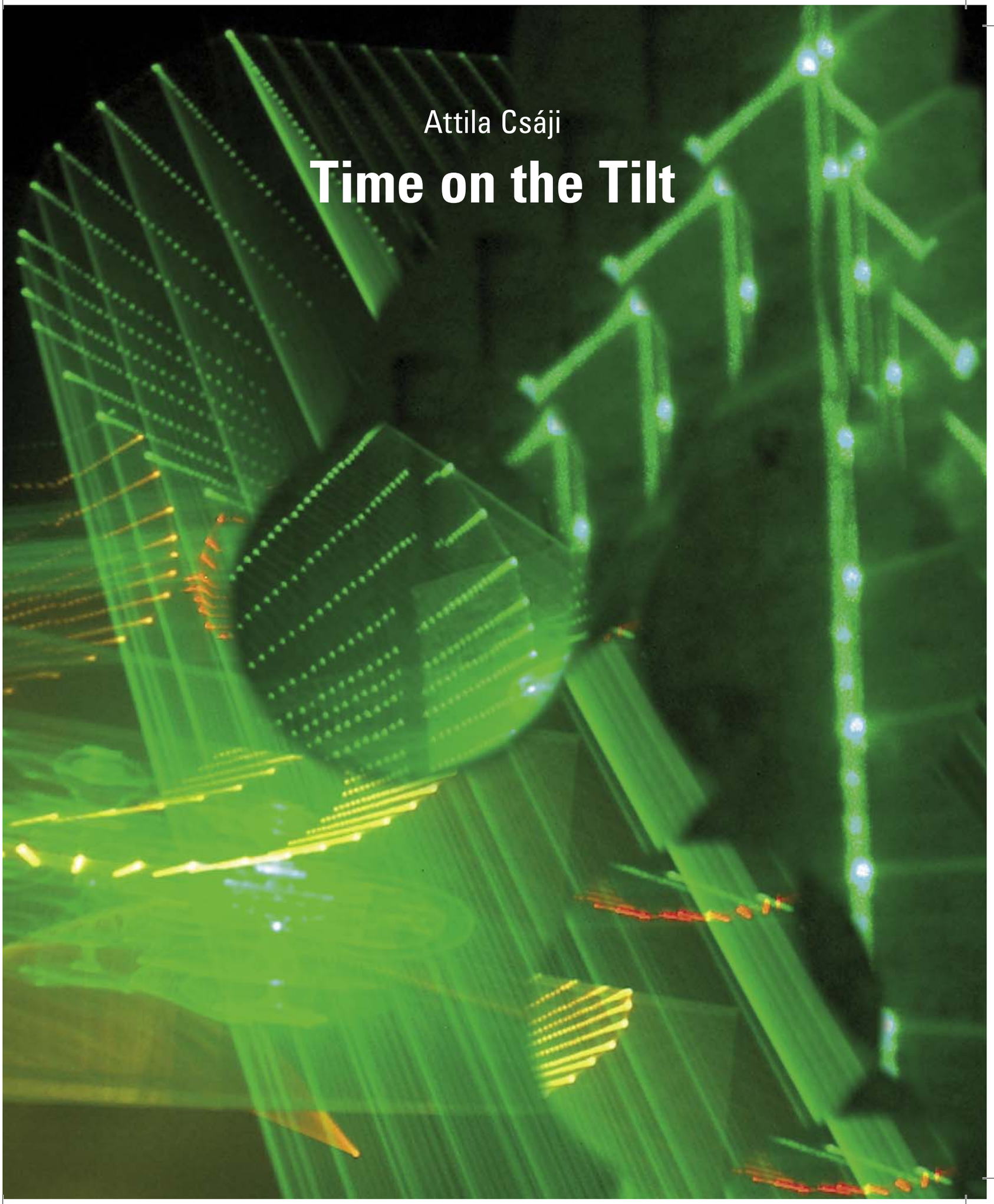

Attila Csáji

Time on the Tilt

This is a selection of Attila Csáji's lectures delivered at Union College-New York, Scenestudy, MIT/CAVS-Cambridge,Mass, Budapest University of Engineering, Budapest University of Applied Art, Light Symposia, etc. and his writings based on those lectures. expounding highly original ideas. Textual overlaps are occasioned by recurring themes.

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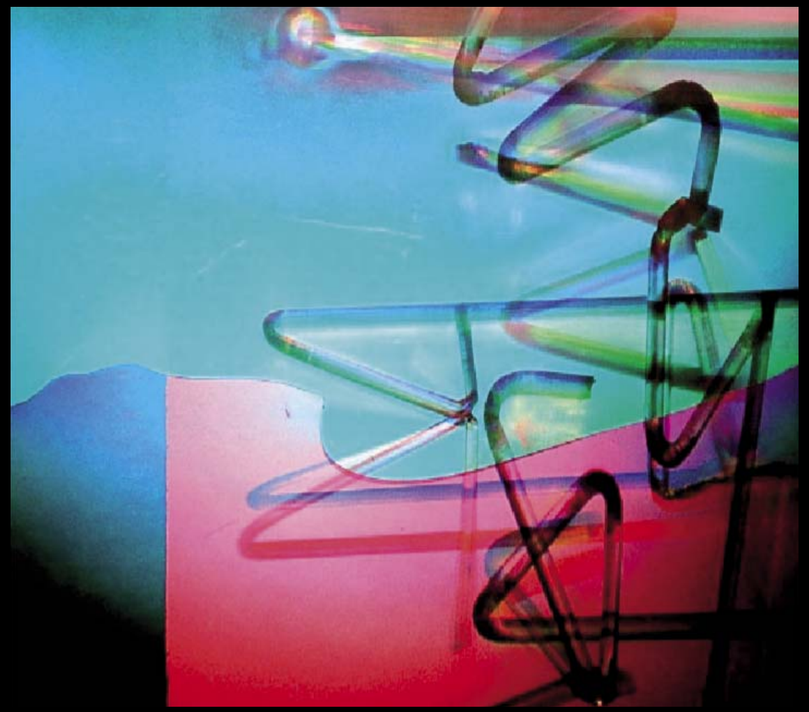
Attila Csáji

Time on the Tilt

György Kepes Foundation – PÜSKI Publishers Ltd.
Budapest, 2009



LIGHT ART IS THE ART OF POSSIBILITIES

Curator: Pietro Franesi
Artist: Attila Csaji

In my view, during the last few decades light has increasingly become one of the most important artistic media due to the opto-electronic revolution and to the cooperation of artists, scientists and engineers.
I have built my works, the holograms and the laser environment to be presented at NYBA, upon these results. In holography, I am first of all interested in those virtual possibilities which are hidden behind the basic magic of it: it means not reproduction, but visual creation. I am searching for those possibilities which are opened up only by holography. For example, the contestation of the spatial evidences (e.g., Spring for Voltaire), transparency of masses (Hun-Jarrya), floating/levitation (e.g., Light Calligraphies).I would like to show a multimedia light sculpture, mobile in time and space and accompanied by music, too. Today, drawing with light lines is almost magical. It is pulsating, alive, you see it being born from a point of light, the scale of the line drawing is expanded. These potentialities for me are inevitably contrasted with the start, the very beginning, the pictograph – with the drawing of the prehistoric age. These prehistoric drawings could be reinterpreted with light. They could become a virtual reality by which the space of a gallery could be turned into a light-bunting. A thoughtful experience is created which makes an unusual contrast between one of the world's most dynamical cities, New York, and the prehistoric paintings that were one of the first visual experiences of mankind.

Attila Csáji is an artist researcher from Budapest, one of the most important organizers of the Hungarian neo-avantgarde in the 60s and 70s.

He is a painter, a graphic artist, a lights artist and a holographer, so he's definable as a "scientist artist" because his art work can communicate through particular scientific techniques.

In particular, the use of laser beams and holograms presupposes a very wide knowledge of physics, in fact, these techniques prove to be still quite complicated.

He was supported by the "Central Research Institute for Physics" of Budapest, the American "Interscience Technology" and many others who have recognized Csáji's talent.

He participated in 450 exhibitions including the most important events in the field of art and science such as "Electra 83", exhibitions of the Paris Museum of Modern Art based on the use of electricity in art, and "Lichtblicke", the first world holography art exhibition in Frankfurt.

Now Attila Csáji is going to arrive at NY BIENNALE ART as the artist of a special project called "light art", as a spokesman of "Immaterialism", the Manifesto of NYBA.

What does Immaterialism mean? What is its relationship to art?

Art was born from the distance between its manifestations and reality, through artificial shapes created by the artist.

Contemporary art creates a gap from objective reality, which carries on a process of outdistancing from what the subject is and what it can represent: this is the "principle of indifference".

For this reason the "Bottle Dryer" of Duchamp played a revolutionary role in contemporary art. The subject of an art work acquires new values.

Duchamp asks himself: " What is a work of art? If I took a bottle dryer from a wine merchant and put it in a gallery, would it be a work of art?"

Yes, because the bottle dryer, in that case, doesn't represent its classical function but is a translation of reality, it acquires a new shape that takes the place of the original one.

The object loses the original function but suggests something else, giving rise to a lot of different subjective feelings.

From a material object we transcend to immaterial tastes, sensations, meanings.

Nowadays we live in an immaterial world characterized by symbols we want to be represented with, virtual entertainment, virtual love, but we still need real sensations.

So also art moves in this direction, towards a digital, virtual, aerial shape.

Science wants to carry us on this journey more and more.

Every day matter is studied in its thinnest part.

Now we can speak about nanoparticles, we can consider even the invisible parts of the universe, which at the same time are the constituents of all we are surrounded by.

So science become a fundamental instrument for Immaterialism which can fill the gap between reality and ideal and to set up a new code order that is both ancient and contemporary.

Immaterialism is intended to propose a new commitment to contemporary society to overcome the material values with those of the immaterial.

NY BIENNALE ART means to be the Manifesto of this philosophy.

Attila Csáji's art works represent the idea of immaterialism, in fact, his installations want to return to the primitive idea of drawing: the pictograph of the prehistoric age reinterpreted with light.

One of the particularity of his works is the contrast between New York, the city of dynamism and progress, and prehistoric painting which represents the first kind of visual expression.

With some of the most advanced technologies, laser and hologram, he brings the public primal and pure emotions.

Technology is utilized for a return to primordial sensations, where the immaterial surpasses the material.

This apparent antithesis represents one of strengths of Csáji's art.

Csáji doesn't want to represent a material object, his works don't want to be copies of reality but new visual creations.

He wants to show us a multimedia light sculpture, mobile in time and space also accompanied by music.

With light art all is possible, every shade of color, different beams of light, sudden sparkles creating new, always different sensations.

The shapes created by Csáji with optical effects are always in evolution, renewing at every moment.

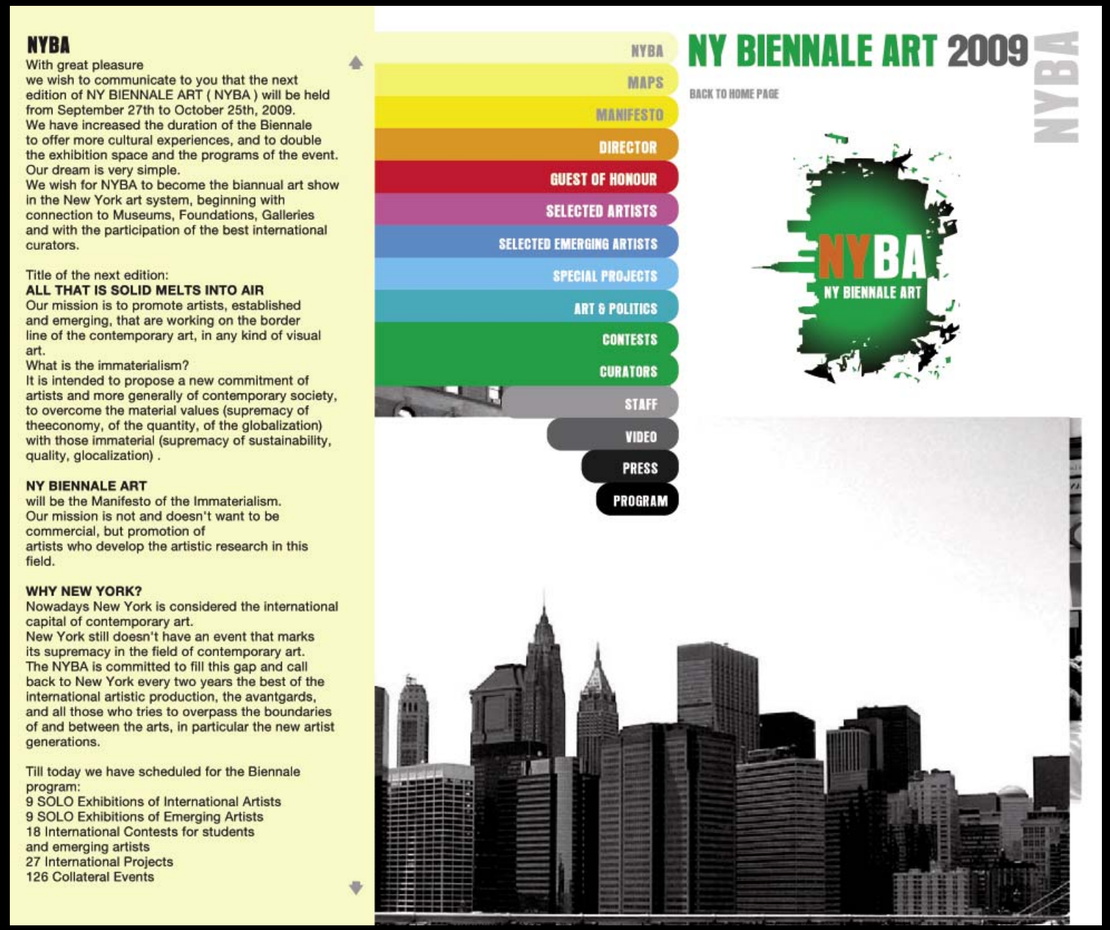
In this case cooperation between science and art allows us to raise art from a static material value to a dynamic and free immaterial one.

Although New York is considered the international capital of contemporary art, there is little that marks its supremacy in the field of truly contemporary art.

The NYBA is committed to fill this gap. It will biannually call back to New York the best of international art, the avantgarde and all those who try to overcome the boundaries of and between the arts.

We are honored to have the participation of an artist of his stature who, beyond being a great artist, also follows the goals of our NY BIENNALE ART.

Dr. Pietro Franesi
NY BIENNALE ART
Director

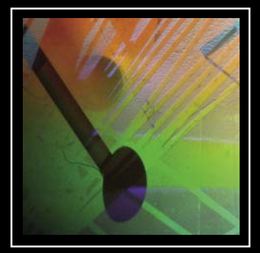


Welcoming Address to the II. Light Symposium,

Eger, 1996.

Light is one of the greatest human experiences that all ancient cultures properly revered, respected, and adimered.

This is the second time that we have organised a Light Symposium here in the Kepes Centre where scientists and artists, technical specialists and art historians, historians and architects and representatives of many other professions not yet listed come to meet one another in order to listen to what each has to say about light.



About light - which is our life.

About light without which we cannot live.

About light which is common like the days of the week; about light, which is our sacred reality.

About light which is the subject of research for scientists and technical specialists; about light, which has been a symbol for thousands of years.

About external and internal light – about the fundamental reason for visibility, about the source of life.

About light which is a paradox in itself, which is of a dual nature.

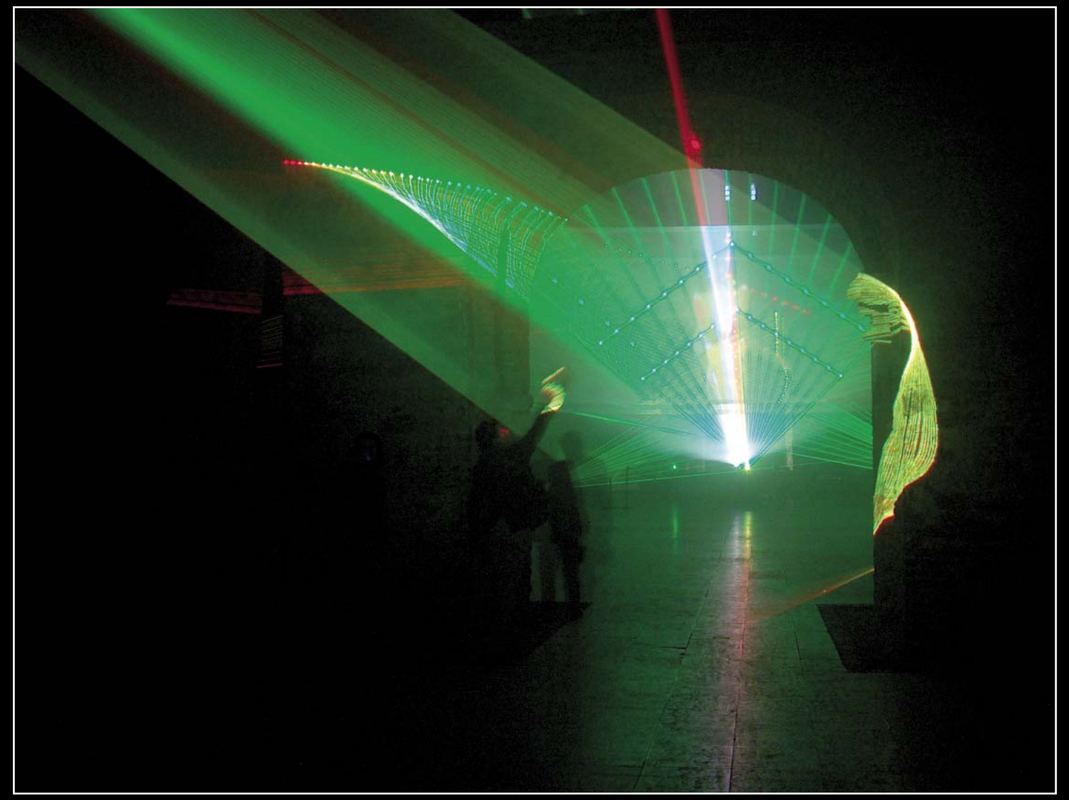
But could this dual nature also be the embodiment of essential human nature?

If we are studying light, are we not studying ourselves again?

Are we projecting our desires into it? Are we transforming the contradictions between innovation and tradition into paradox? Are we trying to tame the wild debate of our century, the quarrel between adventure and order, along with their destructive tensions, into a creative force?

We attempt to conjure up a creative time of being together in thinking and in conversation.

Hoping that we might succeed, I welcome you all, from neighbouring countries or from overseas, from Massachusetts or California. Let us all remember and honour the memory of György Kepes, who created at the Massachusetts Institute of Technology the institutions' CAVS, which created a home for cooperation in thought and action in a similar manner for artists, scientists and technical specialists. And now I would like to introduce Dr. Norbert Kroó, physicist and member of the Hungarian Academy of Sciences, who has a long-standing part in this cooperation yet has retained his sense of humour, along with his passion for playing, as he has recently expressed his belief that science is a game for adults paid for by the government. And if we also add to this the commonplace that by our time science has become a power in production, we reach another paradox. So please welcome Norbert Kroó, who will now give his opening address.



Light Art:
A Personal Introduction

Strange forms of light were flowing, floating, and fleeting across a huge, arching wall in a dark hall with a glass cabin in its centre. Fast asleep in the glass cabin was a female volunteer. This was the exhibition named *Dreamstage* put on in a dark and in a light hall by MIT's CAVS Institute.

The idea was to make the processes of dreaming and sleeping visible through harnessing the electrical activity of the volunteer's brain, her eye motions, the changes in her skin humidity, and some other variables into pairs of scanners which then modelled and projected into the environment in huge sizes the laser light beamed at them. In the light hall one could browse scientific information on the brain and its activities. Whether it was indeed the volunteer's dreams that were projected, or just some biological processes activated by sleeping is open to question. The essential point, however, lies in the basic ingredients of the experiment: its interdisciplinary character, its application of high-tech resources, its desire to penetrate the realm of the unknown, its expansion of the limits of our knowledge and resources, and the creation of a spectacle that derived from a direct modelling of light.

Light art is the direct articulation of "bodiless" light realised through an intimate knowledge of the properties of light and by means of projection or artificial light generation. It is a virtual reality whose separate ingredients merely carry the potential of a work of art. Light is an irreplaceable part of our existence, especially to a visual artist. Visibility is vital to artistry as well as to the generation of an artistic experience. The Sun is the greatest of artists, so the Impressionists once said, and visual artists have been enthralled by the creations of natural light for many centuries. Not once has it entered their minds, though, that light itself could be turned into a tool of shaping and forming, i.e. into a direct tool of artistic creation having the same materiality to the artist as clay, marble, or oil paint as far as it can be analysed, approached, recognised and applied rather in the same way.

The origins of light art reach back to ancient times but its actual beginnings only to the first half of the 20th century marked especially by the activities of the Bauhaus school of applied art and László Moholy-Nagy. Danish-American Thomas Wilfred had not only worked out a thorough aesthetic theory of the new genre but created some of the appropriate instruments as well as some significant works of light art. He had also established in 1930 the Institute of Light Art. It was György Kepes who headed the Light Department in the New Bauhaus and the School of Design founded by Moholy-Nagy, and who then went on to establish the Center for Advanced Visual Studies (CAVS/MIT) where artists, scientists, and engineers could freely collaborate. A quality academy of technical arts, CAVS today resembles an electron microscope when compared to the simple magnifying glass of those prophetic beginnings. The optical-electronic revolution of the last third of the 20th century has not only transformed our world in a radical way but has enriched the tool-kit of visual artistic expression with matchless new possibilities. Now, to humanise and adapt artistically those possibilities is not only an unavoidable challenge, but also one of the most attractive adventures.

Since I am an artist rather than a historian of art or a physicist let me introduce in a personal way befitting an artist who draws overwhelmingly on his own experiences the research into the "materiality" of light, and also the humanisation of that new tool.

I have been tampering with light art for decades. As I first started my related activities at the invitation of physicist Norbert Kroó at the Central Physics Research Institute of Budapest in the late 70s, I initially engaged in getting to know the properties of laser light from the angle of a painter, or more precisely, from the angle of an artist wanting to use more visual possibilities than before. While recognising the properties of a material like marble can draw on thousands of years of experience, and many procedures can be simply adopted from classical masters, laser light in the 70s was almost completely virgin territory to the artist, a territory that would reveal its properties only through years of laboratory experiences.

The three basic properties of laser light are as follows:

1. Extreme directibility and single point focus;
2. Extreme brilliance concentrated into a single point;
3. An extremely ordered and monochromatic quality which gives rise to a high degree of interference.

Now, those properties conceal varying visual possibilities which can be summarised as follows:

1. From laser light's extreme directibility comes the possibility of drawing by scanning. We release the light focused into a single point upon a pair of mirrors moving along an x and y axis (this in fact is the idea of a laser scanner) while we tie up the electronics controlling the movement of the mirrors with a computer. The drawings scanned into the computer can thus be projected with the necessary modifications. Since the drawings projected have no depth of focus, they remain in perfect focus in each sector of space. By further influencing the speed, the size, the anamorphic quality, or the brilliance of the drawings projected, we may gain drawings that evolve from a single point in front of our very eyes in varying sizes and animations. In fact, with a laser brilliant enough we can even arrive at cityscape projection sizes. In 2005, Los Angeles-based light artist Hiro Yagamata re-drew by means of laser scanners the huge Buddha limestone statue destroyed by the Taliban in a cliff-cavity of Bamiyan Valley, Afghanistan in its original size..

Earlier this year I used an entirely different approach and resources to create two laser environments mainly based on scanning in the Kiscelli Museum of Budapest. I can safely say that the background technology I used was not at all inferior to that used by my American counterparts. I described the ensuing light environments evolving over time in an article entitled "Mythical Light Space and High-Tech" in the August issue of *New Art* (Új Művészet). Here are a few lines from that article: " To draw with lines of light today is almost tantamount to magic. The line drawings come to life from a single point, and they continue to live while their order of magnitude expands enormously. One can draw upon a wall, a tulle screen, into space, or upon a wall of spray or oil-vapour, or even clouds."

The whole process raises the need to re-interpret that most elementary of visual means of expression: the simple line.

"Concealed within this new possibility is inevitably a confrontation with the very inception of art. The cave drawings with their moose and reindeer, galoping horses, bears, burd-headed people, shamans wearing radiating or bird's and beetle's headgear, figures with spears, waterfowl, heron, masks and ships: they are all line drawings. Our forebears might just as well drawn those simplest lines in sand, but they had chosen to carve them in cliffs. They had made an effort for survival. With our new lines of light we can re-interpret those drawings. We can now turn them into virtual reality by turning the interior of a church into a texture of light. The magic force of lines is thereby enlarged. In the Kiscelli Museum we could partake of many moments of birth. Forms emerged from the pillars at heights of some thirty feet, from rustic brick planes set among the pillars, from tulle and spray both in space and before the walls. These constantly changing graffiti of light did no damage since they disappeared into thin air as soon as the electro-magnetic radiation stopped."

Applicable for space projections are not only lasers but also heavy duty conventional projectors. But I shall discuss these and some other possibilities of light art at a later stage. Now I want to return to some other artistic applications of the properties of laser light:

1. An extreme brilliance concentrated into a single point works for the spatial presentation of a cone of light.

"LASER AND DANCE - Relations", 1984.
Joint production of the Budapest Dance Ensemble and the Photon Art Group
Choreography by Antal Kricskovics
Light choreography by Attila Csáji
Photography by Péter Korniss

2. From the second property of laser light, i.e. its extreme brilliance bursting out from a single-point focus, come light structures and light sculptures of cityscape sizes. In scorching August heat each sun-lit point of the ground receives light power equalling app. one milliwatt. For a piece of paper to be set aflame light energy equalling less than one watt is sufficient. To create light structures and lights sculptures in an interior space like that of the Kiscelli

2. The extremely ordered quality of laser light works for interference and superposed images (star-flower).

3. Drawing from scanning comes from laser light's extreme directibility and concentration into a single point.

Museum, lasers with a power of a few watts each are sufficient. It is upon the extreme concentration of laser light power that some new procedures of processing materials are based. Laser light is extremely precise and extremely efficient. With carbon-dioxide lasers radiating in the invisible range one can cut glass, metals, plexiglass. Those appliances are more and more widely used.

3. The third property of laser light is its extremely ordered and monochromatic quality. To borrow Professor Jánosi's words, while a kripton bulb emits a "fuzzy" light across the whole visibility range between 400 through 800 nanometres, laser light, e.g. the "well-combed" light of a helium-neon laser is emitted strictly at 630 nanometres and is uniformly red. When led through a prism, it can only be diverted but never dissolved, it will continue to be red light emitted at 630 nanometres. From its extremely ordered quality follows its strange property that when led through an extremely clean material it breaks into two only to unite again a little further emitting meanwhile a mysterious network of light. The ensuing system of alternating highs and downs meeting up with each other establishes the phenomenon called interference. This proclivity of laser light towards establishing interference proffers such rich visual provinces as interference laser graphics, superposed pictures as well as a variety of holographic representations.

As mentioned earlier, we had conducted experiments at the Central Physics Research Institute of Budapest from the mid-70s. My participation was made possible through the generous hospitality and assistance of Norbert Kroó D.Sc., leading authority of Hungarian laser research.

In 1977, we established the group we called Photon Art. Within our particular division of labour it fell to me as a painter to explore the causal relationships amid the encounters of light waves seemingly so accidental and chaotic. I was also expected to create some order in the whole process by finding the most useful motifs, the rules and resources of a potentially conscious formation of the process. During the experiments I became conscious of such further possibilities of interpreting what we were seeing as would promise an entirely novel method of re-phrasing images. Essentially, the method relies

upon interference, but the true novelty of what we see is offered by superposition for which a coherent beam of light is indispensable. The motif stored on a so-called image record can be further interpreted by inserting classical optical resources at the appropriate places. From the ensuing image one can discern both the original micro-motif and its Fourier-transformation, which is an interference image derived from the original motif. Their respective proportions can be altered in a metamorphic process. Probably the greatest possibility offered by this method is that it makes the bridge visible between the sensuousness and the law-governed nature respectively of what we can see. The organic and continuous visual alterations present so many transitions from a world visible with the naked eye to a world of laser interference obeying extremely precise mathematical laws. This process has yielded a matchless riches of forms that only laser light can produce. We had the method patented in 1980. Visual thinking inherent in this method presupposes concentrating on metamorphic processes, the related temporal factors, the production of an entire environment with light, multi-mediality, and familiarity with various interdisciplinary ideas.

The interference arising from differences of course run by lightwaves carries spatial information as well as temporal. Specially ordered, i.e. coherent light has become the basis of holography. Unfortunately, Dennis Gabor's genius had found the principle of the hologram and the necessary material evidence at a time when the source of light needed, i.e. coherent laser light was not available. It was the invention and application of laser light that made holography the source of new possibilities gushing forth like a chain-reaction. Still, it took some ten years from the invention of lasers for holograms to appear in public showrooms. It was only in 1971, at an exhibition put on in Vienna to mark the centenary of visual communication, that Margaret Benyon presented some artistically conceived holograms. The first world exhibition introducing holography as a new artistic medium took place in Frankfurt am Main at the inauguration of an all-German Film Museum in 1984. The event's invitation card carried a grotesque conceptual artwork by Harriet Casdin Silver of MIT's CAVS. This was the first time that Caulfield's patent was applied to an invitation card. I was the only East-European artist invited to exhibit and I contributed my reflection hologram series entitled "A Spring for Voltaire". We had prepared the series in the Physics Institute No. 1. of the Budapest University of Engineering.

The series leads the spectator into a visual realm that only holography can produce. Over and beyond the basic magic of holography, i.e. the fact that one can generate temporally variable space on a plane, I was primarily intrigued by some new, real perceptual experiences generated by holography, experiences that had had only a virtual existence previously. In the series, one of the basic axioms of spatial perception is questioned making an absurdity real. It is an axiom that the thing up front necessarily covers the thing behind it, but this axiom loses its validity with the third piece of the series in which the spring inside the head covers the eyes, the nose, and the mouth, all closer to the spectator than the spring. This is how a spatial impossibility, a miracle, or an absurdity can become reality through holography. It was at this exhibition that Ms Harriet Casdin Silver approached me and invited me to MIT. I first visited MIT in 1987-1988 when CAVS elected me as a member quoting my activities in light art. At MIT I mainly researched the pictorial possibilities offered by transmission holography. My holograms of light calligraphy were prepared in MIT's Media Lab. I delivered a whole series of lectures on possibilities of light art with special regard to the so-called superposition method at MIT, Boston University, and Union College.

The few thoughts I have submitted here are parts of a definitely personal introduction into light art, a form of art becoming more and more complex every day. Light has become a creative medium with possibilities constantly unfolding and extending. Many aspects of light art presuppose a re-thinking of the spatial and temporal qualities of ordinary art. In their purest manifestations, the visual arts are becoming an art of the visual process.

Whether light art falls within or outside the Avantgarde, the Post-Avantgarde, or Postmodern Art is something I do not want to discuss here. Light art is a field of visuality with immense dynamics. Rather than a style or trend belonging to a period in the history of art about to terminate, it is an ensemble of media possibilities that have emerged recently but are pointed definitely towards the future. Prompted undoubtedly by the dynamic development of optical electronics, it is also informed of the basic human need to dip all new results of technology and science in the depths of man's psyche.

First appeared in Hungarian in the 2006/1 issue of Maktár, a quarterly journal of the Hungarian Artists' Association.

New Sights – New Experiences of Space

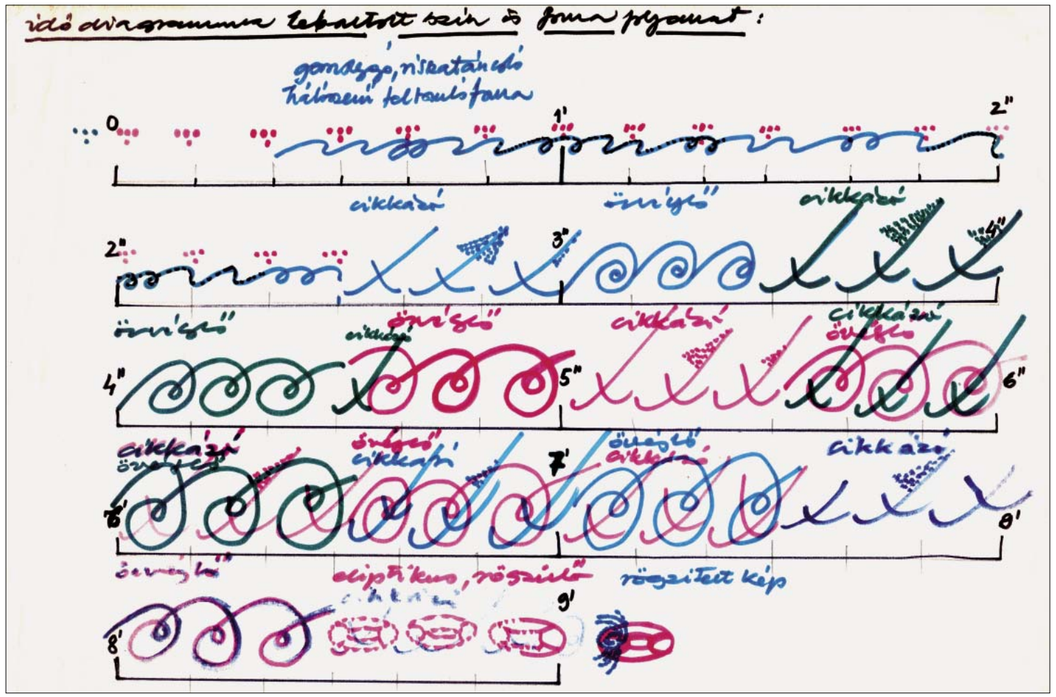
An exhibition of laser interference, Preface to the Catalogue, Hungarian National Gallery, January 1980

„The road will continue even at the edge of our present horizon", I noted some ten years ago at a time when plastic shapes and metallic colours came to dominate my painting. I was making external light more and more decisive in the interpretation of my forms. The link between light and picture was becoming more and more organic but for all that, I did not think that from my pictures richly interpreted by light my road would continue to "painting by light".

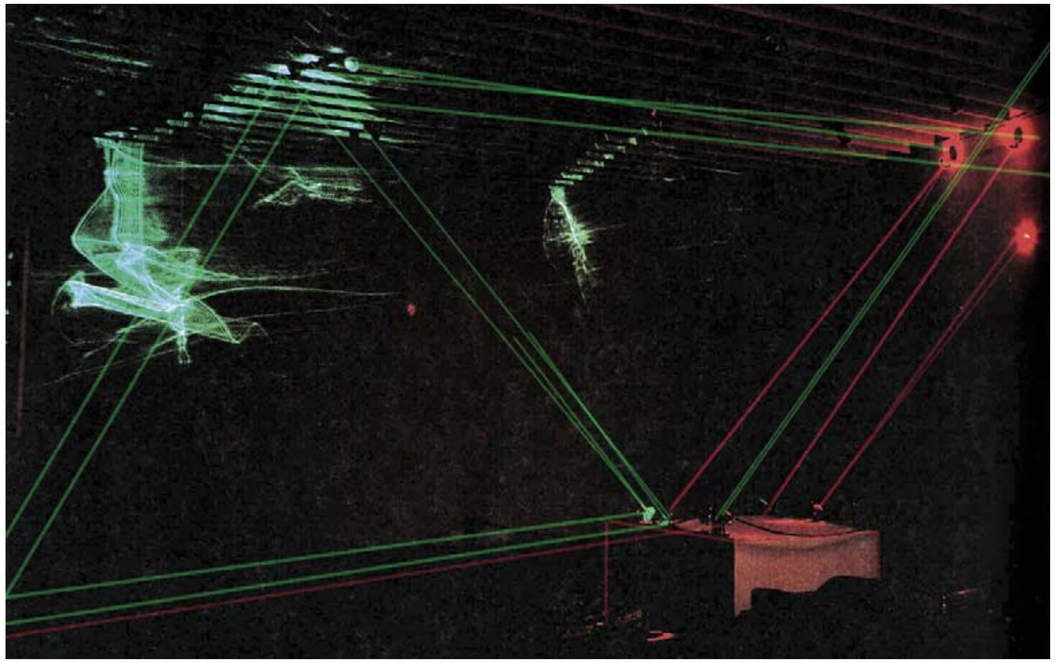
I needed to become acquainted with a new resource, a new source of light with peculiar characteristics, i.e. laser light for this progress to take place in my painter's career. I owe this acquaintance to my getting acquainted some three years ago with laser expert Dr Norbert Kroó. I became very excited and enthralled. What you can see at this exhibition is a product lasting only a few minutes of the work we carried out over those three years.

