}{a(t)} = H_{\text{ubble constant}} = \sqrt{\frac{8\pi G \rho_0}{3}}$$

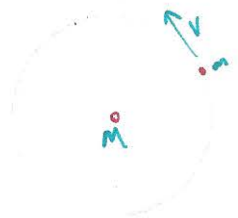
$$\dot{a} = a\sqrt{\frac{8\pi G \rho_0}{3}}$$

$$\boxed{a = c e^{\left(\sqrt{\frac{8\pi G \rho_0}{3}}\, t\right)}}$$

$$\boxed{\frac{\partial y}{\partial t} = y \quad \text{Exponentiele Groei}}$$

als de differentiale gelijk is aan de orginele

Donkere Materie & Melkweg Rotatie



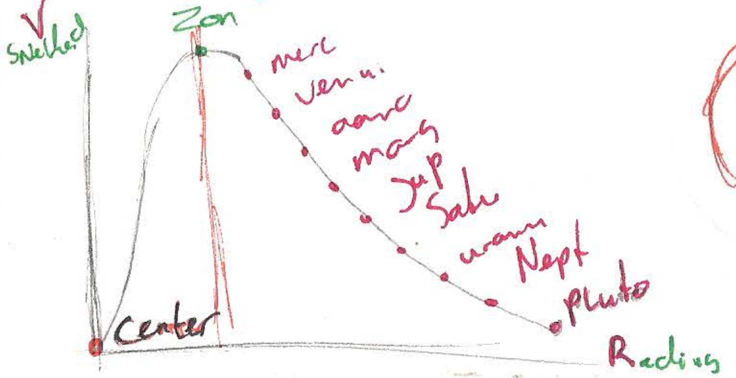
$$\frac{MV^2}{r} = \frac{GMm}{r^2}$$

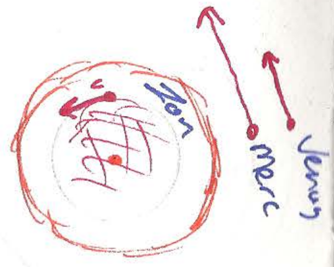
$$V^2 = \frac{GM}{r} \qquad V^2 = \frac{1}{r}$$

