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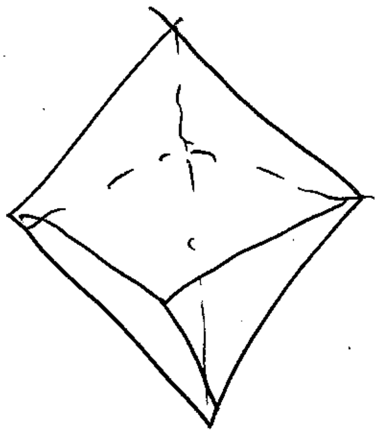
ABSTRACT

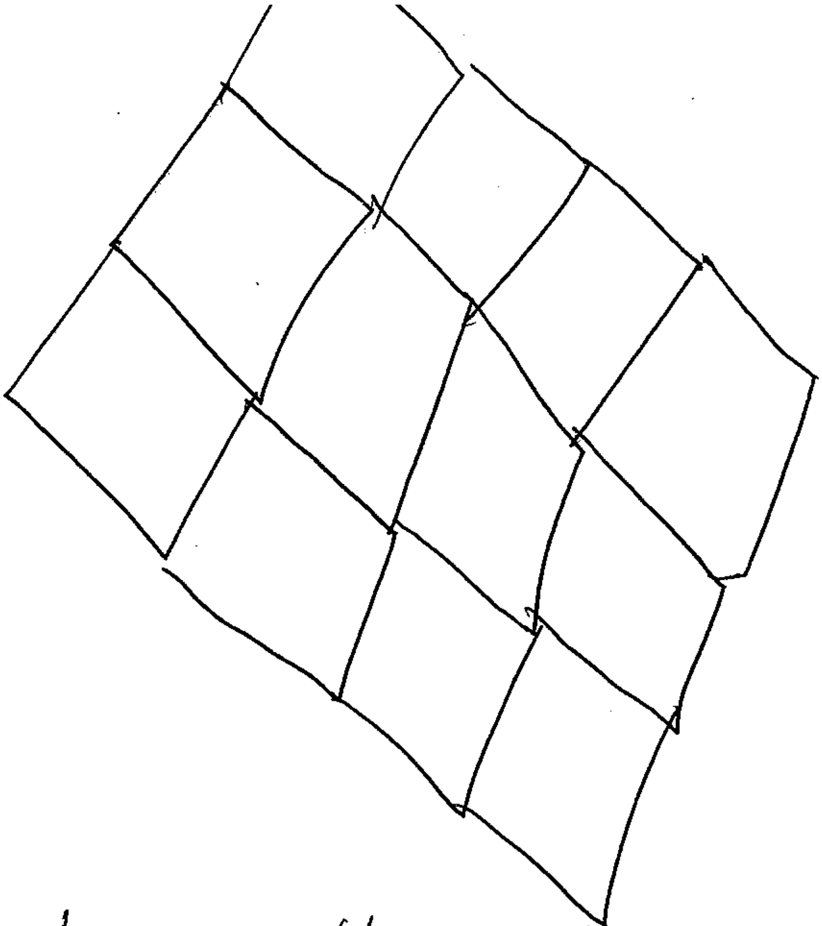
This paper tries to clarify the notion of info fields and the role of geometry in particle physics.

INTRODUCTION

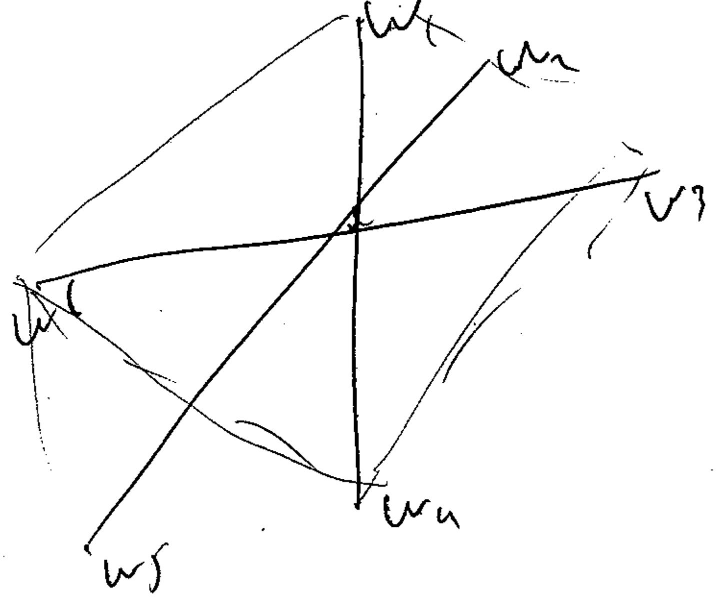
It is my belief that the universe is composed of octahedrons