What you can see is new and highly unusual in our visual culture. From among the countless possibilities offered by laser light we have focussed on one of its specific traits, i.e. its *interference* enabling us to transform a continuous, coherent, and monochromatic laser light into visual processes.

Laser light can produce a peculiar "photograph" of the material transluminated by it. First of all, it hides structural features open to our habitual visual observation. Although chance



„Struggle": A process of colour and form broken adjusted to a time diagram – 1980, Hungarian National Gallery.
Visual Design by Attila Csáji / Electronic music by Máté Victor / Laser expert: Norbert Kroó D.Sc.



had contributed to laser light's discovery, it is by no means exposed to pure chance. The rich linear network produced by interference can give rise to explosions from a nucleus, or to lines intertwining with exact precision into mysterious, rhythmic constructions of space.

The closing surfaces of materials are at war with threads of light, and it is the threads of light that transform in the end. They turn into something radically different from what they were, and yet, into something that nothing but laser light can produce.

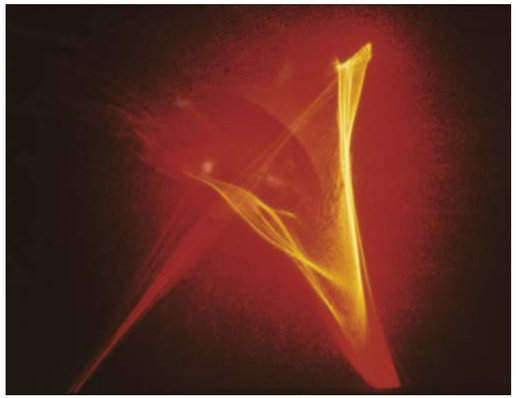
And all this is subject to selection, repetition, and composition into visual textures.

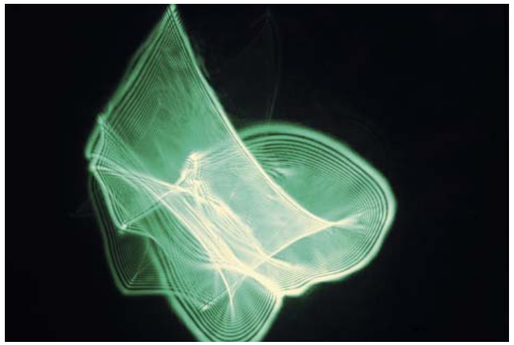
Gaining ground rapidly in modern science and industry, this monochromatic and coherent beam of light is a specifically contemporary phenomenon. The coherent, tightly compressed beam of light arising from incited atoms can also become a resource for pictorial organisation.

One of the great deeds of our century's visual culture has been its transition from mimetic art to expressive art – together with the huge expansion of the limits of a reality made visible. With the multiplication and differentiation of new instru-

An excerpt from the laser light environment produced at the Hungarian National Gallery

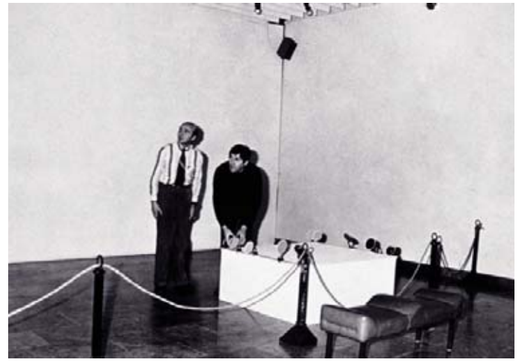
Interference motifs (1977-78)



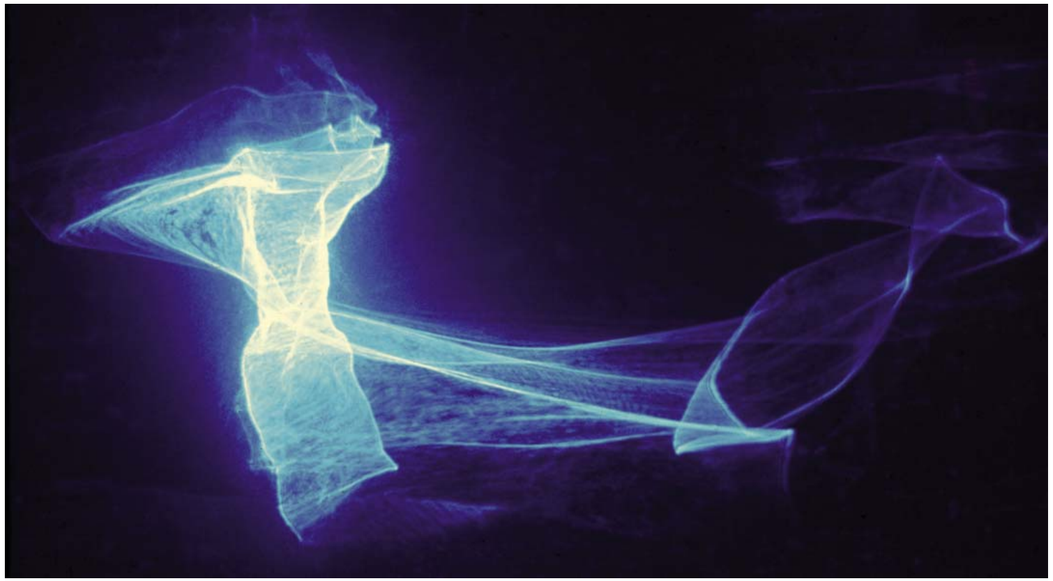


ments, this "new picture of the world" becomes more and more varied, a picture further enriched by the arts, science, and technology. The ongoing creation of our directly perceptible reality is a joint venture. Today, paradoxically, representing reality is reaching spheres where it becomes almost as refined as music. Lasers offer just one of many possibilities that we should approach with the openness of those capable of living through fresh experiences rather than with the deference so typical of the device-fetishism of our century. And while approaching lasers with the right attitude we should also try and feel out how this device can contribute to making our future knowledge of the world and ourselves more exact. Or how it can contribute to our own sensitivity and openness, qualities without which it is impossible for us to build ourselves up in a true sense.

Budapest, 29 December, 1979



Norbert Kroó and Attila Csáji adjusting mirrors in preparation for a light installation.



New Sights – New Experiences of Space

„Obeying our deepest instincts, we try to chase away chaos and create order in our experiences. One grasps the tools suited to introduce order into a flood of natural signals with such readiness as if one's life depended on them, and indeed, it does."

GYÖRGY KEPES

Whether one's age deems something to be art or not says little about aesthetic quality. Citizens of ancient Greece did not deem sculpture to be an art, while today we think it was one of the most representative forms of expressing that age and hardly anyone in the art profession today would dare doubt its being art.

One of the many features of our century has been a rapid expansion of the toolkit and media of the visual arts. Simultaneously, new genres and, especially, new borderline cases have emerged. The very concept of art has undergone a vast expansion.

Owing to the common co-operative adventure of a physicist and a painter, a similar outcome has evolved. Both have divided and matched their thoughts and activities rigorously between them.

For the painter in the adventure, introducing principles of composition into pictures from a laser light mobile was the principal issue. This is precisely what I want to write about in this article.

The interference pictures that had entertained expert or lay visitors to the Central Physics Research Institute so much, attracted me, too, to the laser lab some three years ago.

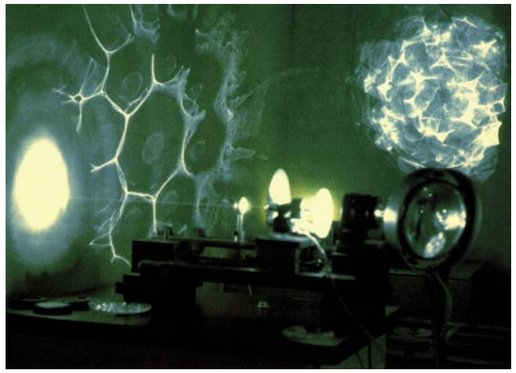
Laser lab in the Central Physics Research Institute where we started out on our experiments.

The dynamic touch of external light upon my own pictures had intrigued me since the mid-60s, this being one of the reasons why those pictures had become more monochromatic and metallic over the years. My surfaces had become so intricately entangled with external light that my rhythmic plastic surfaces came to appear maimed without a certain side-light directed upon them.

Thus, it is not surprising that the phenomenon I came up against in the optics lab of the Institute literally enthralled me. It was such a moving experience that I found it impossible to shake off.

It was not the self-sufficient force of object-less forms and colours that so fascinated me since by then I had pursued non-figurative painting for fifteen years. Rather, it was the poetic richness of exact forms revealed through interference. I sensed the vast scope for use, but could not begin to sense how to. Its accidental nature embarrassed me, as did my total subjugation to it. I lived on a high for a few days but the best I could think of was that we had to embark on a long, meticulous work process since the solution seemed very, very far away. At such times as this I knew one had to act in a very disciplined way. My enthusiasm abated.

The beginnings of resources for the superposition method.



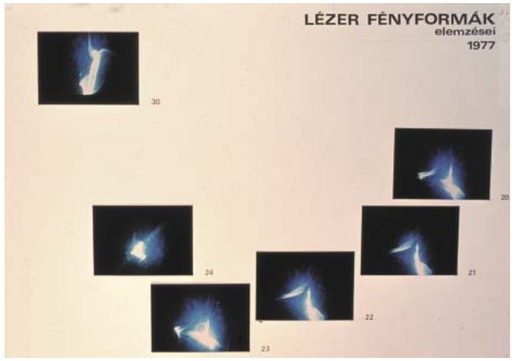
First, I tried to ascertain what stages of the work process would fall to me. Starting from an entirely new angle, I felt I had to acquaint myself first with various materials and surfaces shot through with laser light. I had to make selections not with the eyes of a physicist, but with those of an outsider painter who happens to be sensitive to non-figurative forms. I felt my ultimate consideration would have to be what the materials, forms, situations shot through with laser light were worth as sights.

The first stage of our work involved taking photographs. Initially, we made some slides of just those sight phenomena that appeared to have the greatest visual value.

Back at home, I started to analyse the recorded interference pictures on the basis of the slides. At first, I compared the sights to what I had already known since one needs something to fall back on. Some of the slides reminded me of Naum Gabo's forms: those centrally organised metal and string compositions that, in their cool Constructivism, evoked spatial models of mathematical formulae. For all their impersonality,

Attila Csáji preparing an image record.

Attila Csáji's laser studio.

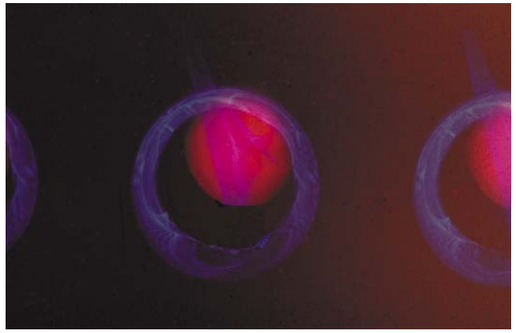


though, they tended to beam out some poetic atmosphere. Gabo did accept that he was impersonal as an artist, but his intentions far exceeded those of mathematical model-building. When scrutinised a little more carefully, Gabo's structures proved to be crucially different from those seen in the interference pictures. The primary difference in sight is that in the interference pictures the dominant outlines were surrounded by parallel contours heading in the same direction as the dominant outlines, in contrast, Gabo's strings indicated an entirely different organisation with the contours pointing invariably towards the centre. Another crucial difference being that Gabo's materials would never allow for an interference picture since their movement serves up an ever changing space dynamic. Also, an interference picture at rest is but the possibility of a process that can be enhanced into magical proportions. Still, the reference to Gabo is important since he experimented with a metal rod set in motion so that its formal and spatial volumes could be multiplied. This may very well have been the inception of mobile sculpture, as yet without any aesthetic value.

In any case, what Gabo could do with a metal rod could by no means occur to string compositions. Although with other forms and in a richer context, the problem culminated with Nicholas Schöffer.

These analyses were useful and thought-provoking since they offered me an insight into the evolution of much 20th century art. The forecasts that chimed in with our research were especially fascinating, e.g. László Moholy-Nagy's vision of the coming of light painting instead of, or alongside with, painting with traditional materials: "the existence of light forms holds out a promise for the future".

„As we progress from painting with paint and brush towards painting with instruments, we have to feel certain that our progression will not spoil our sincerity, nor will it degrade the spiritual quality of our painting. While a painter must be privy to his celestial craft, he must also become intimate with co-



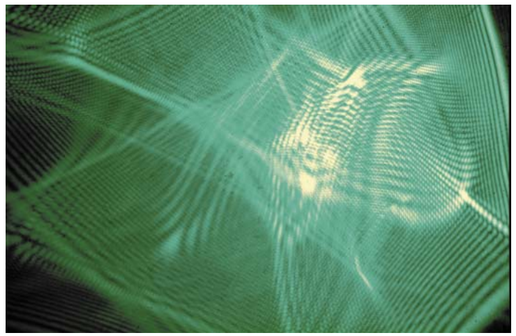
Analysing light formations, 1977.

lour measurements, the wavelengths, the purity, the brilliance, the excitement of light… Only then will it become obvious that, physiologically speaking, the eye is more akin to the pure light of the spectrum than to mixing paint on the palette."

„Most artworks of the future will fall to light painters to execute", Moholy-Nagy proclaimed in a fever befitting a prophet.

Thoughts like this arrived at during my work only reinforced the truth of my ideas.To return to my analyses: at a later stage I began to classify my sights according to the definitive *structures* of their forms rather than according to their associated or structural links to some Avantgarde art. Thus, I differentiated forms possessing saddle-like surfaces, forms organised around a centre, forms exploding out of a nucleus, concentric forms, etc. A gradual "scale" also began to take shape since I had made hundreds of slides. After recording the surface forms of selected materials, too, I was also able to make subgroupings.

But I found this arrangement far from satisfactory. I found it disquieting that the moving of the materials involved too many accidental elements. Although the recorded picture was



an exact equivalent of the surface selected for translumination, but this took care of only part of the problem. No doubt, it was well suited to make for well-composed photographs and slides of high aesthetic value, i.e. pieces of photographic or graphic art. But sadly missing was the mobility and dynamic so inherent in the phenomenon, and to include those, too, one needed to move the materials in an orderly, pre-planned way.

The next stage involved moving the materials with an *engine*. The interference graphs of a single selected, motor-driven material organised themselves into a single orderly process. This was how the simplest form of a laser light mobile came about.

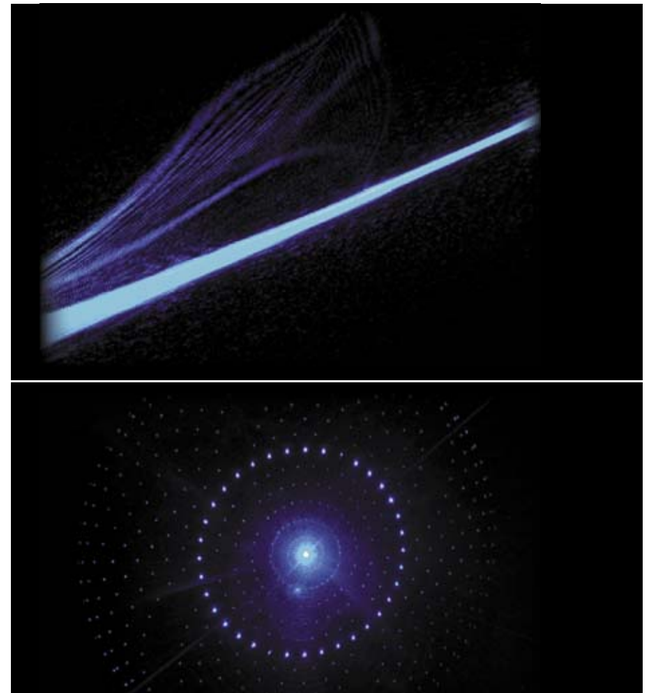
This gave me a boost to analyse the sight values of what I saw still further. I could now analyse processes of forms changing set within sequences of orderly movement. Static scales could now become dynamic, and spatial juxtaposition could become temporal. A harmony of process and form was now within reach. Chance elements causing so much confusion at first could now fade into the background. I now had a new angle for observing dynamic forms: the evolution and formation of interference graphs.

But the most crucial issue was yet to be addressed. Without addressing it, all my preparatory work would have remained in torso. The interference graphs did become orderly, no doubt, but there was as yet no way for me to compose their dynamic, too. I do not hesitate to call my initial experience of the phenomenon an experience of *magic force*. To use Ernő Kállai's words, I thought "the hidden face of nature and reality" was emerging in front of my eyes. Not in transposed, impoverished figures of books but as an apparition, with such immediacy as a bird flies up before us while we roam the fields. All this felt like an initiation rite.

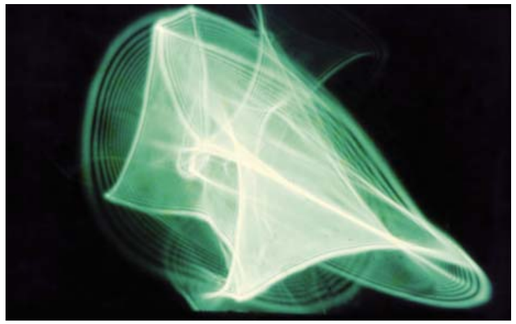
It was this "magic" force evoking psychic movement that I had to reinforce with my organisational and compositional intervention. The magic quality arose not only from the unusualness of the spectacle but also from the emotive effects of forms and colours.

Once we have got so far, let me make a short detour.

20th century anthropologists including such masters as Malinowski and Cl. Lévi-Strauss had vehemently opposed the 19th century idea that magic belonged to an obsolete stage of civilisation. To them, magic, in close association with art, wasan invariable asset of the life of human communities. To quote Sir Herbert Read, "magic lives on" since it is the goal of magic objects and rites "to arouse and maintain emotions that are crucial to the practical life of the community". Collingwood, the philosopher historian had noted that "it is the primary function of all magic activity to arouse in its agents emotions



necessary or useful to the maintenance of life… Magic activity in a society corresponds to a dynamo supplying emotional driving force for the mechanisms of practical life. Under no circumstances can man survive without magic, and it can be



found in every healthy society." (Let us add the magic art of Picasso or Henry Moore, church ceremonies, military parades, ballroom fetes, pop concerts, right on to football derbies.)

While magic art does possess some personal elements, its emotions are predominantly communal. Those emotions cannot gush forth without magic objects or rites. But once out, they act as catalysts of communal feelings having as they do a more significant role in the formation of those feelings than generally thought.

At times when communal feelings are confused, magic objects and rites tend to jumble, and they lose much of their intensity with the dreariness of social life at large. Such periods usually enhance the spread and even the self-imposition of the impersonal in art. This was certainly one of the features of most 60s art the world over. This development could, of course, make for the special deepening of the artist's vision as well as for a rational analysis of loads of accumulated information. However, for an artist the claim to have an open mind can by no means be narrowed down to being open to the newest trends in art; the artist must much rather be open to reality itself, and the problems arising from our existence and spiritual development. In experimental art it is the latest trends, rather than some classical ideas, that are routinely referred to as ultimate authorities. On the other hand, for an artist to exclude those trends completely from his/her horizon could make it almost impossible to express themselves in language intelligible to their contemporaries.

The reader might find it strange that I have burdened my rational analysis with a detour on magic but what seems like a contradiction is only partly one. The manner in which scientists present their experimental findings is a logical progression pointing to the truth of their theorems. However, while we read their papers we are totally barred from the operation of their minds' deeper layers.

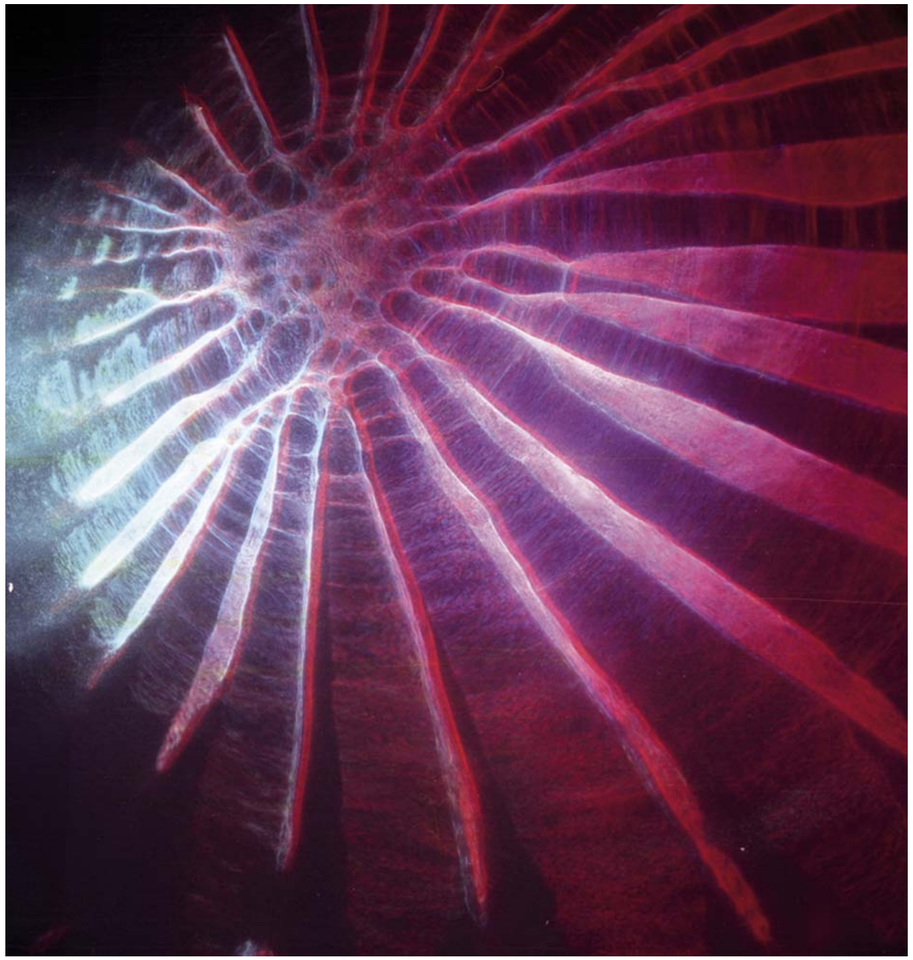
To provide insight into the operation of those deeper layers cannot by any means be part of the papers' job – only in special cases. For us to realise that those layers do exist it is enough to note that "heureka" is by no means a privilege of the ancient Greeks. The practical and intellectual removes created by specialisation, however, tend to separate today's scientists and artists considerably. It is worth considering what J.W. Dewey had written about this: „Perhaps the most important issue for our world is how to reconcile practical science with the aesthetic world-view. Without the former, mankind would fall prey to blind forces it cannot influence or utilise. Without the latter, however, people would turn into economic monsters engaged in incessant bargaining with Nature and each other, and should their leisure time be not filled with sheer boredom, they would not be able to fill it with anything else but vain ostentation or freakish entertainment."

Modern technology has extended the range of signals perceptible to our eyes. As is often noted, instruments may very well perform a vital function in our civilisation. Gigantic telescopes and electron microscopes reveal exotic worlds too distant for the average citizen not used to travel vertically. In the mid-60s a geneticist friend of mine showed me a few coloured cell biology sections wondering what contents the non-figurative forms suggested to me. I had never studied biology, and my own non-figurative paintings were exclusively aimed at revealing man's internal world. Both of us were stunned to find that my comments were functionally correct since they interpreted the roles of individual cells within their respective organisms rather aptly. Today, I am no longer stunned at such an experience. No non-figurative painter who speaks a visual language freely can be a stranger among scientists. For a scientist to gain an insight into the world of cells is an everyday experience. As a physicist friend of mine has noted: interference graphs for him and his colleagues are just as intimately familiar as are mountains to any Swiss shepherd.

New provinces of perception cater not only new information, but also *new sensuous experiences and harmonies*. Direct insight into these provinces is typically a product of our 20th century. Such insight for an artist suggests the continuity of man's external and internal realities.

But to return to our fundamental issue: what procedures or instruments do we need to be able to organise the new sensuous experiences and harmonies provided by laser light into dynamic compositions, ones that are suitable to offer heightened experiences to spectators?

The decisive first step in attaining that goal was instantaneous. I took that step when I realised how exactly surface units could be converted to time units. With the corresponding calculations, the varied optical information, recorded formally in a scale, that I had selected for a particular composition could be accumulated in a single surface. (I will not here go into the details of accumulation.) Following a designated path, laser light projects the composition onto a screen. Laser light here plays the same role as a pick-up needle does on a gramophone disk. We have named the new device a *light disk* after the gramophone disk. The rhythm of the projection can be controlled by motor-driven transmissions.



"Star-flower"

Thus, on a single *light disk* a huge amount of visual information can be stored. A recorded "laser symphony" can be reproduced anywhere given the device and the information. Using several co-ordinated lasers and light disks simultaneously, the effect of the compositions shown can be multiplied.

It took some very lengthy teamwork to create the exact technical description of the new idea, as did to build the device, to compare its effects with earlier visual effects produced by lasers, and also to upgrade the fundamental idea continuously. Our patent description records our teamwork, vitally important for the entire project, in detail.

At one stroke, the new devices for planned composition solved my most essential problem.

This was how I could plan the spectacle presented at our

first laser interference exhibition in the National Gallery. The coherent cluster of photons leaving so many induced atoms became a tool with which I could visually organise my compositions. The laboratory experience of "the hidden face of Nature" was turned into a spectator's experience in all its immediacy and freshness. The extraordinary interest of the public enthralled us all. True, some of the audience had been expecting holograms while our problem was of an entirely different nature, but the unabated interest for our presentations made me wonder: is the public really so insensitive to novelty as we are prone to believe? Or is it only the experts' fault that they are too timid to find enough "psychological fly-swatters" to captivate the public? „We ought to incite our muses rather than tame them", I hear sometimes ringing in my ear. Shyness is just as unacceptable as recklessness. Perhaps we have succeeded in finding a device that can make the public more ready to embrace the non-figurative art of the 20th century, a device through which the forms arising from exact mathematical equations can yield processes of visual expression which can stir emotional responses? Perhaps this new device may help us bridge the gap, becoming ever more frightening, between the art of exact, rational forms, and the art of man' internal provinces of meaning?

A laser light mobile can be utilised across an extremely varied range.

First of all, as an emerging genre with peculiar characteristics, to produce self-sufficient shows combined with electronic music, slides, etc. as it happened in the National Gallery with exactly phrased "screenplays" containing simplified mechanical instructions stuck on the lasers as sheet music. I won't go into the details of the schedules given as a time diagrams, suffice it to say that they recorded various forms, form-giving processes, spatial orientations, colours, musical links, etc. for each unit of time according to a general idea adjusted to local conditions. Rather than being improvised each time, it went on along the same lines on each occasion exactly as planned. The effect of the ongoing spectacle was reinforced by electronic compositions by Máté Victor. The feasibility of our experiment was fully borne out by our shows presented in the National Gallery.

If we had our own exhibition premises, it could meet even a massive demand, and could enrich the City of Budapest with a peculiar spectacle envisaging the 21st century.

By projecting the visual forms recorded on a light disk onto a stage set, we could couple the stage scene with a novel spectacle which could make way for a re-interpretation of such classics as *Csongor and Tunde,* or *Bluebeard's Castle.*

In mime productions, the laser-borne visual forms, possessing constant high definition, could be projected onto e.g. dancing figures enriching the dancers' movement with their own, enhancing thereby the effectiveness of the show.

With the appropriate rhythms, forms, spatial orientations etc. pre-selected, light disks could be used for enlivening orchestral concerts.

With their spectacles and experiences of a different type, light disks could contribute to the visual material of films in general, and sci-fi films in particular.

Heavy duty lasers could produce large-scale open-air spectacles e.g. at 20th of August festivities.

Likewise, heavy duty lasers could enliven the cityscape with its laser-borne visual forms projected onto large screens fastened upon the roofs or lateral walls of public institutions, hotels, etc.

Also in design, advertising etc.

Or indeed, in the future, an idea that may appear fantastic at present, but only scientists and technologists know how realistic it is, the standardised production of small-size lasers could make way for the *home enjoyment* of a peculiar genre of visual art with the help of pre-planned light disks providing *original experiences* rather than mere reproductions of art. Indeed, by providing the appropriate scales and accompanying information, even lay people could creatively improve and upgrade the genre.

And, finally, let me evoke the remark I formulated for myself as a warning some ten years ago: "The road will continue even at the edge of our present horizon."

While our devices multiply, expanding the borders of reality gathers speed continuously. The arts, science, and technology chip in equally with taking this further. The ongoing expansion of our directly perceptible reality requires joint action. Paradoxically, reporting on the edges of our reality tends to thin out as if it were about to dissolve in music. Lasers offer just one of many possibilities that we should approach with the openness of those capable of living through fresh experiences rather than with the deference so typical of the device-fetishism of our century. And while approaching lasers with the right attitude we should also try and feel out how this device can contribute to making our future knowledge of the world and ourselves more exact. Or how it can contribute to our own sensitivity and openness, qualities without which it is impossible for us to build ourselves up in a true sense.

First appeared in Hungarian in the June 1980 issue of *Új Írás (New Writing).*

Cell Crystals and Laser Light Symphonies

At the base of poetic beauty lies the unfolding of science, proclaimed Walt Whitman at the end of the 19th century. He upheld an unshakeable confidence in the exact sciences and their practical, i.e. technological extensions believing firmly that those would contribute to a more complete human existence, not the least because they would encourage rather than obstruct the endeavours of great poets.

Such belief had turned into firm hope by the time György Kepes, with a hundred years' experiences in his mind, could claim that the revolution in science and technology had transformed even our everyday lives. Although György Kepes was never insensitive to the pain of the wretched and the miserable recorded so often in the arts of the last century, his confident mind spotted not only the nightmare of a possible dehumanisation in the future but also the chance for a new communal kind of art to be consummated by artists. It was his fundamental requirement *vis à vis* artists that they should incorporate modern scientific and technological discoveries and adopt the creative use of novel resources.

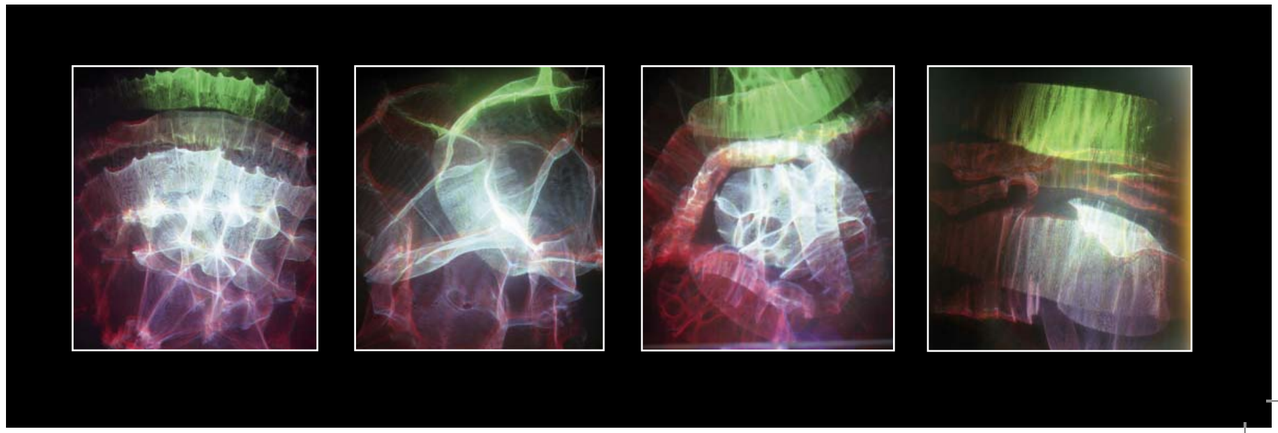
It was amid the artistic ferment of the early 20th century that the idea was born that a painter was to nurture an intimate relationship with colour measurements, the pure brilliance and wavelengths of light, and the scope of artificial sources of light.

As theatrical and film artists were feverishly trying to adopt artificial sources of light, painters and sculptors were only making the first tentative steps in this direction. With the inspiration of a sage, Moholy-Nagy wrote this: "Most visual works of the future will be accomplished by painters who paint with light. They will have the scientific knowledge of a physicist and the technological skills of an engineer. They will only have to add to all this their imaginative powers, creative instincts, and emotional strength." For Moholy-Nagy a white canvas by Malevich is the ultimate simplification of the painter's canvas into a projection screen. According to Moholy-Nagy, Malevich's last picture is an ideal screen for light and shade effects reverberating from its surroundings.

Experiments conducted to sublimate matter in the first decades of the 20th century have recently acquired special significance with the introduction into the visual arts of a source of light with peculiar features, i.e. laser light. The first steps in this regard were taken in the early 70s. The special features of laser light are as follows: extreme direction and brilliance, and a monochromatic quality that makes for extreme coherence and interference.

A forerunner of creating a laser-borne pictorial experience was Dennis Gabor who in the British Laboratory in Rugby had accomplished holography, a revolutionary new way of recording a spectacle. 3-D photography through holography rests upon light interference, a phenomenon offering a vast scope for other applications of laser light. Yet, it took some ten years after the invention of lasers for the hologram to appear in art exhibition rooms. In 1971, Margaret Benyon presented some holographic pictures at the Vienna exhibition marking the centenary of visual communication. The vistas of an artistic application of the hologram are impossible to foresee, but attempts ventured so far are already fascinating (e.g. Furst's design of an holographic auditorium, holographic cinema, etc.).

A hologram exploits but one of the possibilities offered by lasers. Of an entirely different character is the resource that rests upon the extreme direction of a laser beam and can boast the most varied form-giving qualities from among all the



instruments applied during a laser show. This is laser graphics accomplished by oscillating mirrors, a synthesis of graphic art and science.

Varied but regular forms are created by oscillating mirrors controlled by a computer. The forms are essentially Lissajous graphs, images of the track shifts of two or more points engaged in simple, periodic movements. Points in very rapid movement projected by mirrors add up to lines in the eyes of spectators – and from those lines certain figures reminiscent of spirographic forms emerge. All this requires a costly technical back-up apparatus.

Laser environments are of quite another character. They are based upon laser light constructions of landscape sizes and can be very varied depending on immediate spatial conditions and possibilities of interpretation and technical back-up gear. Recently, a huge laser environment has been seen over the international exhibition halls of Documenta in Kassel.

When in 1977 Norbert Kroó and I set out on our adventure of exploring laser-borne visual experiences, both of us had had a past of related activity. Norbert Kroó had been the leading figure in Hungary's laser research and an internationally renowned laser expert for quite some time, while I had been involved in further fashioning my pictures with the help of light for years.

