

## **SYMMETRY / BRIDGE / ASYMMETRY**

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**Abstract:** *In this short lecture I should like to present one of the possibilities of the dynamic image metamorphoses, which builds a bridge of light and image between the palpability and the abstract laws, using the method of superpositioning.*

### **LIGHT BRIDGE BETWEEN THE SENSIBLE AND ABSTRACT REALITY**

As an introduction I give an overview about our research on the visual field, when the laser light appears “material-like”, then I will speak about the method of superpositioning, followed by the characteristic of the light-bridge and the symmetry-asymmetry features of it. As a quick apology I have to mention, I am a painter, not a scientist. My adventures with light started about 30 years ago, or more precisely it got a special inspiration, since the possibilities of light in the art, such as the sidelights, the polarized lights or the use of ultraviolet luminescent powders, have interested me long before. The real impetus stemmed from the meeting with the laser, a light source with unique properties, in the late seventies. I have to thank this to Norbert Kroó, who was the leader of the Hungarian laser research in that time. We worked together for a long time, and for me this field is still the most fascinating and feels as an adventure. In 1977 we had founded the Photon Art Group at the Budapest Central Research Institute for Physics, Hungarian Academy of Sciences (MTA-KFKI). The members of the group were as follows: Prof. Norbert Kroó, József Tóth laser-constructor, and me, Attila Csáji, as a painter. We addressed ourselves to a task of exploring the pictorial possibilities of laser light. Our aim was, as I stated in the catalogue of one of our exhibitions at the Hungarian National Gallery: the amplified light of the stimulated emission of photon radiation have to become an instrument for pictorial composition, it have to become applicable to create composed visual flows.

The Americans concentrated in their experiments (with the possibilities of laser light) on the controllability of the collimated beam. They used that for drawing by controlling scanner pairs even at the 70s. Since the appropriate quality scanners for that were on the COCOM list, we had no opportunity to study them. The other characteristic feature of laser light is the great light power that can be collimated in one point. This property has the potential to shape materials. The third feature is its monochromness, its coherency which makes the light capable of interference. The application of laser light in holography also comes from this property. In our experiments we concentrated on this monochromatic feature of laser light, but not in the field of holography.

When we had divided the works within the Photon Art Group, I had to study the cause and effect dependencies of laser-interferences in this physical phenomenon, to solve the pictorial composability. I have written several times about this topic, e.g. (Csáji, 1980), now I only make a brief overview: As a painter study oil-paints, acryl, etc. and the possibilities that come from their materialness, or the sculptor the types of stones, the potentiality of processing, molding the metals, I wanted to discover the characteristic features of laser light. I was interested in the visual “materialness” of the laser beam and the content of vision that can be created with it. A difference, of course, is that I had no antecedents. In this experiment 30 years ago, I had to start almost everything from scratch. I would like to emphasize to the artist the fact, which is an understood thing among the scientist, that interference in the physical research was well-known, however, its consequent visual analyzation was an unknown territory.

I would like to briefly talk about a decisive episode of this research, about the light bridge that is based upon the method of superpositioning and its relation to symmetry. This visual bridge is a consequence of a visualization system based upon the third principal feature of laser light: the monochromness and its interference capability.

The creation of superposition method and the visual bridge that comes from it were based upon our several years of experimenting in the laser laboratory of MTA-KFKI. We have measured and recorded the radius of laser light, the size and plastical structure of the transparent surface in which the light went through and the pictures that were produced. These images have formed in a Fourier cone and inside that cone in all segment of space sharp picture can be found; therefore the view has no depth-of-field. It followed that we tried to use different projection screens with various geometrical properties and also the necessity of further experimenting, since the picture that is formed in the cone, grows as the projection surface moves away. It has a spatial inertia, which is needed to overcome in order to produce exacting (high quality) views.

To influence this, I have constructed an instrument: a flexible system of lenses, prisms and optical screens. The resulted new picture manipulation system together with the so-called method of superpositioning have been patented by us, in the time of the memorable presentation (show) in the Hungarian National Gallery. (1) the united application of

the laser light, (2) the entering of the classical optical systems at mathematically defined time points, (3) the flexible movement, and (4) the transparent surface that contained the pictorial information had led us to a new image-transforming method. We have named that method “method of superpositioning” (Csáji and Kroó, 1992).