These can fill space completely

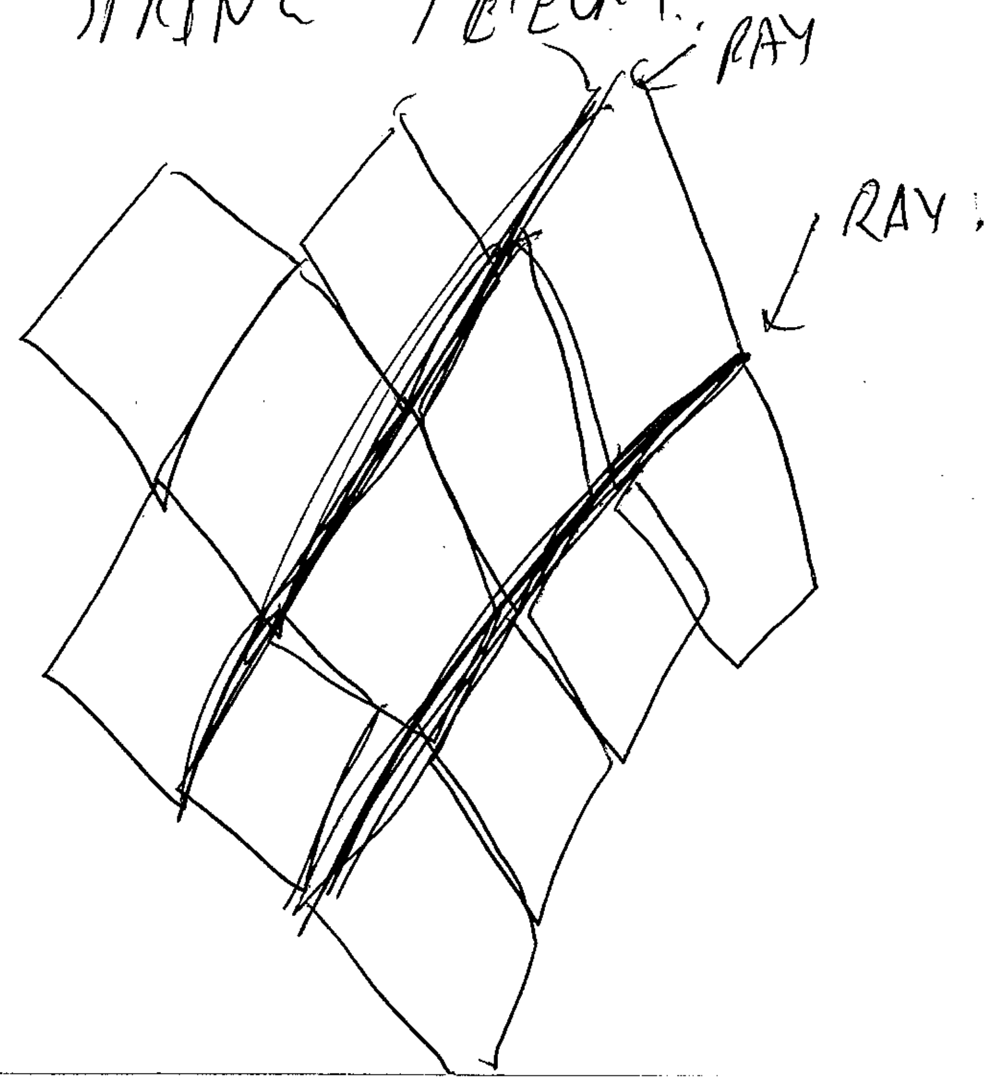


where they are composed OF STRUCTURES ANALOGOUS TO THE CARTESIAN AXES



THESE ARE FIELDS
COMPOSED OF INFORMATION
THEY ARE CALLED INFORMATION
FIELDS OR GUT FIELDS.

ALONG THE BOUNDARIES
OF THE FIELDS THERE ARE
PATHS CALLED (RAYS).
THESE MAY BE THE STRINGS
IN STRING THEORY.

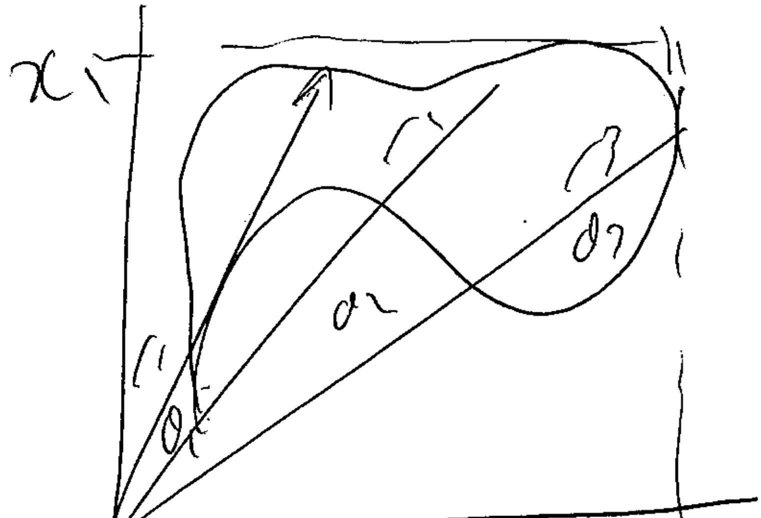


CENTRAL TO THIS THEORY IS THE NOTION OF A (PEEL) SET

$$\hat{X} = \{R^n, x^n, \theta^n, a^n\}$$

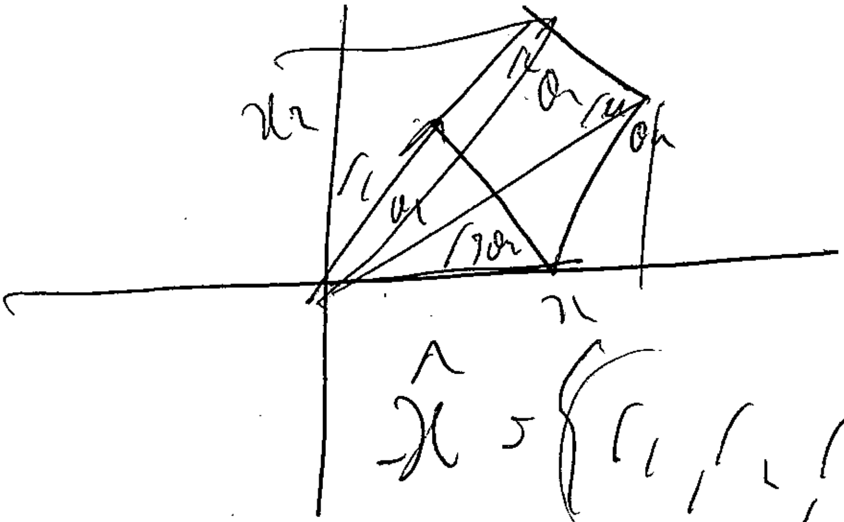
where R is the radius, x is the distance, θ is THE ANGLE AND a is THE NUMBER OF ELEMENTS.

FOR EXAMPLE



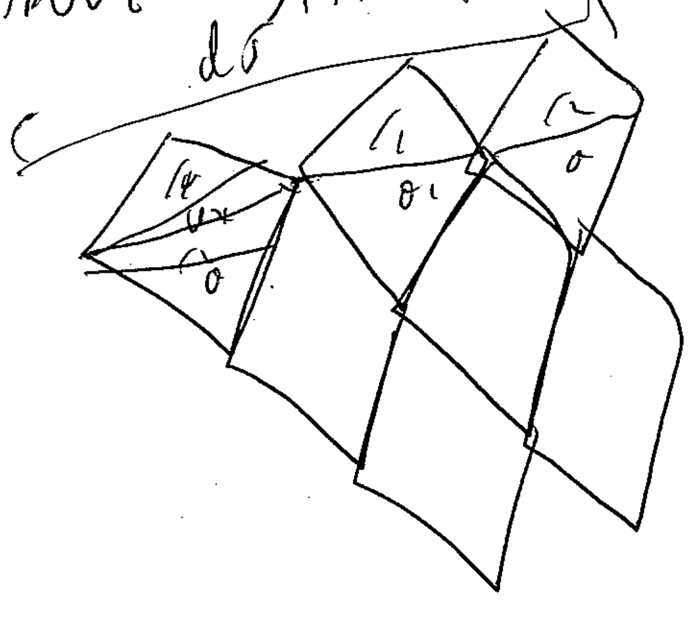
IS DENOTED BY $\{r_1, r_2, r_3, \theta_1, \theta_2, \theta_3, x_1, x_2$

OR



$$\hat{x} = \{(r_1, r_2, r_3), (\theta_1, \theta_2, \theta_3), x_1, x_2\}$$

THESE CAN BE MANIPULATED TO CONTAIN AS MANY ELEMENTS AS NECESSARY TO DESCRIBE A GEOMETRY. IF A SPACE IS MADE OF MANY ELEMENTS WE CAN SUM THE ABOVE SETS TO FORM A METRIC



where

$$ds = \{r_1 + r_2 + r_3\}$$

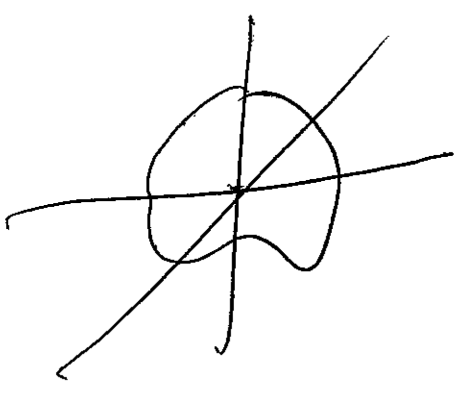
THE PURPOSE OF THIS

PAPER IS TO SHOW HOW GEOMETRY AND THESE SETS IN PARTICULAR CAN INFLUENCE PARTICLE PHYSICS.