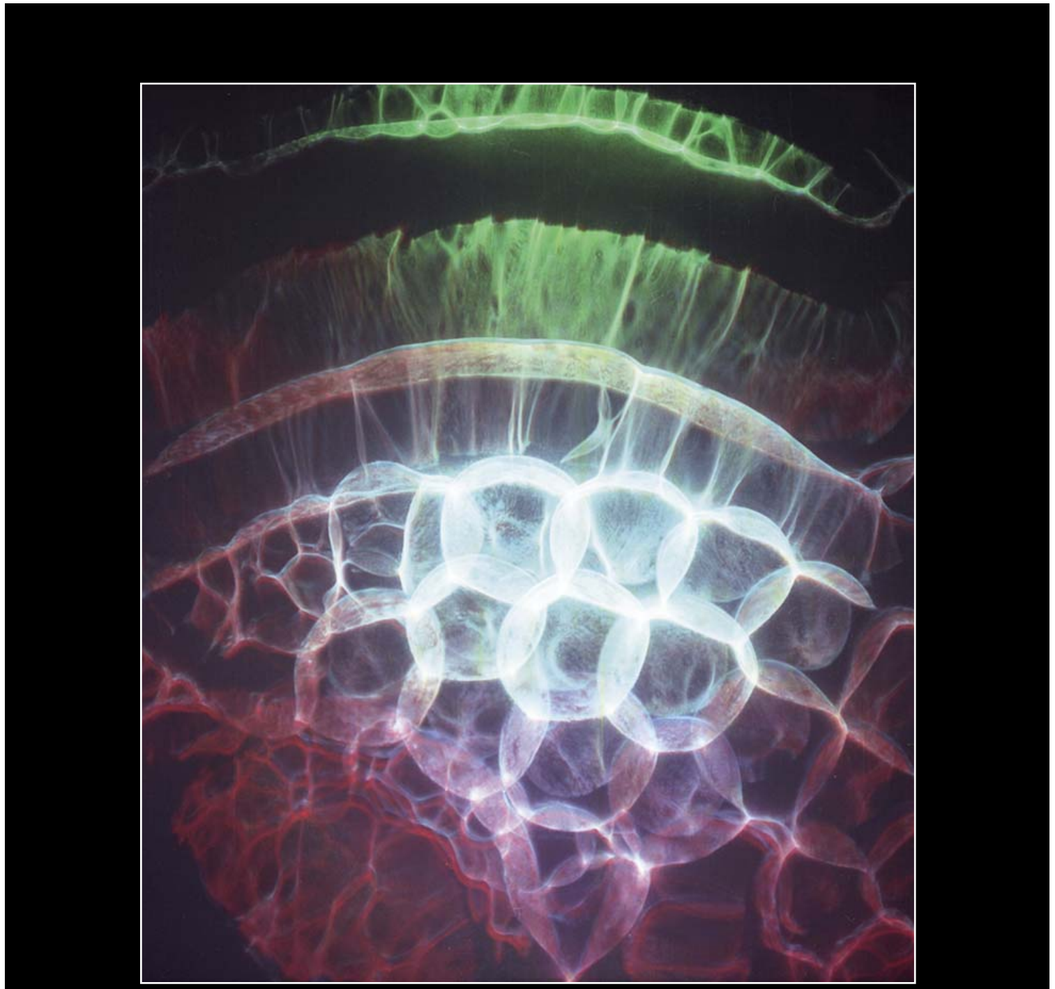
I had tried to upgrade the virtual values of my plastic paintings mainly by illuminating them from the sides. Since the late 60s, external artificial sources of light had become my indispensable tools in shaping and mobilising my paintings dynamically. I sensed the possibility of *painting with light* in the phenomenon I encountered in the optics lab of the Central Physical Research Institute. Norbert Kroó and I had decided to focus our attention upon laser interference. Without belittling the worth of our technical back-up gear (just one argon-ion laser we used was worth many thousands of dollars), the greatest value of the light mobile we had turned out was its simplicity. Naturally, we could not have attained such simplicity without getting hold of all the relevant information, a process that had taken us three years of persistent work.

Nor do I want to go into the intricate details of our work. Suffice it to say that we considered it our most important task to create order in the accidental pictorial chaos generated by the encounters of light beams. To achieve such an order, we had to find the most helpful motifs, and, even more importantly, the means and rules of a conscious fashioning of the spectacle. First, we had to make a careful analysis of the motifs that had the highest spectacle values. Attending to those motifs, at a later stage of our work I shaped the units to be cast from easily moulded materials, and then we cast the image record through which the laser beam was to pass from glass or polyester. One needed to know a very complex system of rules in order to design an image record. One needed to relate the motifs found to a painter's analysis of materials, rhythm to engine-driven movement, composition to faculties of the image record. This is how a multitude of rhythmic and composed pictorial information could be recorded on a single image record.

In a set-up like ours, laser light played a role very similar to a pick-up needle while applied to a gramophone record. Covering a pre-designed track, laser light simply projected all optical information previously put into the record. Thus, the coherent and focused light of photons leaving their incited atoms became a means of *composing* a pictorial spectacle. The effect of the spectacle was raised to an astonishing power.

Although we exploited only a fraction of the possibilities we had discovered, our presentation in the National Gallery launched laser light as a means of creating exuberant spectacles to the Hungarian public in a resounding way. Our continuing experiments had yielded such a wealth of additional possibilities of pictorial interpretation that we were able to work out a new method of pictorial re-interpretation. We have since also developed the technical back-up to presenting so-called "pre-holographic images".

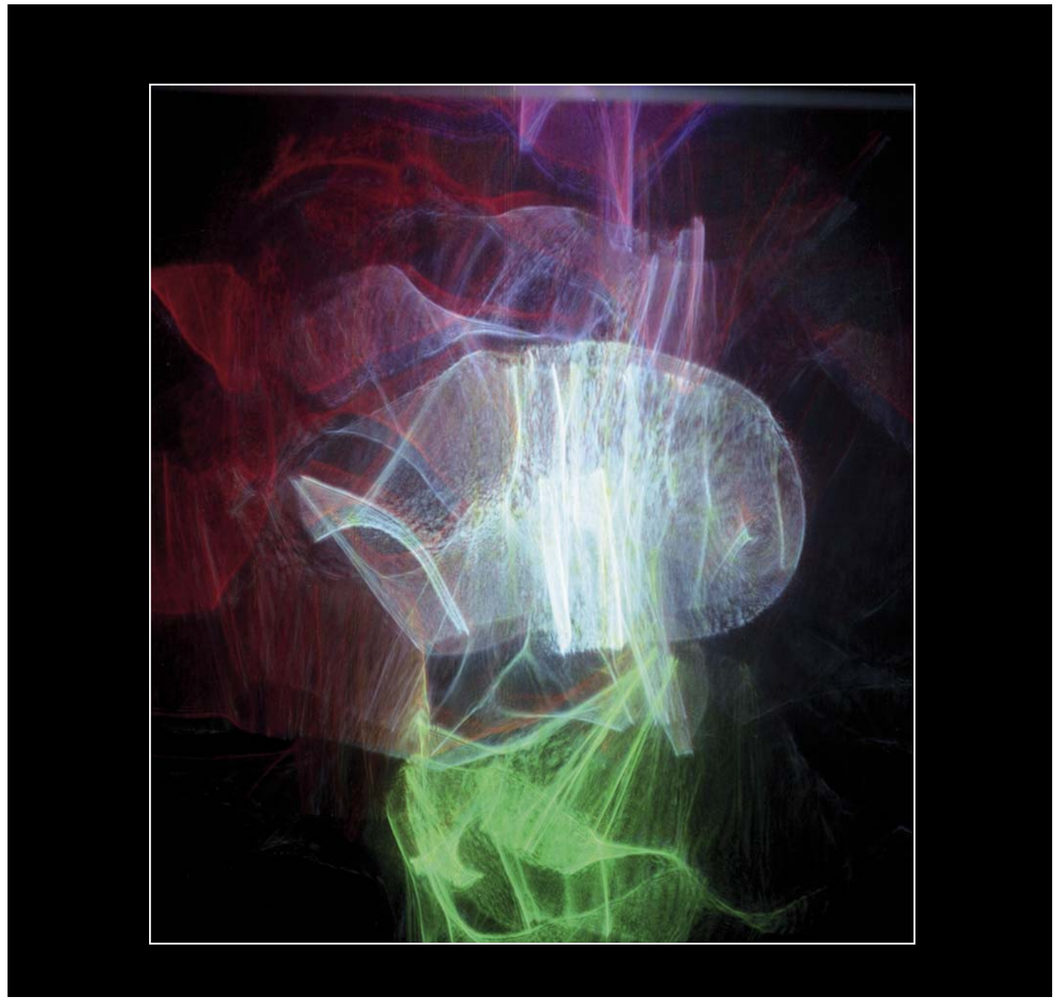
Motifs put into image records can be re-interpreted by applying classical optical instruments. On one pole, the real motif can be projected while on the other pole, its Fourier transformation, i.e. the related interference image. This method holds out the possibility of visually bridging perception and physical law. Through a series of pre-holographic images we can reach pure laser interference. Organic and continuous image changes call forth a transition in front of our eyes from the world as seen by our naked eye to light interference that obeys an exact mathematical description. Amid this transition that we call "pre-holographic" both the "object image", i.e. the shaped motif, and the interference image appear simultaneously, although in changing proportions. Such a metamorphic process holds out the promise of a vast exuberance of laser-borne forms. Our pre-holographic images were featured at our shows in the Horticultural University and the Military History Museum. I named one of our "laser light symphonies" Cell Crystals due to its motif organisation. The laboratory spectacle of the hidden face of Nature could thus become a vital experience for the general public. This new province of perception provides not only new information but also new sensory experiences and harmonies.



Superposed recordings or pre-holographic images, 1980
"Cell Crystals"

A few months ago I published an article in *Új Írás* (New Writing) on the many potential applications of our laser light mobile. I now want to mention just one of those potential applications. Perhaps the most varied application of the metamorphic process provided by our laser light mobile offers itself in the theatre. Pioneered by the Bauhaus movement, light theatre can not only produce additional lighting effects by introducing lasers, it can also provide an extremely varied light accompaniment, never before accomplished by any technical means, that can generate a theatrical environment in its own right. By light theatre I do not mean an overdose of lighting effects designed to crush both the audience and the play performed but an organic, many-faceted kind of co-operation that enhances the audience's response to the inner workings of the play precisely with the help of consciously designed visual processes. The job of a visual designer here is very similar to that of a composer.

On the open-air stage of Székesfehérvár's Vörösmarty Theatre this last summer we made the first steps towards the theatrical application of lasers. True possibilities were raised



here but to a modest extent since we had to adapt to an already finished stage set. Laser light was present on the stage for only a quarter of an hour. What we were aiming at was to assist the interpretation of the play in faithfulness to its spirit through a humility that naturally flows from depth. The perception of nuances may well have been stifled by novelty but a more differentiated judgement will surely be possible when a light environment on a stage will be more than a mere curiosity. We have by now got rid of the superstition that painting must draw on rhythmical elements recorded on a plane but we have yet to get accustomed to painters who are also designer artists, their light symphonies on an equal footing with the work of theatrical directors.

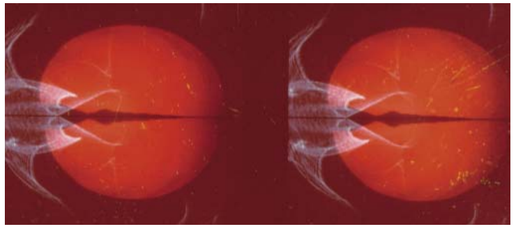
As well as undergoing a revolution in science and technology, our continually transforming world also undergoes a revolution in seeing. Expanding the limits of our reality visible to us must be a communal deed. Within this communal deed to be carried out in a world that has lost its yardsticks it is an artist's special duty, to return to György Kepes' thought evoked at the outset, to artistically fulfil requirements set by "a new reality and a new yardstick for living" in the context of a new communal art.

First appeared in Hungarian in the December 1980 issue of *Természet Világa* (Nature's World).

The Fifth or Sixth
Attila Csáji's laser composition – Pannónia Film Studios 1982-83

The first Hungarian film in laser animation*

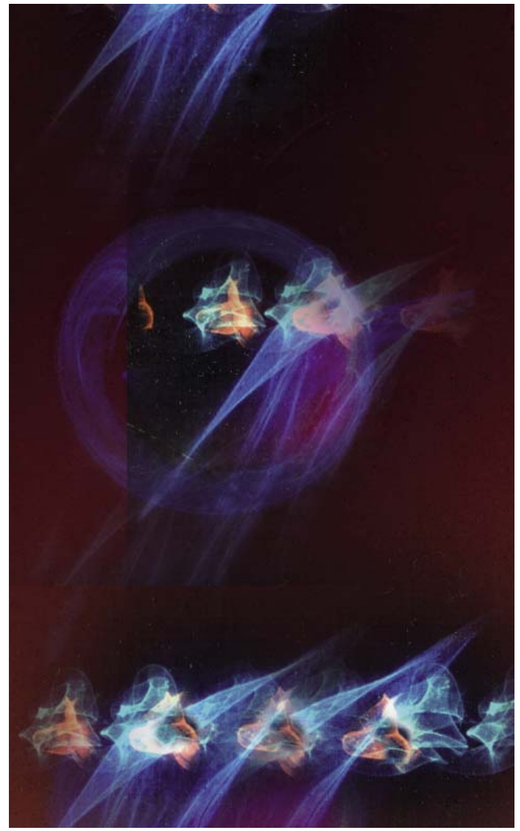
„I was born in Szepsi in 1939, in a small town among the mountains between Kassa and Rozsnyó. My childhood coincided with World War II, I had lived through the expulsion of many Hungarians from Slovakia, and had then a happy, relaxed year in Holland. My years as a young man were similarly hectic marked as they were by rifts and re-starts. I had learnt how to draw ever since I was a kid both from important and less important masters. I was soon enthralled by the ways of expression modern art had to offer. I was attracted to the Avantgarde in an age which tried to deny or at least bracket it. From the early 60s I became one of the organisers of the Avantgarde in Hungarian visual arts. I established SZÜRENON, a group of artists who filtered and developed the new visual ideas through their own existence and the HERE and NOW that surrounded them. Pollution hitting our external and internal



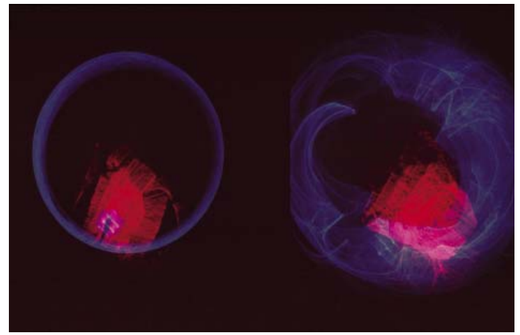
environment equally worried me. Repulsed equally by the terror of 'freshness' and narrow-minded clichés, I searched for the least dogmatic ways of visual expression. With my laser adventure in my backpack, endowed with a freedom emanating from lights, I have remained a painter.

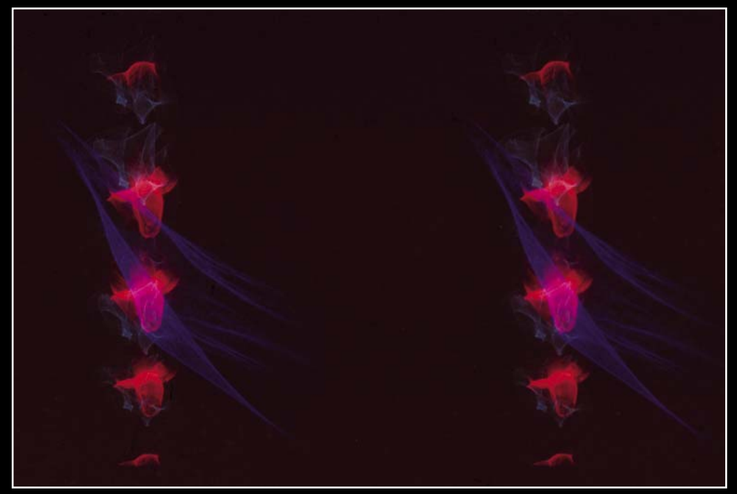
This film of ours springs from experiments conducted both in the Central Physics Research Institute and my studio. The film spans an optical bridge between what is visible and what can be mapped mathematically. Its pillar is a peculiarly ordered kind of light: laser light. Without such a pillar the bridge

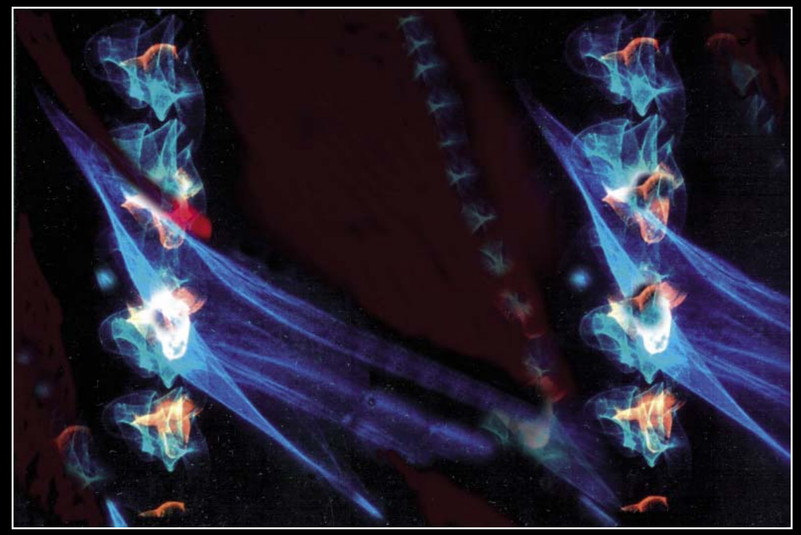
* Directed by Attila Csáji, technical director: Áron Sipos, laser expert: Norbert Kroó, photography: Miklós Bíró, editor: János Cipauer, music: Antal Babits, assistant: József Tóth. Shown in the following venues: Hungarian National Gallery, Musée des Arts Modernes, Paris, Filmmuseum, Frankfurt am Main, Filmothek der Jugend, Oberhausen, II. Light Symposium, Eger, MIT, Cambridge, Massachusetts etc.



Excerpts from the laser animation film







cannot be built. Just like electronic light revealed by instruments, laser light can be serve as a source for new sensory experiences and harmonies. A dynamic metamorphosis is the most pervasive form-experience of our film. It is a visual paradox that bridges the gap between microcosms and macrocosms by establishing strange correspondences. From galaxies new cells can spring, and from crystals, infinite spaces.

The instruments that are so indispensable in our civilisation create a world that expands continually around us. Our film is not a mirror-image of the world revealed by instruments, but it certainly rhymes to it. This is exactly where its peculiar 20th century poetry comes from."

An excerpt from the blurb printed in Film Almanac 1983.

LASER EYE

An Interactive Light Mobile constructed in the transit lounge of Ferihegy II Airport, Budapest. 1985

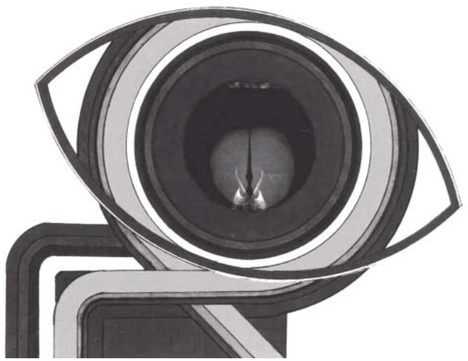
The mobile creates the experience of metamorphic shapes. It not only eases the strain of waiting but also involves the audience and the environment into the process of creation. The permanently changing forms erupt from the depth of a laser crater; their metamorphosis is connected to the departure and arrival of planes. The object is framed by a vast circular form, reminiscent of the human eye. Its centre is shaped like the cone of a volcano with a crater.

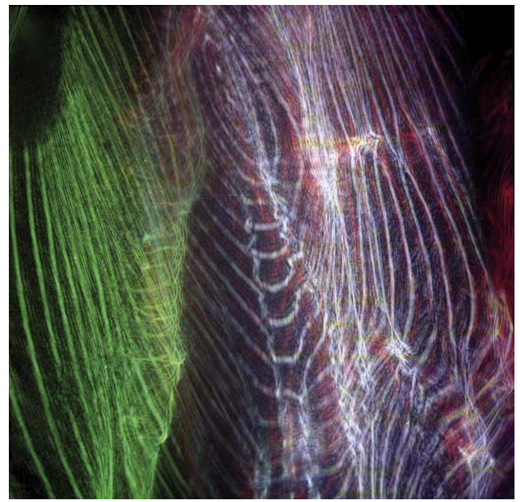
The laser show is projected from behind on a sand-blown glass disc with a diameter of 1 meter which is placed on the bottom of the crater of the protruding form. The applied superpositional method takes the audience on a journey into depth, into the inner layers of matter as they are revealed by the laser. This method makes them experience "the hidden face of nature"(Ernő Kállai). The forms organically evolve from one another and change smoothly and playfully before the viewers' eyes. Unexpected metamorphosis is their element in which crystalline structures are organized into living cells and then into cosmic spaces.

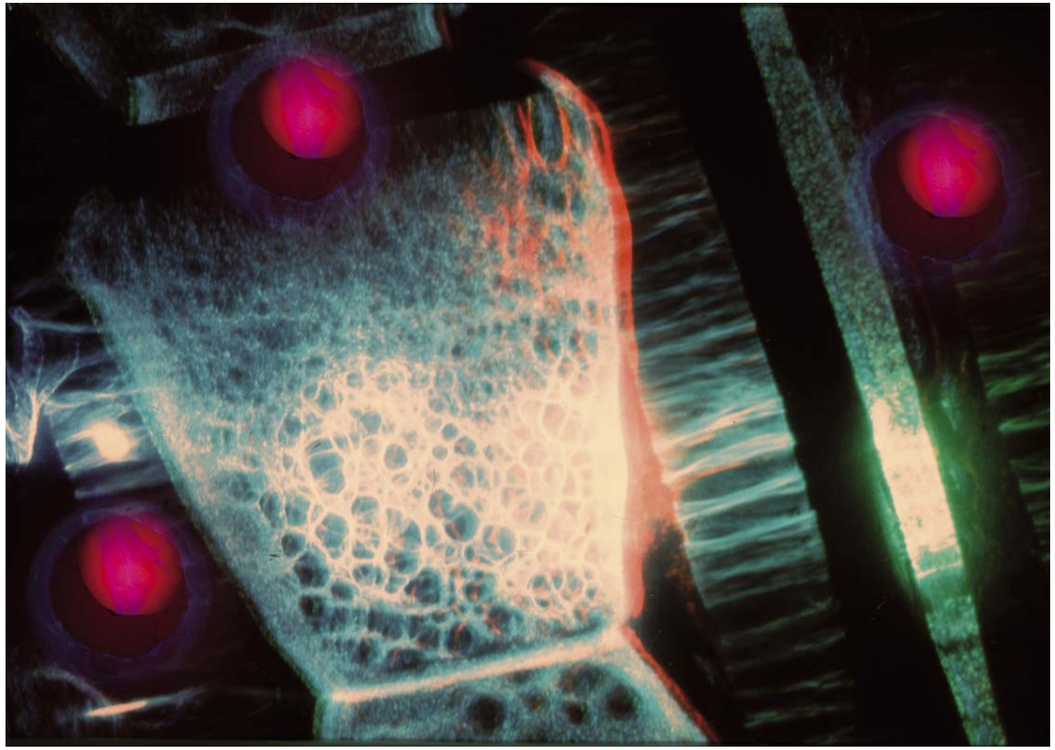
This journey into depth is connected to the journeys above the surface, to the flights which arrive from and depart for all parts of the world. If a plane lands, say, from Amsterdam, there appears a tiny floating form in the centre of the concentric circles. It is a scanner form; its shape recalls a bird or an airplane. Its 'flapping wings' come closer and closer as the amplitudes grow, and when they reach the edge of the innermost circle, the vision is dispersed in a rupture. It is replaced by a pulsating circular signal, the sign of arrival.

If we step in front of the light barrier, built into the 'eye', this laser eye 'sees' us. Green leds light up, signalling that the mobile is ready to establish contact with us. If we put our hands on the sensors which are situated on the lower side of the outer circle (their form imitates hands), we can transcribe the vision by making it dissolve and change its character. We can transmit several instructions at the same time or we can watch the succession of different characters within one selected variant.

The eye-shaped frame is a paradox in itself. The glass disc is placed into the 'eye' so that it corresponds to the position of the retina in the human eye. While the retina transmits visual information from the outside to the brain, here it is the laser beam from inside that creates a metamorphic process on the surface. It is also a paradoxical allusion to the early history of optics, to the Euclidean explanation of vision. Euclid thought







that rays of light would leave the eye and "feel the shapes of objects"... This absurd explanation has been, in fact, realized in this light mobile with the help of laser which is the protagonist of the present revolution in optics:

A laser program activates three distinct realms of forms:

I. The scanner exploits the fact that the laser produces a well-collimated beam. Changing the frequency modulates the scanner's movements and creates linear drawings of continuous lines.

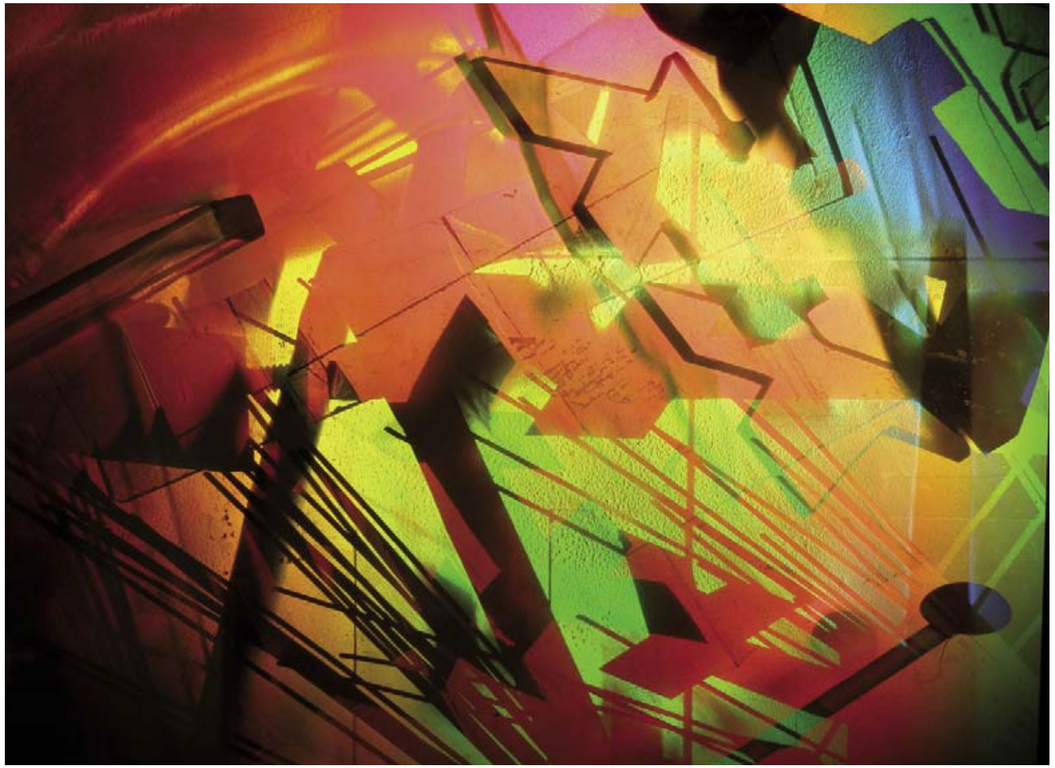
2. The modelled t:ansparent surface creates spatial webs of pure interferences.

3. The superpositional method, elaborated in experiments in my studio and the Central Research Institute for Physics of Hungary, produces light-images of the consecutive layers of the modulated material. These are called pre-holographical forms by physicists.(The method and the applied instrument were patent registered in 1980.) The forms this method allows to produce have led to a new style which creates metamorphical changes by joining the spatial webs of interference with structural images in a controlled manner. By continuously transforming the optical constellation and by modelling the plastical surface of the plate, specific forms or emblems can be 'drawn'. The method is also well adapted to commercial purposes. The laser show is complemented by a continuous projection of images, polarised into different forms and colours, on the background simultaneously with the activation of the scanners.

The eye-shaped frame is made of plastic in subdued, greyish colours. The instruments – a 40 mW helium-neon laser, a superpositional light mobile, scanners, a polarizing projector, electronic control, a light barrier, sensors, and optical elements – are hidden in the plastic body.

On the Expanding Borders of the Visible Universe: Holography in an Artist's Approach

Associating that which can be seen with that which exists is a centuries old misconception. The maxim "seeing is believing" can be heard quite often even today, though such a narrowing of reason seem grotesquely humorous and refers more to the person uttering it than to reality. Paradoxically such doubts may also carry a positive momentum – or at least some thought encouraging distrust – provided they do not lead into rigid conclusions but relate to *the manifest need of creating a mental image of the world. We are living in a continuous electromagnetic flux. The overwhelming majority of the electromagnetic radiation is invisible to our direct perception. With the aid of instruments however, man was able to expand the radius of perception.* In the twentieth century the importance of instruments has become crucial. With regards to the expansion of visibility instruments seem to display parallelisms with the views of Paul Klee the excellent painter of the first part of the twentieth century: *The artist's task is not to mirror, but to make visible.*



A transmission hologram dissolving across fields, Cambridge MEDIA LAB, 1988.

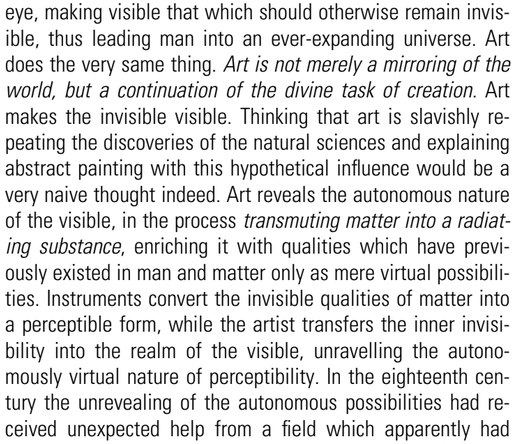
Instruments have created a new universe for the human eye, making visible that which should otherwise remain invisible, thus leading man into an ever-expanding universe. Art does the very same thing. *Art is not merely a mirroring of the world, but a continuation of the divine task of creation.* Art makes the invisible visible. Thinking that art is slavishly repeating the discoveries of the natural sciences and explaining abstract painting with this hypothetical influence would be a very naive thought indeed. Art reveals the autonomous nature of the visible, in the process *transmuting matter into a radiating substance*, enriching it with qualities which have previously existed in man and matter only as mere virtual possibilities. Instruments convert the invisible qualities of matter into a perceptible form, while the artist transfers the inner invisibility into the realm of the visible, unravelling the autonomously virtual nature of perceptibility. In the eighteenth century the unrevealing of the autonomous possibilities had received unexpected help from a field which apparently had precisely the contrary interests. The purpose of this field had been the objective mirroring of the outer reality, the tool developed to this end was *the camera*. If a machine is capable of mirroring then the mirroring itself cannot be an art. The theory of mirroring which originated in the renaissance had received a final blow. In the last hundred years the camera turned to be more than a simple instrument of mirroring, it has been proven to profess a range of *new and autonomous possibilities* – and it also turned out that man was capable of exploiting these, creating a multitude of artistic achievement. The camera expanded the boundaries of the visible, and helped to bring about a basic shift of direction in the field of fine arts: horizontal orientation gave way to vertical immersion...

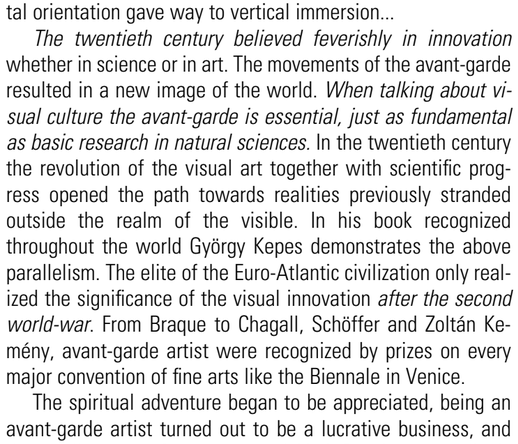
The twentieth century believed feverishly in innovation whether in science or in art. The movements of the avant-garde resulted in a new image of the world. *When talking about visual culture the avant-garde is essential, just as fundamental as basic research in natural sciences*. In the twentieth century the revolution of the visual art together with scientific progress opened the path towards realities previously stranded outside the realm of the visible. In his book recognized throughout the world György Kepes demonstrates the above parallelism. The elite of the Euro-Atlantic civilization only realized the significance of the visual innovation *after the second world-war*. From Braque to Chagall, Schöffer and Zoltán Kemény, avant-garde artist were recognized by prizes on every major convention of fine arts like the Biennale in Venice.

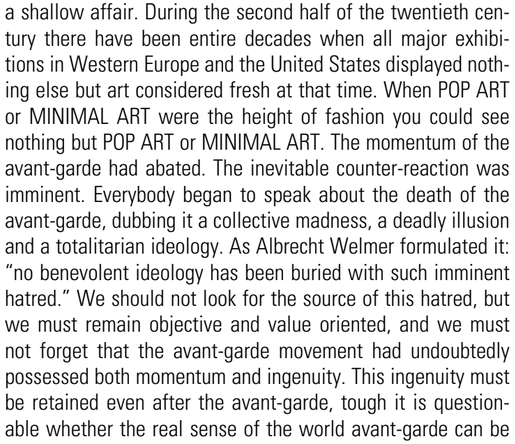
The spiritual adventure began to be appreciated, being an avant-garde artist turned out to be a lucrative business, and the small groups of yesteryear quickly inflated to exceedingly broad world-movements. Innovation was considered to be valuable, and in the tails of comets quickly became its own distorted and idolized shadow. Innovation became uniform. The dictatorship of freshness was created. Instead of one's relation to reality only the fresh relation to the movements was valued. In a conceptual installation Spoerri created a witty caricature of the situation: an art gallery is turned into a vegetable stand, "the fresher the better" – by the end of the exhibition the once fresh tomatoes turned into a rotting decay. Success can only be achieved if one's merchandise is always fresh. These expectations have turned many an exhibition into a shallow affair. During the second half of the twentieth century there have been entire decades when all major exhibitions in Western Europe and the United States displayed nothing else but art considered fresh at that time. When POP ART or MINIMAL ART were the height of fashion you could see nothing but POP ART or MINIMAL ART. The momentum of the avant-garde had abated. The inevitable counter-reaction was imminent. Everybody began to speak about the death of the avant-garde, dubbing it a collective madness, a deadly illusion and a totalitarian ideology. As Albrecht Welmer formulated it: "no benevolent ideology has been buried with such imminent hatred." We should not look for the source of this hatred, but we must remain objective and value oriented, and we must not forget that the avant-garde movement had undoubtedly possessed both momentum and ingenuity. This ingenuity must be retained even after the avant-garde, tough it is questionable whether the real sense of the world avant-garde can be left behind at all.

We continuously keep modelling the world. We build and rebuild it, knowing that here is no final solution. This is not the acceptance of the impossibility, but a paradox loyalty: the loyalty of an inquisitive mind to its own principles and also an acknowledgment of the finality of human nature. This practice however spans into the infinite, because it carries the basic principle of spiritual work: creation. This practice, working into the transformation of consciousness into something present furthers the creation of reality. The art of light originates from the avant-garde. Its twentieth century predecessor were the leading artists of the avant-garde. *László Moholy Nagy* in his writings and with his modulators of light and space created the fundaments in the Bauhaus movement. What he said about the tasks of the light-painters of the future is now common knowledge. The intimate relationship fine art has to achieve with the bright radiation of light, with the interference, the prisms, lenses and various other optical devices, *has in the last few years became an especially timely issue, as we are currently witnessing an opto-electronical revolution multiplying its possibilities.* These possibilities do not enfold on their own. The cooperation of artists, scientists and engineers is needed. *György Kepes* formulated the above need, and in the MIT in Cambridge he created the CAVS the first institute of the world serving the purpose of this cooperation.