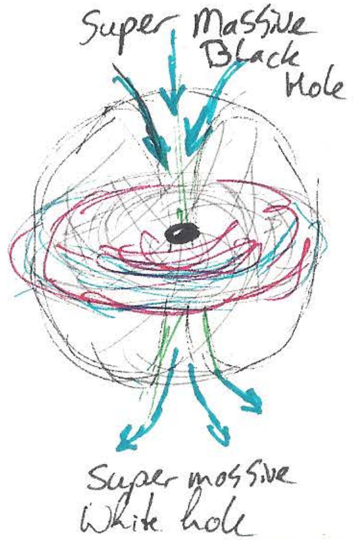
$$T^2 = R^3$$

$$Time = \frac{2\pi r}{V}$$

$$T^2 = \frac{4\pi^2 R^2}{V^2} = \frac{4\pi^2 R^3}{GM}$$

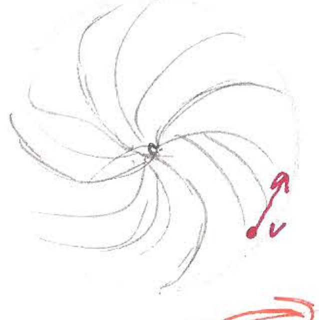






melkweg

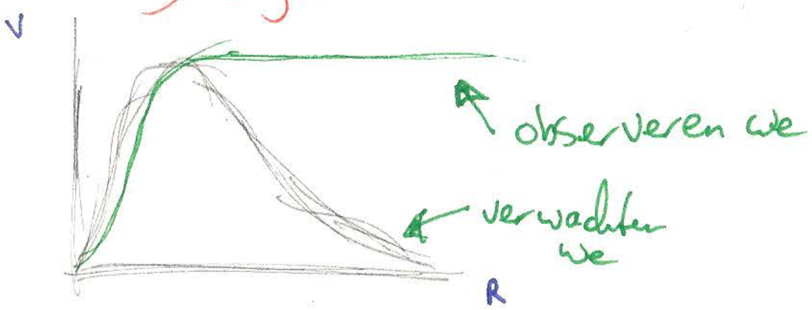
Probleem met Melkweg

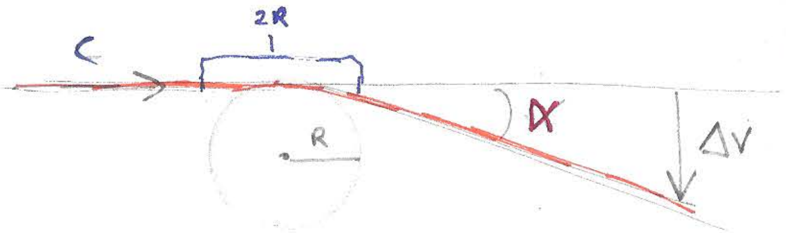


Sterren gaan ~~[illegible]~~ sneller dan volgens formules moet

Zou moeten weg vliegen

$$\frac{MV^2}{r} = \frac{GM_m}{r^2}$$





$$F = ma = \frac{Gmm}{r^2}$$

$$\Delta t = \frac{2R}{c}$$

$$a = \frac{Gm}{r^2}$$

$$\Delta V = a\,\Delta t$$

$$\Delta V = \frac{Gm}{r^2}\,\frac{2r}{c} = \frac{2mG}{rc}$$

Verwacht → $\boxed{\alpha = \frac{2MG}{Rc^2}}$ Newtonian

Werkelijkheid → $\boxed{\alpha = \frac{4MG}{Rc^2}}$ Relativistisch

De massa van ons Melkweg komt niet overeen met wat zou moeten volgens relativiteit. 2X zo zwaar

Rotatie Vector

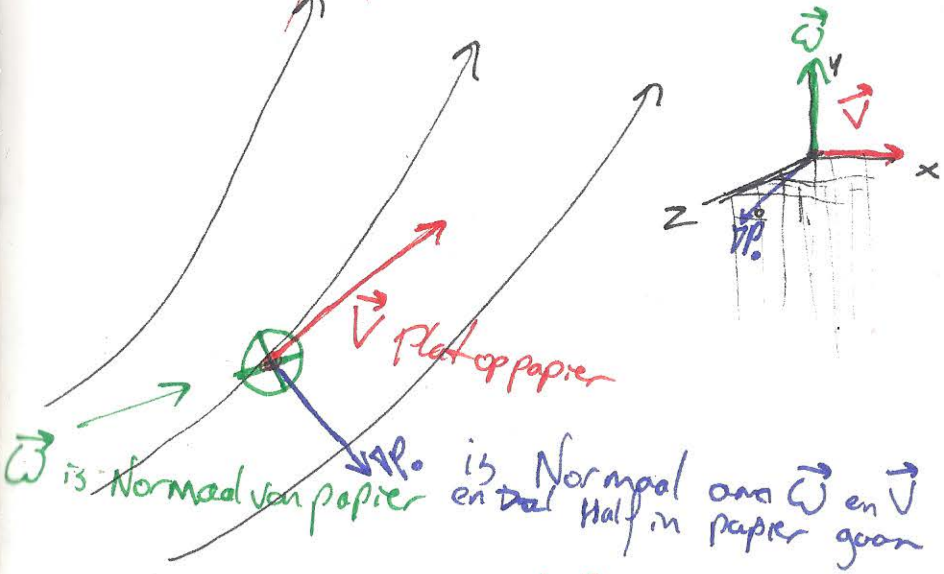
$$X_1 = x^2 + y^2 + z^2$$
$$X_2 = xy + yz + z^2$$
$$X_3 = -3xz - \underline{z^2}$$

$\vec{\omega}$ = rotatie = $\frac{1}{2}$ Vorticity

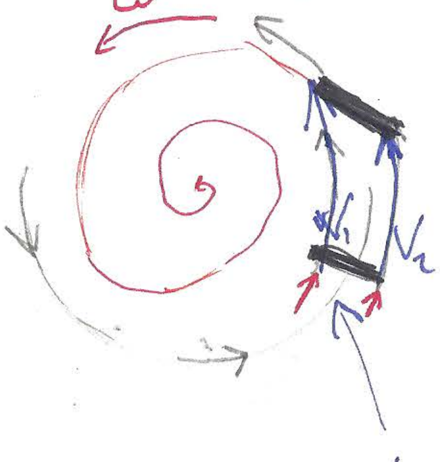
$$\vec{\omega} = \frac{1}{2}(\nabla \times \vec{V})$$

$$\frac{1}{2}(\nabla \times \vec{V}) = \frac{1}{2}\begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x_1} & \frac{\partial}{\partial x_2} & \frac{\partial}{\partial x_3} \\ V_{x_1} & V_{x_2} & V_{x_3} \end{vmatrix} \left[\frac{\partial V_{x_3}}{\partial x_2} - \frac{\partial V_{x_2}}{\partial x_3}\right]\hat{i} + \left[\frac{\partial V_{x_1}}{\partial x_3} - \frac{\partial V_{x_3}}{\partial x_1}\right]\hat{j} + \left[\frac{\partial V_{x_2}}{\partial x_1} - \frac{\partial V_{x_1}}{\partial x_2}\right]\hat{k}$$

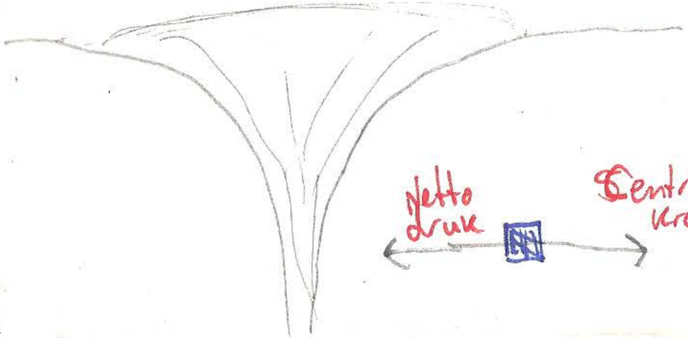
In een vast object is de velociteit altijd overal het zelfde, 2 keer de hoek snelheid