DIFFERENT SHAPES CAN BE REPRESENTED BY THE PEEC SETS

DIFFERENT SHAPES CAN METAMORPHOSE BY CHANGING THE UNDERLYING VALUES OF THE SETS. $\hat{\chi}_f \to \hat{\chi}_i$: □ → △

THE ABOVE FIELDS HAVE WHAT IS TERMED A CENTRE



THESE ARE USED TO PERFORM CALCULATIONS

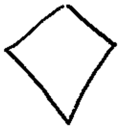
IT APPEARS THAT THE LAWS OF THE UNIVERSE ARE SIMPLY THE INTERACTIONS OF GEOMETRIES.

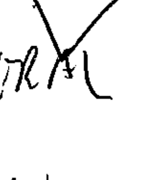
GEOMETRIES CAN BE USED TO DESCRIBE HIGHER DIMENSIONAL BY GIVING EACH DIMENSION A LINE SEGMENT

1d  $\theta = 0$

2d  $0 < \theta < 360°$

3d  $\theta = 180°$

4d  $\theta = 360°$

5d  $\theta = 540°$

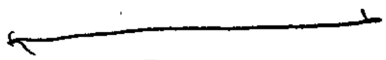
IN GENERAL

n POLYGON $= (n-2)\,180$

where n = number OF SIDES

FOR EACH DIMENSION

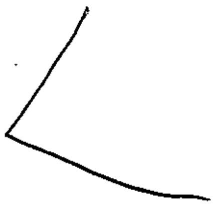
x^k INCREASES BY 1



1d $\{\theta = 0$

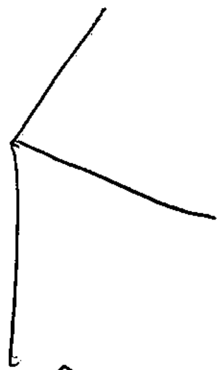
$\{x_1\}$

2d



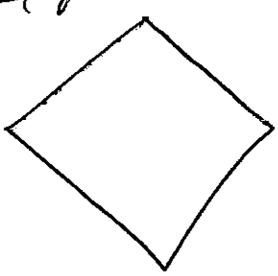
$\{x_1, x_2\}$ $\{\theta = 1$

3d



$\{x_1, x_2, x_3\}$ $\{\theta = 2$

4d



$\{x_1, x_2, x_3, x_4\}$ $\{\theta = 3$

WHEN REPRESENTED BY A POLYGON

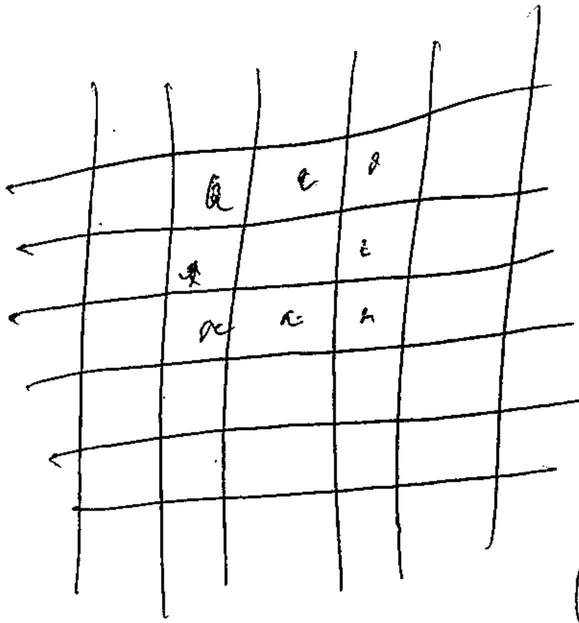
$= (n-2)180$

when n = d and

number of DIMENSION = d-1

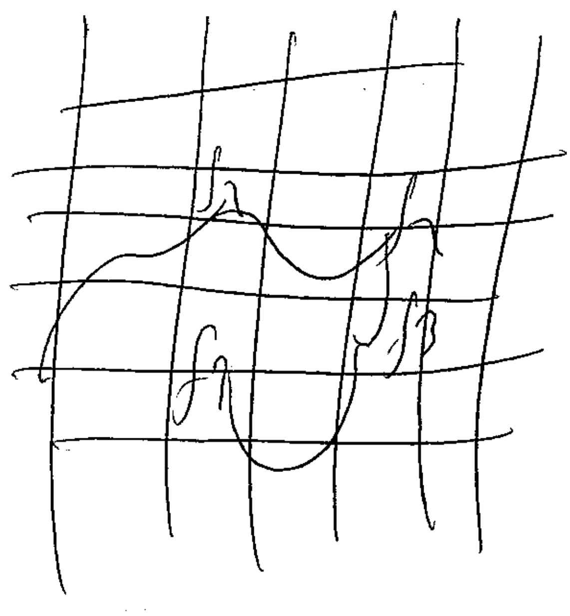
HERE IT IS BELIEVED THAT EACH ARM OF THE FIELDS IS A NEW DIMENSION. THEREFORE THERE ARE 6 small DIMENSIONS PLUS 4 FOR SPACETIME = 10 DIMENSIONS IN TOTAL

THE UNIVERSE CAN (Ai) @
BE DENOTED BY THE FIELD
AS A GRID



BY KNOWING
THE ORIENTATION
OF THE FIELD
THE INNER ONE
CAN BE SOLVED

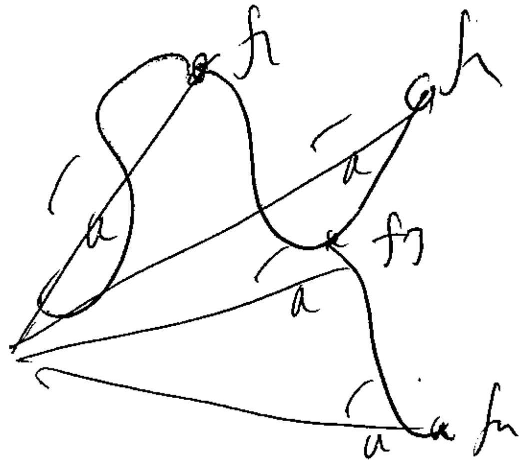
A COMPLICATED SHAPE CAN
BE REPRESENTED BY A SET
BUT THAT SET CAN HAVE ITS
OWN GEOMETRY AND SO ON