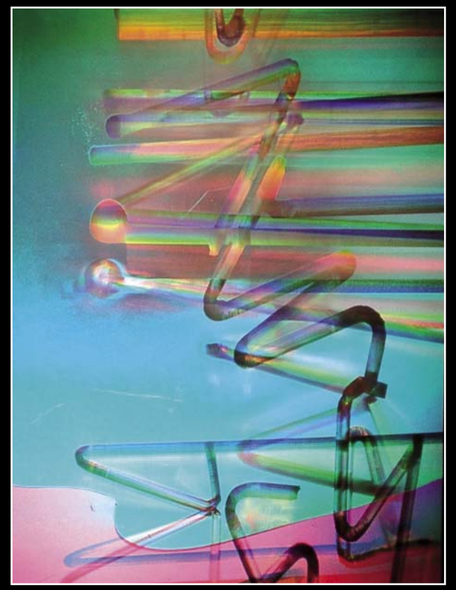
The boundaries of the visual arts are dissolving, photographers rely on methods utilized by the fine arts and the reverse is also true. The machine has become part of the work of art,

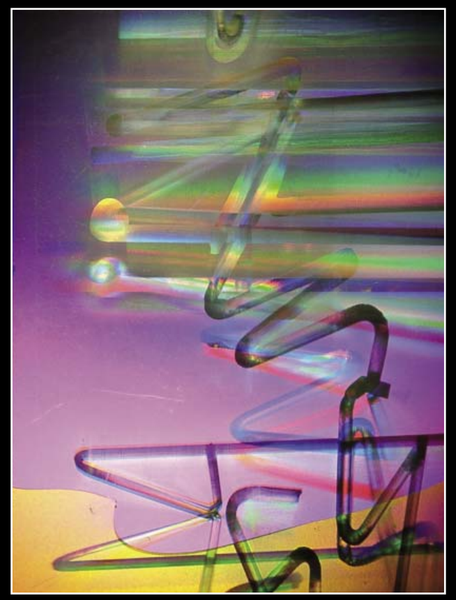






A transmission hologram dissolving across fields





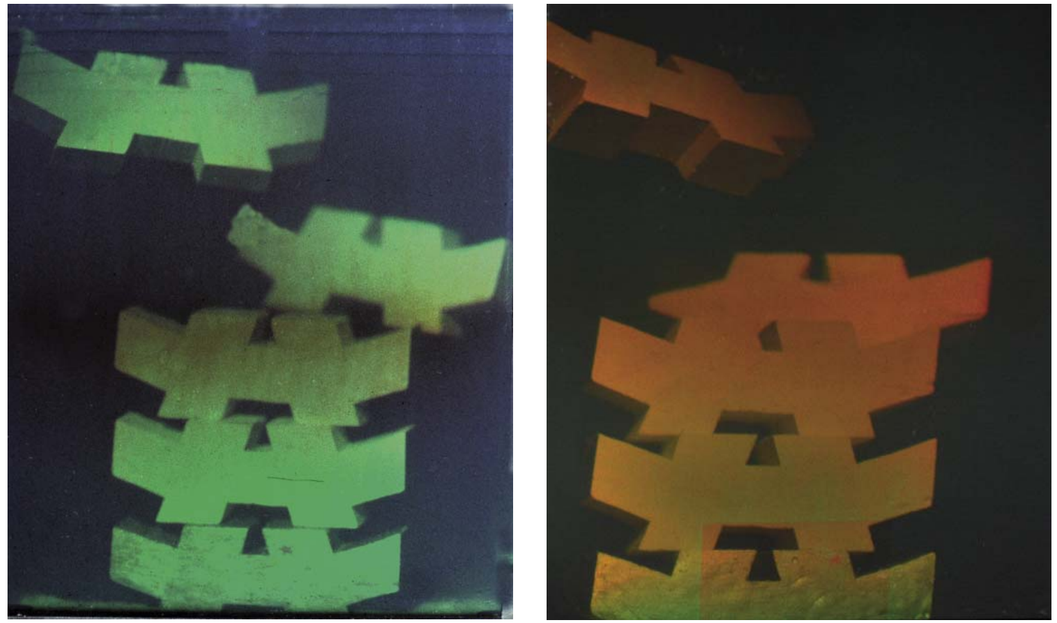
"Light calligraphies" (transmission holograms), Cambridge MEDIA LAB, 1987-88.

it has become an aesthetic reality, and in the *pure art of light* kinetic constructions are no longer seen thus achieving the total de-materialization of the visual experience. Light, the very reason of visibility has become the source of the visual experience. For the viewer the fluid levitation of the immaterial stream of light articulated by the artist conveys an experience of creation – something similar to experiencing a live musical performance. In a light environment the viewer is inside a forever changing work of art, also becoming a part of it. This amplifies the power of the experience. On the occasion of the previous symposiums of light I have already elaborated on my work regarding my achievement concerning the pure art of light, the work originating from the imaging potential of lasers, which has led to the *"superpositioning method"*. I had began this adventure in the sixties, the research concerning the imaging potential of lasers, *it has led me into the previously unknown realm of a virtual world which could be made visible,* and drew considerable international attention.

Now holography is my topic. The three basic qualities of laser – extreme manoeuvrability, focused intensity, monochromatic nature and the consequent phase coherence together with the capability of interference – show different imaging potentials. These have played a considerable part in expanding the boundaries of the visible universe. *Holography is based on the interference capability of lasers. The method was discovered by Dénes Gábor in England in 1948* – as described by Pál Greguss in his book entitled "The Dawn and horizon of holography" – when on a magnificent Easter Sunday morning while waiting by a tennis court he suddenly realized that the information related to the amplitude, wavelength and phase of a coherent beam of light may be transformed in the form of interference pattern into a value of intensity which can be captured on a photo-sensitive plate. The resulting image would display the total object relationship of space, changing in accordance with the position of the viewer. Gábor called this interference pattern hologram. This happened well before the discovery of lasers. From the sixties onward, with the discovery of lasers providing a coherent beam of light holography acquired an instrument which would open new realms for science and art. In the April of 1971 Dénes Gábor wrote the following: *"for a researcher there is no greater happiness than seeing his theory progress like a chain reaction creating the fundament for new chapters of science."*

Soon after that art began utilizing holography. The first exhibitions of holograms were opened. In 1971 in Vienna an exhibition was organized *"On the centenary of visual communication"* and *Margaret Benyon* already displayed holograms created with an artistic purpose. Naturally, at that time the purpose of the exhibition could not have been the elaborating of undiscovered artistic possibilities. One of the first people to utilize holography with an artistic purpose was *Harriet Casdin Silver*, who from the sixties onward cooperated with *Steve Benton* the developer of the transmission hologram and the head of the MEDIA LAB. With a dazzling visual sensibility she rejuvenated a more than a thousand years old art form, that of the portrait painting. Her achievement is not to be considered from a technical aspect, but from a visual one. Meanwhile other artists also considered the utilizing of the new possibilities. The primary experience of a hologram as a visual art draws its power from the particular magic that it displays a totally three dimensional image of the visible – on the plain of glass or metal – and this is not achieved by an optical illusion, but on specially differentiated and altered information. And in this quality it is captivating even in the form of a reproduction. For an artist however there are many other problems originating from the specific qualities of holograms which must inevitably be addressed and clarified. What new visual thoughts, what relationships between space, mass, colour, form and materiality are to be revealed through this medium? How does it alter the relationship of the visual experience and time? Is it capable of creating a visible rendering of abstract ideas? How and in what way does it expand the boarders of visual expression? The answers to the above questions are currently being formulated. There are many methods for creating a hologram /transmission hologram, rainbow hologram, multiplex hologram, reflection hologram etc./ Holograms based on white light are the most suitable for artistic purposes.

After the discovery of lasers, it takes approximately twenty years until holograms created with explicit artistic purposes are presented in an exhibition of ground breaking significance. At the beginning of the eighties the first large-scale hologram auction was organized in Europe entitled *Licht-Blicke – Glimpses of Light* which was considered by the German press to be the first world exhibition of holograms. This impressive exhibition was organized on the occasion of the opening of the German museum of motion picture, and generated large public interest. The exhibition was intended to be a cultural and social event of a an immense importance, accordingly it was opened by Chancellor Walter Scheel, and reported on by six major European television networks. The invitation displayed a rainbow hologram by Harriet Casdin Silver – this was the first time to utilize the Caulfildian printed hologram for such a purpose. It was a peculiarly grotesque picture showing a set



"Break-away and floating" (reflection holograms), Physics Institute of the Budapest University of Engineering, 1984

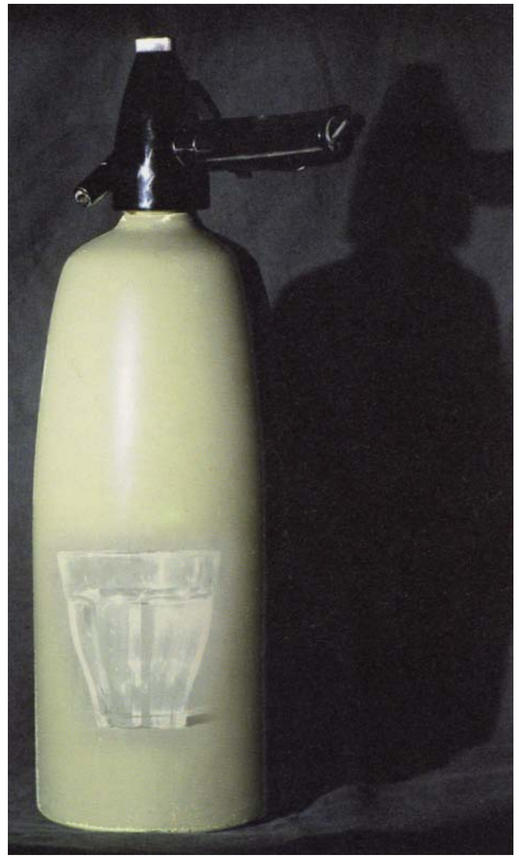
of teeth protruding from an opened mouth in the process of devouring a roll of film.

The German critics classified the members of the exhibition into three categories:

1. The first included those who liked the basic magic of the hologram, and were enjoying the possibility of producing a three dimensional space validated by the alteration of the space relations based on the movements of he beholder, thus creating something far beyond the boundaries of the fixed perspective. They were captured and satisfied by this possibility.

2. The second group included those who utilized the hologram for communicating the goals already achieved by the avant-garde. These people formulated thoughts originating from constructivism, minimal art, surrealism, pop art and so on. Some world-famous artists were included in this group such as Salvador Dali.

3. The third category had very few members. These were the people who did not follow the previous achievement of the fine arts avant-garde, but instead realized that holography concealed a previously undiscovered visuality and specific autonomous possibilities. This was a previously unknown system of thought and visual experience, originating from the visual qualities manifest in the creation process of a hologram. In what way are the qualities of a hologram determined by the coherent wavelength, the setup of the instruments, the angle of light and other practical considerations? How can these qualities be utilized for broadening the boundaries of visuality, how can the visual experience be intensified? The critics included *my series of three holograms entitled Spring for Voltaire* into this third category.. The subtitle of my paper includes a personal reference: holography from the artists' point of view. Please allow me to be personal, and to talk about my thought on holography through my own works. I would like to apologize from those already familiar with my thoughts with regards to holography. The twentieth century was characterized by a questioning of the apparently evident. In my Voltaire series I question the apparent laws of experiencing space, by creating a visual image which clarifies that the truth of laws is not exclusive. *One of the laws of our experiencing space is that the object in the front covers the object behind it. But*



"There is a glass of water in the siphon bottle" (reflection hologram), 1984.

must this always be so? Could a space be created where this law would not be valid? Not just theoretically, but as real visual object. I articulated this problem while looking for the specific irreplaceable visual possibilities of the hologram. In other words this would be space-image contradicting the truth-experience of a vulgar rationalism. It was not by chance that I have chosen Voltaire and that I have chosen the spring. I was interested in an associative relation, but even more the special relationship of an organic form and a cold industrial one. On *the first hologram* the space relations are conservative. The spring placed before the Voltaire mask covers the nose, the eyes or the mouth depending on the position of our eyes. On the *second one*, the spring is place in front of a negative image of the Voltaire mask our space experience becomes unstable, positive and negative images shift according to the position of the viewer. Even so, in the relationship of the negative head and the spring back and front work according to the conventional laws of experience. On the *third one* by utilizing the peculiar relationship of the emulsion coated side of the photo-sensitive material and the laser, the head floats in the space before the plane, and the spring is inside the head, but as the spring was closer to the laser when the hologram was created the spring behind the head covers the eyes, the mouth and the mouth which are in front of it. This leads to a bizarre phenomenon contradicting the laws of experiencing space. The hologram presents an impossibility of experience. I am not interested by the theory explaining the dimensions, but by the ability to make such a visual creation.

After the Licht-Blicke exhibition many large hologram exhibitions were organized in various cities in Europe and the United States, among them in October of 1984 (the same year as the Licht-Blicke) we organized a hologram exhibition in The Hungarian National Gallery together with the Institute of Physics of The Technological University. The purpose of the exhibition was to show the audience the peculiarities of the new medium born from the meeting of science, technology and art. It showed the scientific aspect of holography, its reproductive and creative artistic capability. On this exhibition I utilized holography for presenting an absurd world called *Hun-Jarrya*. The title is based on wordplay: it is a combination of Hungaria and the name of Jarry, the author of Ubu Roi. This is an impossible world, the throne of which is occupied by the impersonal presence of the chair. This chair, elevated on a platform occupied the middle of the hall like a unfeeling and simple conceptual installation. Four simple red plaques were placed above the chair. It was entitled *Message to J. Kosuth*. In front of the first one an egg was placed on a tray of sand. Before the second one the photo of an egg. The third had the definitions of the word originating from a Hungarian and from an English dictionary. The fourth one showed a hologram of an egg. Years before J. Kosuth exhibited a chair, a photo of a chair and the definition of the word. With this he showed that the world has become a conceptual place. The Message to J. Kosuth is a reflection. The world in not conceptual but illusionary. Seemingly there are spaces which can be entered into, but this is jut an illusion. The world is closed. The wall is more real than the egg. Lóránd Hegyi wrote the following about this work: "The hologram entitled Message to J. Kosuth is a work

of art specifically related to a context. "One and three chairs" is considered to be a basic work of the concept art, it is based on the relation of a concrete original object, the image resulting from the imaging of this object, and the concept defining the object. Kosuth attempted a radical de-materialization and conceptualization of art. When Attila Csáji in 1984 "send a message" to J. Kosuth he does it in a postmodern situation, when conceptual art is well over its peak. To the three stages a fourth is added, a totally illusory representation of the visible, a hologram. The four stages can be interpreted together as part of a relation, but a historical interpretation is also possible: concept art is present as an experience of the modern art, a quotation, a reference. The hologram becomes part of the program because of its deceptive and self-revealing qualities: walking before the small plate the illusion is seen only for a brief moment, and as it disappears we are left to ponder the questions of the avant-garde, the possibility or the utopia of a recreated world, and the heroic dream of a radical identification between art and life."

One of the holograms of the exhibition had a very common title: *There is glass of water in the bottle*. This is a trivial utterance sentences like this can be often be heard. The hologram shows something trivially impossible. We see a bottle and inside it a glass of water. Our utterances are simplified into concepts. We barely notice the absurdity. Reality is only revealed if our relation to it is freshened. Otherwise it is obscured by cliches. The everyday absurdity is characteristic of Hun-Jarrya.

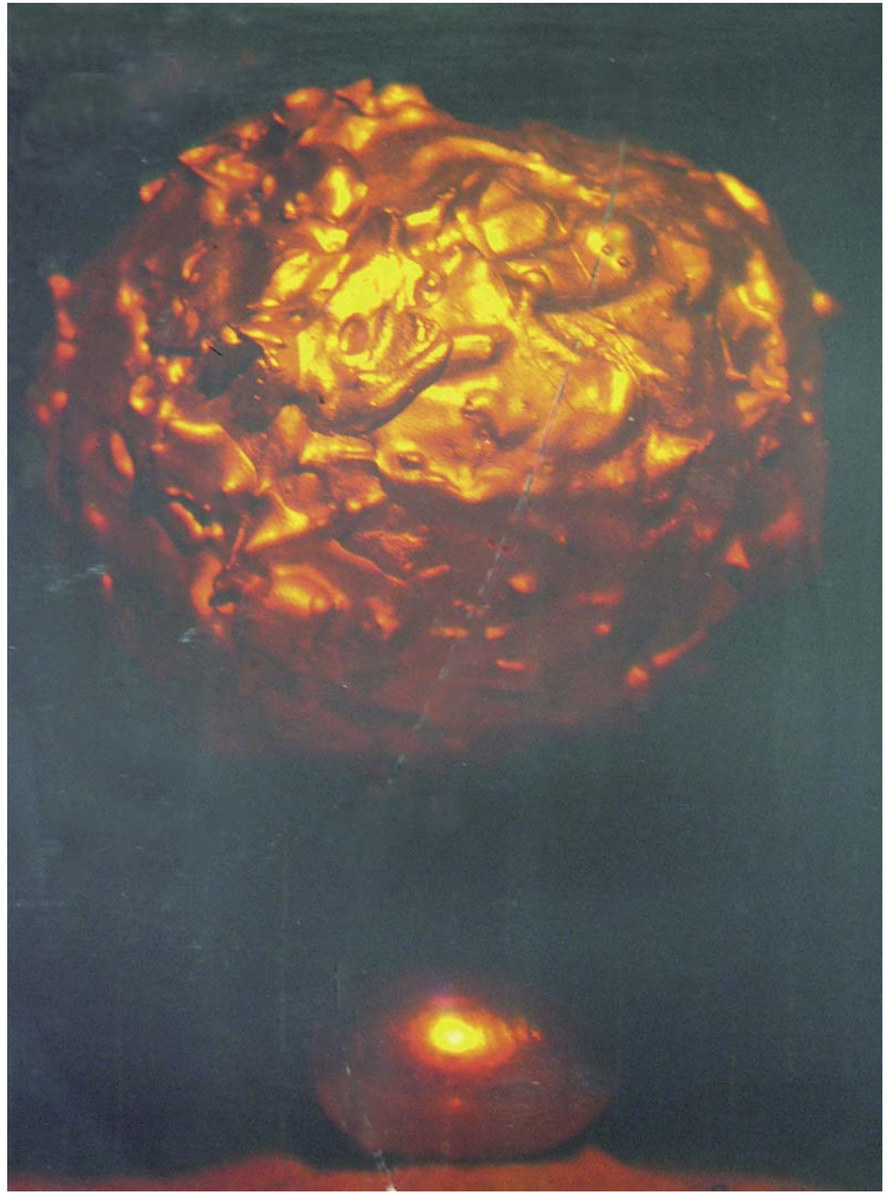
Another hologram is entitled: *A stage of the revolution*. The hologram shows a hand with a finger pointing at the sky. As we walk before it, is unexpectedly completed. On the tip of the finger, as if by a juggler's trick appears a cobblestone, the choice weapon of the proletariat. It is only seen for a glimpse, in the next moment it is obscured by the changing of the angle.

Stone and egg. A huge rough block of stone is levitating above an egg. Ottó Mezei wrote about this hologram that it had a magical effect even more powerful than the overtly large two dimensional fetishized objects by Magritte. I do not want to go on, there were many exhibits worth mentioning, the huge five pointed star made of crabs which changed its colour from a metallic green to red, the mark of the floating disruption and so on. In the Licht-Blicke exhibition one of my laser-animation created in the Pannónia Filmstúdió was also exhibited, and I was contacted by Harriet Casdin Silver, a member of the CAVS laboratory of the MIT who told me that she would welcome me among the members of the CAVS, and wanted to know, whether I would be interested in such an invitation. Naturally it would not be her decision, but she would recommend me for membership. After receiving the necessary information the invitation was endorsed by such internationally recognized figures of the technical arts as Otto Piene or Paul Earls, and so I became a member of the MIT/CAVS. This meant that I could use the facilities of the Cambridge MEDIA LAB. Until then I have been using the Djenisjuk method of reflection hologram, here Steve Benton introduced me to the possibilities of the transmission hologram. These had other, different visual qualities than the kind I utilized before, and allowed me to develop new ideas. I would like to say a few words about these.

Calligraphy of light. This is a conscious return to the calligraphic paintings created at the end of the sixties: the message-sign-grids. These plastic compositions interpreted by lateral light were the starting point. In the calligraphy of light I was not as much interested in the spatial nature of the hologram, as its capability of changing colour. This is why the starting point for some of the calligraphy had been a method of holography where the shifts of plane and space conveying a spectacularly rich possibility of colour changes. The calligraphic signs were created from a special transparent material, formed in such a way, that the aesthetic value was matched by a colour changing capability. The viewer walks before the hologram and has the illusion of creating colour out of the colourless plain. The order of the changes does not follow the order of the rainbow, it is more free, much more unexpected and complex, in an environment determined by the artist.

I should also mention the books of light, or the holographic version of the stone tablet. I could speak about the holographic space of the Tower of light, but much more time would be needed for such an elaboration. Let me finish my lecture by quoting the thoughts of R. Jackson an excellent art-historian of The New York Museum of Holography:

"In the XX. century laser technology occupies a role similar to that of the printing press in the XV. century. Both were radically new instrument of communication, both were based on the most modern technology of the age. The most adventurous artist of the age adopted them as instruments allowing them to spread their creative message in a somewhat broader environment. For the modern artist the utilization of the laser technology is not more extraordinary than the usage of the printing press for Albrecht Dürer."



Stone and egg (reflection hologram), 1984

A Spring for Voltaire

Reflection holograms,1984

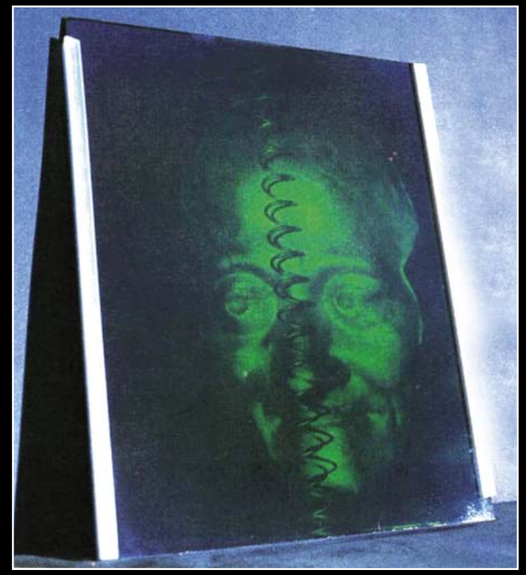
A series of three elements wich reveal and question the taken-for-granted properties of spatial perception. The selection of objects was not fortuitous. The rationalist philosophy of the Enlightenment, even if its lustre has somewhat faded away, isstill embodied in Voltaire's brilliant mind. The spring is significant not so much by virtue of the associations it may evoke (the potentiality of flexible movement,etc) but rather as an industrial object. It is a thin spatial form wich lets the light penetrate behind it, but wich casts a shadow at the same time. It is particurarly suited for the precise definition of spatial relations.

The first object stands for our habitual rational perception of space. In front of Voltaire's mask there is a spring which partly covers it and casts its shadow on it. Thus it produces a more or less conventional space. The emerging field of associations is doubtlessly peculiar, but it is merely associations and not a space yet. It is not significant; for a time it can be bracketed, although not eliminated.

The second object shows the negative form of the mask with the spring in front of its hollow space. This produces some perceptible changes. The head of Voltaire is transformed: it looks as if it belonged to some fat cardinal. Although all details are reproduced faithfully, but in negative, the properties of a plastical body in space have changed. A measure of uncertainty has been introduced into the perception of space: the nose looks sometimes convex, although it is concave, and somethig similar happens to the hollows of the eyes. But the relation of the spring to the head still conforms to our usual sense of space.

The third hologramm was made of the same arrangement. It exploits a specific property of holograms: if the emulsion side of the plate is turned towards the viewer, the form appears in front of it in space, and concave shapes are made convex.

Thus the negative of Voltaire's head becomes positive again and appears in the space in front of the plate. During exposure, the spring was closer to the laser than the mask, it partly covered the head while casting its shadow on the negative mask. Because the emulsion side of the plate has been reversed, a curios metamorphosis takes place: the spring is now inside the head and it casts a shadow in front, on the forehead and the nose. But this spring wich is farther away covers, at the same time, the nose wich is nearer to the viewer or, if he/she moves slightly to the left or to the right, the mouth, the chin,etc. Contradicting all our expectations concerning spatial perception, it is the object behind that covers the object that stands in front of it. What is the result: a spatial impossibility or the anticipation of a new dimension? It is the holographer's job to offer its visual formulation, to reveal the visual logic of thinking, but certainly not to cut short its process.



A Spring for Voltaire. Reflection holograms,1984

A Message to J. Kosuth

„The concept is like an egg, in which under the influence of warmth,
life is more concretely organized, so that when life is realized,
it may optimally negate the egg."

A.Cs 1967.

In the hologram exhibition, realized azt the Hungarian National Gallery, Budapest, in October 1984, a chair was put in center of the room on a pedestal

„ In everything new there is something cosmic. And in everything cosmic there is something emptiness", said a poet not so long ago."What is important in understanding a painting?" a painter was asked.- He replied in short, „A chair"

Yes in reality the chair is missing. In its place appeared 'sensation' . But many times in the case of sensation, we need the chair. We are so used to being confused by the lack of time, that we are no longer confused by it.

Many years ago, when conceptual art came onto the art scene, J.Kosuth displayed a chair, with the photograph of the chair beside it and the definition of a chair, as found in the Concise Dictionary. He let us know that the world is becoming conceptual.

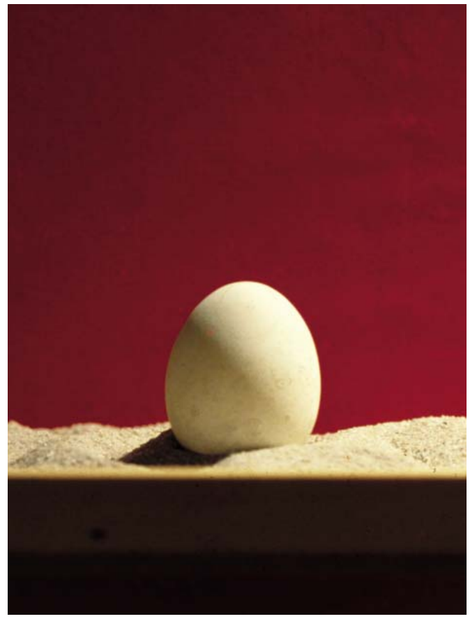
„A Message to J. Kosuth" is a response.

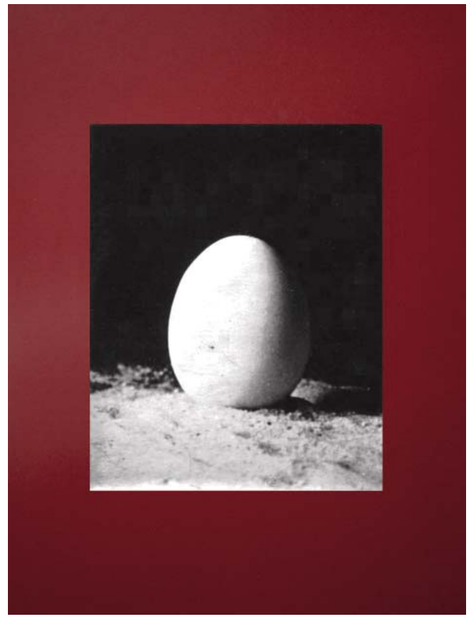
Over the chair there are four red passe-partouts. In front of the first passe-partout, in quarz sand on a wooden tray there is an egg. On the second passe-partout there is a photograph of it and on the third there is a definition of the egg taken from the Hungarian Concise Dictionary. On the fourth, there is a hologram of the egg.

The world has not become conceptual, but illusory: as if there were spaces in which we can be realized, into which we can penetrate. But this is mere illusion. The world is closed. More real than the egg, there is the wall.

„A Message to J. Kosuth" is a snub to those enthralled by trans. It points casually to the transitoriness of all trends, to a virtual word instead of a conceptual one, to a new pedestal, and also the transitoriness of all pedestals.

(Hungarian National Gallery – Hologram Exhibition, October, 1984.)





A Message to J. Kosuth

The Bridge of Light

Objective: creating a virtual bridge of light over the Danube

á t H I D a l á s * p r e M O S T e n i e * B R I D G i n g

Central-European Visual Arts Symposium

Párkány-Esztergom, 30-31 May, 1997

Visual artist György J. Bartusz, deviser and one of the organisers of the event:
"On 30 and 31 May we bridged the Danube by placing visual artworks upon the truncated pillar of the ruined bridge in Párkány, and by putting up an exhibition in Esztergom's Danube Museum, both followed with eager interest by the public. The truncated bridge of Párkány had turned into an open-air stage."

Art historian Lóránd Hegyi, director of Vienna's Museum of Modern Art:
"The spirit of Central-European art consists in the conglomerate, in eclecticism, in variegation, in subjective sensibilities, in introverted microclimates. Out of these many different microclimates a compound is born, a compound called conglomerate in geology, i.e. a mineral containing many different kinds of rock that never become homogeneous. It preserves its variegation while it appears a fully-fledged unit."
(Excerpts from the catalogue of the symposium)

A few dry facts about the utensils used: helium neon lasers used for measurements, 7-10 watt copper vapour lasers used for creating light constructions, deflecting and dividing mirrors and controlling electronics used for building light paths. Why did we use copper vapour lasers?

A huge advantage of copper vapour lasers is their mobility. Their optical systems can be built up quickly. They run on 220 volts unlike heavy-duty gas lasers, e.g. argon-ion lasers that need 3 phases of 380 volt and 30 amp current each for a light emission of a few watts. Nor do they need water cooling. One of their disadvantage, however, is that they are dependent on outside temperature for their laser effect to occur at all. The types we were using were operational in a range of 20-35 degrees Celsius. This gave rise to serious problems since there was a strong, chilly wind on the day of the show which cooled the air so much that however much we tried to keep our lasers warm by covering them with rugs and a tent, only one of the two utensils would start. In vain had we tuned the dual laser light composition the night before, only a part of the laser environment could be shown.

Let me quote again from the catalogue of the symposium:

The Bridge of Light is meant to connect virtually the two banks of the Danube in the longest stretch without connection. Virtual connection was realised at a point where there had been a bridge for half a century, a bridge that was destroyed during WWII and the inhumane political climate of the post-war years including the chauvinistic suspicions of some Slovak circles did little to encourage reconstruction. I attach the construction I have devised. It is the product of the previous night's imaginative work and its computerised extension.

This was the plan of the light construction:

The light beams start from the truncated pillar on the Párkány bank.

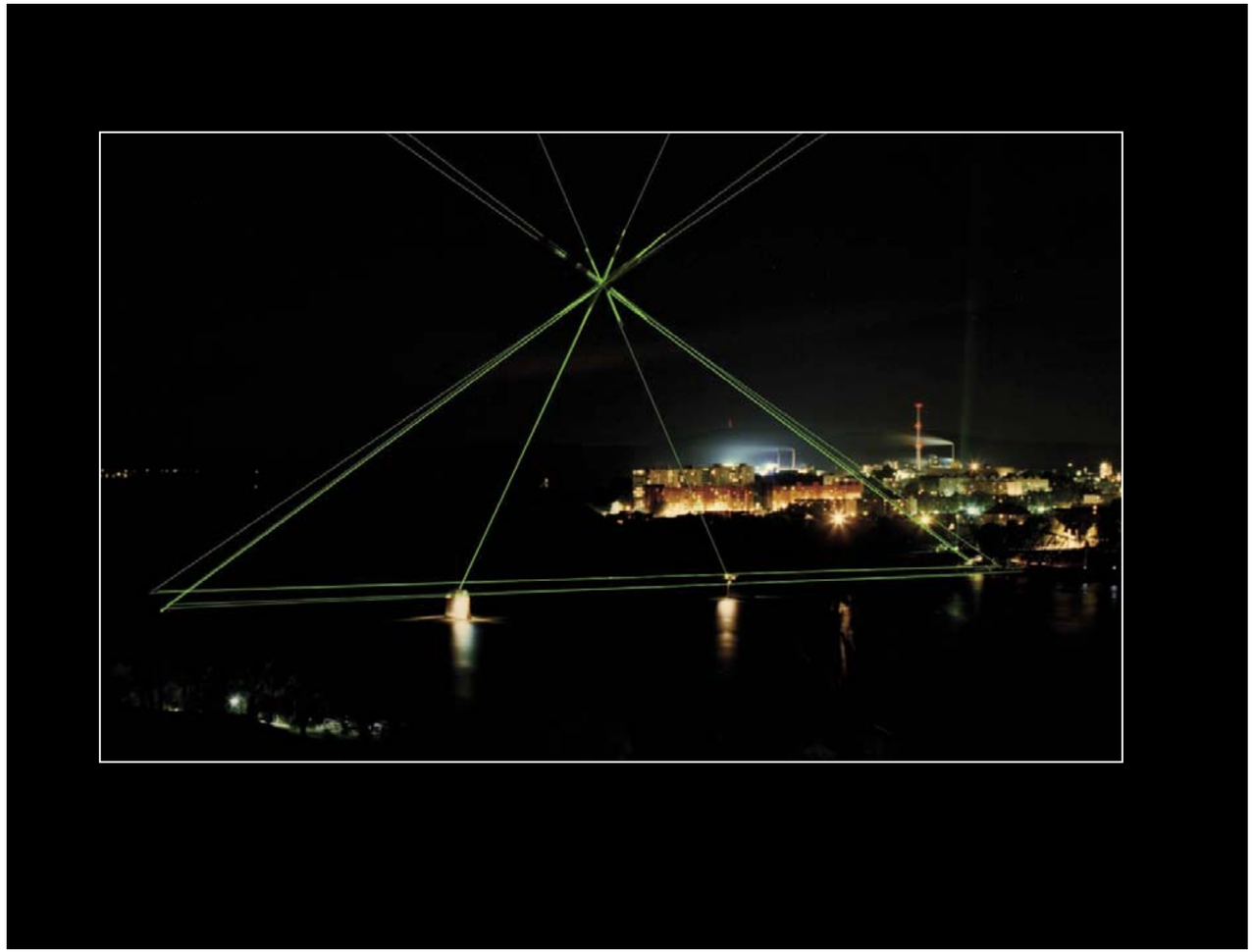
Connection between the two banks will be established by two parallel light beams taking into account where the rest of the pillars had actually marked off the bridge track.

Aided by deflecting mirrors, the two collimated beams will be aiming also towards the sky. The four light beams will intersect roughly at the middle of the river, erecting a huge light pyramid. As the light beams get more and more distant, they get dimmer and dimmer shining up at their intersection, however, with their powers adding up to a brilliant star of light. This new star over the Danube is meant to raise the hope of a real, future connection across the river.

Let me quote the thoughts of Bálint Szombathy, a Hungarian artist from Serbia at the symposium:

„Nothing but light and enlightened thinking can bridge the distances among people, or can create an atmosphere in which bridges truly connect us. Bridges can be made of real iron, but they can also be made of good intentions, gestures of reaching out revealing love rather than hate among us. Participants of BRIDGING have confessed to a bridge of the latter kind."

Due to the reasons mentioned above, my laser light construction was only partially accomplished on the day of the show. However, I can now easily get over that irritation since the BRIDGE has by now been built in very real terms. Our gesture of reaching out with good intentions has become a reality. The bridge named after Princess Mária Valéria has re-emerged from its ashes and can today fully perform its duty of assisting two separated nations in finding each other again. Rather than becoming homogeneous on command, as in the past, today they can become Central-European in their own respective, variegated ways.