The bridge building with the method of superpositioning means an unusual and strange process with poetical image transformations, which is located symmetrically from the objective recognition of the image in the focal plane. It creates a bridge between the natural visual picture and the abstract spatial-lattices with the help of the coherent light.

By moving the picture disc that contains the optical information (of the objective picture and the wispy interference structures) in the axis marked by the laser light in two opposite directions (moving away and moving closer) different image transformations had formed with various metamorphoses. We can treat these transformations as symmetry, if we do not stuck in the uniqueness of the images, but concentrate on the tendency of the change. By moving away from the objective picture the image determining ratio of the created interference spatial-lattice grows in both directions and the objective picture becomes more and more interweaved and transformed. The further increasing of the distance makes these lattices dominant and the objective picture disappears. Visually, the superposition of the interferences and the objective picture, the visual transformations between the terminal points, are the most fascinating.

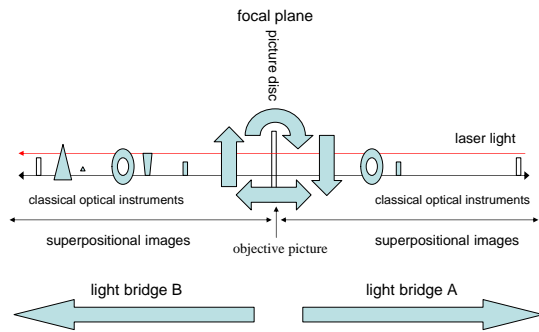


Figure 1: The optical system of the light bridge

I quote from one of my previous articles: “The motif recorded on the picture disc can be further modified by classical optical instruments. The original carved motif can be projected, as one terminal point or as another which shows the Fourier transform of this motif: the interference picture associated with it. The greatest possibility of this method is the visualization of the connecting bridge between the palpability and the lawfulness. Here, we arrive to pure laser interferences through sequence of preholographic pictures. The organic and continuous pictorial transformations create symmetrically, in front of our eyes, the connection between the naturally (without any aid) sensible reality and the mathematically exactly modelable light interferences. In this pictorial transformation, that is called preholographic by us, the objective picture (the carved motif) and the interference image appear simultaneously, in a changing ratio. This continuous process of metamorphoses contents a rich variety of forms that can only be reproduced by laser.”

The pictorial transformations created by the coherent laser light build the bridge by the method of superpositioning between the objective picture and the spatial-lattices of interferences. This bridge evolves, symmetrically in both directions, between the objective and the abstract. This light bridge also means a symmetric two-directional bridge between figuration and non-figuration. By this connection it resolves a contradiction, which is irresolvable for so many people. In the hidden face of nature, however, they always formed an organic unity.

Two different approaches meet in the creation of the light bridge: a scientific and an artistic. Are they symmetric? Or asymmetric? It is a matter of viewpoint. In my firm conviction they are essentially the same. We continuously keep modeling the world. We build and rebuild it, knowing that there is no final solution. This is not a resignation to the unsolvable, but a paradox loyalty: loyalty of an inquisitive mind to itself and the admission of the finality of human nature. This practice, however, spans into the infinite, because it carries the basic principle of spiritual work: creation.

Finally, let me recall some thoughts from the “Symbol-storage”: “The *bridge* is a universal symbol. The bridge connects; it makes possible the get over from one side to another. It is a crosswalk, through which the fetus comes into the world, through which the candidate becomes initiated, through which the spirit gets from the Earth to the Heaven (the chosen among the powers above and the mortals, the priest builds a bridge: the Latin pontifex, priest, high-priest means word-for-word “maker”). The universal symbol of bridge remains valid for the light bridge, as well, but only in the case when it is inspired by artistic creative power. The bridge for the spirit is made by the substitutional artistic application of the superpositioning method. This humanizes it. Without this inner-light, the laser light bridge leads to a deserted world, to the pure nothing.

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