$\omega = V \cdot R$



V_1 = groter dan V_2



Met Stabiele beweging "steady Motion"

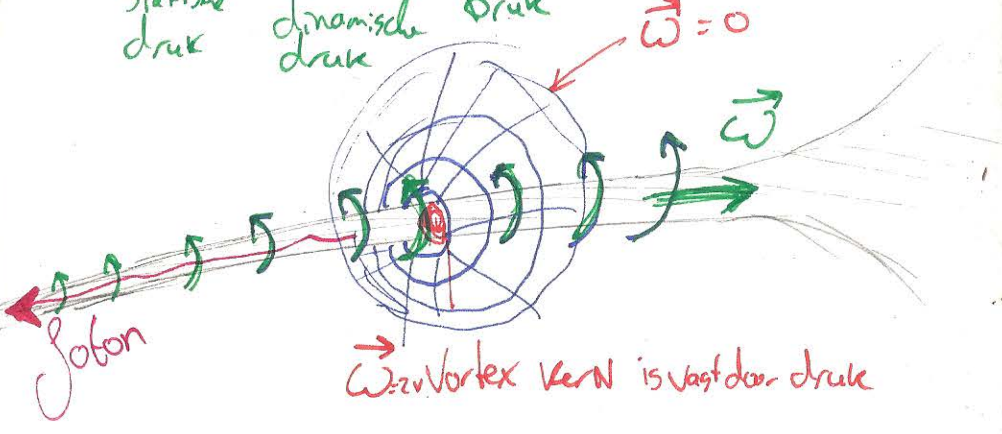
1 oncompresbaar
2 geen viscale krachten

$$\vec{V} \times \vec{\omega} = \frac{1}{\rho} \nabla P_0$$

Velocity Vorticity dichtheid Verloop van druk (gradient Stagnation Presure)

$$P_0 = P + \frac{1}{2}\rho V^2 + \rho U$$

statishe druk | dinamische druk | lichaam druk

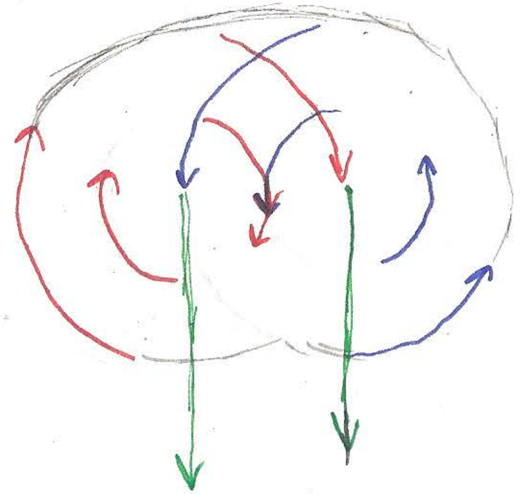


$$\frac{\partial \Gamma_c}{\partial t} = \oint \frac{\partial p}{\rho} + \oint \vec{G} \cdot \partial \vec{r} + \oint \frac{M}{\rho} \nabla^2 \vec{v} \cdot \partial \vec{r}$$

Veranderingen Circulatie = druk krachten + Lichaam krachten + Viscoas krachten

Zwaarte kracht en Electro~~magnetisme~~ statische
Zijn irrationele Vortexen $\oint G \cdot dr = 0$

electromagnetisme is irational
$\oint G \cdot dr \neq 0$



Helmholtz Vortex theorie

1 Kracht van een Vortex is over de hele lengte Constant

2 Vortex kan niet zomaar Stoppen. Moet contact maken met de rand of een gesloten weg vormen

3 Zonder externe krachten blijft een irrotationele Vortex irrotationeel.

$\nabla \cdot \vec{u} = 0$

u : velocity

Navier Stokes equations

Lineair Momentum Wet energiebehoud

$$\frac{\partial \vec{u}}{\partial t} + \vec{u} \cdot \nabla \vec{u} = -\frac{1}{\rho} \nabla p + \nu \nabla^2 \vec{u} + \vec{f}$$

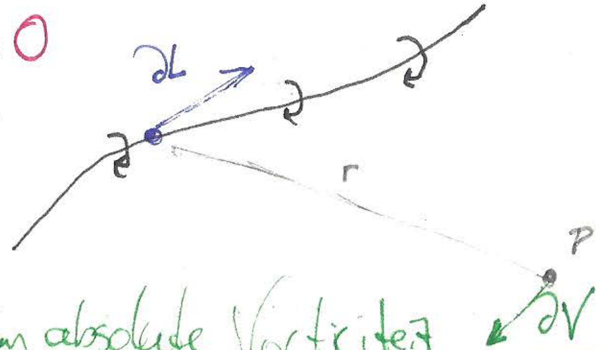
Viscosity Vloeistof

de kracht van een Vortex buis (circulaties) vortex flux

$$\Gamma = \int_A \vec{\omega} \cdot \vec{n}\, \partial A = \oint_C \vec{u} \cdot \partial \vec{s}$$

