

LIBERO ACERBI

## The wave particle of Art”



Topic: ART Theory

Author:

Libero Acerbi  
Via Lombardia 28  
40139, Bologna,  
Italy  
libi-@libero.it

Reference:

IAEA Experimental  
Aesthetics Symposiums  
Berlin 1992, Prague 1996,  
Dresden 2010

E-mail

libi-@libero.it  
Libero Acerbi  
via Lombardia 28  
40139 Bologna Italy

## THE ARTON

I call “ARTON” the elementary unit of Art. In other words the element of Art. Let me consider it to behave like a “wave-particle”.

**ELEMENTARY ARTISTIC EVENT:** it is just a specific set of initial and final conditions. An Arton leaves the source, arrives at the detector, and nothing else happens.

**PROBABILITY AMPLITUDE OF AN ELEMENTARY ARTISTIC EVENT:** it is a complex number  $\omega$  (we have a real part of Art and an imaginary part of Art).

**PROBABILITY OF AN ELEMENTARY ARTISTIC EVENT:** in an ideal experiment is given by the square of the absolute value of the probability amplitude of this elementary artistic event (we have just a real part of Art)

$\omega$  = the probability amplitude of an elementary artistic event (real part of Art and imaginary part of Art)

$P$  = the probability of an elementary artistic event (real part of Art)

$$P = |\omega|^2$$

When an elementary artistic event can occur in several alternative ways and we are **not capable of determining** whether one or another alternative is actually taken, the probability amplitude for this event is the sum of the probability amplitudes for each way considered separately. We have interference :

$$\begin{aligned}\omega &= \omega_1 + \omega_2 \\ P &= |\omega_1 + \omega_2|^2\end{aligned}$$

If we expand  $|\omega_1 + \omega_2|^2$  we see that:

$$|\omega_1 + \omega_2|^2 = |\omega_1|^2 + |\omega_2|^2 + 2|\omega_1||\omega_2| \cos \delta$$

Where  $\delta$  is the phase difference between  $\omega_1$  and  $\omega_2$ . The last term  $2|\omega_1||\omega_2| \cos \delta$  is the interference term.

On the other hand, **if an ideal experiment is performed which is capable of determining** whether one or another alternative is actually taken, the interference is lost. The probability of the elementary artistic event is the sum of the probabilities for each alternative.

$$P = P_1 + P_2$$

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## SELF-ORGANISATION OF THE ELEMENT OF ART

Author: **Acerbi Libero, Dr.** (pseudonym: Libi)

e-mail: [libi@libero.it](mailto:libi@libero.it)

address: Acerbi Libero, via dei Borgognoni 8, 40136 Bologna, Italia.

### SELF-ORGANISATION OF THE ELEMENT OF ART

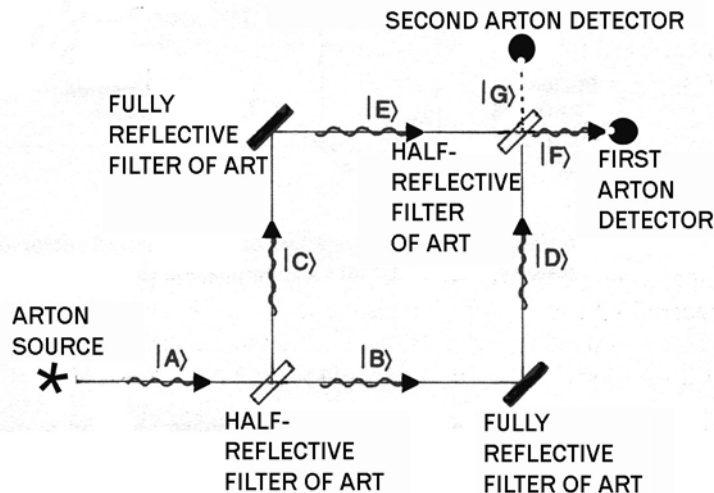
If we consider the element of Art as a wave-particle that we shall call **Arton**, the state of its wave function will change over time according to Schroedinger equation, which may generally be expressed in the form:

$$|\psi\rangle = u|A\rangle + v|B\rangle + w|C\rangle + \dots + z|F\rangle$$

where the weight factors  $u, v, \dots, z$  are complex numbers (a real part of Art together with an imaginary part of Art) and  $|A\rangle, |B\rangle, \dots, |F\rangle$  represent the various position or spin possibilities for the element of Art. Hence we can say that **ONLY THE PROPORTIONAL RELATIONSHIPS (FRACTALS) BETWEEN THESE WEIGHT FACTORS HAVE MEANING.**

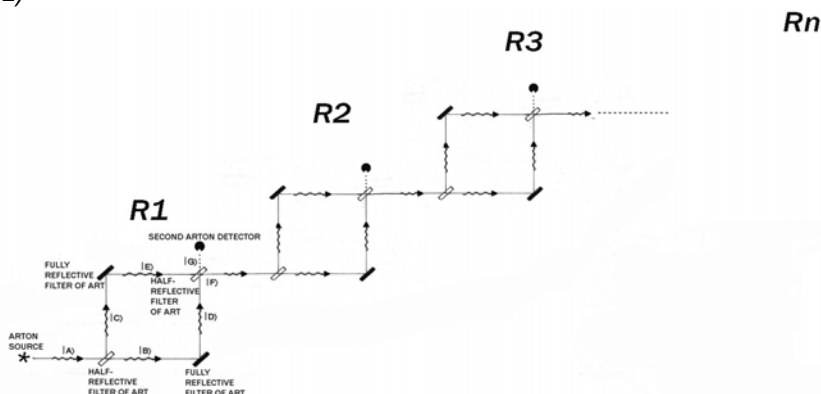
We can consider a thought experiment with an Arton entering a Mach-Zehnder interferometer, which leads to the collapse of its wave function:

(figure n°1)



We could consider the path of the element of Art in this interferometer like **A SELF-REFERENTIAL LOOP** and, in such a case, we could imagine that this also occurs in a **RECURSIVE** manner, if we think of a succession of interferometers, as in the figure below:

(figure n°2)



### DIGITAL CRITICISM

## EXPERIMENTAL COMPARISON BETWEEN ARTWORKS

In Libi's "Crucifix" of 2007, (Libi alias Acerbi Libero),



(figure n°3): **Libi**, "Crucifix", 2007, manual assemblage wax digital painting, oil colours, gold, on wood, 198x130x2 cm.

around the body of the subject we have a geometric gold pattern, the symbol, in a dynamic system of Art, of a control space consisting of the Mandelbrot set containing **attraction level** sets within it.

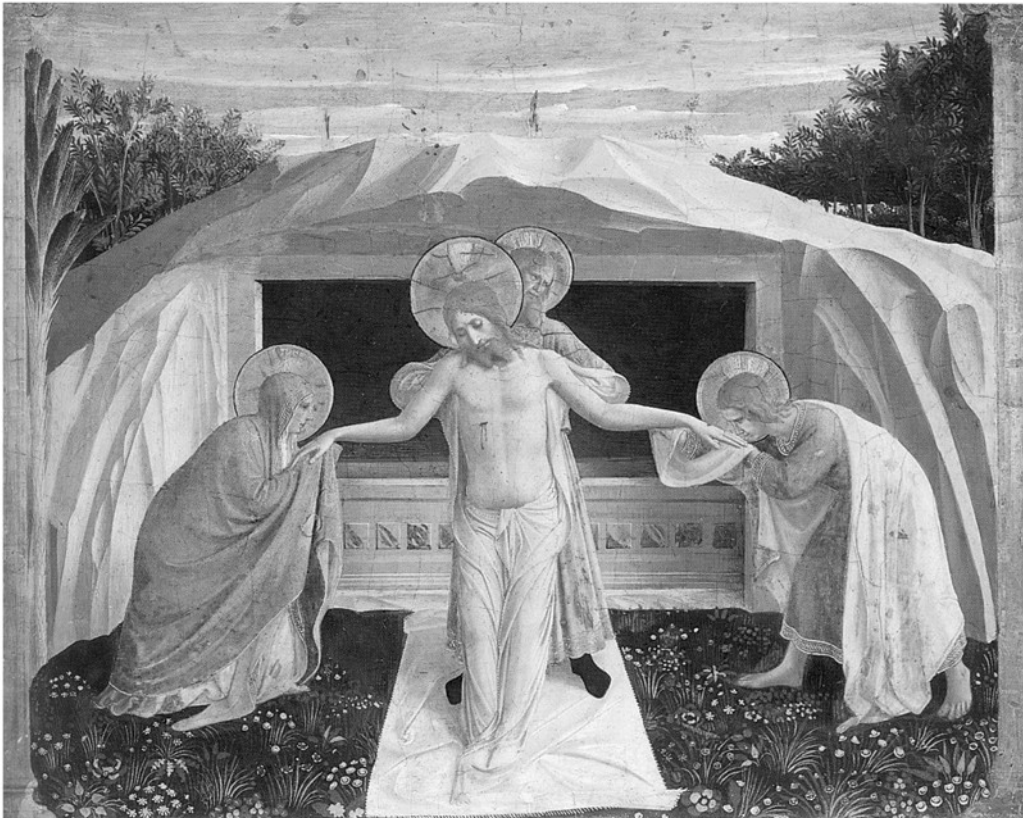
These level sets, within the ordering set, certainly bear a relationship to the life of Christ, utmost attractor or repulsor, but in this representation, a painted work of Art, the crucifix is the artist himself. The work is, in fact, a reflection upon one aspect of Libi's theory, according to which the elements of Art are organised by recursive self-reference.

What takes place on an elementary level is also projected like a shadow into the higher levels; and this, according to this theoretical inspiration, enables a criticism of any work of art. A type of criticism we could call "**digital criticism**", bearing in mind that in this case digital signifies considering the field of complex numbers.

Certain fixed points in the Julia sets, sets controlled by the Mandelbrot set, are never reached by the recursive dynamics of the elements of Art. That is to say, their boundary does not extend as far as the fixed point. **Invariant circles** (Siegel disks) are formed. In its recursive evolution, an element of Art will sometimes, on reaching the corresponding invariant circle, start **rotating about it**. The fixed point in art, in such cases, is said to be **irrationally indifferent to the elements of Art**, since though it attracts the elements of Art, the latter will never reach it.

“Irrationally” because subject to a certain condition of irrationality (Diophantine). References to this dynamic situation are evident not only in the “Crucifix” by Libi, but also in many paintings with a sacred theme: the haloes of saints are one example.

In the **“Entombment”** by **Fra Angelico, 1440,**



( figure n°4): **Fra Angelico, “Entombment”, 1440.**

the fixed points, at the centre of the haloes of the holy figures, are irrationally indifferent. The one for which the Saint acts as intermediary is never reached by what in the artwork represents the reality, but is rather isolated from it by an abstract golden circle. A circle which is an orbit of the reality around a transcendent and, in the final analysis, irrationally indifferent attractor, albeit with a symbolic exception: the realistic and human head of the Saint within the golden disk.

That which is the elementary self-organisational structure of any work of Art appears as evident formal and symbolic content in both works considered here. However, in Libi’s crucifix there is an awareness thereof, supported by the theory.