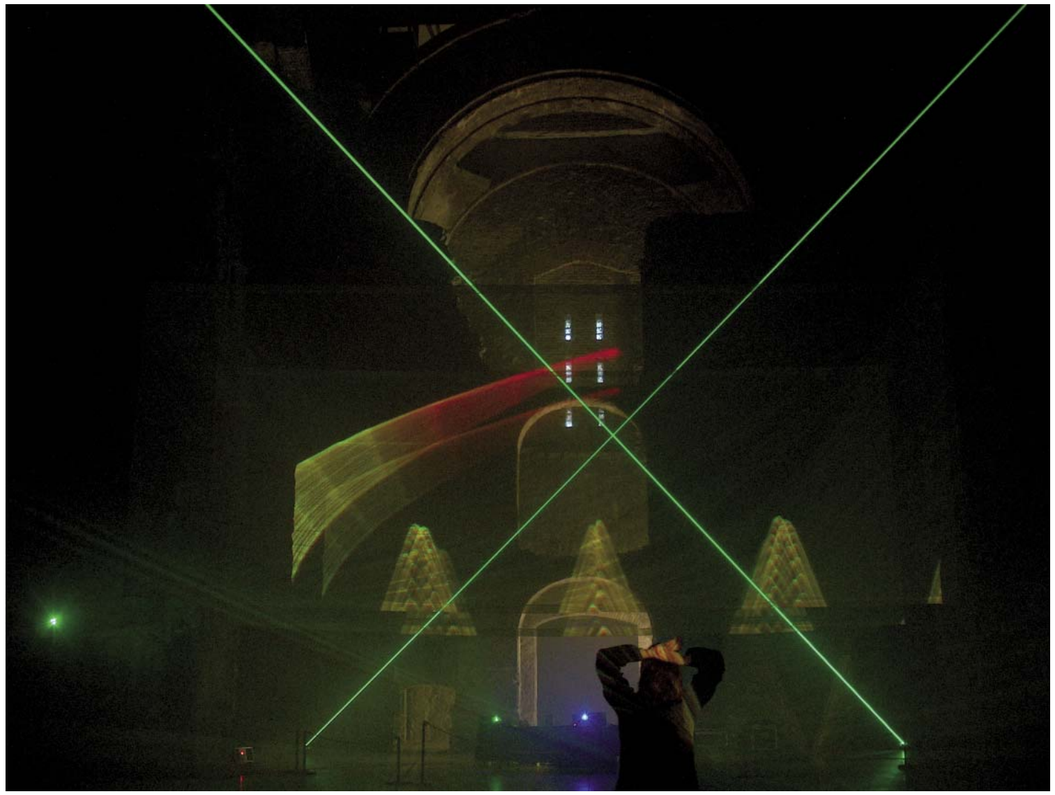


Mythichal light space and high tech

The showing of „Visszatérés" (Returning) and „Lappok és laptop" (Lapps and laptop), laser environments in the Kiscelli Múzeum

An immense, almost ten meters high candle has been burning and flickering on a wall of a house in one of the central squares of Copenhagen. This projected motive – which was at the same time an embracing double spiral – burnt to embers in fast forward, flickered as a dying flame, died, was engulfed by darkness, the burnt out stub then rekindled, and rebuilt itself into an immense candle. "Returning" (Visszatérés) – this being the title of my light installation showed at LUX EUROPEA – showed how an irreversible process can be overturned. The whole process only lasted for five minutes – repeating itself over and over.

Lux Europea, the gathering of light artists, had been organized in the Danish Capital during the period of Danish presidency of the European Union. All the current and aspiring members of the Union (19) were represented by an artist; the environments they designed were incorporated in the bustling and pulsating nightlife of the city for three months.

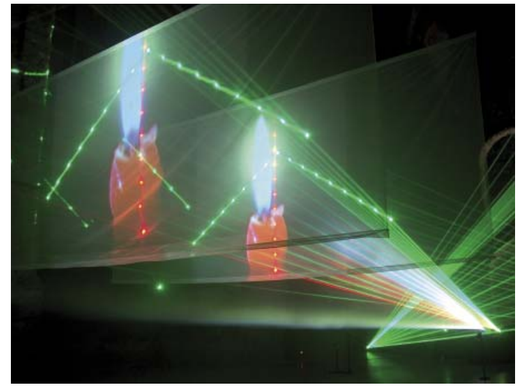


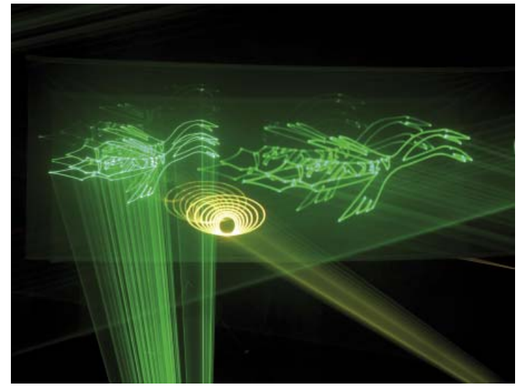
The concept of light art is more than five decades old, as light not only makes visible the world around as, but also carries the possibility of direct image creation. The opto-electronic revolution of the last decade conveyed a special importance to this form of art. Comparing the tools used by László Moholy-Nagy to the tools used today is similar to comparing a prism to an electro microscope. Discovering the new tool's potential is an ongoing process, light art has matured enough to warrant large European artist gatherings – primarily in the northern countries from Scotland to Denmark. Light art, the direct articulation of "bodiless light" which, depending of the qualities of light, is realized through projection or generation of artificial light. Virtual reality is created, the elements of which are merely vessels of the work of art.

We presented a perfected version of „Returning" last October at the Hungarian Academy in Rome, in the courtyard of the magnificent Falconieri palace designed by Boromini (as an event of La Notte Bianca) followed by another presentation this April in the church space of the Kiscelli Múzeum. This later event encompassed two days, accordingly the project could be expanded, the equipment enlarged, and a new light environment was created. My partner in the construction was research engineer Tibor Groholy. We used ten (!) Yag lasers, the electronics, scanners, powerful projectors provided partly by GTLASER, partly by Foton Art Stúdió. We have no knowledge of ever having used so many laser systems in a creation of an European light environment.

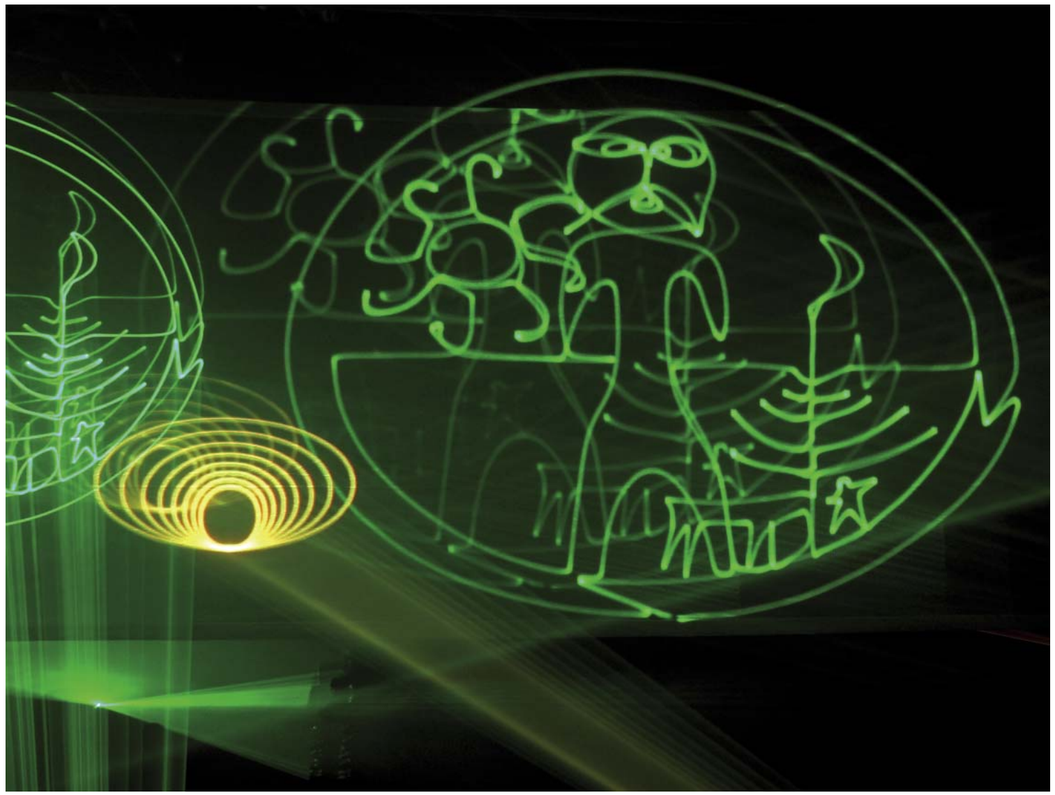
My light environment, or we might as well call it light-performance, entitled Lapps and the laptop goes back to prehistoric times to the pictographs and shaman drums, to the line as the most direct tool for visual communication. The pictographs have always fascinated me with their absolute simplicity and the vigor emanating from them. The line is one of the most simple and most abstract element of visual expression, used since millennia. And I felt especially attracted by the possibilities of reinterpreting the line through light.

After a destructive-innovative-rushing century – the 20th – rebuilding is unavoidable. In the wake of the avant-garde, we must rediscover the building blocks of our universe. Everything must be reinterpreted. Even the line. For the good of our messages to be formulated. As I began researching the visual possibilities of lasers in 1977 at the KFKI – aided by the physicist Norbert Kroó – I approached the particular "materiality" of lasers with the eye and empathy of an artist, and I analyzed the





visual possibilities originating from the quality of light. I felt almost magically drawn by the direct image creation with light. Lasers have three fundamental qualities, each leading to different visual possibilities: they are pinhole sources of light, the luminance can be concentrated into a point, they are monochromatic. Our research led to the patented international discovery of the so-called super positioning method (based on the monochromatic nature of laser). I have used the possibilities of this technology in numerous light-environments throughout the world at Budapest, Vienna, Stuttgart and Copenhagen. This was the reason why the Massachusetts Institute of Technology invited me to Cambridge and elected me a fellow of the CAVS/MIT. Before the fall of the Iron Curtain the so called COCOM-list made impossible the utilization of the pinhole quality of laser, at the MIT I could experience it first hand. In the last decade I have specially utilized the visual qualities



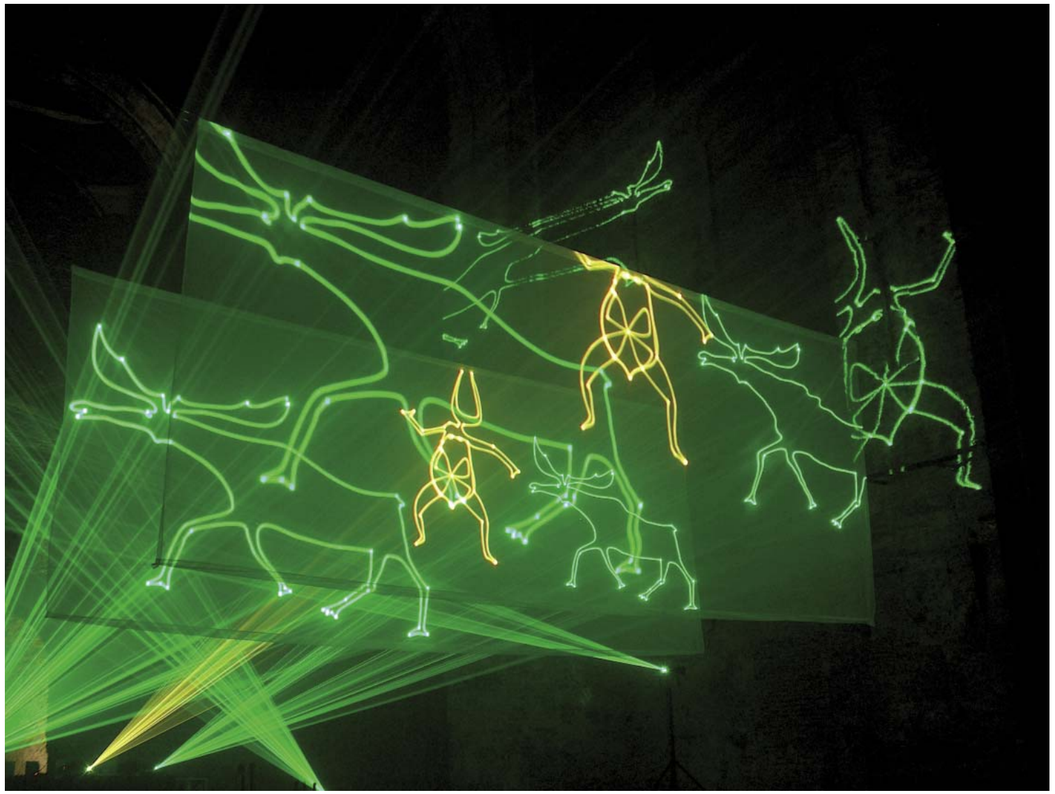
originating from this, with the aid of research engineer Tibor Groholy. One of the defining qualities of laser: it is a pinhole light source, and it can be directed very well. This pinhole light source may be directed to double mirrors, the mirrors moving along the X and Y axis, and line drawings can be created utilizing a computer. These are lines of light without any difference in tone, and may be projected on a cityscape large scale. I used this technology to re-create the ancient pictographs, with the YAG lasers made by GT Laser.

Visual innovation cannot be stopped. Those attempting it will turned to stone just like Lot's wife. In art innovation must not be hindered – as it is inevitable – it is the fetishization what must be eradicated. And beneath the remains one must find the most simple-complicated road leading from soul to soul. So this is not modern enough? Allow me to retort: why can't we be independent, why should we follow the thought of the men whose soul has been peeled of?

We should not judge modernity according to the standards of the last century.

Today drawing with light lines is almost magical. It is pulsating, alive, you see it being born from a point of light, the scale of the line drawing is expanded. You may draw on walls, on fabric, in space, on curtains of water, on drizzle of oil or even clouds...

These possibilities for me are inevitably contrasted with the start, the very beginning, the pictographs… Elks and reindeers, horses, bears, bird headed or bug headed men, shamans with crowns, water birds, herons, masks and ships. All

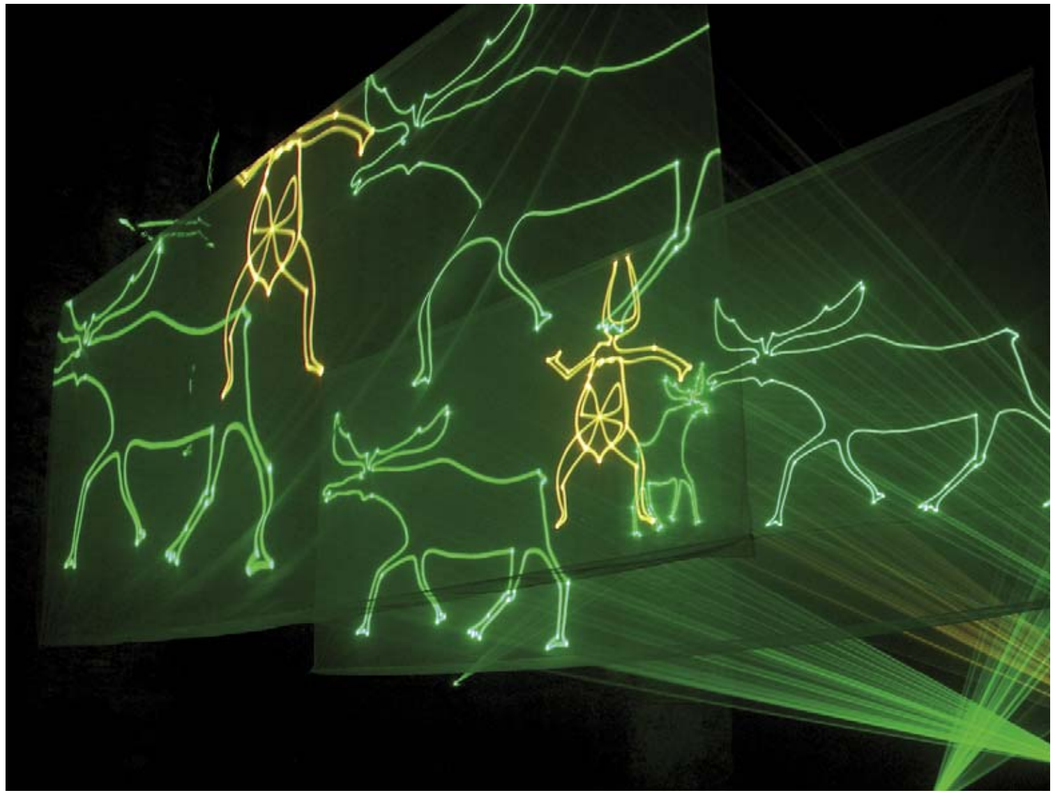


constructed out of lines. The line, the simplest tool of visual expression could have been drawn into sand, but they have chosen to engrave it into rock. They have fought for durability.

Light lines make us reinterpret these drawing. They created a virtual reality, which turns the space of a church into a canvass of light. The magical power of the lines is emphasized. In the Kiscelli Museum we might almost experience the birth. The forms appeared on pillars at the height of ten meters, on the rustic plane between the pillars, on fabrics on water-vapor, these constantly changing drawing of light do not damage anything, and disappear as soon as the electromagnetic radiation is turned off.

The pictographs were created millennia ago. We do not really know why. According the most probable explanation as parts of a hunting ritual. Simple and particular. Created by people who were very familiar with their own environment. They still had faith, trust, empathy and vigor. Through them, we can reach new perspectives. These drawings are perfect examples of visual creation. They remain effective. They constitute the beginning of art, or at least visual art. They mark the first significant achievements of human consciousness. They were born out of entrails, but their content is not dominated by the base instincts, they were pulsating with the yearning for a contact of a more complete word transcending humanity. The hidden power of nature.

These drawing are reborn in the magical flow of light forms. And the magical flow of light forms is followed by sounds: a Hungarian folk song "I like the sun, I like the moon,



but it is the stars I like the most" followed by the sound of drums, shamanistic chants, and finally a magical song: "fire you beautiful"…

But this fire is green. Emanating life force and vigor.

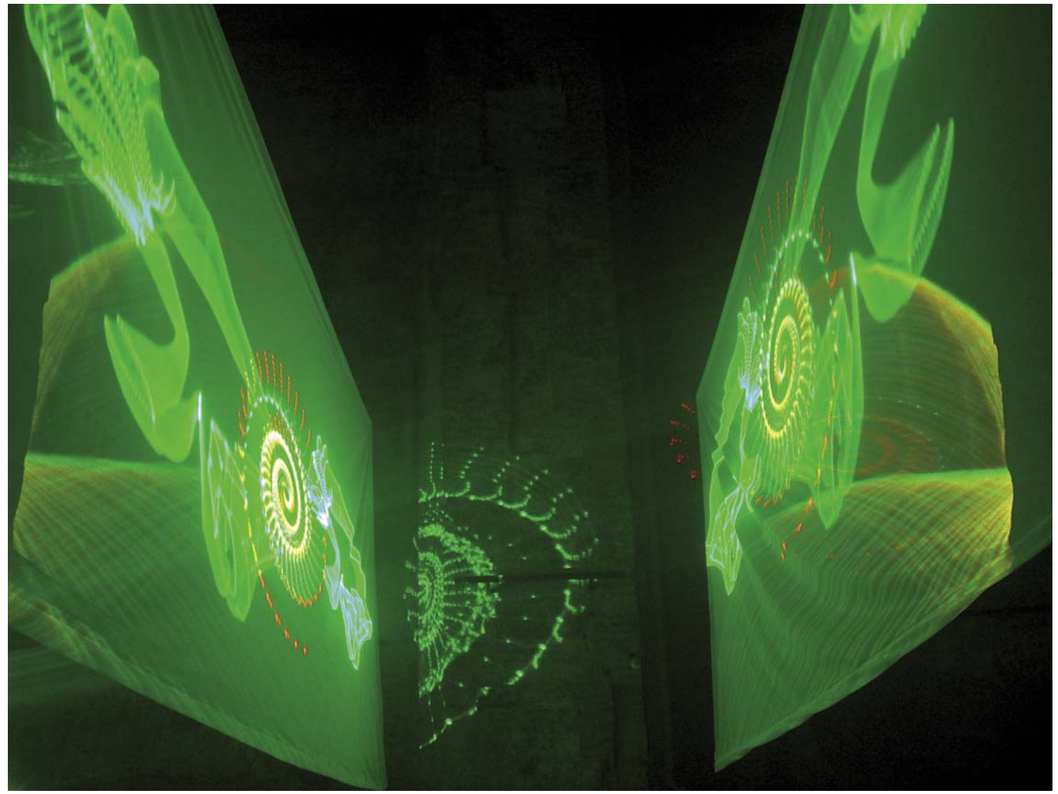
The lightspace – in which we move in the church space of the Kiscelli Múzeum – becomes mythical. Opens up metaphysical dimensions for us.

„Everything whole is broken." This is how the 20th century started.

Triumph and destruction. The joint of the souls cohering force became lax. According to some thinkers, the most endorsed tendencies of art in the last decades of the last century are united by a single purpose – a conspiracy against the soul. This is probably a going a bit too far, but the tendency is real: everything which can not be rationally interpreted or is not base, must be filtered out, everything which attempts to carry us towards our inner self must be filtered out, the most base instincts are to be let loose on the being.

But an another kind of yearning is also slumbering in the instincts. Just like the deeply elemental nature of the pictographs.

The 21th century must be the century of change. The most complex example of this is the grain. Buried in the ground, it slumbers, and when the time comes it is reawaken again and again. The 20th century had been a century of scientific technical revolution. In the spirit hidden into rationality a process similar to that of the grain is taking place. Without rational thought, science is impossible. And the special spiritual force



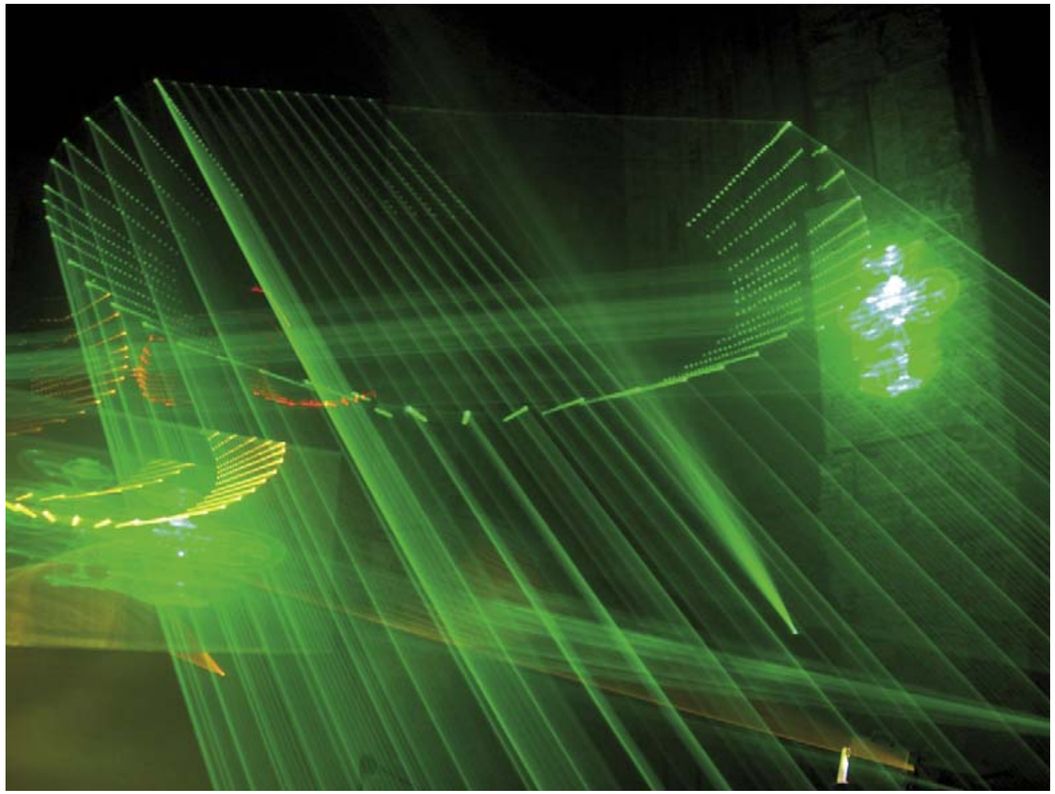
lived through rationality may paradoxically hides rejuvenation in itself. As our island of knowledge about the universe keeps growing, its boundaries also keep growing, and there it encounters not knowing. And among the deepest thinkers of our age, a growing number have experienced an inner humbling of the soul, an intense yearning towards the transcendent.

Here art and science meet.

I noted a few thoughts about my two light art works shown in the church space of the Kiscelli Múzeum. Let me turn again to "Returning" the candle flame conquering darkness. I am quoting from „Jelképtár" (Repository of symbols):

„The candle is an ancient symbol, the symbol if the Light of the World. According to Hungarian folklore, one lives as long as his candle is aflame. To light a candle for someone is an ancient custom, which is still alive, a deed where remembrance turns against passing away. We light candles for them memory of those we loves or venerated." The yearnings to conquer the inevitable, the irreversible are shimmering within. "Returning" suggests the magical belief in the reversibility of the irreversible.

Many call our age the information age. Information and communication have increased in value. Art has been pushed to the periphery, yet art is the highest level of communication. This contradiction is caused primarily by the fact that the art of the last decade of the 20th century mostly shows man as an individual bereft of transcendent perspective, whose soul is peeled. Most of the promoted tendencies of art were about these phenomena,



We are living in a radically expanding technical civilization, where the role of the engineer and the scientist are clearly defined, but the artist is in an insecure position, and devalued. This accentuated by the irresponsible sloshing about in apparently successful visual innovation. We are slowly getting over this. Real visual innovation is mostly taking place in the field of media research. We must make ourselves capable of responding to this art form, to transforming ourselves through humanity, immersing ourselves into and transforming ourselves through visual culture. At the same time, we must find the old and new functions of art. In a world becoming more and more uniform.

In my youth, doubt was my fundamental experience. I doubted words, slogans turning into their own opposites, the hasty too quickly executed changes of thought, the much too severe order, later I doubted the sloshing chaos disguising itself as freedom. I was much more cautious with chaos than with order, because I know that reality can not be squeezed between the boundaries of understanding, indeed these boundaries must be stretched in order to be able to receive – through the sensible opening up of the mind – the new image of the world unveiled through research. I know that where now we see chaos, there connections may unveil if we alter our perspective. Important connections pointing towards the future. The experiences of my work also warn me of this. Yet, my fundamental instincts move me against chaos. I was not drawn towards technical civilization, but I soon realized that we must not reject this kind of technical civilization; we must make ourselves capable of solving the problems generated by it.

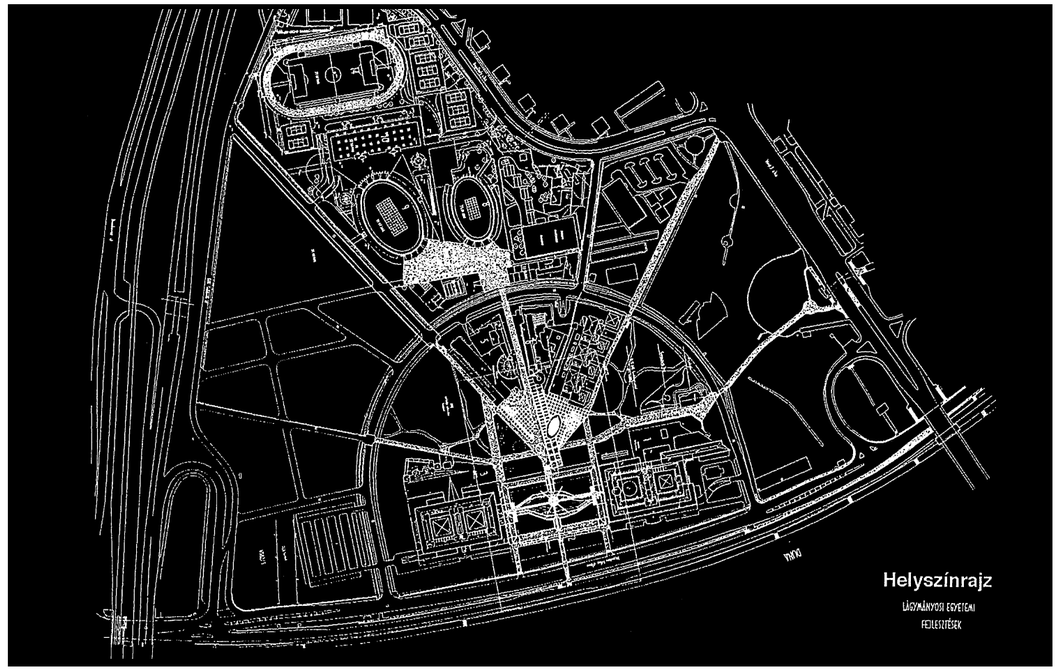
A Proposal to Build a Tower of Light

As Envisaged by Attila Csáji
In the Grounds of Lágymányos Campus

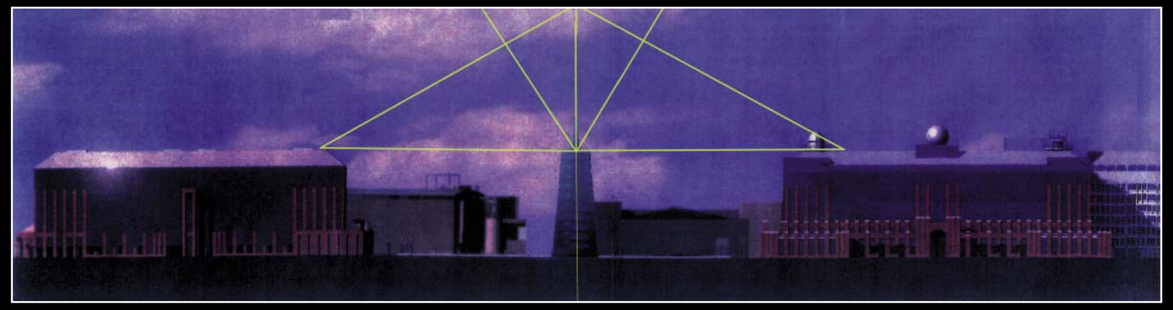
The Tower of Light to be set in the axis of the panorama of Budapest offers spectacles created by high technology for festivities and tourism.

The Tower of Light is a huge obelisk consisting of three parts:

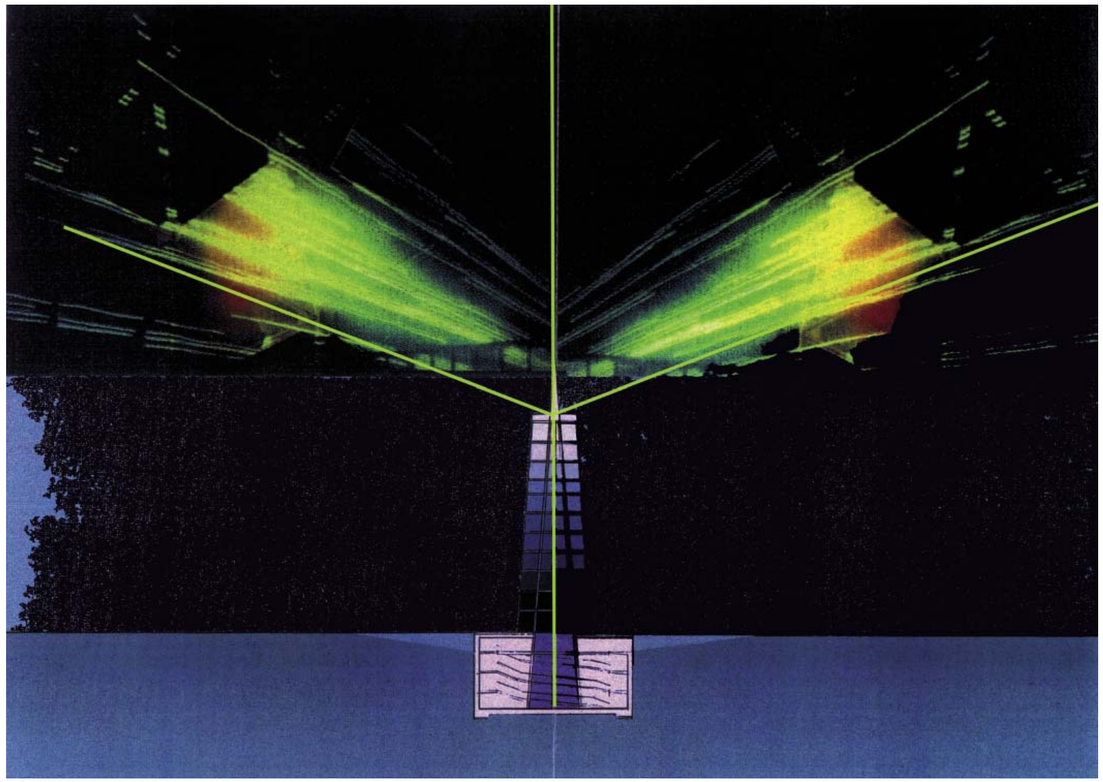
1. A truncated cone 33 meters high and 8 meters in diameter upheld by a steel frame, in colours from black through lighter and lighter shades of blue to a transparent glass surface, is what can be seen aboveground. At a certain height, it provides a huge projection surface upon which at pre-determined times moving, visually varied, metamorphic images accompanied by music can convey a "picture book" of 1100 years of Magyar presence in the Carpathian-basin, the founding of the Hungarian state and subsequent cultural and historic events as well as the 2 000-year continuity of the city of Budapest.



Plotting for a tower of light in the centre of the Lágymányos University Campus

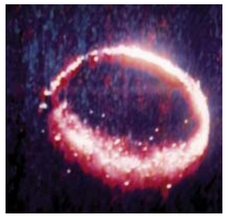


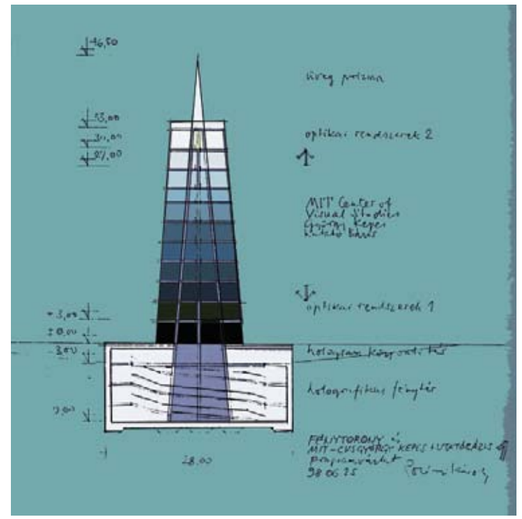
Plan for a tower of light in the centre of the Lágymányos University Campus



2. The ground-floor level is open in the middle downwards. The axis of light continues downwards into depths representing the cultural "roots" of the nation in an holographic space of light. This space also evokes the image of a cultural DNA, i.e. double helix since it can be approached along never intersecting ramps shaped like helices. In the space embraced by the helices some outstanding achievements of the Hungarian spirit are shown (from the golden treasure found at Nagyszentmiklós, through the St. George statue of the Kolozsvári brothers, right on to Csontváry, Bartók, and Dennis Gabor).

3. The laser spectacle visible from outside is generated from the top glass prism of the Tower of Light, also used by the public as an outlook point. It is from here that a green, infinitely tall exclamation mark is formed by an axis of light, an apparition turning into burning colours every hour signifying in elementary simplicity that the Sun of this geographical region is rising. The axis and rings of light complemented at times by boughs of all the colours of the rainbow and of varied geometric shapes generated through a modulation of the laser beams can be seen from a great distance.





Section plan for the tower of light designed by Károly Polónyi.

The foundation plate beneath the "pool" of holographic light space, thickened under the tower's feet, and the cylindrical wall braced by the double helix ramps are made of watertight concrete. The main structure of the Tower of Light is a stand containing three steel tubes braced against splaying by the cylindrical surface they bear. The same stand upholds the structures bearing the elevators and the staircases.