$\vec{\omega}$: Vorticiteit Vector
$\vec{n}$: Normaal Vector t.o.v. ∂A
∂A: oppervlakte doorsnede Vortex
$\vec{u}$: snelheid Vector op de gesloten curve C gebundeld met opp A

$$\frac{\partial \Gamma}{\partial t} = 0$$

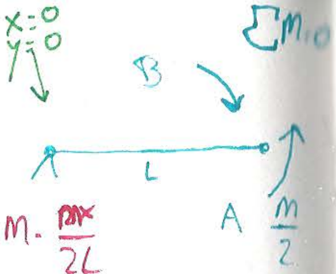


Wet van absolute Vorticiteit

$\boxed{\text{absolute Vorticiteit} = \text{Relatieve Vorticiteit} + \text{Planetaire Vorticiteit}}$

$$\eta = \zeta + f \qquad \frac{\partial(\zeta + f)}{\partial t} = 0$$

dubbele integratie methode



$M_1 = M - \frac{mx}{2L}$

$$\frac{\partial^2 y}{\partial x^2} = \frac{M}{EI}$$

$$EI \int \frac{\partial^2 y}{\partial x^2} = \int M - \frac{mx}{2L} \, dx$$

constante

$$EI \frac{\partial y}{\partial x} = Mx - \frac{m}{2L}\left(\frac{x^2}{2}\right) + C_1$$

$$\boxed{EI \int \frac{\partial y}{\partial x} = Mx - \frac{mx^2}{4L} + C_1} \quad \boxed{1}$$

$$EI y = \int Mx \, dx - \int \frac{mx^2}{4L} dx + \int C_1 dx$$

$$EI y = M\frac{x^2}{2} - \frac{m}{4L}\left(\frac{x^3}{3}\right) + C_1 x + C_2$$

$$\boxed{EI y = \frac{mx^2}{2} - \frac{mx^3}{12L} + C_1 x + C_2} \quad \boxed{2}$$

---

x:0
y:0

$$EI(0) = \frac{m0^2}{2} - \frac{m0^3}{12L} + C_1(0) + C_2 = C_2 = 0$$

x:L
y:0

$$EI(0) = \frac{mL^2}{2} - \frac{mL^3}{12L} + C_1(L) + 0$$

$$0 = \frac{mL^2}{2} - \frac{mL^2}{12} + C_1(L)$$

$$0 = \frac{mL}{2} - \frac{mL}{12} + C_1 \qquad C_1 = \frac{ML}{12} - \frac{ML}{2}$$

$$\boxed{C_1 = \frac{-5ML}{12}}$$

$$1 \rightarrow \phi = \frac{\partial y}{\partial x} = \frac{mx}{EI} - \frac{Mx^2}{4LEI} + \left(-\frac{5ML}{12EI}\right)$$

$$2 \quad \Delta = y = \frac{mx^2}{2EI} - \frac{Mx^3}{12LEI} - \frac{5ML}{12EI}$$