A

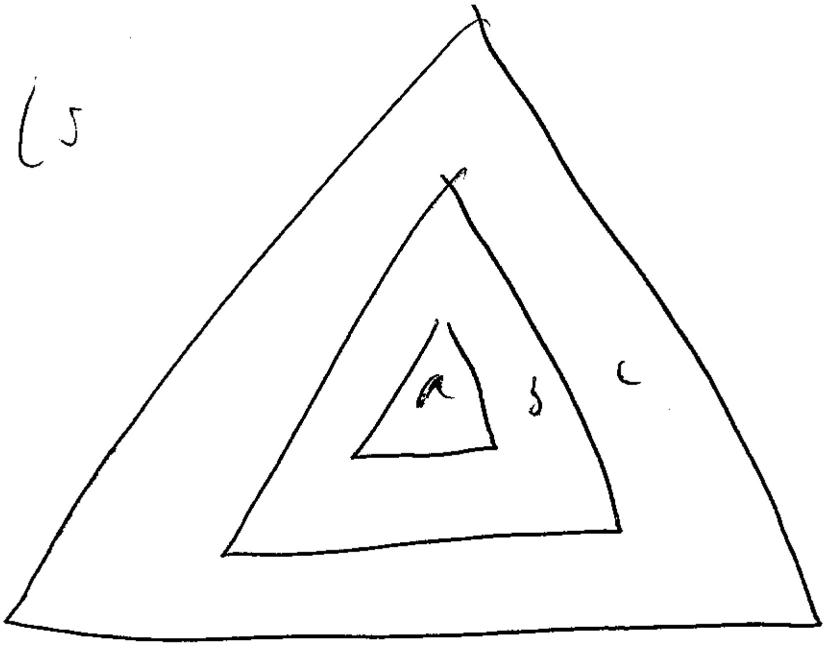
B2

THAT IS



WHERE f_i IS ANOTHER SET $\hat{x}_i$ = THIS CAN PRODUCE 'HIGHER DIMENSIONS' IN INFORMATION
THE PATH INFORMATION FOLLOW IS KNOWN AS A TRAJECTORY.
HERE GEOMETRY ITSELF IS CAPABLE OF PERFORMING CALCULATIONS

ls



$a = \alpha b = \gamma c$

WHERE THE VALUES OF α and γ ARE SIMPLY INTEGERS.

WE CAN ALSO ADD ELEMENTS TO A MATRIX WITH

$M(2,2)$ MEANS ADD 2 ROWS AND TWO COLUMNS ON A MATRIX.

& FOR A TRAJECTORY x_0, v_0 NEED TO BE KNOWN

USING THE EQUATION FOR THE VELOCITY OF A WAVE

$$V = \lambda f$$

$$\lambda = \hat{x}_i \rightarrow f = \frac{1}{T}$$

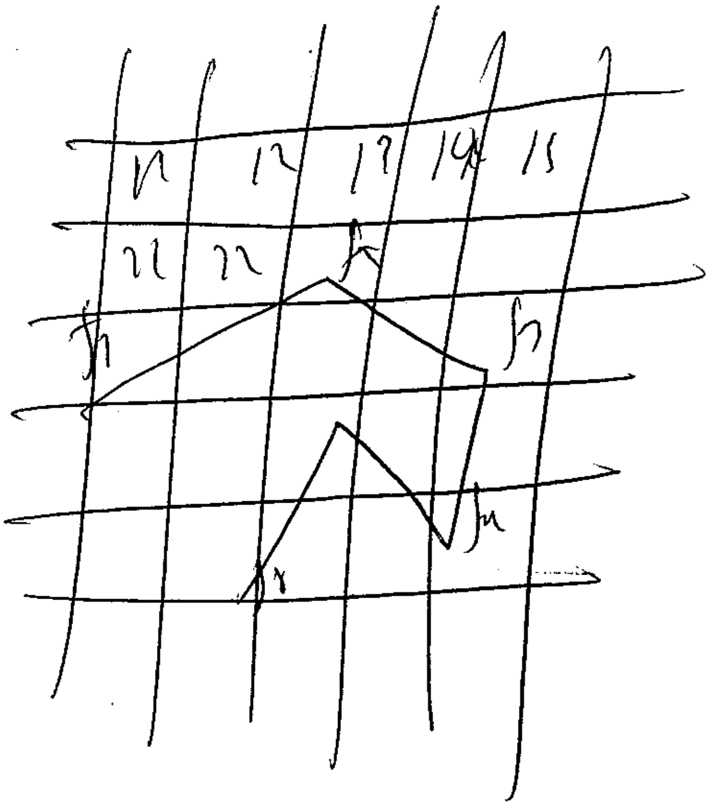
$$V = \{x_1, x_2, x_3\} \cdot \{f_1, f_2, f_3\}$$

$$= \{x_1 f_1, x_2 f_2, x_3 f_3\}$$

$$= \{V_1, V_2, V_3\} \quad \text{ie } \frac{x}{T} = V$$

HERE DECISIONS ARE CRUCIAL. DECISIONS ARE THE PATH TO BE TAKEN BY GEOMETRIES. IE THE CHOICE BETWEEN GEOMETRIES.

THUS THE SPEED OF LIGHT IS THE FASTEST RATE AT WHICH DECISIONS CAN BE MADE



$$f_1 : \hat{x}_1 \to \hat{x}_2$$

$$f_2 : \hat{x}_2 \to \hat{x}_3$$

$$f_3 : \hat{x}_3 \to x_4$$

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

$$\lambda_1 f_1 \rightsquigarrow \lambda_2 f_2$$

$$\lambda_3 f_3$$

$= \{V_1, V_2, V_3\}$ WHERE

V_i has (λ, f) etc

THUS THE DECISION ALTERNATIVES ARE WHERE THE INFORMATION IS.