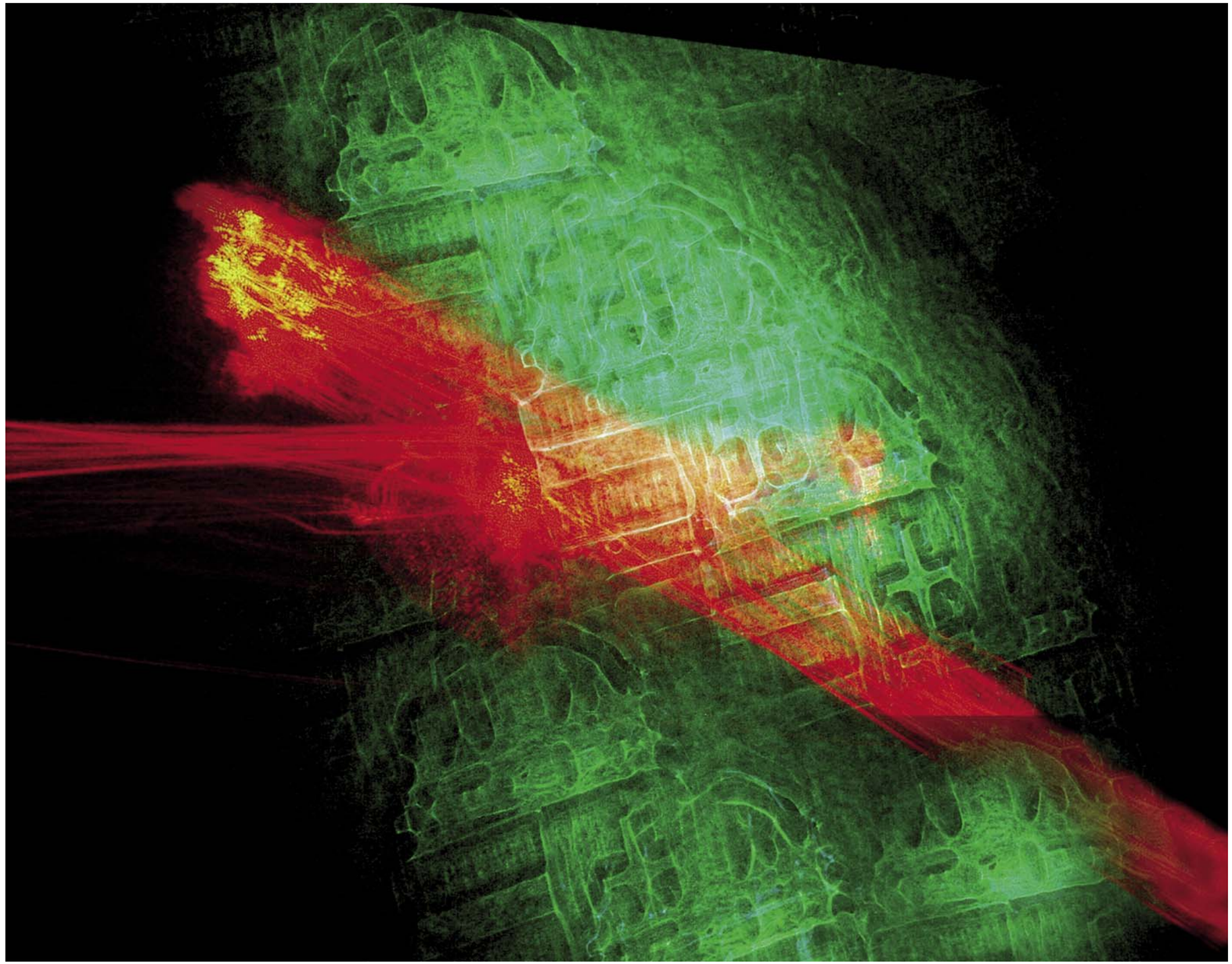
1998.08.24

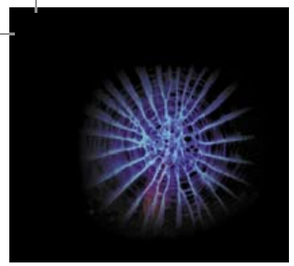
Architect:
Károly Polónyi

Structural design:
IPP Ingenierbüro für Bauwesen Polónyi und Partner

"Born from Light":
a superposition recording of the Hungarian coat of arms

„I had built a system of rephrasing images upon the coherence of laser light. A bridge came about between mathematically scannable, abstract spatial networks, and the recognisable world of our natural environment. It was my method of superposition that had outlined the peculiar, mystical vision of a Hungarian coat of arms from among the billowing light formations of networks of interference."



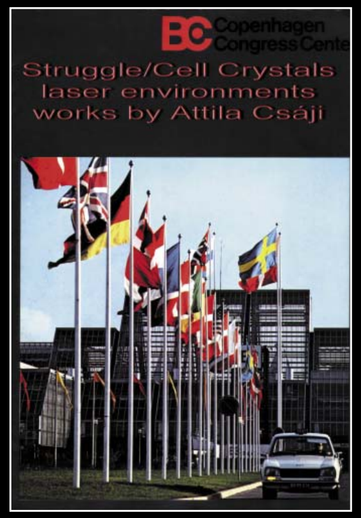


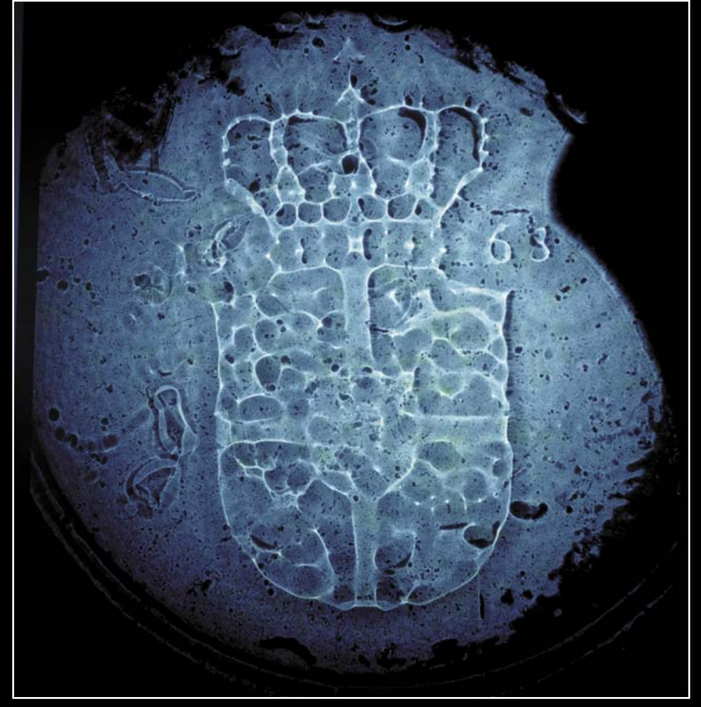
Some Light Environment Created by the Author

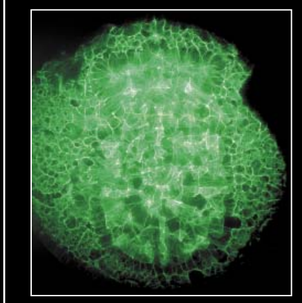
Presenting Attila Csáji's light symphonies "Struggle" and "Cell Crystals" at the Bela Center, Copenhagen.

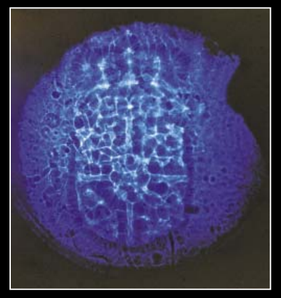
Dep. Director of the Hungarian National Gallery Gyöngyi Éri introducing the presentation built upon some new results arising from an analysis and development of light interference.

The internationally novel method of superposition in re-phrasing images and its development, the light record, had all worked for "cell crystals" or the Danish coat of arms to emerge from a flow of pictorial metamorphoses. Thus, it was unambigouously proven that even interference could be artistically composed.

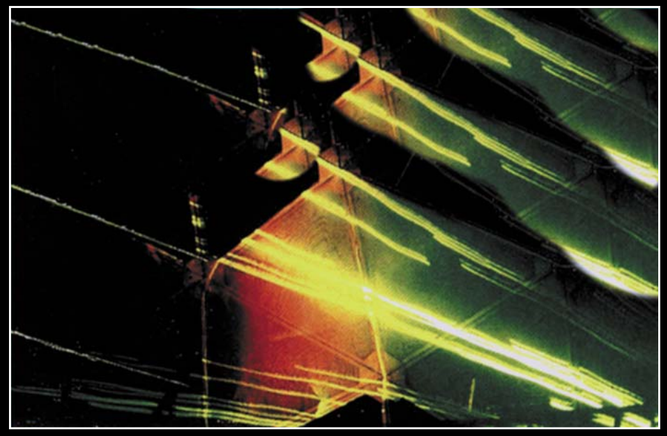






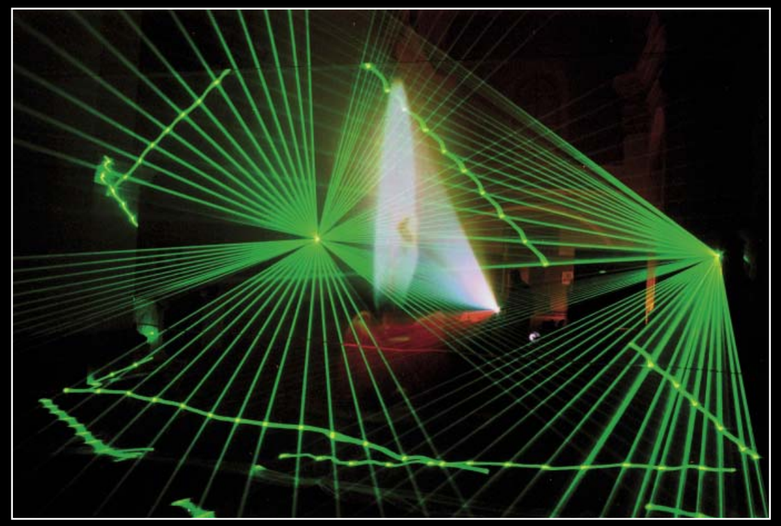


"Light – Earth – Sphere" a laser environment presented in Balatonboglár, Hungary,1995.



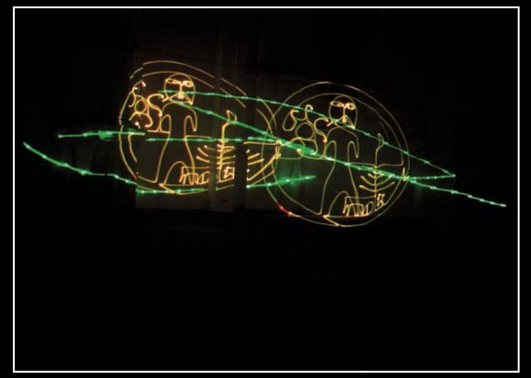
“Returning”

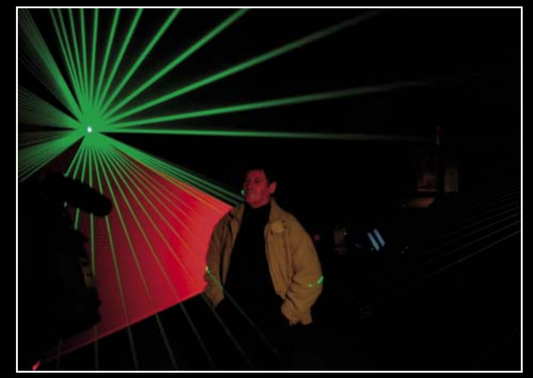
a laser environment presented at the VI. International Light Symposium at the Eger Church of the Holy Trinity, 2005.

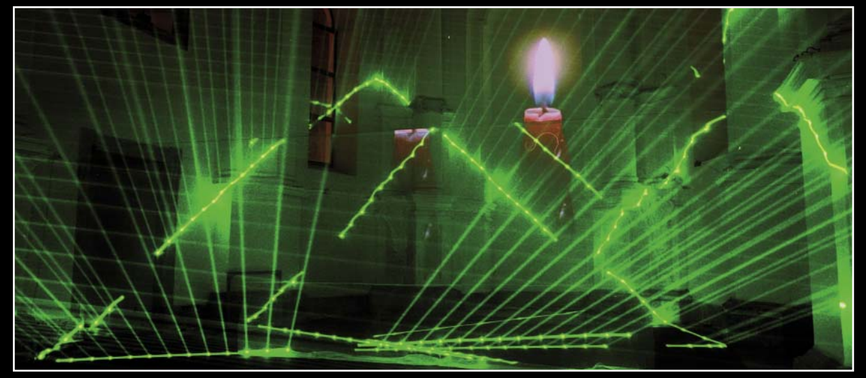


“Lapps and a Laptop”

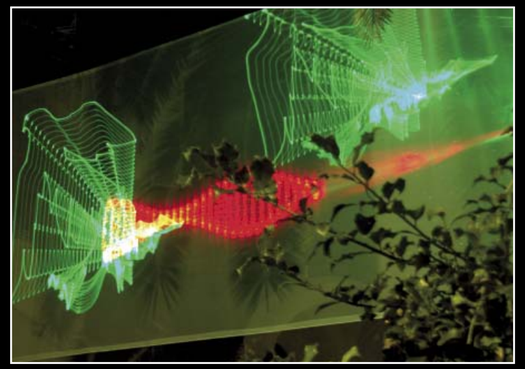
presented at the VI. International Light Symposium at the Eger Church of the Holy Trinity, 2005.





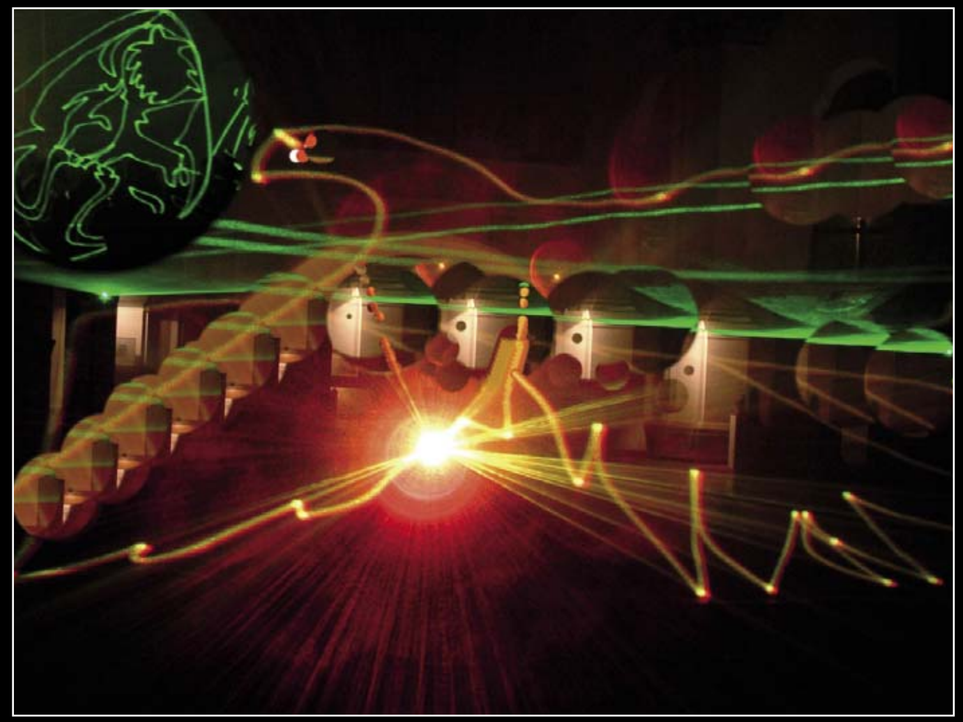


Attila Csáji's laser presentation at the "White Nights" series of events at the Palazzo Falconiery (Hungarian Academy) in Rome, 2004.



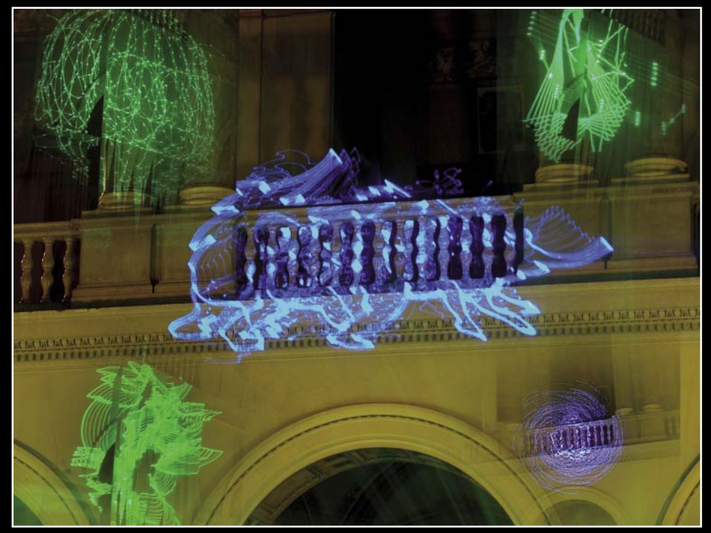
"Hexes (Witches) and Light"

presented at the Budapest History Museum as part of World Science Forum 2007.



“Hexes (Witches) and Light”

a mythical light play presented at a “Night of Lights” event at the Budapest Museum of Fine Arts, 2007. The music was composed by László Dubrovay



„Returning”

a large-scale light environment presented at the light art exhibition „LUX EUROPAE 2002” in Copenhagen.

The open-air exhibition put on by the Danish Cultural Institute at the time of Denmark” EU presidency wished to point to European togetherness through the medium of light art thought to be the most topical and future-oriented form of art. The exhibition was ceremonially launched by PM Anders Fogh Rasmussen in the Copenhagen City Hall.

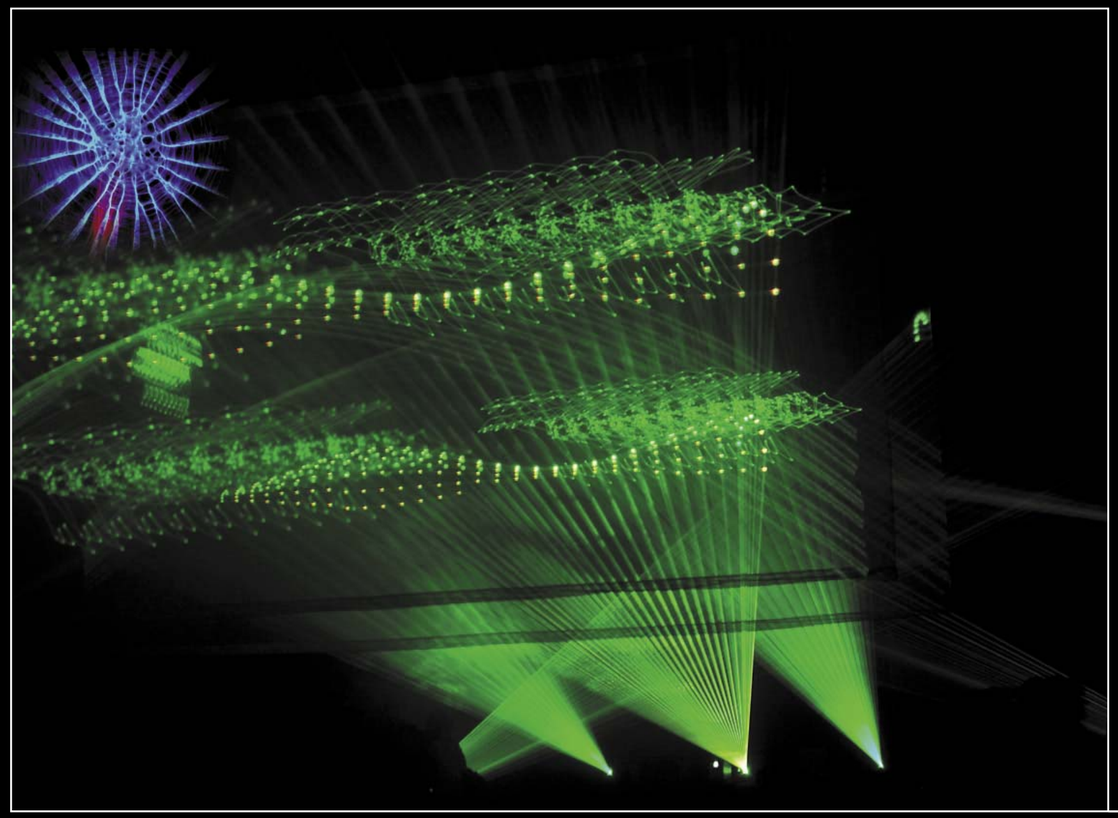
The shows themselves took place in various Copenhagen public spaces. For four months, works by 19 light artists from 17 countries became a part of the city’s everyday life.

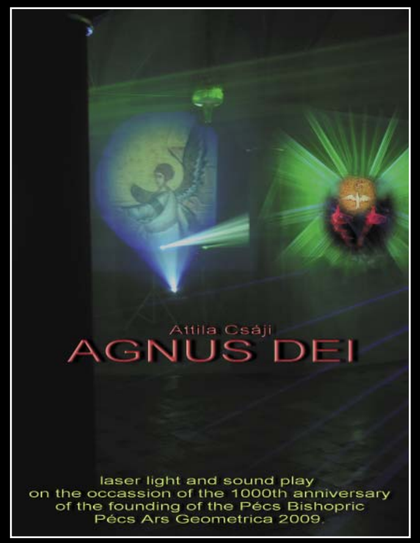
“Returning”, i.e. my light installation in memory of the 1956 Hungarian uprising was featured in a central place, the wall of the Danish Cultural Institute, principal organiser of the event.

I had chosen an extremely simple motif: an immense burning candle, reminiscent of a double helix, measuring some thirty feet in height. The projected motif was constantly animated. At a stepped-up speed, it first burnt out, and then, from complete darkness, it flared up again and rose into a burning candle of immense proportions. An irreversible process thus became reversible. The whole process took about 5 minutes only to repeat itself again and again.

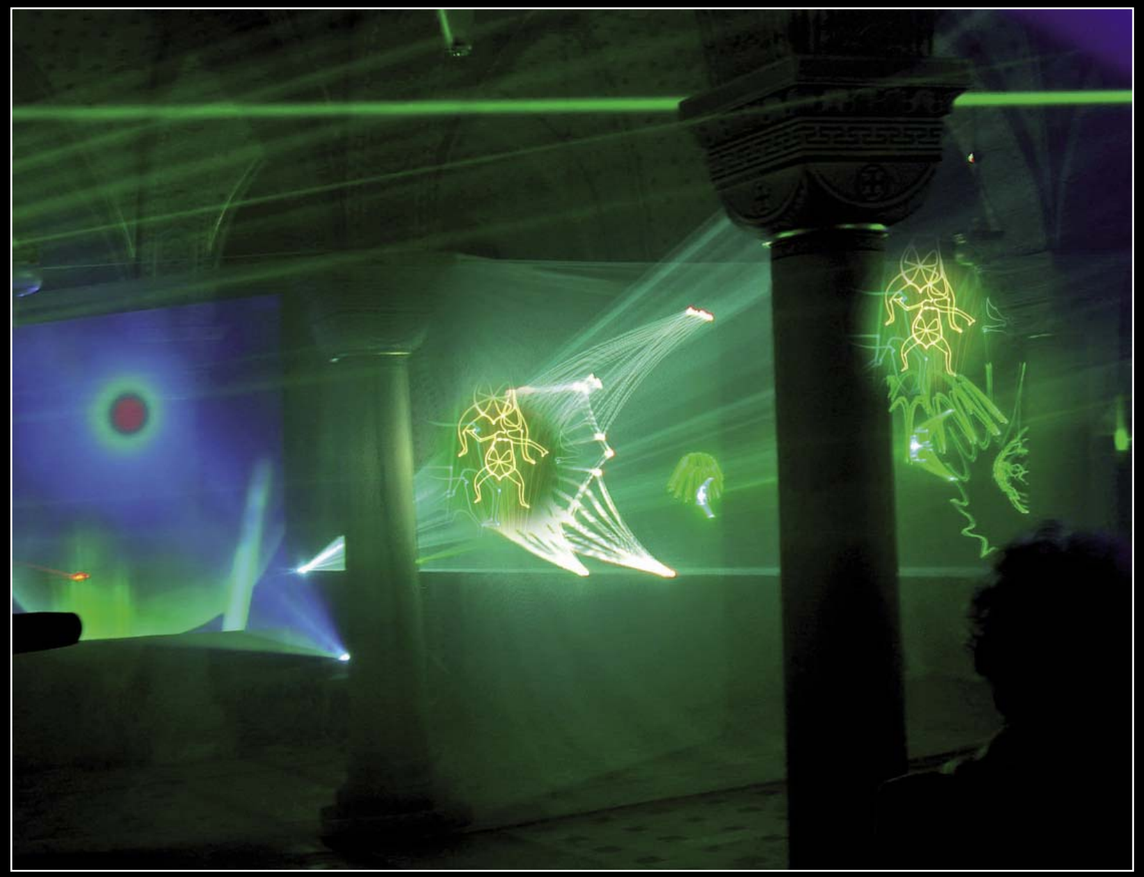
An Agnus Dei
laser light and sound play presented in the Romanesque crypt of the Cathedral of Pécs to mark the 1000th anniversary of the founding of the Pécs bishopric as part of the 2009 Ars Geometrica events devoted to the interrelationships of science, technology, and art

PAGE
Pécs – ArsGEometrica 2009
Interactions and Border Crossings in Art and Science






AGNUS DEI



Attila Csáji: A Source of Light

An homage to custodians – a memorial hologram to mark the 100th anniversary of the Budapest Museum of Fine Arts in 1 000 numbered copies signed by the artist, and 30 numbered copies in 9-colour permutations.

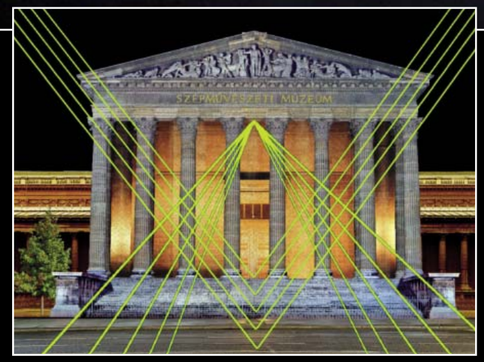
The title fully embraces the contrast that underlies the artist's attitude: that between a restrained and sober objectivity and an introverted and sensitive search for the basics of existence.

„For Attila Csáji it is precisely light, so writes Lóránd Hegyi in his Beyond the Avantgarde, that can illuminate the hidden face of Nature, it is light that can reveal invisible, hidden, but essential traits, it is light that can unite the intellect with the organic world, and so light becomes a mystical force in the artist's world, a force that can weld together the infinite Universe with the infinite provinces of the human spirit. Light looming in his pictures represents the infiniteness of the Universe just as well as it is an optical metaphor for the revelations of a personal existence and an intellect."

In this sense, the Museum of Fine Arts, through the artworks it preserves, is both an accumulation and a source of light nurturing the essential soil of our existence. It is also a post-avantgarde formulation of a classical idea. The basic visual motifs are the portico of the Museum, the V sign for Victory, and the permutation of colours. Geometrically arranged beams of light and hard-edge structures break out and die away from under the tympanum and from the ceremonial steps in V-shapes repeated five times. The surging beams form intersections in space symbolising the interdependence of the motifs used by the artist.

The hologram has been prepared in two versions. One of the versions presents a single image in 1 000 signed and numbered copies. The other version presents 3 x 3 images of colour-permutations depending on a changing viewing angle in 30 signed and numbered copies. The changes in viewing angles and pictorial experience suggest the idea that the experience evoked by the visual arts, an experience subjected to our sensitivities and attitudes, is very similar to the visual structures offered by A Source of Light: now the experience is covered in darkness, now it begins to loom with a realisation spectrum extending to brilliant brightness.

N. T.



"A Source of Light"
Memorial holograms

Addressing the 7th LIGHT SYMPOSIUM BUDAPEST 2007.

Dear Friends, Ladies and Gentlemen,

A salutation's first words should be thanks. Thank you for honouring me with your presence at the opening of the 7th International Light Symposium. Thanks to the presenters because a number of them rearranged their other tasks to create space in their life to be able to present their lectures, thus enriching the programme of the symposium and to present us with an intellectual experience. Thanks to the Hungarian Arts Academy, president Imre Makovecz, secretary Flórián Kováts and their colleagues for providing the opportunity to organise the Light Symposium. Thanks to the Board of Trustees of Creative Arts NKA, the Norwegian, the Danish and the Dutch Embassies for supporting our work. Thanks to the members of the International Kepes Company and especially to András Mengyán for their help.

We are opening the symposium after our national celebration: 23rd October, so some thoughts cannot go unsaid.

The light is coming from the East. The Sun rises in the East.

Us here in Central and Eastern Europe do not know from literature, for example from science fiction, that there was an incredible umbrella which covered the Sun, and there was darkness even in the middle of the day. But let us pass this: what was the name of this umbrella, the important thing was, that below this umbrella we were faced with darkness even during the day. We are still aware of its shadow today. "Darkness at Noon" that is how our writers aptly called this period.

We were hungry for light. For light, that is the fountain of life. Of renewal.

Of rebirth. Past the era of "Darkness at Noon", past the false myths, but also past the cults making a fetish of innovation. Past the avant-garde and post-avant-garde too.

But it is a fact that visual renewal is unstoppable. Those who try it end up like the wife of Loth: they turn into a pillar of salt, they turn into stone. In the arts, renewal must not be stopped – because it is unavoidable – but turning it into a fetish has to be stopped. The ascension of trends.

And under the debris the simplest the most complicated road has to be found, which leads from soul to soul according to the classical description. Is that out of date? Let me ask back: can we be more independent, is it essential to follow the thinking of the man "stripped of his soul"?

Let us not make decisions about modernity according to the last century's stereotypes.

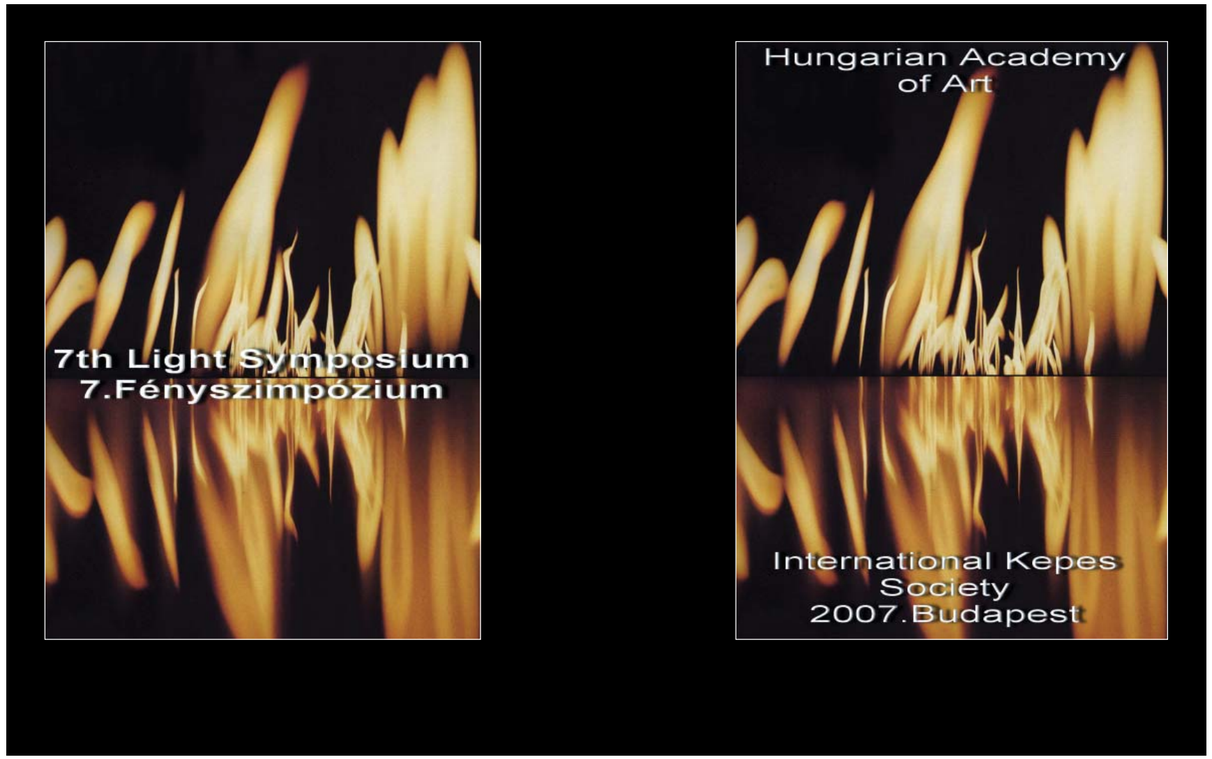
György Kepes – whom our association is named after – liked to quote the writing of an old sundial: "My guidance is light, yours is shadow".

Let us be led by the light – but not only external but also internal light. We lacs this inner light more than bread.

We need the light, which bears such behaviour, that is past "the long wild argument of tradition and ingenuity".

A light that is mundane and sacred at the same time. A light that fertilises: fills as with life.

Participants of the VII. International Light Symposium, 2007



Booklet of the VII. International Light Symposium, 2007.

About the Life of Kepes Society

Dear Ladies and Gentlemen, let me introduce you to some dry facts, let me list some of the programmes completed during the life of Kepes Society.

But before I do that, I would like to welcome our new member Seth Riskin light artist, from Cambridge and I would like to present him with his membership certificate.

We organised several events.

We had a remembrance meeting and exhibition entitled "Light in science and arts" to commemorate the 100th anniversary of the the birth of Zoltán Bay – the magical master of experimental physics – and Dénes Gábor – the inventor of the holograph – jointly organised with the Electro-technical Museum.

There was an expert meeting of the Company's light-workshop at Siófok-Töreki artist retreat. This light-workshop was introduced at Ernst Museum one evening.

The company had regular gatherings, the so-called Kepes-evenings in studios, at the Electro-technical Museum, at Ernst Museum, at the Tódor Kármán Wind-tunnel Laboratory of Budapest Technical University and other places.

The Company has organised two study tours to Finland. We made contact with the Finish Dimensio Kinetic and Light Artistic Group.

At universities – for example at Kassa Technical University (Slovakia) we organised a highly successful so-called Kepes-day about the connection between art, science and technology.

Besides these we organised numerous exhibitions.

In Eger in Trinitárius Church, at Kepes Museum.

In Brasso Museum, in Transylvania

At the Picture Gallery in Sepsiszentgyörgy, in Transylvania.

The Hungarian Institute in Helsinki introduced the exhibition of three light artists.

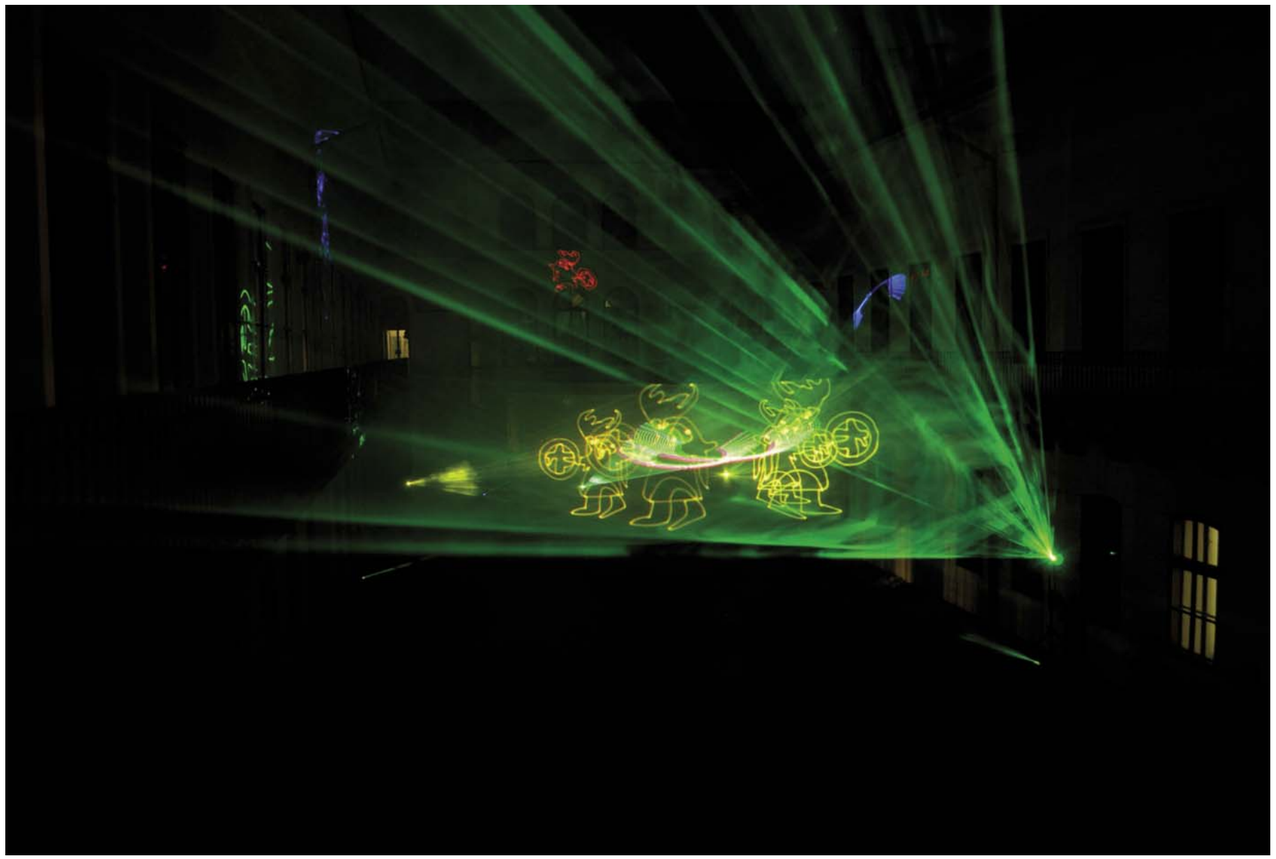
The Hungarian institute in Paris introduced the exhibition of seven light artists.