Vector Equalibrion

Nobele elementen

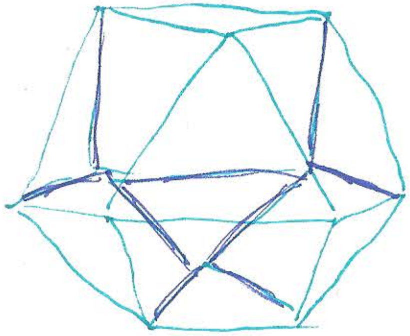
Neon 2,8

Argon 2,8,8

Crypton 2,8,18,8

Xenon 2,8 18,18,8

Radon 2,8,18,32.18,8



□ = Vasthouden

△ = Vortex

↑

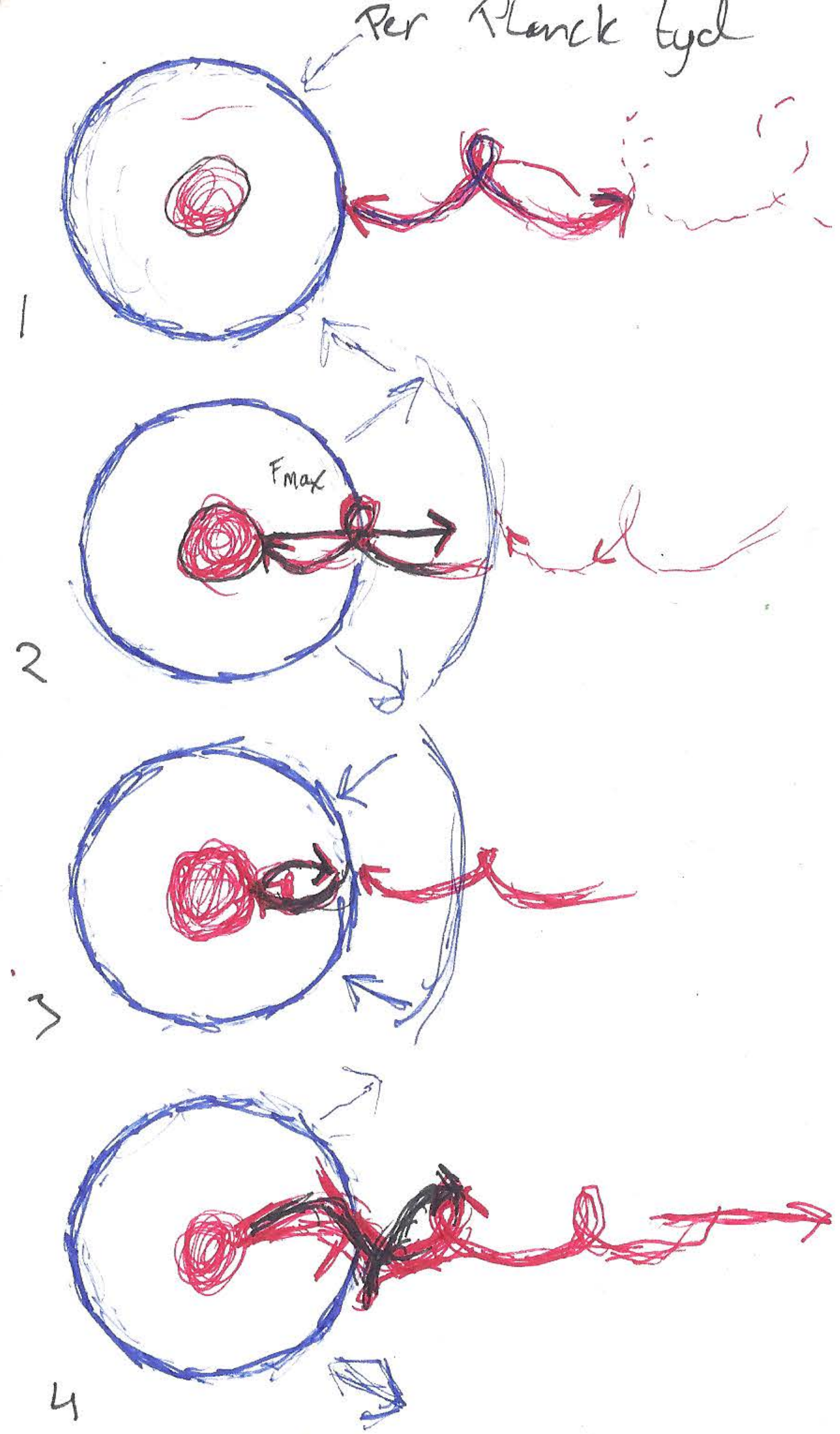
Resultaat Vectoren

Icosa Hedron

