

## MORE ABOUT CAOS:

Premises:

$$\sum_n u_n | \alpha \rangle = u_1 \cdot \alpha + u_2 \cdot \alpha + \dots + u_n \cdot \alpha$$

$$\langle u_i | u_j \rangle = \delta_{ij} = 1 \text{ si } i = j$$

$$\langle u_i | u_j \rangle = \delta_{ij} = 0 \text{ si } i \neq j$$

$|u_i\rangle \langle u_j|$  equally.

Suppose that  $u_n = (a, b, c)$  i  $\widetilde{u}_n = (-a, -b, -c)$  i  $\langle u_n | \widetilde{u}_n \rangle = 1$  pel compliance with the ortonormality (linearly independent vectors or canonical basis in a grup). It also happens  $\sum_n |u_n\rangle \langle \widetilde{u}_n| = \sum_n | \widetilde{u}_n \rangle \langle u_n | = 1$  n=n.

El scalar product of 2 vectors always give a number.

Next we express F as a wave function =  $\sum_n c_n \cdot u_n$

Conceive the Liouville or Hamilton equation

$$|\rho(t)\rangle = \sum_n |u_n\rangle e^{-iL_n t} \langle u_n | \rho(t_0) \rangle \text{ or}$$

$$\Psi(t) = \sum_n |u_n\rangle e^{-iE_n t/\hbar} \langle u_n | \psi(t_0) \rangle \text{ respectively.}$$

Each new "t" represents another  $\psi(t)$ . when  $n \rightarrow \infty$ , the results are more reliable for statistics; as if measure the Schrödinger equation "n" times: for every "n",  $\widehat{H} \cdot \psi(t) = E \cdot \psi(t)$ . then, the caos is fulfilled.

$$\psi_{n+1}(t) = U_t \cdot \psi_n(t_0)$$

$$\text{Knowing that } (a \ b \ c) \begin{pmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \\ \alpha_{31} & \alpha_{32} \end{pmatrix} = (e \ d) \text{ where "e" i "d"}$$

are the values of energy

assuming that (a b c) are functions of  $\psi(t_0)_n$  d'1 a n (n=3) and we only have 2 types of energy.

We can assume that the exponential satisfies the equation Schrödinger for  $n=1, \dots, n$ . In the case of **Hamilton**,

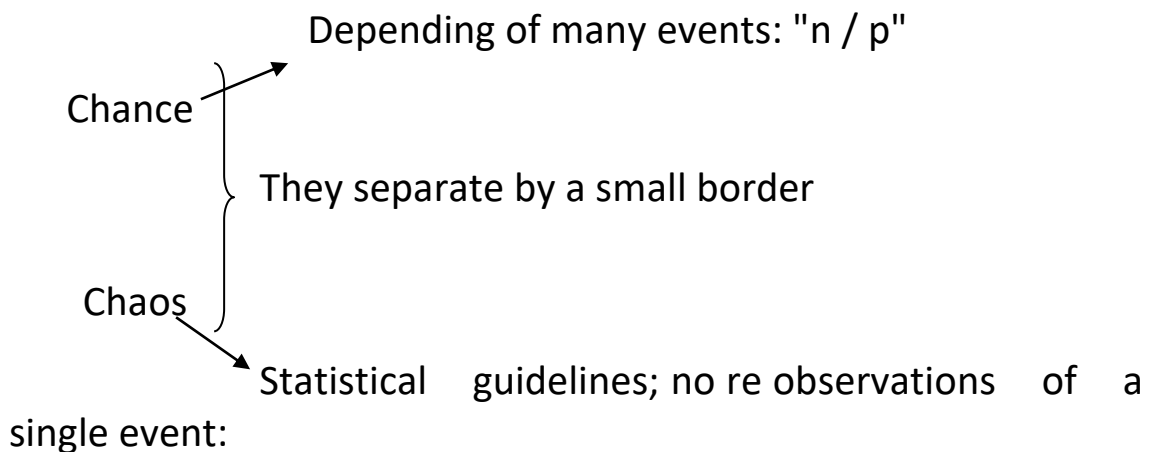
Probably  $e^{-iE_n/h} \rightarrow$  function (1), whereas  $\langle u_n | \psi(t_0) \rangle$  is the scalar product and gives an *own value* of that function (1). While  $\Psi(t)$  is the result of the vectorial product [ $w = u \times v$ ]

$$e^{\langle a | \alpha_{11} \rangle + \langle b | \alpha_{21} \rangle + \langle c | \alpha_{31} \rangle} = e^d \quad \text{and the same for } e^e.$$

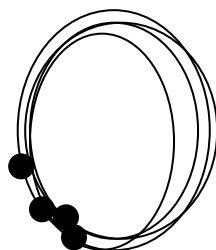
(remember  $F = \sum_n c_n \cdot u_n$ ).

We can measure de  $t=1$  to the time we want.

Because of its mission to which I have been subjected to other voluntary and sometimes forced, I purchased a docile temperament. I have an accentuated sensation of who sends and who obeys. For qualified people, the only thing I can do is learn.



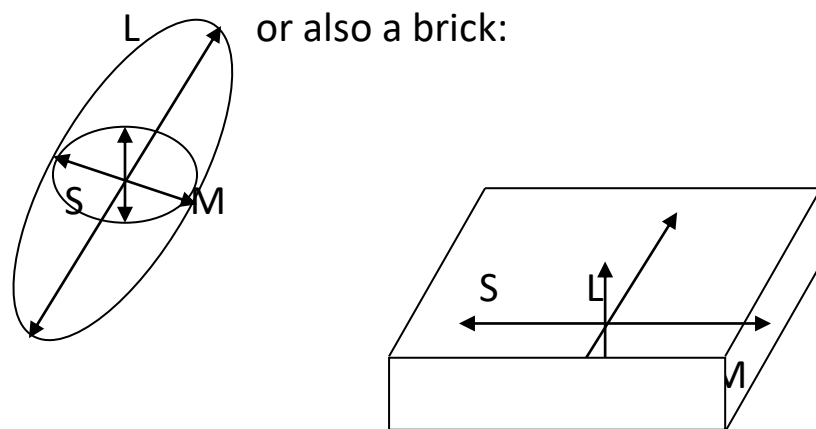
etc



Determinist: Newton

Random: Univers and initial awards (premises).

We take as a study an object: a rugby ball:



The **vibrational rotation**: when you turn using the axis S we find that the rotation is less homogeneous than using reference axis L.

Therefore in  $U(t) \cdot \psi(t_0) = \psi(t)$ , that equates the chaos with the stability of when  $n \rightarrow \infty$  (that is when  $n \rightarrow n + 1$ ) the events become connected between them, then each case "n":  $e^{a_n}$ , it multiplies and does not add independently, forming:  $e^{a_1} \cdot e^{a_2} \dots e^{a_n}$ ; That is, they are connected, since they will never pass 2 particles there (or, what is the same, there will never be the same probability!).