We organised a series of grand exhibitions in Kassa entitled "Come Along to the Future". Here at the opening of the Kassa exhibition it was said that there is always somebody, who redreams the Leonardo's dream: art, science and technology never separates totally.

The International Kepes Company is the collection of those

Some contributors to the Kassa exhibition: György Bartusz (Kassa) partially covering Tibor Zielinszky (Budapest), Ádám Szentpétery (Kassa), Bálint Bolygó (London), Éva Bortnyik (Vienna) wearing a red scarf with Michael Bleyenberg (Cologne) behind her, Klára Kuchta (Geneva) with András Mengyán (Bergen/Budapest) behind her, Csaba Tubák (Vienna), and Museum Director Peter Markovic (Kassa).

With Director Peter Markovic behind him, Attila Csáji launches the "Come with Us into the Future" exhibition of the International Kepes Society at the Museum of Eastern Slovakia in Kassa, 2007.



Attila Csáji's light environment in the atrium of the Kassa Gallery, 2007.

people, who are re-dreaming this dream again and again. Among the presenters of the light symposium we find artists and art historians, writers, architects, physicists, mathematicians, cultural engineers and so on from many different countries.

I quote György Kepes, who lived through the 20th century and fought the battles of avant-garde: "it is time for a deeper faithfulness".

I am saluting the participants of the 7th Light Symposium in the spirit of invention and deeper faithfulness.

Thank you for hearing me out.

Attila Csáji
Chairman of the International Kepes Society

My Conversation with My Pictures

The most important autobiographical story for an artist is an interior process. To me as a painter, it has been my conversation with my pictures. This is what has helped me build a road leading to my future. Let me specify this with an example!

I painted my Sign Grid Messages at the end of the 60s. My sign-grid messages were in fact plastic structures representing gestures that could be interpreted as a mime-dance performed by a hand. Those gestures could be transformed with the help of changes in lighting, and could evoke the fascination of ancient cultures as they bore messages from a borderland of order and chaos. They also provided a peculiar formula of living, that of organic living that co-exists with matter bringing it to life rather than defeating it. Each sign took its final shape in communication with all the neighbouring signs in a freedom evolving through the lived freedom of its environment, creating a structure individually, yet in an organic bond with other signs, and creating an order that is at once lived and liveable.

All this takes place in the temporal sequences of the signs being "inscribed". Thus, visible time that can be divided up into units of individual signs enriches the 3-D sight with another dimension. This is how all four dimensions unite into one single whole of, shall we say, co-existence. Such an approach to my pictures simply clamoured for some more contribution from time and light to be included as further agents of interpretation. I applied some moving side-lighting producing a sight which was mobilised by light itself. With the lighting changed, the pictures started to breathe in the process of their own "inscription", not to speak of the corresponding changes in their mood. Thus, movement became the ultimate tool in creating metamorphic, moving pictures as well as the unfolding of further interpretations by light, e.g. using paints sensitive to varying wavelengths. My thinking paved the road not only to light-art, but also to an ecological approach to the world.

I devoted the last thirty years of my life to experimenting with laser light. My experiments were supported by the Budapest Central Physics Research Institute both instrumentally and in other ways. At the end of the 70s I created the so-called superposition method which proved to be unique in an international sense.

When I first spent half a year in CAVS in MIT in Cambridge, Massachusetts, my experiences reinforced my conviction that even we, East-Europeans can offer novelties to the tried researchers of MIT. I shall never forget their astonished glances as we watched the variable motives of cell-crystals, or the evolution of masks and heads transforming out of light interference.

Although CAVS or the Media Lab, venues of truly remarkable results, were the very centres of laser-media research world-wide, I can safely say that they did not have the faintest idea as to how I had induced a physical phenomenon to produce the series of metamorphoses I have just described. It became obvious that my pictorial transformation method based upon the coherence of laser light, i.e. the superposition method and the light record were international novelties. This is

"Bull's Nuptials", 1964

“On the Walls”,1993

why senior researcher of CAVS Paul Earls greeted me as an outstanding innovator, and called me “a pioneer of unknown virgin lands”.

I have never wanted to keep in step, or to follow anyone for there was no one to follow in this field. Instead, rather stubbornly, I have always done everything my own way.

Through my conversations with my pictures, the road I was treading was self-evident. Sometimes there can be a meeting of introspection with essential external tendencies such as the emergence of light-art with the optical-electronic revolution. This is how paradoxes can be resolved. But to me, deep down, it has always been introspection that has determined everything else. And in no way was I interested in anything being fashionable or out of fashion.

A few years ago at MIT I witnessed something that is very typical of us Hungarians living today. A young woman-historian of art who had for a time lived in Boston had written a lengthy paper about György Kepes and the institute he had established. On reading the paper, a researcher of CAVS, a friend of György Kepes’, said this to me: “It is intellectually OK, but for some reason, Hungarians cannot play in teams, they do not pass the ball to one another. It’s very sad because, you know, not even the greatest individual achievement can count for much without teamwork. Instead, it tends to downgrade itselves.” The way we downgrade ourselves, the way we fool ourselves into our own pettiness has become the sad reality of many Hungarians who were turned into János Kádár’s sheepish people.

We simply have to renew ourselves intellectually so that we can unfold our internal creative energies more fully. Simultaneously, we also have to refute crippling dogmas like the adage that the more west of Hungary someone works, the more his or her work is worth.

In my youth, it was my basic attitude to doubt everything: words, slogans that turned into their direct opposites, rapid accommodation to the status quo, an order too hard and strict.

Later, I came to doubt the chaotic dabbling camouflaged as order. I have always handled chaos with more care than I have handled orderbecause I know very well that we must not fit reality within the limits of our understanding. Instead, we have to extend those limits so that they can accommodate a new image of reality established by research and our sensitive minds. I also know that where now we see only chaos we can find coherence once we alter our approach. An important coherence that can lead us closer to our future. Experiences of my own work have proved that this is so. Still, my elementary

“Bird’s Cross”, 2001

instincts have always made me shun chaos. Perhaps the reader finds it strange but I have never been attracted by technical civilisation. On the other hand, I soon realised that rather than rejecting technical civilisation we have to mould ourselves capable to try and solve the very problems it goes on generating.

“Sign-Grid BS” (Braun Collection)

“Message XXII.”, 1969 (Hungarian National Gallery)

"On the Walls II.", 1994

Recalling Béla Hamvas

Thoughts on his exhibition in Szentendre's Károly Ferenczy Museum, August 1997

When I was a young man, which was in the 60s, one of my decisive experiences was ORDER, and another, DOUBTING. We were living in a tough, petrified, unchangeable, ruthless ORDER camouflaged as totally objective. Yet, this camouflage proved to be more real than what lay beneath it. And DOUBTING. The young in the 60s represented a generation that had lived through and, for the most part, executed the revolution of 1956. DOUBTING was reinforced in me rather

"Blue Sign-Grid XXIV.", 1969 (Gábor Kovács Art Foundation)

basically by this circumstance alone. I tended to doubt words, slogans turning into their opposites, an overly rapid accommodation to the status quo, an order much too tough, a dabbling kind of chaos, political or artistic movements, everything. Meanwhile, I also nursed an openness, a sincere curiosity. It was a homespun truth for me that we must not cram reality within the limits of our understanding. Instead, we must expand those limits so that we can embrace with an open sensitivity all the new images of reality and the world produced by research. Such an approach is by definition wide open to any Avantgarde. I had learnt that where we initially saw only chaos we could easily see coherence provided we changed our approach. A coherence that was important enough to point to the future.

But over and beyond all this, I felt strangely certain of my wish for a VITAL KIND OF ORDER, one that helped me live. It was precisely this wish of mine that was hugely reinforced by my acquaintance to Béla Hamvas. It was he who helped me realise that what looked like ruthless order from the outside was in fact sheer chaos. During one of our conversations he pointed out that one feature of our century was the spread of a new barbarism which had erupted vertically, from the depths of society rather than those horizontal onslaughts of barbarism thousands of years ago. The new barbarism flooded not only society, but also its art. This is why along with the "modern" we also needed some things that were "un-modern" in their essence.

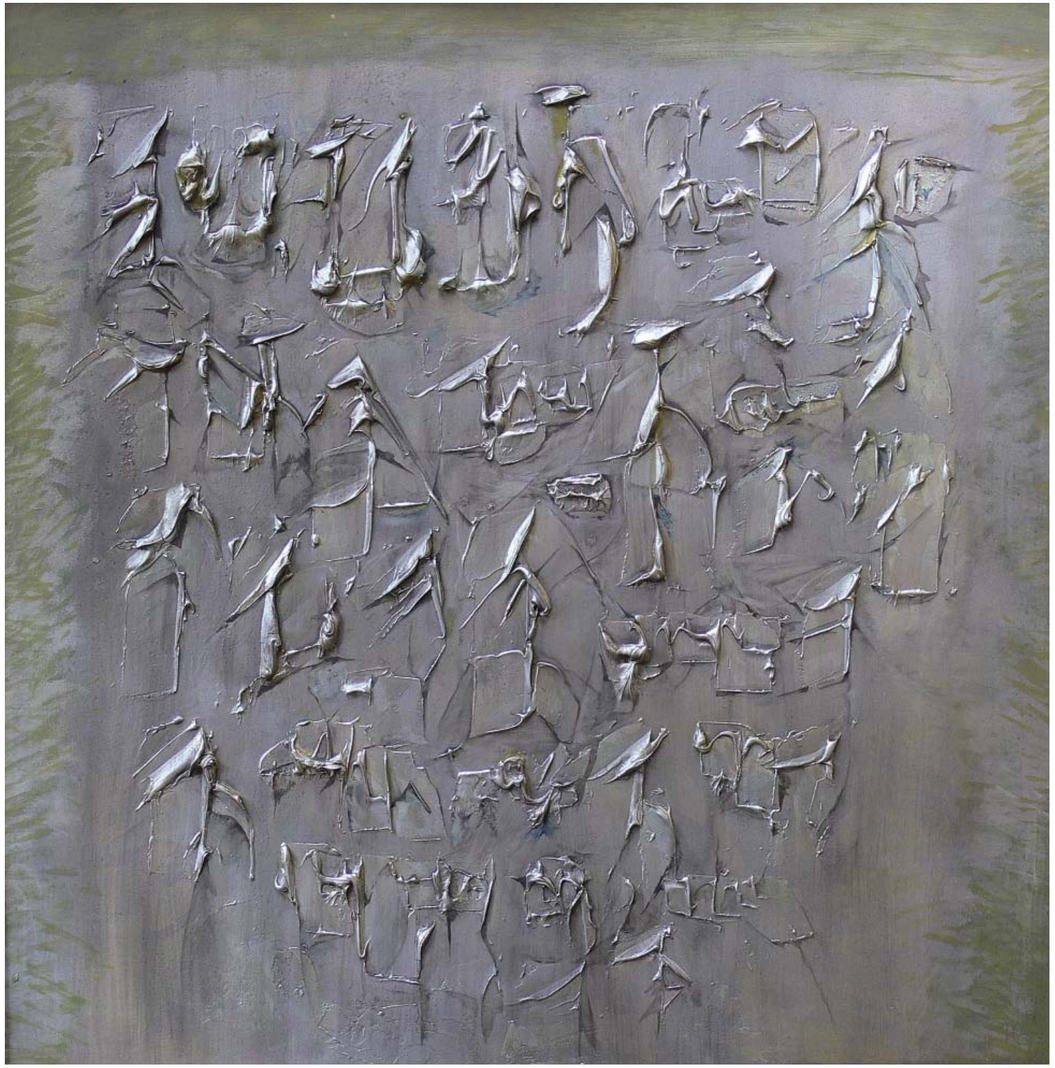
I had never been a fan of Béla Hamvas', but I knew he was a man of exceptional value and sensitivity. For me he was a catalyst more than anything else. I had made his acquaintance at Petrigalla's place in Vécsey St., a smoke-filled pad bustling not only with freedom but also the odd bedbug. Later on, I paid many visits to him with friends or on my own. He called on me in my studio several times, and sent me a letter of apology whenever he was unable to attend a vernissage of mine.

His first visit to my studio occurred after my show at Petrigalla's place. On seeing my expressive, Surrealist paintings he asked me whether I was aware of what forces my paintings were setting in motion, and whether I was able to handle such forces? Although his comment was critical rather than appreciative, I was not at all hurt. He did not mean to hurt me. Rather, he wanted me to give it all a thought.

He made his most astonishing comment in 67, when I showed him my first Sign-Grid paintings. He was silent for a while, just looking at them. Then he said this: "These are works extremely Greek in spirit". I knew that coming from him, those were words of serious praise but I could not exactly figure out what he was trying to convey. I looked at him clearly at a loss for I failed to see any connection between the Greeks and my Sign-Grid paintings. As he stood there engulfed in his thoughts and still looking at the pictures I felt in my bones that his comment had been meant in serious appreciation. He must have recognised immediately that what he saw was no mere calligraphy but something infinitely more complex in spite of its elementary simplicity.

Then I said: "My Sign-Grid paintings are children at once of doubting, of freedom, and of order". They spring from a gesture arising from the borderland of orderliness and chaos. They are at once immensely individual and universal. Each Sign-Grid is a compact structure, but also one that can be broken down to individual units. Each unit is an autonomous being, an autonomous sign which, however, links up to its surroundings influencing it without destroying it. As I was explaining to Hamvas the freedom, the order, the internal world becoming external, things that my Sign-Grids paintings were trying to express, sudfdenly he nodded: "With the Greeks the momentary is always included in the eternal, and to them magical and logical thinking are not two, but one." With those words he considered the matter closed.

His comments were hugely inspiring. He supplied me with manuscripts of his writings from his "Five Undelivered Lectures" to his "Scientia Sacra" (Sacred science). The latter was still in my possession in 1968, the year of his death. When I returned it to his widow, Katalin Kemény, she said that that particular manuscript copy was about the only one she was absolutely certain of retrieving.



"Sign-Grid XXVI.", 1970.

And a company stood in the middle,1964.

Mosaics from my Life

My childhood is tied up with the Highlands, the delightful landscape between Rozsnyó and Kassa, and mainly, of course, with Szepsi, the town where I was born. Unexpectedly, images emerge in my mind of us all sitting in a horse-drawn sledge approaching the narrow gorge of the Szádellő valley, or sitting among neatly shorn boxwood bushes and under some towering, ancient pine-trees in my Grandmother's garden, the sturdy, white Calvinist church where my Father used to preach, and my awe among the furniture with clawed legs in the obscure rooms of my Grandfather. And paintings, drawings, pottery. The unforgettable whicker of my colt as I try to straddle him holding on to his mane, and our enormous cherry-tree, the Great Book of Red Indian Tales, or the mysterious wilderness of Murány forest. And some less peaceful memories of the bombing of Kassa, the raids by left-wing partisans after the war, the deportation of my Father, the Slovak crowds flooding the streets chanting chauvinistic slogans like "Magyars into the Danube". And yet another shameful slap into the face of Europe, the decrees of the Benes government, forced re-settlement, sunrises behind the bars of boxcars where I slept on a mattress atop the cupboard.

Arrival in the "promised land" of Hungary, Budapest. A shift. Or was it? Yet again, we were handled by coarse security personnel with submachine-guns, and taken to a school in Aréna Street to get washed and disinfected. The Interior Minister's thugs treated re-settlers from the Highlands like scabby beasts. It was then that the terrifying word "Fascist" lost much of its terror in my mind. In utter disbelief, I realised as a child that there could be hatred even among Magyars. But why? I did not understand. I was to remember the word State Security Department (AVO for short) for life.

And the unexpected gift of a happy year in Holland, in Utrecht-Driebergen, with the Van der Horst family. My bicycle wanderings with Minie who was studying to be a painter in Utrecht. Museums, collections, pictures. And for some other sights: Rotterdam bombed to the ground, the Rhine, a dead river, weeks spent on the North Sea with Friesian fishermen in a "nebulous Walhalla", a bar of chocolate every day, then collecting chestnuts in the Queen's Drierenberg palace gardens, and studies in drawing. Back in Budapest, continuing those studies in Ferenc Zajti's studio for several years.

As an adolescent, I sensed the revelation of freedom inherent in Rimbaud's poetry weighing on me, it was from him that I learnt how to wonder as a "drunken ship", governed by the magic of words, to waters where I could enter the inexhaustible world of a liberating spirit unbound by my studies at school. That is how the revolution of October 1956 found me. I was stunned by yet another unexpected experience. That freedom could exist in external reality fascinated me. The hope was born of a recovery from class struggle, social incitement to hatred. I had always known, and borne within my soul as vitalising energy, that there was some strange transcendent force beyond each individual, a force that one can call community. At the time of the revolution this hidden, mesmerising force was becoming a living reality. To many, and for a long time, it had seemed that 20th century civilisation had succeeded in eliminating it. The sacrifices of the revolution provided a living rebuttal to this idea.

And then we were struck by fright, by thousands of men sitting in their tanks achieving yet another victory for red star terror. Doubt had become the order of the day, not just in me, the young man, but in my whole generation and beyond. We doubted slogans turning into their opposites, we doubted movements, we doubted all those slightly too rapid acts of accommodation, we doubted an order hard as a rock, cold as ice. Intellectuals moved underground. Pushed to the perimeters or beyond were such greats as Béla Hamvas, Árpád Mezei, Nándor Várkonyi, Lajos Kassák, Dezső Korniss, Tihamér Gyarmathy. This was a period of interior exile. I became conscious of this recognition: for an artist interior events were of paramount importance provided he had a compass that he could follow. In the meantime, I became a painter. A new generation of artists came on the scene in the mid-60s, a generation

"People Waiting", 1963.

“Szürenon VI.”, 1964

that had lived through the revolution as adolescents, wanting to turn their wish for freedom into art. They refused to fulfil society’s deformed expectations, and they also refused to put up with hopelessness.

Rather than being a mere onlooker, I soon became one of the chief organisers of the new Avantgarde. I sought out all the young artists whose frame of mind was similar to my own. I recruited them from pads infested with bedbugs, cellar clubs, and laundry or attic studios, mortuaries turned into ateliers. I could move them from utter anonymity into some modest reputation, from crippled isolation into a medium of vital spirituality. This was how Gyula Bocz, Sándor Csutoros, István Haraszty, László Haris, István Ilyés, Gyula Pauer, Péter Prutkay, Péter Türk, to name but a few, were able to find one another. I created SZÜRENON, a series of exhibitions of the Hungarian Avantgarde in Polish museums followed by an “R” exhibition presenting not only core members, but also some artists who had exhibited in IPARTERV, not to speak of such masters of the older Avantgarde generation as e.g. Dezső Korniss. The “R” exhibition was characterised in print as “a turning point. After so many years, at last we could relish the entire Hungarian Avantgarde in all its complexity”.

For me the turning point came in the late 70s when after my years of painting marked by a plasticity interpreted by light I could venture into the research of the pictorial possibilities provided by bodiless light, more particularly, coherent laser

“East I.”, 1995

light in the Central Research Institute for Physics, a research I have Professor Norbert Kroó to thank for. Not so long ago, in connection with my light-art presentation in the sombre church halls of the Kiscell Museum I wrote the following: “Today, visual innovation is unstoppable. Whoever tries to stop it, might turn into a pillar of salt like Lot’s wife. In the arts it is not innovation that must be stopped. It cannot be stopped in any case. What we would do well to stop is making a fetish out of innovation. And beneath the rubble, we would do well to seek a way that is at once the most complex and most simple, the way that reaches from soul to soul, as our classics would put it… Would that way seem out of sync with our age? Let me ask back: can we not be more independent than that? Are we to emulate the thought processes of soulless individuals? Perhaps we should not outline our own age in sync with the patterns of a century that has just passed.”

Written in November 2008 to contribute to a book in progress with Napkút Publishers on public figures born in 1939.

"East III.", 2001

Appendix

ARTISTS' ARTICLE

The Application of Lasers to Compose Pictures: The Method of Superpositioning

Attila Csáji and Norbert Kroó

ABSTRACT

'Painting with light', t
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become a reality for artist
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Most visual art of the future will be painted by light.

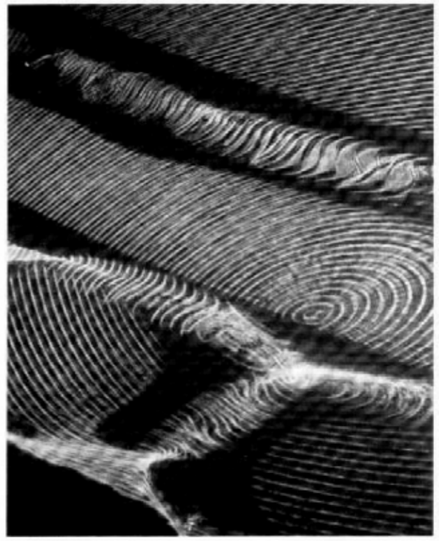
—László Moholy-Nagy

Our stormy age has raised many questions, one of which involves the relationship between modern science and art. Many people think that science and art are in contradiction. This feeling is based on two arguments: first, that modern science is a threat to mankind, with art unable to block this threat; second, that science and art are developing in opposite directions. Neither of these arguments is supported by fact.

Science and art have, perhaps, never been as close to each other as they are now. Both are creative disciplines; both have the tendency to synthesize. Many scientists are involved in some kind of art, and some of them even consider science to be a special form of art.

Bridge-building between the two disciplines is an aim of many people today, although scientists approach this problem from a different direction than do artists. Swiss drama writer Friedrich Dürrenmatt (winner of the Nobel Prize in literature) compares his writing to quantum mechanics, stating that the 'absurd' is present in both. At this point, logic and reality confront each other.

Fig. 1. *In Wave Fields*, **multi-laser-interference pattern transformed by various optical elements, 1980. (Photo: Csáji)**



PATTERNS

According to Norbert Wiener, originator of cybernetics, "One of the most interesting aspects of the world is that it can be considered to be made up patterns. A pattern is essentially an arrangement. It is ch acterized by the order of the elements of which it is ma rather than by the intrinsic nature of these elements" [1

For example, when we look at a written text, our fi impression might be that it is static. But, in fact, it is ir mately connected with different processes. First of all pattern has been formed. The written text was first c ceived, then printed, then read and so forth. When we lo at a pattern, processes in our brain are induced that lead the perception of the pattern. Similarly, patterns indu processes in other biological systems or machines. Both t formation and recognition of patterns are connected wi dynamic processes.

One should distinguish between manmade patter and patterns that have been created by nature. Manma patterns often serve a purpose, for example, such patter may be connected with spoken or written language, wi music or visual arts. There are many other types of manma patterns, created by machines, buildings and so fort Patterns created by nature may be formed by the inanima world or by biological systems.

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Norbert Kroó (educator, physicist), Central Research Institute for Physics, The Hungarian Academy of Sciences, Konkoly Thege, Út 29-55, Budapest, Hungary.

Received 10 July 1990.

COHERENCE

The roots of coherence lie in the *dual nature* of all elementary particles; this means they can be defined either by their properties as particles with mass, momentum and kinetic energy; or defined as waves (with wave vectors) that oscillate with well-defined frequencies. This is true for photons, phonons, spins and bosons as well as plasmons, neutrons and electrons. This dual nature of elementary particles is the basis of the theory of complementarity, which states that matter has two complementary 'faces' that cannot be seen simultaneously. If, for example, we are interested in the particle character of matter, its corpuscular properties are observed; if we are interested in its momentum, we observe the wave-properties. The principle of complementarity was utilized by physicist Niels Bohr, the founder of the quantum model of atoms, and his co-workers in varied fields, including biology, psychology, anthropology and ethnology.

Much attention has been paid to the coherence of light since the end of the nineteenth century. Opticians are the most experienced in the field of coherence, since they have dealt with the concept for the longest time. What, then, is the significance of coherence? Basically, coherent light sources are responsible for producing interference effects when two beams of light are superposed.

Interference, with the sun as an incompletely coherent source of light, has been used to clarify several basic aspects of physics. Recognition of the role of interference phenomena of light increased after the discovery of lasers, as they are light sources that best display coherent properties.

INTERFERENCE PATTERNS IN ART

Interference patterns are created by light scattering from an object. In each case the pattern results from the Fourier transform of the function describing the surface geometry of the object.

In the mid-1970s we formed FOTON-ART and launched a research program to work out methods for using coherent laser beams to create patterns. Our aim was to succeed at arranging the coherent light emitted by lasers into preplanned pictorial patterns [2].

We were aware that esthetic quality does not depend on whether something is judged to be 'art' at a given time. In ancient times, the Greeks did not regard sculpture as art, yet today sculpture is the representative form of expression of that age; no one doubts that it is art in every sense of the word.

It was our belief that 'light art', by combining science and technology to produce a visual effect, could similarly become a representative form of expression of *our* age. One of the principal features of art in the twentieth century involves the great variety of available media and tools of art with which artists can choose to work. At the same time, new genres—even mixed genres—have been created, resulting in the broadening of the definition of art.

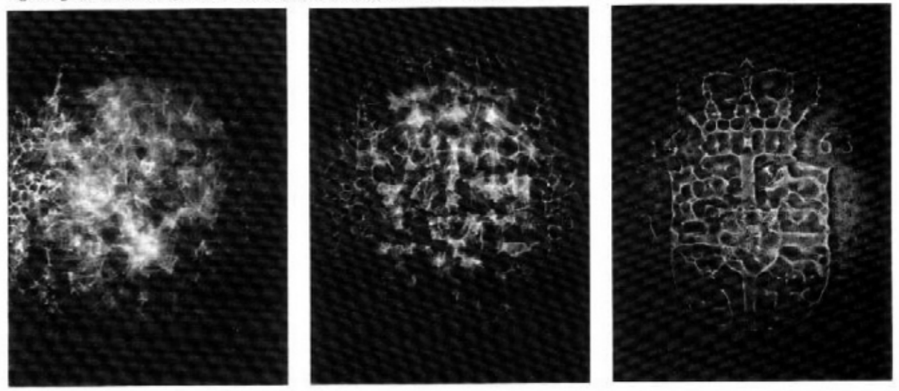
LIGHT ART

When we started our research, we believed that the discovery of the laser, this new source of light with its special qualities, provided insight to ideas that the Bauhaus followers had once expressed. With prophetic inspiration, painter and photographer László Moholy-Nagy wrote in the early decades of the twentieth century that most visual art of the future would be painted by light. He encouraged painters to acquaint themselves with the shining purity of light—with its wavelengths, colorimetry and with the possibilities inherent in artificial sources of light. He believed that painters should augment their own creative instincts and emotional powers with knowledge of science and technology. Moholy-Nagy found the significance in Malevich's blank canvas to be the ultimate simplification of the picture.

The concept of using disembodied light in art was very stimulating to the Hungarian avant-garde, and numerous works of this sort became part of the international art scene. Pianist Sándor László constructed a 'light organ' designed to accompany music with colored light patterns. Sculptor and composer Nicolas Schöffer is best known for his metallic mobiles and plastics in which light plays an important role. He recognized that dynamics is the most original characteristic of our technical civilization and created artworks that were machines that metamorphosed before our eyes. This became the basis for kinetic art.

Hungarian György Kepes, a founder of the New Bauhaus and a 'light artist', wrote that the revolutions that keep changing the concept of form, the playful flirtation with shapes and techniques, must give way to more serious commitment. He wished to contribute to the successful reunification of man and

Fig. 2 Figurative metamorphic laser process (left to right), 1987. The coat of arms of Denmark emerge from interference patterns.



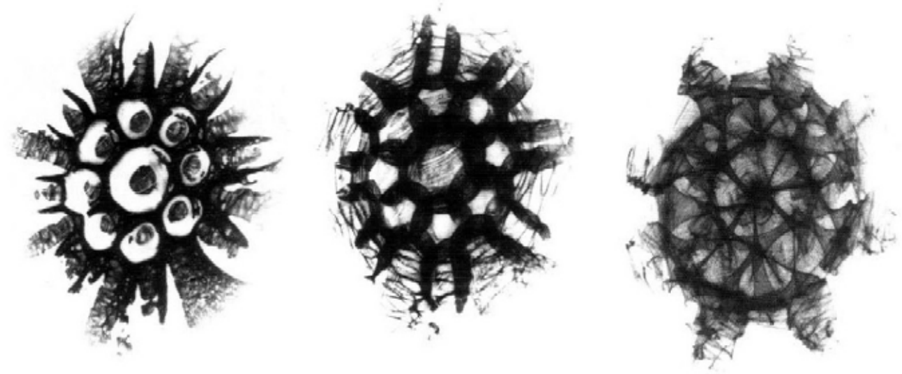


Fig. 3. *Cell Crystals*, laser-light art, 1980. These images illustrate the use of nonfigurative metamorphic processes in light art.

nature. Kepes founded the Center for Advanced Visual Studies at the Massachusetts Institute of Technology to advance new technologies and relationships among new scientific discoveries and art.

Because artist and Nobel Prize winner Denis Gábor invented holography in Hungary, holographic studios were operating there earlier than they were in its more-advanced neighbor, Austria. The Hungarian National Gallery staged an exhibition of holograms and art in the same year as did the German Film Museum in Frankfurt.

The Hungarian National Gallery also staged FOTON-ART's first show in January 1980. The media reported that there was 'laser fever' in Budapest, and that never before had there been an event in Hungarian art of such proportions with such diverse audiences. We presented *Struggle*, a light symphony and laser environment that was visited by 20,000 spectators in just a few days. The total number of visitors to the exhibit reached approximately 300,000.

SHARED ADVENTURE

In our collaboration as painter and physicist, we systematically divided and coordinated our respective concepts and activities, allotting to the scientist the task of introducing the painter to the physical aspects of our work.

Our cooperation laid the foundations for the kind of relationship that had been expressed by Moholy-Nagy, with one of us, the physicist, providing a suitable background for the painter's work. The painter's role included finding the right means of pictorial expression, discovering and progressively narrowing the relationships among the tools used and working out the ways in which a spectacle could be designed to provide the appropriate setting for visual contemplation. First of all, the irregular flashes of light, the simple geometric forms and the isolated characteristic interference patterns were carefully analyzed. Gradually, we reached the point where we were able to correlate transilluminated transparent surfaces with interference patterns defined by the Fourier transforms of the given surface.

The quality of mobility intrinsic to this phenomenon demanded that we do more than mere static analysis but, rather, also analyze the dynamic processes involved. Soon our observations of the dynamics of forms took on new aspects in which the individual pictures became less important than their ability to undergo metamorphosis.

This metamorphic process showed most clearly that the tools were broadening our senses, not only by creating new information, but also by opening new areas of perception leading to new sensual experiences and harmonies (Fig. 1). Direct insight into these processes is characteristically a twentieth-century phenomenon. We consistently came across parallels between our light art and other twentieth-century art forms, from gesture painting to Op Art. Our research was often slowed by the revelation of such parallels, for we were tempted to embark on stray adventures; however, these findings were significant. We set them aside temporarily to concentrate on the definition of causal relationships. We realized that in order to make these manifestations suitable for visual contemplation we had to uncover the essence behind the metamorphic processes. Parallels with other completely different nonfigurative art forms in this century signify a continuity between the inner and outer worlds, creating the possibility, hitherto unknown, of breaking down the barriers dividing the experiences and cultures of this age.

Next, we ordered the relationships we had uncovered. It was no longer appropriate to confine ourselves to the analysis of details. Instead we had to look toward producing entire processes, developing a rhythm to broaden the character of the metamorphoses.

A designer of a light-art show must consider not only formal aspects but also the proportions among the various

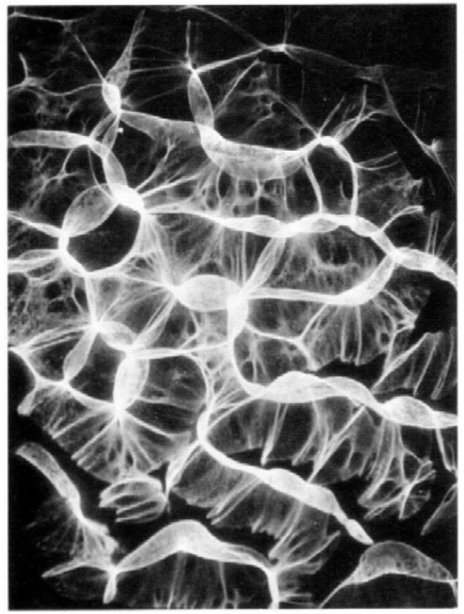


Fig. 4. ***The Fifth or the Sixth*****, a laser-animation film, Budapest, 1984. The imagery in this film continually transforms from one state to another, from star clusters to living cells, from crystals to infinite space. (Courtesy of Pannonia Film Studios)**

parts of the surroundings of the spectacle. In putting these considerations into practice we found new definitions that led to a novel method for redefining the picture. Following the success of our exhibit at the National Gallery, we patented the technique of light art and its tools in January 1980 [3]. The tools comprise a flexible lens-and-prism network that lines up along a laser beam. At the core is a transparent disc that carries the pictorial information. A key feature of the procedure lies in the coordinated use of manual and computerized technology. We first made drawings of the motifs, reduced them photographically to the desired size, projected them onto metal or some other material, then cast them from a clear plastic material. The resulting transparent, clear disc contained the composed pictorial information in plastic form. A motif captured on the transparent disc could be anything from a flower to a human head, from a Coke bottle to a shop logo, depending on how the surface was adjusted. We called this plastic disc the 'objective picture'. This plastic objective picture is transformed by the coherent laser beam to interferences correlated with the optical system and its setting. In this way the motifs on the disc could be changed not only in size but also transformed into different shapes. We could project the motif as it was designed, or we could transform a plastic motif into characteristic interference patterns. The method was especially suitable for making the relationship between perception and physical laws tangible. Through what we called 'pre-holographic pictures' we reached pure laser interference. It was this method that we used to develop the Danish coat of arms at the Bela Center in Copenhagen (Fig. 2).

Organic and continuous pictorial changes created the transition between the world as we perceive it with our naked eyes and the precise, mathematically definable light interference. This meant that in the pre-holographic pictorial transition, the objective picture and the interference patterns were perceived simultaneously, but mixed in varying proportions. This metamorphic process held infinite possibilities in forms created by pure laser light.

Our Experiences

Using our method we were able to create a variety of shapes and movements that seemed to occur on various levels of material organization. We first expressed this in our program called *Cell Crystals* (1980) (Fig. 3 and Color Plate A No. 1), which presented an exotic world, a journey into the secrets of nature. The experience brought about a sense of being in a cool laboratory and coming into direct contact with nature, as though looking through an electron microscope while zooming in on fibers and benzene rings, on DNA spirals and crystalline structures. Viewers participated in the action in real time, since the projection was not merely two-dimensional, but a whole environment. These projected forms have infinite focal depth and allowed the projection to be shaped into any geometric configuration. This allowed for maximum stimulation and even enabled viewers to seem to become part of the screen.