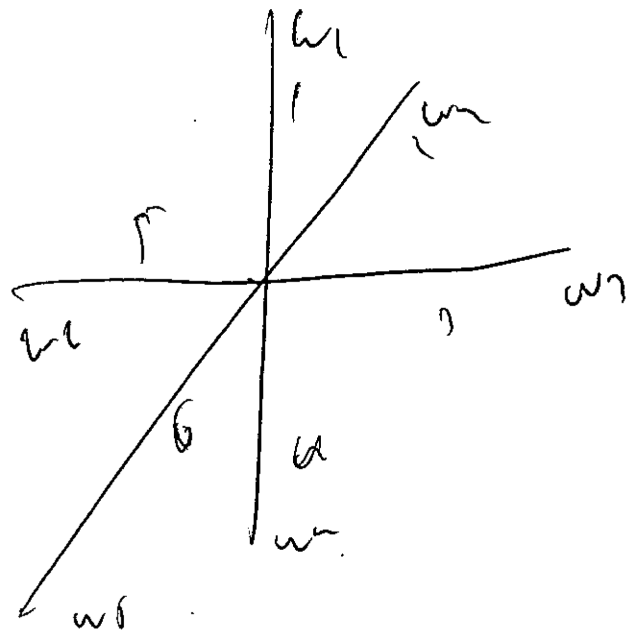
$V = \lambda \int$

$\lambda = \hat{x}$ $\quad f = \hat{\int}$

$\hat{x} \oplus \hat{\int}$

$= \{x_1, x_2, x_3\} \oplus \{f_1, f_2, f_3\}$

$= (V_1, V_2, V_3)$ $\quad u \quad x\int = \frac{x}{f} = V$



$w_6 = \int_6 = V_6$

WE ALSO NEED TO MEASURE DISORDER → ENTROPY CAN BE USED OR WE CAN DEFINE ANTI-INFO

ANTI INFO IS ESSENTIALLY (16)

THAT WHICH IS NOT PART OF

THE SOLUTION SET

UNIVERSE $\cup \hat{x}_i \neq f_{ee}$

WHERE f_{ee} IS THE DESIGNED SHAPE
(USEFUL GEOMETRY)
EACH UNIVERSE IS GIVEN A

CERTAIN NUMBER OF 'FORMS'

IN WHICH f_{ee} IS ALLOWED
THIS IS ESSENTIALLY INTERACTIONS
OF GEOMETRIES

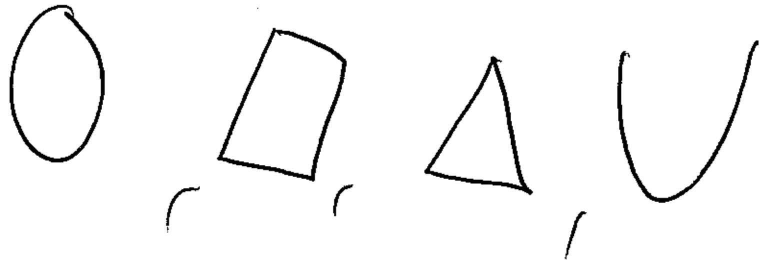
ANTI INFO = INFO - BASE

TOTAL INFO = x_{∞}

Info = $\hat{x}_f^{\,i} \wedge x_{\infty}$

IT IS MY BELIEF THERE MAY BE 9 DIMENSIONS OF SPACE IN OUR UNIVERSE. THIS ARGUMENT CAN BE EXTENDED TO SAY THERE ARE 9 BASIC SHAPES

i.e.



etc

LET THE SET OF OBJECTS BE REPRESENTED BY A. THEN

ΠA IS ALL POSSIBLE COMBINATIONS OF A WE THEN HAVE A SELECTION MATRIX β SUCH THAT THE LAWS REGARDING GEOMETRY ARE

$$\text{LAWS} = \beta \, \Pi A$$

HERE IT IS THE RELATIONSHIPS BETWEEN ~~CURVES~~ SYMBOLS THAT ARE IMPORTANT. THE SYMBOLS THEMSELVES ARE ARBITRARY

HERE DECISIONS ARE CIRCULAR

logic = shape

$\downarrow$

$lev_{a,b}(i,j) = f(x_i)$

STRONG METRIC = shape

= LOGIC

IN TERMS OF ENTROPY

$E = T\,dS$

$\Delta S = k_B \ln \Omega$

$\ln \Omega = (\hat{x})_i$

E = RATE of change OBSERVED

$$\frac{dS}{dt} = T\,dS$$

$$T = \frac{1}{dt}$$

BUT n = FREQUENCY $= \frac{1}{dt}$

$\therefore n = T$

$\therefore$ TEMPERATURE INCREASES FREQUENCY

8 ATTRACTION AND REPULSION

THE CERTAIN GEOMETRIES THAT ATTRACT AND REPEL MAY BE FOUND EXPERIMENTALLY

BUT $x_f - x_i = 0$
FOR ATTRACTION
THAT IS WHEN ATTRACTION
$x_f = x_i$

FOR REPULSION

$$x_f \neq x_i \text{ so}$$

THAT IS

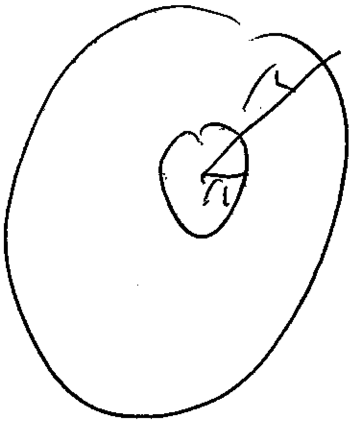
$$\int \left(\hat{x}_f \pm \hat{x}_i \right) = \epsilon$$