Dodecahedron

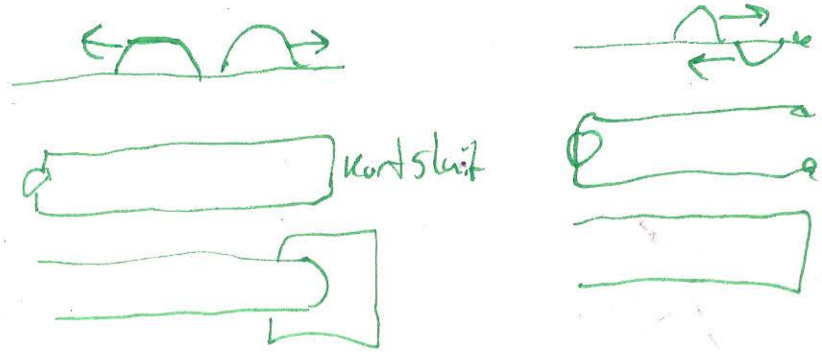
Torus

Vortex



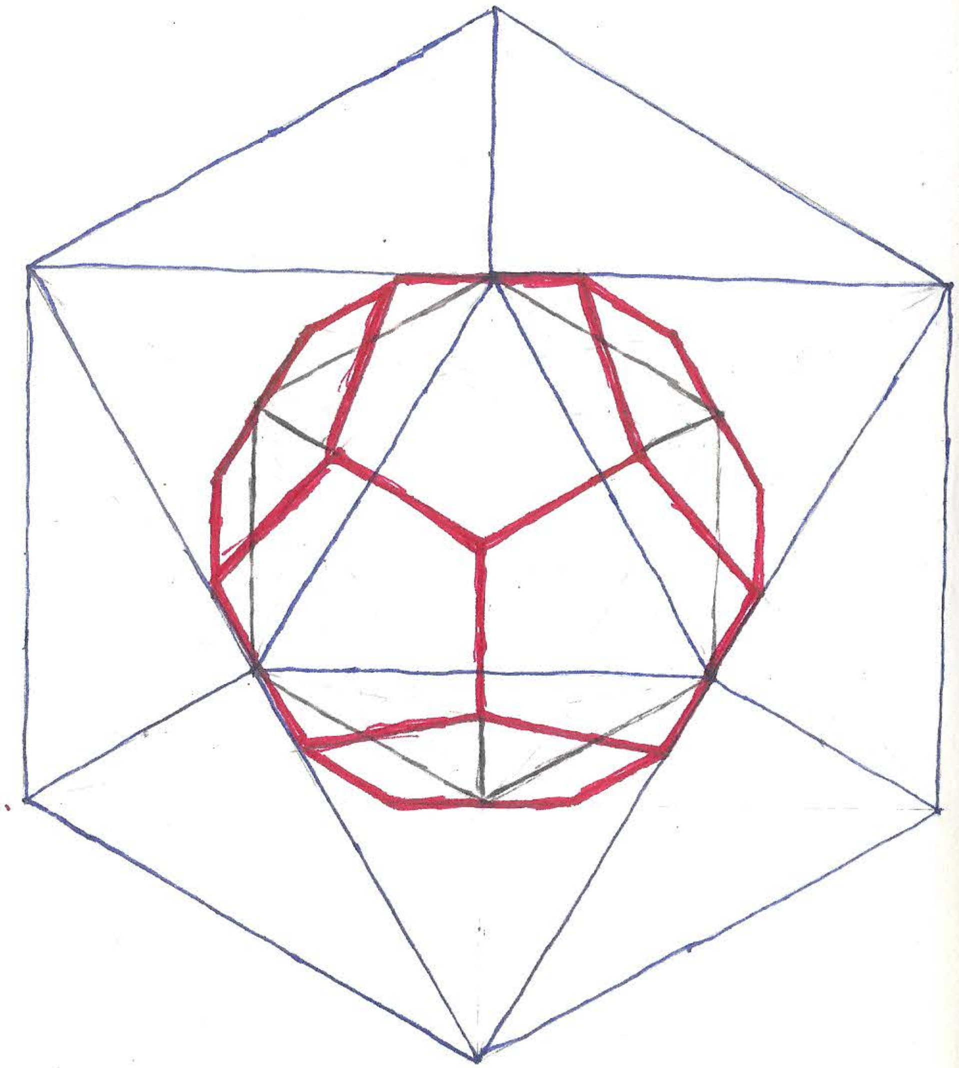
golven vrij eind

Vast eind



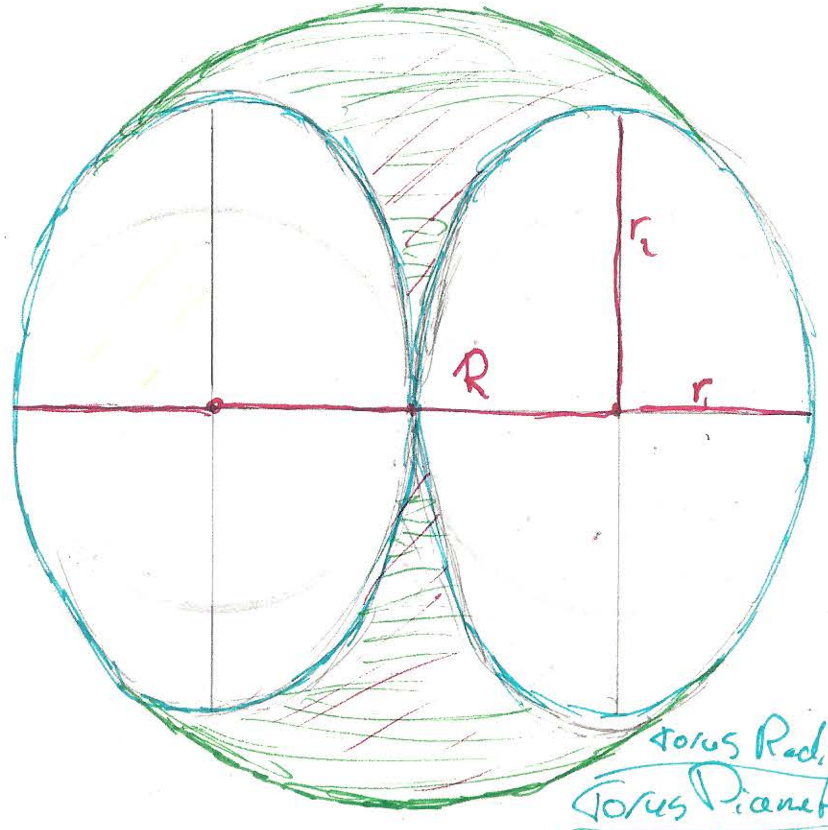
$$\text{impedantie} = \frac{\text{angular Velocity}}{\text{Torque}}$$