FOR ATTRACTION AND REPULSION

* TO FIND DATA EXPERIMENTALLY WE SET UP 2 CIRCLES WITH ONE OF THE CIRCLES HAVING CHARGE ETC

$$x_f = x^2 + y^2 = r_2^2$$

$$x_i = x^2 + y^2 = r_1^2$$



$$x_f - x_i = r_2^2 - r_1^2$$

$$x^2 + y^2 = r^2$$

$$x^2 + y^2 = 0$$

$$x^2 = -y^2$$

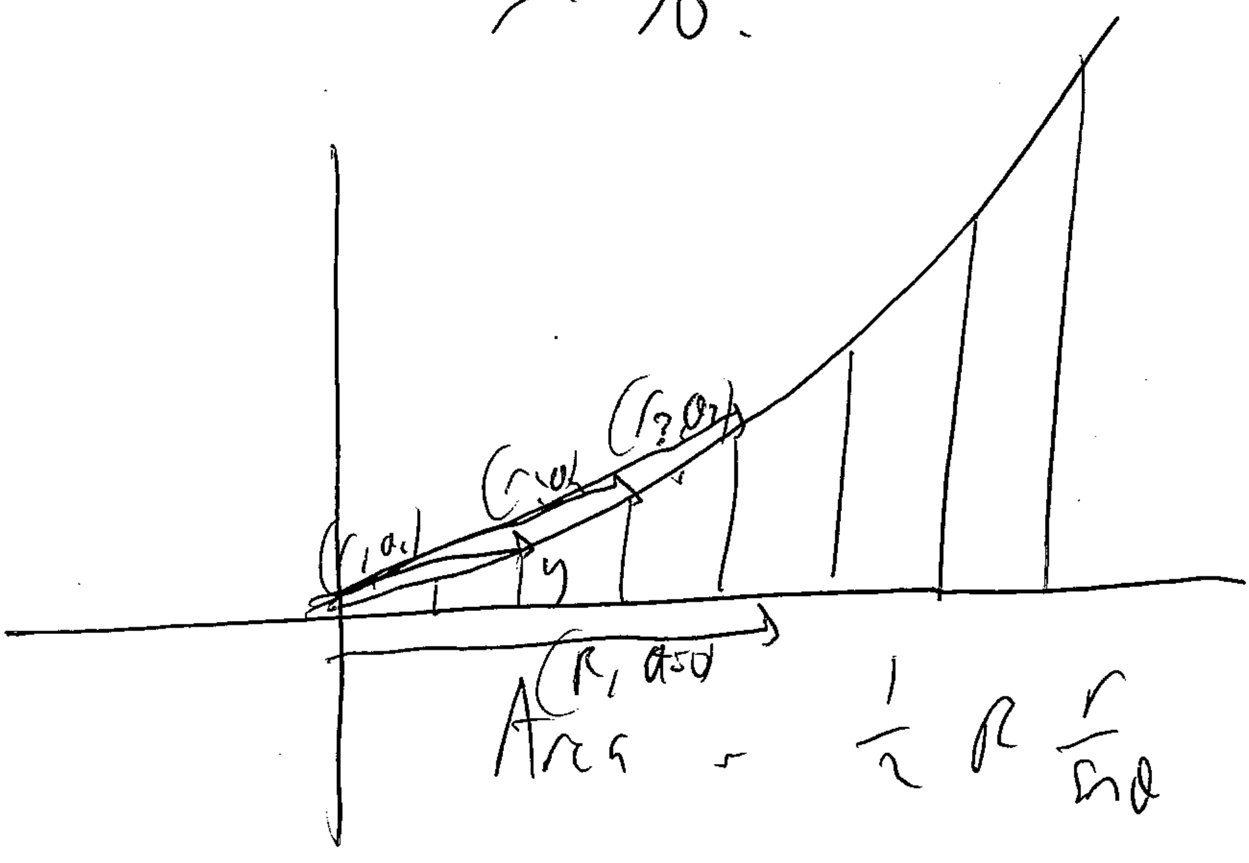
but $r^2 > 0$

(21)

$$\text{Re}\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}\begin{pmatrix} r^2 \\ 0 \end{pmatrix}$$

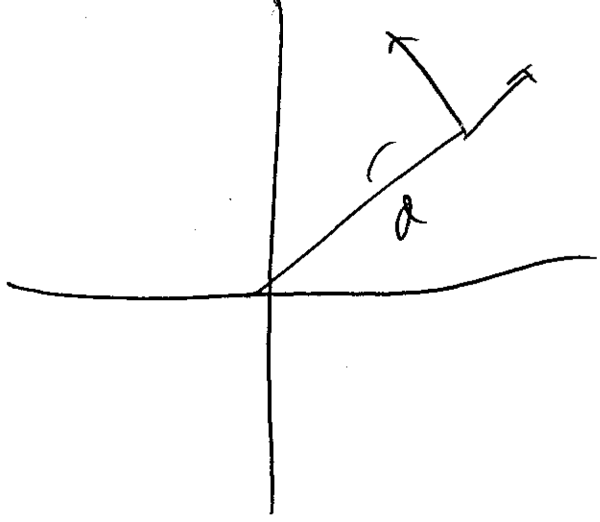
$0 = r^2$ but

$r^2 > 0.$



$$\text{Area} = \frac{1}{2} R \frac{r}{\sin\theta}$$

$$\hat{x} = \{R^N, r^N\theta^N\}$$



$v_r = \dot{r}$

$v_\theta = r\dot{\theta}$

$$\text{Energy} = \frac{1}{2}m\left[\dot{r}^2 + r^2\dot{\theta}^2\right]$$

WE CAN CLASSIFY
ATTRACTION AND REPULSION
AS 'SPECIAL EQUALITY'
WHERE SOMETIMES ATTRACT.
A BASIC COMMAND IS

time (=) frequency (=) distance (=) physics (=) logic
LOGIC IS AWARE OF
DISPLACEMENT IS AWARE OF TIME

A AN APPROXIMATION TO THE
UNCERTAINTY PRINCIPLE

$$x^2+y^2 > r^2$$

r^2 = Plank length = PL

$\delta x_{i,s} = x^2+y^2$

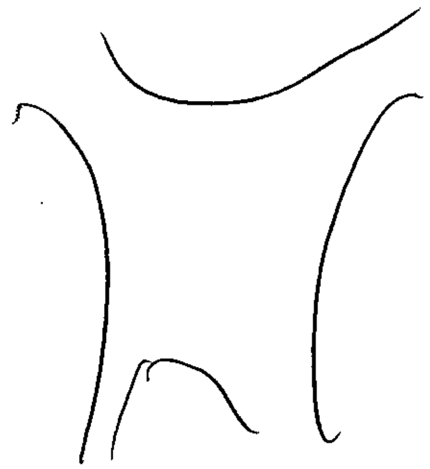
THAT IS $\Delta x \Delta p = x^2+y^2$

$x = s$

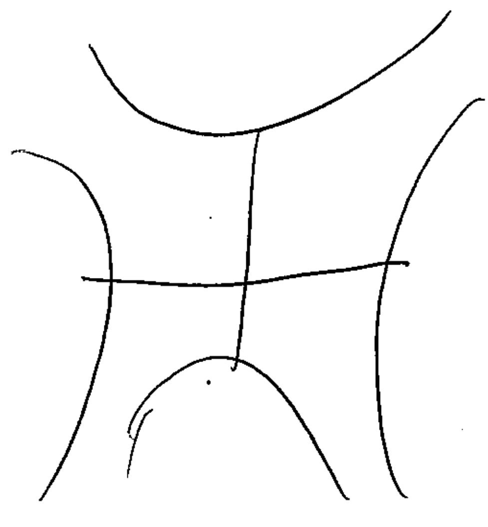
$2x^2 > PL$ and $\Delta x \Delta p = x^2+y^2$

$x^2 > \frac{PL}{2}$ $\therefore \Delta x \Delta p > \frac{PL}{2} \cdot \frac{t}{2}$

IN THE BEGINNING OF STRING THEORY THERE WERE FEYNMANN DIAGRAMS.



HERE THERE CAN BE SOMETHING IN THE MIDDLE.