$$\frac{(\text{golf} - 1)^2}{(\text{golf} + 1)^2}$$



3+1 Dimentie Bal
3 Dimentie Torus

als $R_1 = 1$
$R_2 = 1{,}618$



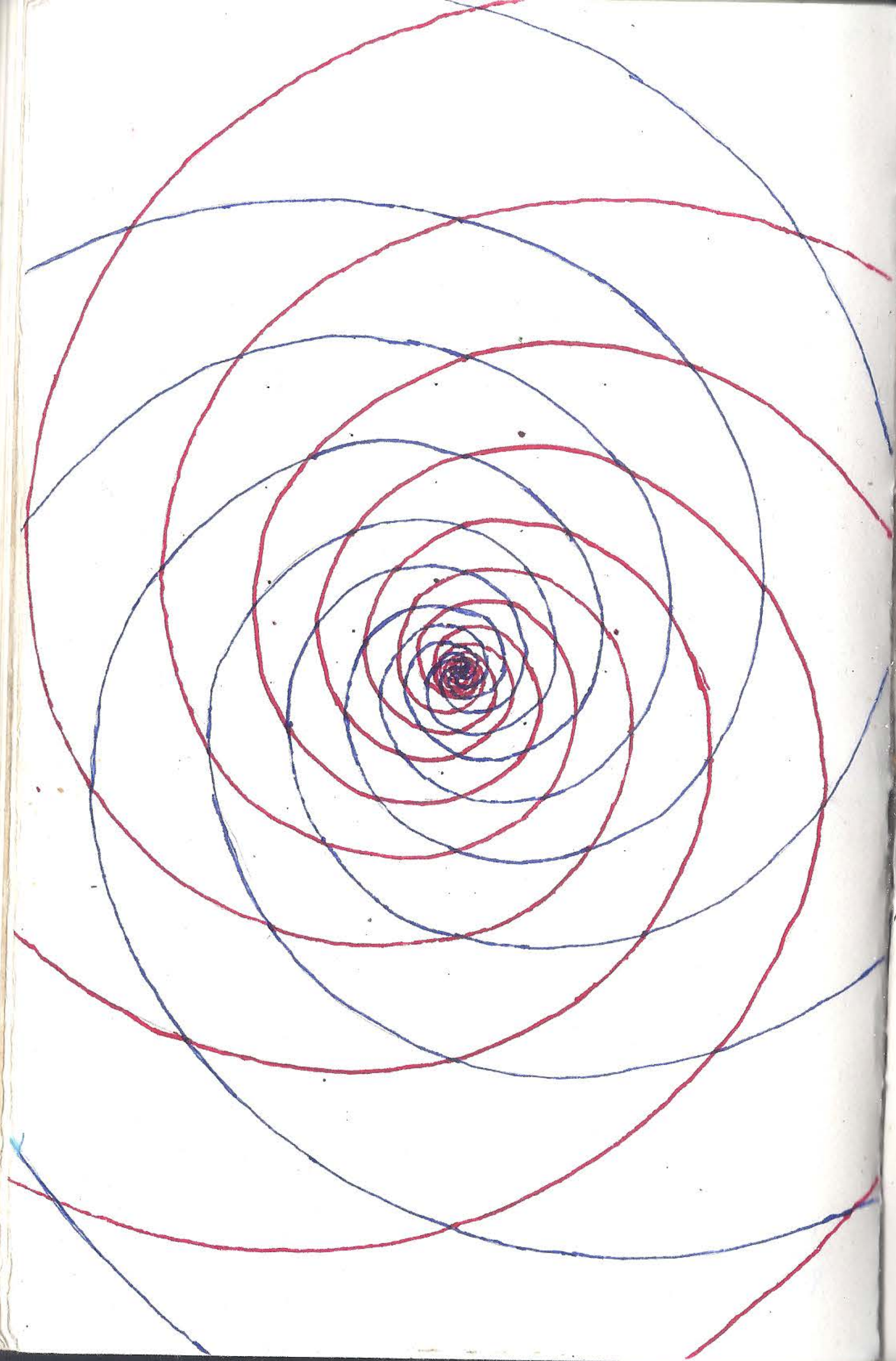
$$\frac{\text{Torus Radis}}{\text{Torus Diameter}}$$
$$\frac{1}{4} e^{6{,}9996968}$$

Homeomophic in een

Euclidian Space 2N+1

$$\frac{R}{D} = \frac{1}{4} e^{6{,}9\ldots} = 274{,}074996 = 2\alpha$$

Fijn Structuur Constante



$$K = m\omega^2$$

$$F = -m\omega^2 x$$

$$\mu = \frac{m_1 m_2}{m_1 + m_2}$$

$$a = -\omega^2 x$$

$$a = -4\pi^2 f^2 x$$

$$t_{planck} = \sqrt{\frac{\hbar G}{c^5}}$$

$$l_{planck} = \sqrt{\frac{\hbar G}{c^3}}$$

$$m_{planck} = \sqrt{\frac{\hbar c}{G}}$$

$$R_\infty = \frac{m_e e^4}{8\varepsilon_0^2 h^3 c}$$

$$\frac{1}{\lambda} = R_\infty Z^2 \left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