THESE ARE THE FIELDS CAN ABSTRACT REPRESENTATION

TO ILLUSTRATE THAT RAYS CAN EXIST WE LOOK AT FORCE. A FORCE IS NEEDED IN THE FIELD

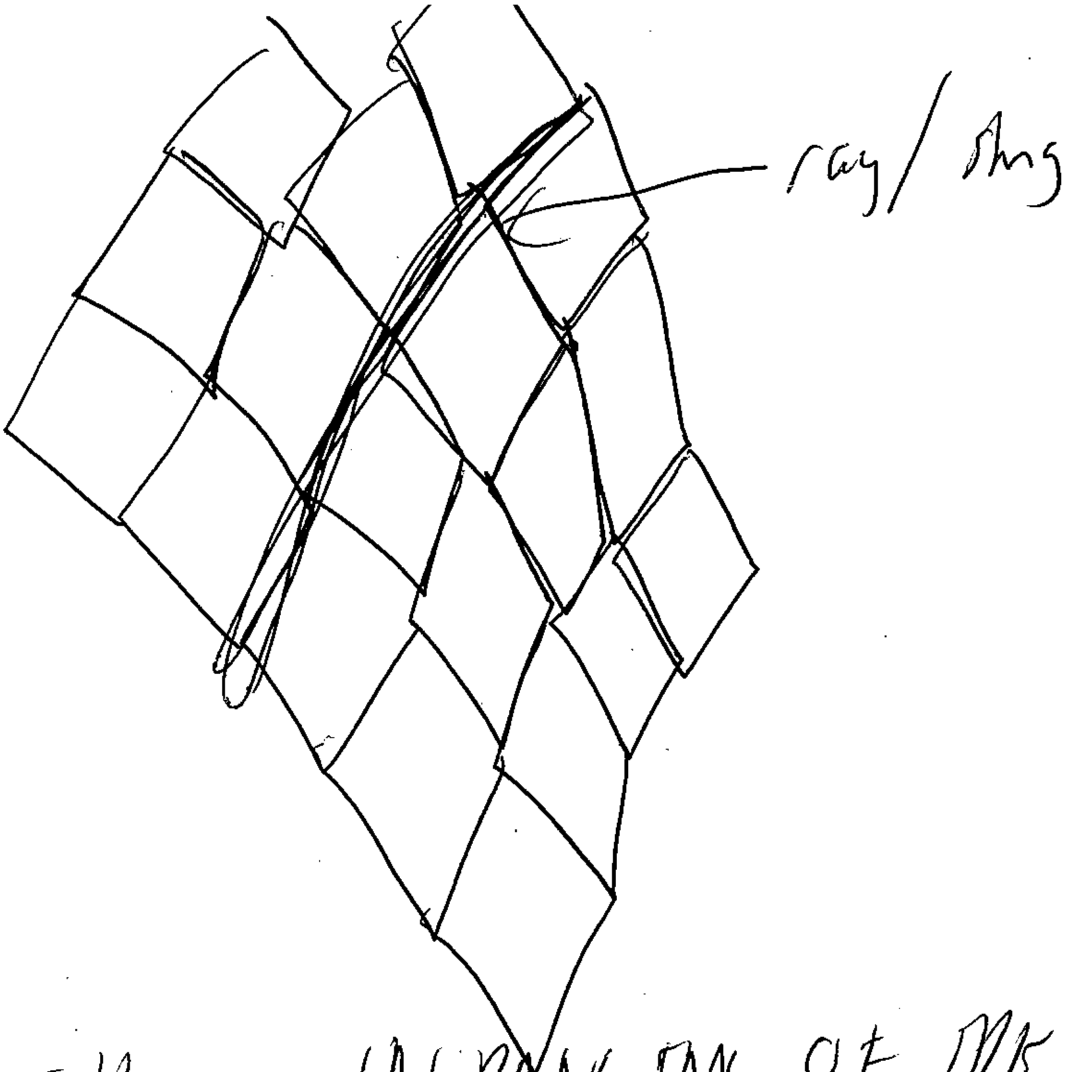
$F = Kx$ → DEPENDENT ON DISPLACEMENT

acceleration $= a = \frac{d^2x}{dt^2} = Kx$

THIS HAS A SINUSOIDAL SOLUTION

$= \sin(xt)$

WHICH IS A WAVE / STRING / A RAY.



THE LAGRANGIAN OF THE RAYS ARE

$$J = \frac{1}{2\pi} \int_0^{\pi} \left(\frac{\partial x}{\partial \tau}\right)^2 - \left(\frac{\partial x}{\partial \sigma}\right)^2 d\sigma$$

THIS IS AN EQUATION FOR RAYS WITH EITHER DIRICHLET OR NEUMANN BOUNDARIES

(26)