$$W = \vec{F} \cdot \vec{x}$$

$$W = \frac{1}{2} m v^2$$

$$E = mc^2$$

$$E = hf$$

$$E = \frac{1}{2} K x^2$$

$$E = \frac{1}{2} m v^2$$

$$E = \frac{2Q^2}{4\pi\varepsilon_0} \frac{1}{x}$$

$$V = \lambda f$$

$$f = \frac{1}{2}\pi\omega$$

$$\omega = 2\pi f$$

$$\omega = \sqrt{\frac{k}{m}}$$

$$K = \frac{F_{max}}{x}$$

$$K = \frac{2\pi}{\lambda}$$

$$\lambda = \frac{h}{mc}$$

$$\lambda = \frac{h}{p}$$

$$W = \vec{F} \cdot \vec{X}$$

$$F = ma$$

$$V_e = \frac{c\alpha}{2}$$

$$V_e = \omega_c R_c$$

$$a_0 = \frac{c^2 R_e}{2 V_e^2}$$

$$a_0 = \frac{F_{max} R_c^2}{m_e V_e^2}$$

$$a_0 = \frac{4\pi\varepsilon_0 \hbar^2}{m_e e^2}$$

$$a_0 = \frac{\hbar}{m_e c \alpha}$$

$$V = \frac{dx}{dt}$$

$$a = \frac{dV}{dt} = \frac{d}{dt}\left(\frac{dx}{dt}\right) = \frac{d^2 x}{dt^2}$$

$$f_e = \frac{V_e}{2\pi R_c}$$

$$q_p = \sqrt{4\pi\varepsilon_0 \hbar c} = \sqrt{2ch\varepsilon_0} = \frac{e}{\sqrt{\alpha}} = 1{,}875545 \cdot 10$$

$$\alpha = \left(\frac{e}{q_p}\right)^2 = \frac{e^2}{4\pi\varepsilon_0 \hbar c}$$

$$\alpha_g = \left(\frac{m_e}{m_{Planck}}\right)^2 = (t_p \omega_c)^2 = \frac{G m_e^2}{\hbar c}$$

$$L_{planck} = \lambda_e \sqrt{\frac{\alpha_g}{2\pi}}$$

$$\alpha_g = \frac{t_p^2 K_e}{m_e} = t_p^2 \frac{F_{max}}{a_0 M_e}$$

Compton frequentie	f_c	$1,235589965 \cdot 10^{20}$
Compton Momentum	ω_c	$7,763440711 \cdot 10^{20}$
Compton Golflengte	λ_e	$2,42631024 \cdot 10^{-12}$
Muon Compton	$\lambda_{c\mu}$	$1,173444103 \cdot 10^{-14}$ m
Muon Massa	m_μ	$1,883531475 \cdot 10^{-28}$ Kg
Tau Compton	$\lambda_{c\tau}$	$6,97787 \cdot 10^{-16}$ m
Tau Massa	m_τ	$3,16747 \cdot 10^{-29}$ Kg
Relative Gravity	E	$2,07650432 \cdot 10^{-43}$
Boltzman	K	$1,3806488 \cdot 10^{-23}$ J k^{-1}

grond root C = 2,088252321

Water → aether = 42800 Hz

Lichtsnelheid	C	299792458	m/s
* Lichtsnelheid Kwantum excitatie	C_e	$1,093845633 \cdot 10^{6}$	m/s
Constante van Planck	h	$6,62606957 \cdot 10^{-34}$	J/s
Elektrische Veld Constante	ε_0	$8,854187817 \cdot 10^{-12}$	Fm
Magnetische Veld constante	μ	$4\pi \cdot 10^{-7}$	H/m
Elementaire Lading	e	$1,602176565 \cdot 10^{-19}$	C
Gereduceerde Constante van Planck	$\hbar$	$1,054571726 \cdot 10^{-34}$	Js
Fijn Structuur Constante	α	0,0072973526	
Bohr Grond Staat	a_0	$5,2917721092 \cdot 10^{-11}$	m
* Coulomb Barriere	R_c	$1,408097017 \cdot 10^{-15}$	m
* Max Force	F_{max}	$29,053507 \cdot$	Newton *
Planck tijd	T_p	$5,39106 \cdot 10^{-44}$	Sec
Planck lengte	L_p	$1,616199 \cdot 10^{-35}$	Meter
Planck Lading	q_p	$1,875545 \cdot 10^{-18}$	Coulomb
Elektron Massa	m_e	$9,10938291 \cdot 10^{-31}$	Kg
Proton Massa	m_p	$1,672621777 \cdot 10^{-27}$	Kg
Neutron Massa	m_n	$1,674927351 \cdot 10^{-27}$	Kg
Rydberg Constant	R_∞	$1,0973731568 \cdot 10^{7}$	m^{-1}
Gravitatie Constante	G	$6,67384 \cdot 10^{-11}$	m/Kg/s
Gravitatie Kopp Const	α_g	$1,7518 \cdot 10^{-45}$	
Planck Massa	m_p	$2,17651 \cdot 10^{-8}$	Kg
Fibonacci	ψ	1,618033988	