& THAT ENERGY IS INVOLVED IN ATTRACTION

$d S = k_B \ln \Omega$ IS DEPENDENT ON CONFIGURATION THAT IS

$\ln \Omega = \hat{C} = \{x^{\alpha}, \ldots, \theta^{\alpha}\}$

$E = T dS$

E = KINETIC + POTENTIAL $= E_R \, dk_B$

$T \ln \Omega = E_R \, dk_B$

$T(\ln \Omega_1 - \ln \Omega_2) = E_R \, dk_B$

$\ln \Omega_1 - \ln \Omega_2 = \frac{E_R \, dk_B}{T}$

but $\hat{X} = \ln \Omega$

$\hat{X}_2 - \hat{X}_1 = \frac{\text{ENERGY}}{\text{TEMP}}$

THUS ENERGY IS INVOLVED IN GEOMETRY

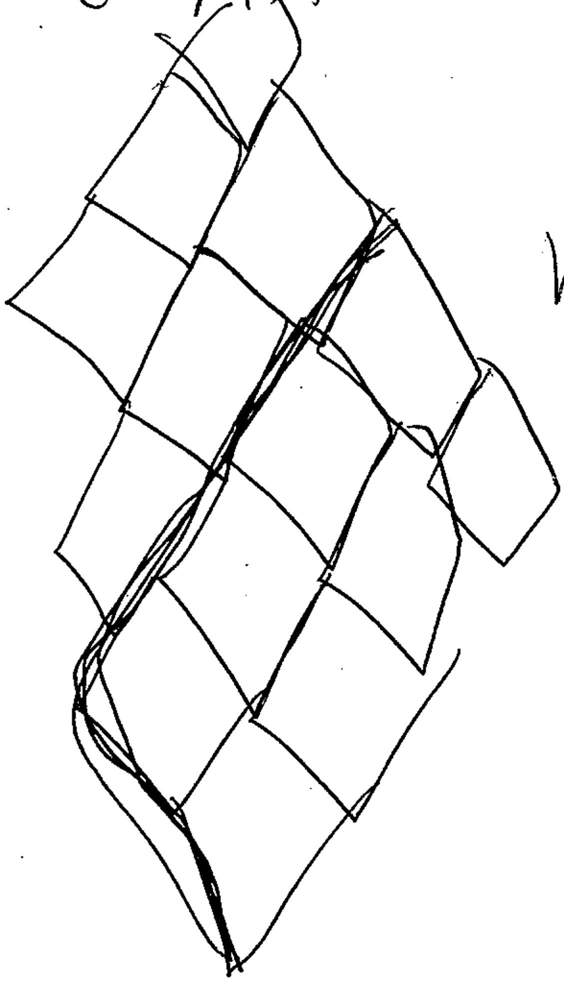
AS

$x\delta - \mu_i = 0$

IMPLIES ATTRACTION

& FOR THE GROUND STATE OF THE FLUID

$E = n\hbar\omega$



$X(\sigma) = \sum x_n w_n \sigma$

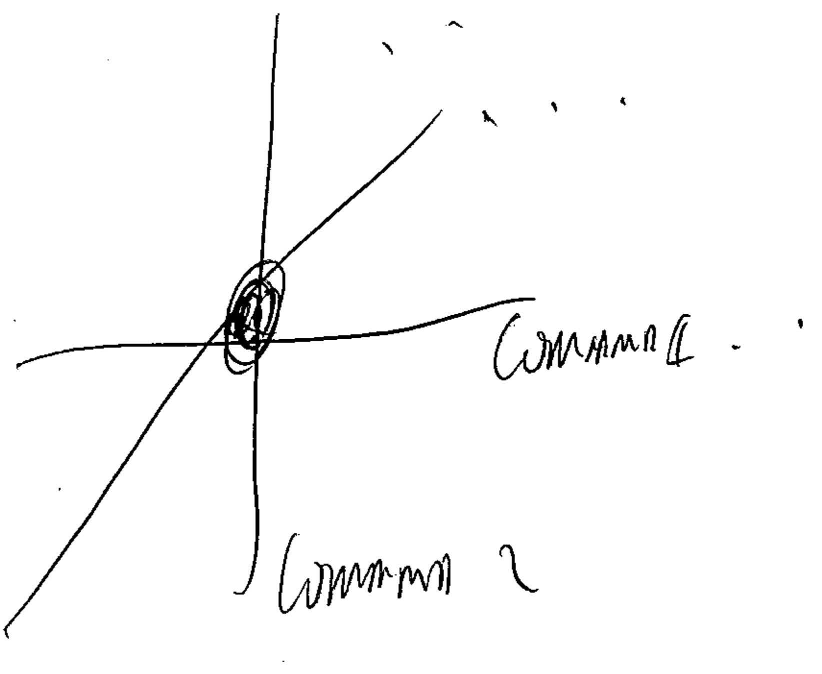
WHERE $\hat{x}_n$ IS THE FOURIER COEFFICIENT

$\Omega = \{x^\mu, \tau, \sigma\}$

A CHANGE OF GEOMETRY CAN (28)
BE A COMMAND FOR
ACTION

$$\begin{tikzcd}
\text{COMMAND 1} \arrow[r] \arrow[d] & \hat{x} \arrow[d] \\
\text{COMMAND 2} \arrow[r] \arrow[d] & \hat{y} \\
\text{COMMAND 3} \arrow[r] & \hat{z}
\end{tikzcd}$$

WHERE $\hat{x}, \hat{y}, \hat{z}$ ARE VARYING
GEOMETRIES.



WE EXAMINE THE CONNECTION BETWEEN LOGIC AND GEOMETRY

(MODUS PONENS)

$$P \to Q$$

$$P$$

$$\therefore \; Q$$

$$\hat{x}_j - \hat{x}_i \xrightarrow{\text{tmi}} \epsilon$$

$$\hat{x}_f \, \hat{x}_i$$

$$\therefore \; \epsilon$$

SYLLOGISM

$$f \to \hat{x}$$

$$\hat{x} \to (\hat{x}_j - \hat{x}_i)$$

$$\therefore f \to (\hat{x}_j - \hat{x}_i)$$

FROM RELATIVITY WE HAVE

$$f = \frac{d}{c}$$

THIS GEOMETRY CAN BE USED TO MAKE DECISIONS

$$f \to R$$

$$R \to x_j - x_i$$

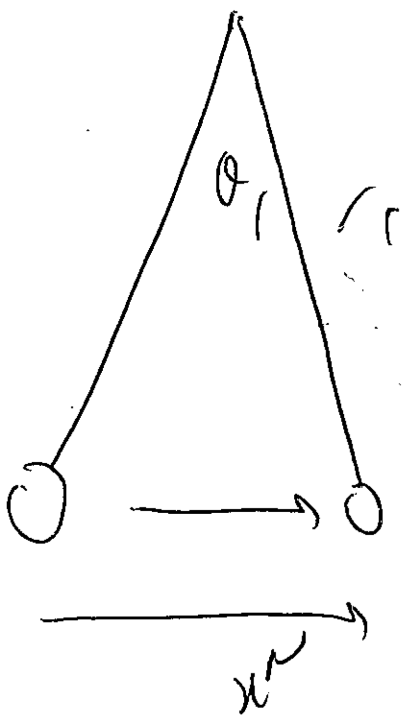
$$f \to x_j - x_i$$

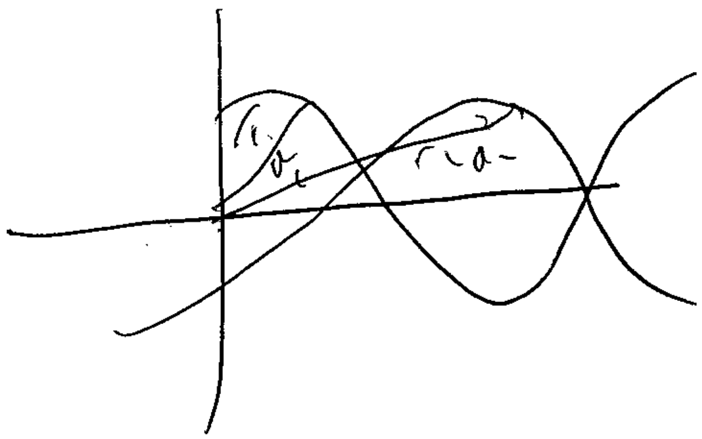
IF WE CAN REDUCE THIS PHASE SPACE WE CAN DESCRIBE THIS WITH A PHYSICAL GEOMETRY

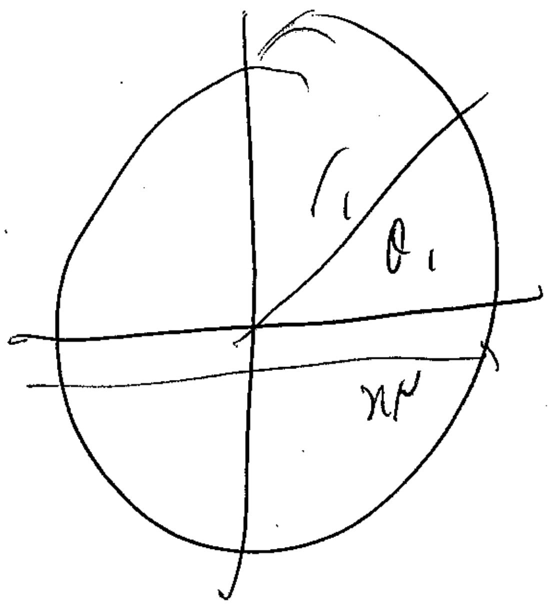
IS PHASE SPACE MANIFOLDING

PHYSICALLY

E.G. FOR A PENDULUM







PROBLEMS SUCH AS THIS GIVE INSIGHT INTO THE STRUCTURE OF [illegible]

$$\hat{x} = \{x^\mu_1, \theta^\mu_1\}$$