The concept of evoking the hidden aspects of nature appeared in our work again and again. This concept also gave rise to *The Fifth or the Sixth*, the first Hungarian laser-animated film, which we made in 1984 at Pannonia Film Studios. It was screened at the Hungarian National Gallery, at the Modern Museum of Art in Paris during their exhibition entitled *Electra* and at the German Film Museum coinciding with the hologram exhibit *Licht-blicke*. The film presented paradoxical correspondences between microcosm and macrocosm by showing living cells forming out of star clusters, and infinite space rising out of crystals (Fig. 4). The configurations were born out of each other, they 'rhymed' throughout their incessant transformations. This was the key that controlled our knowledge of the world, it was the metamorphosis of primeval structure.

To a degree, our encounter with these forms inspired our interactive light mobile *Laser Eye* (1985), a variation of which can be seen in the transit lounge of Budapest's Ferihegy Airport (Fig. 5). It shows an eye-like frame; there is a sand-blasted glass surface that behaves in a way similar to the retina of an eye, transmitting information to its 'brain'. On the inside surface, the reflected light beam creates a metamorphosis. Moreover, the composition is analogous with the beginnings of optics: Euclid explained vision by stating that the eye emitted light beams that sensed objects on contact. If coherent light from a source passes through transparent objects (e.g. the plastic discs mentioned earlier) a relationship may be established between various hierarchic levels of nature. As the light mobile reacts with the environment, it establishes some sort of connection between three different spatial experiences.

One of these spaces is created through dynamic metamorphoses and takes the viewer into the hidden layers of matter. It is a closed, planned program that frequently evokes the world of 'cellular crystals', patterns of the microcosmic world.

The second space is the world we live in, the world as we know it. In the transit lounge at Ferihegy airport, this space is the environment of the light mobile. If we stand in a given place, the mobile senses our presence and causes green light-emitting diodes (LEDs) to light up. We can make contact, play with it by moving our hand, changing the configuration on the sand-blasted glass surface by touching certain spots. We can speed up the transformation of patterns, rewrite the character of the patterns or induce a bright variety of colors in the background.

The third space is an antithesis of the first one. It is the (macro)cosmic infinity of the air and the oceans. This space relates to the environment, to air travel and the diverse parts of the world, to flights leaving and arriving. At the moment before a plane lands or takes off, the electronic machinery of the mobile receives pulses from the airport's electronic control system. At the eye's interior, at a given point, a large floating shape reminiscent of a bird appears, formed by the scanned laser light. It starts out as a point, grows larger, and, as the amplitudes increase, the bird-shape flaps its wings and seems to fly toward us. When the wings touch the edge of the screen the configuration bursts, and from its center a continually growing-then-bursting spiral springs forth: the landing signal. During take-off the process is reversed: the bird shrinks as it flies away, and the spiral shrinks down to a dot.

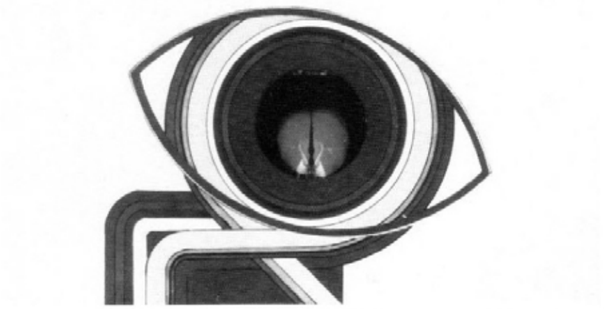


Fig. 5. ***Laser Eye*****, interactive light mobile, 1985. The kinetic movements of this artwork are influenced by the airport environment, including passengers.**

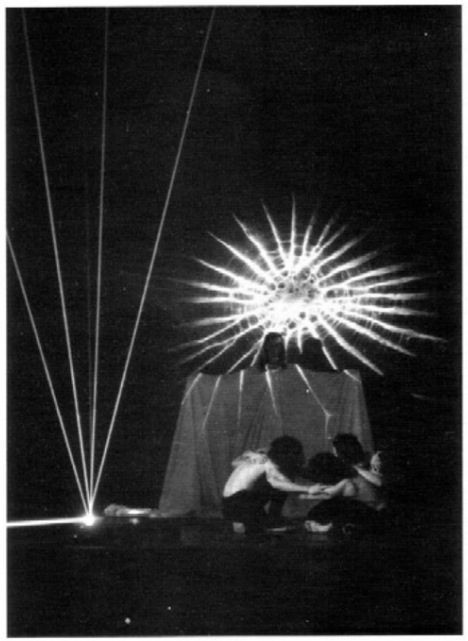


Fig. 6. ***Relations*****, laser-light art and dance, 1983. (Photo: Korniss)**

The mobile manifests laboratory observations, everyday experience, research and games, space and sensing.

A completely different source of inspiration was the historic atmosphere of the medieval ruins of Diósgyör Castle, the setting for our laser *son et lumière* entitled *Sparkling Well of the Past*. It opened with the unfolding of pages of a book that grew to the size of the wall (an enormous 14×-27-m screen) to reveal a peculiar well, from which the laser drew sparkling creatures. It was an unusual metamorphosis. Little medieval bronze figures and metal engravings were transformed, changing their structures and manifesting themselves as photons in pure colors sparkling out of a fine network of interferences. These images became recognizable, then were transfigured anew, metamorphosing again and again.

The laser changed medieval coin figures into creatures of light. The naively charming Roman patterns, ascetic gothic figures and beautifully dignified but feeble miniature kings all sprang from the well, taking shape as projections on the huge screen mounted between two medieval bastions.

We want to create new traditions, but only after reliving already existing traditions. We used these methods in the theater for grotesque plays, dramas and modern dance concerts. The key element of each spectacle was the method of superpositioning, resulting in different transformations; we also

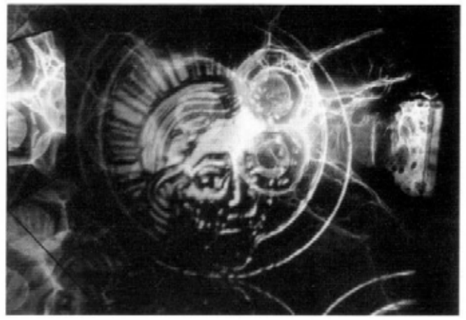


Fig. 7. *The Mount of Olives,* **laser-light art and drama, 1985. Through the manipulation of laser-light beams and the phenomena of interference, the head of Christ has filled the entire scene of this biblical stage play.**

used scanners and three-dimensional light-dynamic elements.

We worked extensively with the modern dance group Budapest Táncegyüttes led by Antal Kricskovics. For the premiere we designed *Relations,* a light accompaniment that continually changed the mood. Dance is an art form that uses the most elementary movements, and light is one of the greatest experiences of man. Now, these two phenomena met by way of the laser (Fig. 6).

The light-choreography was created after meticulous analysis of the music and the dance. In an ideogram we combined the color and intensity of the laser light, the positions of the basic light mobile, the supplementary optical tools (cylinder lenses, optic grids, prisms, etc.), the transformation and dynamics of the shapes, the position of the motifs on stage and so forth. All this was combined with the dancers' movements and the music. Light-choreography, like that of dance, requires thorough preparation and practice. In part, the mobiles became light instruments while the staff was divided into different specialty groups; those dancers with stronger visual and musical senses were placed in the proximity of the mobile. This was because we could not control everything electronically; this also made it possible to adapt to slight inconsistencies in the movement and positioning of the dancers. Moreover, this placement also allowed changes in the stage to be accommodated.

The light mobile, similar to a musical instrument, was able to combine and execute diverse functions. Its basic task was to act as a precisely articulated light accompaniment, but it also took over traditional theater-technical functions such as that of spotlighting.

For *Solitude* (1983–1984), primarily a solo dance, the stage was almost completely dark. From this darkness, an inwardly spiraling, variously bright and colored bubble brought out the dancer. Like a spotlight, the bubble followed her, and, as she danced through moods of despair, fear, isolation, pain and hope, the colors of the bubble also changed, all while engulfing her in light. At times the light would seem to dissolve, and a green flame would break out of the circle then withdraw into the background, only to reappear.

Next, at the other end of the stage, across from the girl, appeared a man, also lying prostrate on the floor. In the darkness a ray of light reached out for him toward the center of the stage. As the girl and the man approached each other, an increasingly intense ray of light pointed to the girl. As the two figures drew nearer, the light on the girl began to move, the rays multiplying, then separating, finally forming a grate. When the man and the girl crawled by each other, the grate closed and became a wall of light. The use of the light mobile as a spotlight, supplemented with a few light-dynamic elements, greatly expanded the traditional possibilities of the spotlight. Only in the closing scene did the light bubble explode, with a multitude of shapes running upward, as the girl's prayer was fulfilled amid a whirl of light. In the closing moments, the dynamics of the light determined the scene.

The method we used in Veronica's scene in the drama *The Mount of Olives* created an entirely different character. The director of this biblical drama wanted Veronica to become mad and in her madness to project visions onto her veil. Our task was to create these visions by means of laser light. First we marked the actress's position and movements, with the size and position of the veil as she was holding it. Next all other lights were extinguished, leaving only the laser's light to set off Veronica's figure on stage. The laser light slowly narrowed, pointing to the veil, whereupon whirling shapes appeared. These shapes were chaotic, representing the reflections of madness. Then, slowly, they began to merge into the reflection of a head. At times the rays creating the head would collapse again into chaos. At last, the rays came forth, more clearly defined, as Christ's head (Fig. 7), which became larger than Veronica, embraced the entire scene and the stage, finally engulfing Veronica herself.

CONCLUSION

The revolution of science and technology is something that cannot be slowed or stopped, regardless of the consequences. Possibly civilization is suicidal or, forever seeking the realization of new dreams, driven to search for matter, tools or energy in order to reshape the world. Once human beings searched for the philosopher's stone. We now know that this stone is not a material object, but rather represents living ideas. Our ability to continuously adapt and transform reality means that we can always find new ways to govern the changing world.

References and Notes

1. H. Haken, *Pattern Formation by Dynamic Systems and Pattern Recognition* (Berlin: Springer-Verlag, 1979) p. 2. Norbert Wiener was an American mathematician and the originator of cybernetics.

2. See Norbert Kroó, *Új Írás* **XX**, No. 6 (1980) p. 83 (in Hungarian); Attila Csáji, *Új Írás* **XX**, No. 6 (1980) p. 86 (in Hungarian).

3. A. Csáji, N. Kroó and J. Tóth, Hungarian patent No. 182.793.

Glossary

Fourier transform—a mathematical relationship between the energy in a transient energy spectrum and that in a continuous energy spectrum of adjacent component frequencies.

coherence—if two light waves are superposed so as to produce interference effects, and there is a constant phase relationship maintained between them, the waves are coherent. Sources of coherent light are necessary to produce observable interference effects.

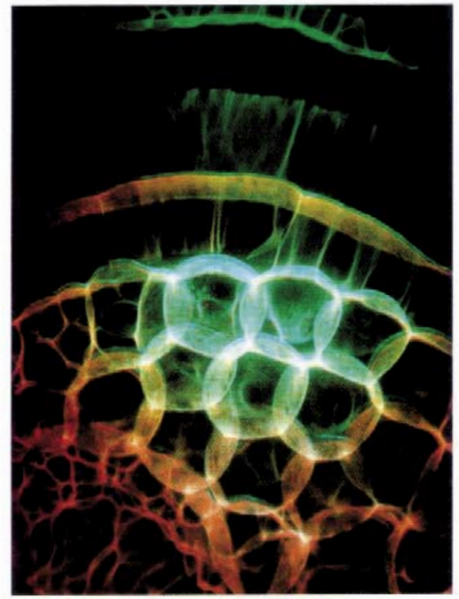
interference—interaction between two or more waves of the same frequency emitted from coherent sources. The wavefronts are combined according to the principle of superposition, and the resulting variation in the disturbances produced by the waves is the interference pattern.

complementarity—in quantum mechanics, the wave and particle models are complementary. A measurement proving the wave character of radiation on matter cannot prove the particle character in the same measurement, and vice versa.

dynamics—the branch of applied mathematics that studies the way in which force produces motion.

superposition—the placement of one configuration on another in such a way that corresponding parts coincide.

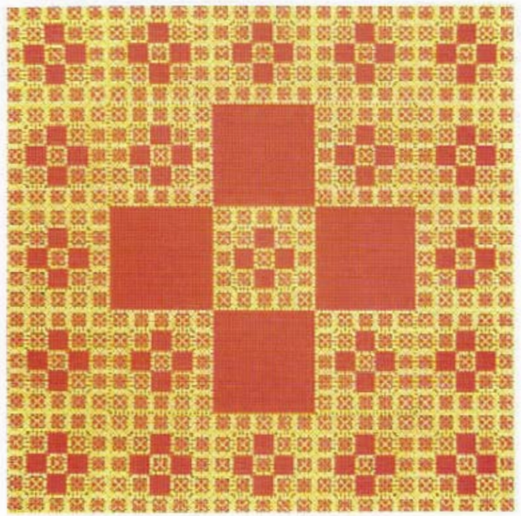
vector—a vector or vector quantity is one that has magnitude and direction, e.g. force and quantity.



No. 2. (right) Michael Heivly, transmitter array, 12–24 ft, 1988. These radio transmitters are beaming topographic sculptures in the form of microwave energy into the constellation Corona Borealis from Ruben Fleet Space Center, San Diego, California.

COLOR PLATE A

No. 1. (left) Attila Csáji and Norbert Kroó, *Cell Crystals,* laser-light art, 1980. During this performance, laser light creates a three-dimensional environment that takes viewers on a journey into the secrets of nature.



No. 3. (left) Dann E. Passoja and Akhlesh Lakhtakia, *G* = 5 (warm series), Group 2 carpet design, inkjet print, 1990. This carpet was produced through the authors' algorithm, with *Q* = 5.

SYMMETRY / BRIDGE / ASYMMETRY

ATTILA CSÁJI

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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-constructer, 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 metamorphosesses. 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.

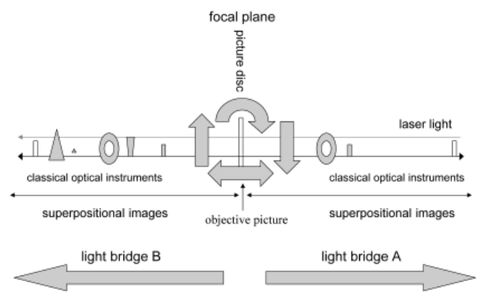


Figure 1: The optical system of the light bridge

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 preholograpic 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 by 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 substational 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.

References

Csáji, A. (1980) Új látvány – új térélmény, *Új irás*, 20, no. 6, 86-92, 1980 June

Csáji, A. (1984) Feder für Voltaire I-III, In: *Licht-Blicke, Holographie – die 3. Dimension für Technik und Kunst*, 214-215, Deutsches Filmmuseum Frankfurt am Main, 1984

Csáji, A. and Kroó, N. (1992) Application of Lasers to Compose Pictures: the Method of Superpositioning, *Leonardo*, 25, no. 1, 23-29, Oxford: Pergamon Press

Csáji, A. and Kroó, N. (1997) Die Anwendung des Lasers für die Bilderstellung: das Überlangerungsverfahren, In: Weibel, P. (eds.) *Jenseits von Kunst*, 157-160, Wien: Passagen Verlag, 1997

Hegyi, L. (1988) Foreword, In: Néray K. (eds): *Attila Csáji: Paintings, Holograms, Light Art, Laser*, 3-13, Budapest: Palace of Art, 1988

Krarup, H. (2002) Light Art in the City, In: *Lux Europae 2002*, 12-18, Copenhagen: The Danish Cultural Institute

Mezei, O. eds. (1997) *Csáji Attila (Monográfia)*, Budapest: Körmendi Galéria Budapest Kiadó

Loránd Hegyi: Attila Csáji

Budapest, Pallace of Art 1988-89

The outlook and the value system of Hungarian art history would fundamentally change if there vas systematic scientific research made into the progressive endeavours of the 1960s. Art critics would again be acquainted with a number of forgotten ouvres and also would be greatly surprised when exploring the previously unknown, early achievements of many artists. Due appreciation, and abstract expressionism, as well as to the peculiar, Hungarian „sur-naturalism", micro-realismm and magical realism, from wich individual artists steered away in extremely diverse directions. The phenomenon of „Sürenon" may also be newly highlighted: it was an artistic program, quite characteristic of the early sixties, conceived by Attila Csáji and his young colleques. It attemted to reconcile the surrealist and the non-objective traditions.

Surrealism, wich after 1957 was again available to Hungarians via publicationsand albums, meant a significant starting-point for Attila Csáji : it represented a possibilitz to go beyond the mechanical reproduction of visible reality and also to manifest subconcious notions, intuitions and associations. It was influenced by both international surrealist art and the activities of surrealist artists in Hungary. It was quite natural, because during the 1950s, dogmatic cultural policycaused all forms of realism to be disredited. In the eyesof the young generation of artists in ther 1960s, realism was an anachonistic and conservative phenomenon, wich remained on the mere surface of things and kept on preserwing meaningless conventions, and wich was unable to take part in the spiritual life of the time, thus , it was regarded outdated. The avantgarde, first of all, the surrealist and non-objectiv traditions, wich had been shut away from the public for such a long time, represented an art wich conveyed a deeper emotional and atmospherical content and a more complex and more abstract meaning. It was an art that also expressed the the contradictory and ambiguous nature of things , one wich revealed the mysteries of individual existence and personal visions. Young artist were attracted by surrealéism, with its freedom of associations, and were also attracted by non-objective art, with its autonomy of pictorial assemblage and its sovereign system of visual forms.

Attila Csáji took interest in both fields. He was concerned with rich forms of nozions emerging form the subconscious, with the re-interpretationof real objects, with the depths of associations projected into natural forms and with capturing the hidden ego that manifest itself in conjectures, dreams and spontaneous gestures. The surrealist transfomation of nature and the cosmos and the trancendental notions, were all aimed at expanding the notion of reality.

Attila Csáji found within reality not only a palpable and perceptible form, but a spiritual cosmos as well, wich has been expanded into infinity by impressions, conjectures and associations, and wich has been transubstantiated by emotions. It is for him, a world full og possibilities of intellectual activities for a reative personality. He was searching for artistic forms in wich his vision could be manifested. And because, as an artist, he is of a fundamentally rational character, right from the start he attemted to create a synthesis of intuition and systematization. He firmly believes that the spiritual universe, wichcomprises of infinitepossibilities and of wich you may only be slightly aware, can only be expressed in an artistic, that is, sensuous and sugestuve way, in rationally built art works. Because, amongst the possibilities offered by reason, a vast domain of conjuctures and associations emerges. Thus, Csáji did non adopt surrealism's psychic automatism, wich was not an exclusive element of Hungarian surrealist endeavours either. Although he connected the rational build-up of the pictorial system with the revelation of subconscious notions, he still retained the element of intelectual control throughout his work. He has always consciously controlled the process of building up the composition. Side by side in his activities werw, the exploration of the characteristic strucure of theautonomous pictorial form and the projection ofsubconscious notions.

This creative program led in 1964, to the birth of his „Sürenon" series. Organic forms appear on the small oicture plane, wich has been produced by painting, scratching and erasing thelacquered and enamelled picture surface. The peculiar, half abstracted organic forms, resemble certainmotifs from nature and floral as viewed under a microscope, yet in reality, they are patches of an informal nature. Rather than by the individual details of forms, nature is evoked by warm yellowish-greenish-redbrownish colours and by the irrationally mysterious golden light. The prsence of the light and the strong contrast-

"Couple II.", 1966

ing effect of light shade, endow the amorphous forms of the plane in the „Sürenon" series with depth and create a spatial appearance. The intricate organic forms appear in an imaginary space and are suggestive of depth and distance.

It is as if a fantastic andastonishing world of an underground zigzagging cave was revealed by thesudden flash of a light, and as if, after the light had gone out, the imagination continued drawwing the forms wich in reality, you had rather felt than seen.

Attila Csáji handling of light makes the amorphous patches concrete, that is, they are transformed into forms of three-dimemensional expansion, and at the same time, it makes these forms elusive and undefinable, causing them to become mysterious and visionary. His method of painting, although it retains an almost naturalistic plasticity in certain details, does not approach microrealism, it rather points in the direction of organic abstract formations, wich occur in informal art.

The „Sürenon" series still shows traces of narration, with a poeticized vision of nature conceived as a theme, and with a pantheistic representation of nature. At that time, Attila Csáji wrote poems as well, wich expressed the same mystic personification of the universe.And as early as the 1960s, there is light in his art, illuminating the „hidden face of nature" : a light that revealsthe invisible and concealed essentials. It is light that embraces the intellect and the organic world in a single unity, that is , in his art, light becomes a mystic power wich ia able to weld together the infinite cosmos and the endless realm of human spirit. Besides being a visual representation of the universe's infinity, light in his pictures is a visual matephor of personal existence and of the selfrevealing intellect. The infinite macrocosm is rendered perceptible by this mystic light, in the same way as the truth of the individual existence uncovers itself in a light that originates from the depths of the personality. Light is the emanation of the spirit. As Csáji's poetic lines read:

„Reality is evoked by its transient image
And the reality of this image is light
light is tangibly unconceivable
and allows you to sense the unconceivable
the light wich is our life
...flows from an infinitely inward space
from the depths within us"

This mystic light wich flows „from the depths of the infinitely inward space", that is, from the ego, shines in the pictorial space of Attila Csáji ,s works made during this time. The „Sürenon" series manifests the seldom meeting of the poetic and the visual, ways of expression. During the following years, the search for an autonomous pistorial system, pushes all types of narration into the background.

As early as 1964-65, Csáji makes a series, in wich flowing calligraphic signs appear in organized, horizontal lines. These flowing forms are gestures which are similar to each other , but naturally, each is differently recorded. On the one hand, Csáji attemted to reconcile spontaneous improvisation with the previously planned visual system, and on the other hand, he attempted to control automatism. Because, if each flowing act repeats the same gesture, it means ó, that the once spontaneous and motory gesture-painting comes under the control of the consious will.

Results of the above experiment were applied in the „Sign-Screen" series made between 1967 and 1970. In indivudual pieces there are sculpturesque forms moulded by a palette knife and aranged in horizontal rows. Certain „informal2 formations stand out from the pictorial plane,as in a relief. these forms record the hand movement as it has moulded the soft material. They are fixed gestures, wich are artuiculated by a sidelight and not by colour.

THe gestures in the „Sign-Sreen" series appear as some type of natural phenomenon: you can feel the movement, the painterly gestures and the action /action-painting/: however, at the same time, the created sculpturesque surface is not personal , it is object-like , objective, like an object of nature. The facture which is created by personal gestures, becomes self-sufficient , a „remnant", or an „object" Thus, the objective pictorial structure covers the personal message.

The „Sign-Screen" series with its sculpturesque surfaces, was the first work of Attila Csáji, where light was not a mere element represented or suggested by painterly means, but an active constituent in the creation of the picture. The strong sodelight enhances the sculptureque quality of the art work: the lit details become more emphatic, the shadows become darker and convex forms are more concretely defined. At this time he began experimenting by moving the source of light, which produced constantly varying pictorial suirfaces.

This use of light led to the idea of applying photo-sensitive colours. In the begining he experimented with silver, since the metallic surfaces reinforce reflections of light. In the „Sign-Screen" series he frequently uses red or blue with silver, because against a silver surface lit by a strong sidelight, sculpturesque forms of warm red and blue, shine more intensely. The pictorial surface becomes a relief wich, whwn moving the source of light, offers newer and newer visual experiences.

Also in the late 60s, Attila Csáji made series entitled „Messages", wich was based on the union of gesture-painting and

"Wedding", 1966

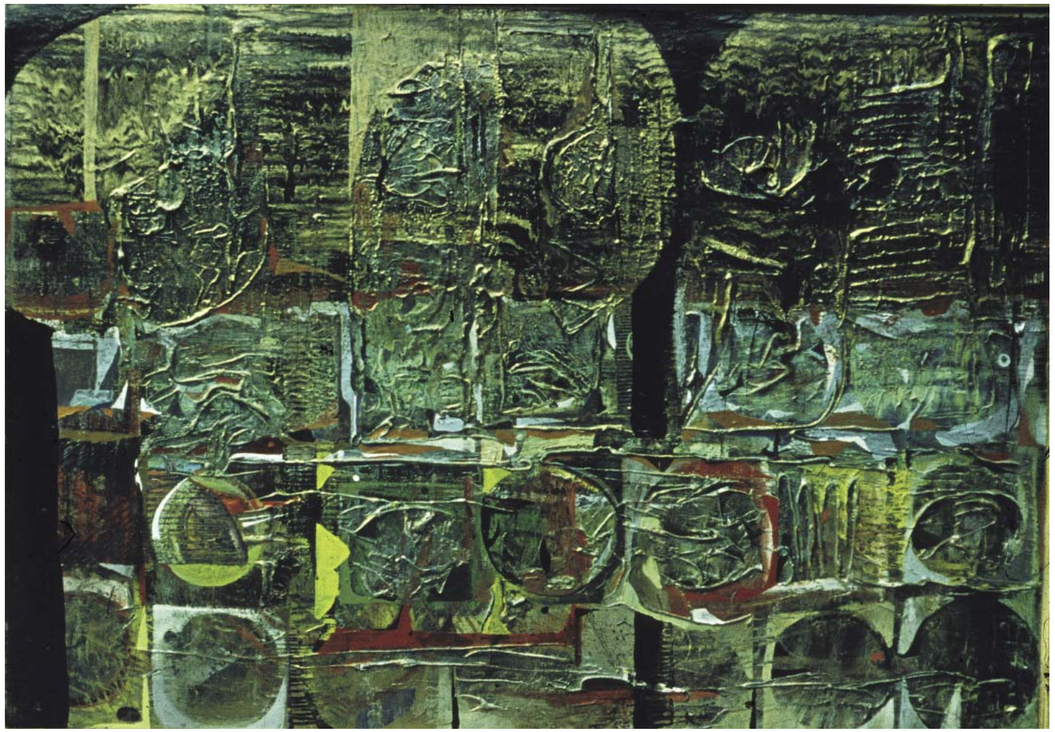
systematic structure. In these works amphasis is given tio the emotiinal and atmospherical suggestive force of colour. Part of Attila Csáji's artistic nature throughout his career, is the need to be more directly self- revealing, wich entails also a trive to enhance the emotional- atmosherical voltage of his paintings. The „Messages" series is closely related to Hungarian Lyrical Abstraction's emotional trend, while the „Sign-Screen" series manifests the exploration of the pictorial structure and a more disciplinedd personal , vocabulary ,. At this time, Hungarian „hard edge" art had been powerfully developing, its central element was the strictly impersonal building of forms. Attila Csáji however, has never associated himself with any trend: he has always kept his personal mode of exrpression and his strive for a synthesis. His art has retained lyricism, but has become stronger and stronger in its analytical approach.

For a short time, due to the sculpturesque moulding of the pictorial surfaces, Attila Csáji's colour-scheme is reduced to either silver or black as the predominant colours. The sculptureque forms, as they are built in the surfaces of the ‚Black-picture' series, dating from 1971, develop the relief-like surface-modelling as shown in earlier works, in the direction of an almost sculptural nature.Various trivial objects and fragments of objects are placed on the surface, in frequently symmetrical, calm and balanced compositions. Everyday objects, materials and rubbish become indefinable under the effect of the silky black colour / or under the effect of complete colourlessness, or lightlessness / We see sombre, mysterious, quasi-sacred objects, like an altarpiece or belonging of an unknown culture. In some black painting the mysterious shine of regions painted in light- reflecting colour , stand against non-reflecting surfaces and seem to float in space, suggestive of infinity. In other paintings, the sculpturesque surfaces appear as objects, like a memorial tablet dating from historical times, one which can no longer be diciphered. Yet , there are other paintings shich show a black, Lightless, infinite and incomprehensibly illusory space, where the shimmering light of shining objects, as if moved by an unknown power, float in the cosmos. In the picure entitled „Cosmos Rubbish"/1973/ there is an unfamiliar, sharp and aggresive object emerging form the centre. It is a threatening and provocative element, suggestive of the possible existence of life beyond our known world.

The „Black Picures" manifested a notion of the unknown infinite spacer and showed the questionable nature of familiar reletionships. They also expressed the eventuality of viewpoints and the relativity of modes of interpretation and approach. Yet, Attila Csáji was in search of new certainties which often have been found in old forms of expression, as manifested in artistic tradition. A charactertistic example of thisis the Kassák series which he made between 1971 and 1974. Besides rendering homage to the legendary figure of Hungarian avant-garde, it is a subjective re-interpretation of Kassák's „Picturial Architecture". Attila Csáji from geomwetric and organic abstract forms, made collages, which at times were remotely reminiscent of „Pictorial Architectures" of Kassák's Vienna period, or of the looser geometry of his later works. They were new attempts in combining a strict mechanical order with a livelyx and mobile system that reached beyond mechanization. Although via a different system of forms, the „Kassák" series collages, mark the return to Csáji's familiar, fundamental issues. The misterious and provocative surface of the „Black Picture" could exist in accordance with the stristly organized, rational compositions of both geometric and organic forms, in the „kassák" series.

As unyielding and self-consistent as he was in following his own ways , Csáji never wanted to reject the influencer of a given moment? neither when he founded the group „SURE-NON", nor when he took part in preparing György Galántai's exhibitions in the Chapel of Balatonboglár, nor later in the early 70s, when, with some interesting works , he was involved with the break-througgh of Hungarian conceptual art. It was is conceptual works where Csáji's political, ideological and siciological interest could best manifest itself. It means that conceptualism for him, was not primarily a metalinquistic experiment, it was not the expression of tautological models and definitions, but the field where particular historical, social and political quetions may be asked. A good example of this is the „Paving Stone" series he made between 1971 and 1973, in which this symbolic motif, with is multitude of diverse meaning, provided always newer definitions in always never contexts.In the work entitled „the Paving Stone's Tomb-Stone", the object has become a polotical symbol, the weapon of the proletariat and the building stone of revolutionary barricades, that is the paving stone, is locked in a plasrtic, foiled box, labelled „Public Catering Company" and put on a catafalque. Thus, instead of being a weapon , it becomes a commodity.

The work made in 1975 entitled „House: Central Eurpoe in the second part of the 20th Century", is thought-provoking. It is a conceptual photo/silkscreen, in which an actual building becomes the allegory of Central European history, of cultural history and of identity confussion: One part of the building preserves its original late-19th century brick-panelled facade, with its oroginal windows-frames, eaves and ornaments



Icontransparent 1969

around the windows. But the other side of thehouse has been „modernized", that is, stripped down by the new owner.This side of the building is bleak, since the ornaments of the original facade have gone, but the building itself , with its original proportions, remains. The two different parts of the dissedted house are mingled in the middle, over the gate, in an awkward and uncertain way. This meeting of the old and the pseudo-new, with its uncertainly and unsolved forms, with the radical dissection of a single building, is a single and compact symbol of a historical situation, the break of historical continuity, the the impasse in the relationship of past and present, the attempt to simply and cruelly rid of the past, wich is doomed to failure, and also ofthe lack of introspection. The two parts of the house are inherited by brothers, both sons of the same father. The inevitable alienation of the brothers due to their separate ways becomes a parable in Attila Csáji's work. It is a visual metaphor of a serious historical and cultural, identity.

In 1975 Attila Csáji spent several monts in Vence southern France, supported by a grant from the Károlyi Foundation. The collages he made there continue the structural princuples of the Kassá-series, usingdifferent motives. At that time he composed his works out of planar forms which he had prviously painted in grey China ink. Some forms are merely decorative elements, while others become, spatial forms that are indicated by tonal values. Thes elements transform plane into a three-dimensional space, while the sharp, clear contours return these froms into two-dimensional forms. Here Csáji is concerned with making the surface „polysemantic", as was the case with his sculpturesque surfaces lit by strong side-light. His forms here are more graceful, his lines are softer,

and elegantly articulated by the Baroque-like curve of the contours. This is, no doubt, an influence of the Provence environment of Southern France.

Coming back to Hungary, Attila Csáji becomes more and more engaded with new possibilities of using light. From 1977 on, he participated in the program of laser research at the Central Research Institute for Physics, Budapest, and attempted to apply the laser light in fine art. Although it is an aesthetic interpretation of a totally new technical medium, it represents for him a re-interpretation of his earlier painterly problems in a new medium, that is, the survey of the relationship between chance events, spontaneous movements and strict, pre-conceived systems.

As he wrote in 1982 „A single picure disc is able to record a multitude of rhytmic and composed visual information. The laser light here plays the same part as the pick-up does in the case of records: following the fixed track it projects the fixed optical information." Éaser light for him is no more than a technological instrument, such as the moving source of light, wich ensures the widest possibilities of reading ther „fixed optical information". Attila Csáji in these works created a visual qualities and new effects. But it is very important that Attila Csáji in thse works created a visual world which could only be produced by laser. It means that he did not only use new techniques in reconstructing a previously conceived visual world, but also psreves the spiritua nature and directions of his earlier art works. Thus, he creates a totally different and new visual system.

In the first laser animation film made in Hungary in 1982-83, Csáji re-worded the quetions he had put forward some 15 years before as a painter. The film was the visual expression of a microscopoic world and of vague forms seen from immeasurable distances, that are the experience and the interaction between the micrososm and the macrocosm. Again, as was 15 years before, his basic experience is the mystery of light: light wich explains the infinite, dark space, and wich helps us to create notions and conjectures: images which have never existed and never been seen.

Research into the use of laser in the field of fine arts, led Csáji to the hologram. It seems that, in his later phase of production, he was succesful in repeating the inification of the activities of the paths of the inventor artist, the informal painter, the conceptual artist, the researcher of technical mediums, the past avantgarde constructors and those who produced never and newer mediums, /For example ,Tatlin, Moholy-Nagy /. Csáji's holograms are far reachingly intellectual and if you wish, you may conceive from them, visually conceptual programs. However, in his laser hologram installations the sensuous experience of the primary vision connects with the theoretical, phlosophical content.

The hologram entitled „Message to Joseph Kosuth" is a characteristically contextual work. Kosuth's work entitled „One and Three chairs" /1965/, wich is considered to be one of the key works of conceptual art, was basicly an examination of these reletionships to each other: the concrete, induvidual object, its image as is created by recording the object, and its definition. Kosuth attemted to make art radically immaterial and notional. Attila Csáji jis „Message" to Joseph Kosuth in 1984, during post modernism, after the flourish of conceptualism was over. He adds a forth to the three stations, a hologram wich is a totally illusory presentation. In this way, besides the tautological definition, he puts forward the sceptical statement that „everything is but an illusion", wich rounds off the work. The four stations are significant both in their interrelationships, and from a historical point of view: conceptualism is present here as an experiment of modern art, as a question or a referenmce. And the hologram has a double role to play in the program: illusion is before your eyes as you walk in front of the small plate, yet then it suddenly disappears, and you must ponder over the question of the avantgarde: Is there a possibility of a recreated world coming into being, or is this only utopic ? Or is it a heroic dream radically identifying art and life?

Attila Csáji's artworks seem to be individually independent of each other or at least are loosely connected and are made of separate groups of art works. Throughouthis painting he takes a thought, even if he utilizes different forms of structures. Within the last years, in his vast tecgnical experiments, he creates a new unity, in which not only does ho cennect the different world of medium experience with the possibilities of communication, but also provides a less visible, survey of time. He is always able to find new context for the recurring qustions of his artistic career, and simultaneously he makes one aware of the power and completing force of history, together with its ever new interpretations. With his individual and undefinably diverse ways, he has made a significant contribution to the last 25 years of Hungarian art.

"A paving stone is a weapon for the proletariat", 1970 !!!!

"A House. Central Europe. Second part of the 20th Century"

Diary entry, Pöstyén, Slovakia,1973

A pair of siblings inherited a common house/homeland. One of them wanted to get rid of all that was indicative of the commonality of the house/homeland: the tympanum, the clinkers… The issue is not that one is nicer than the other, the issue is rather that one is false, and is intended to cover up for something.

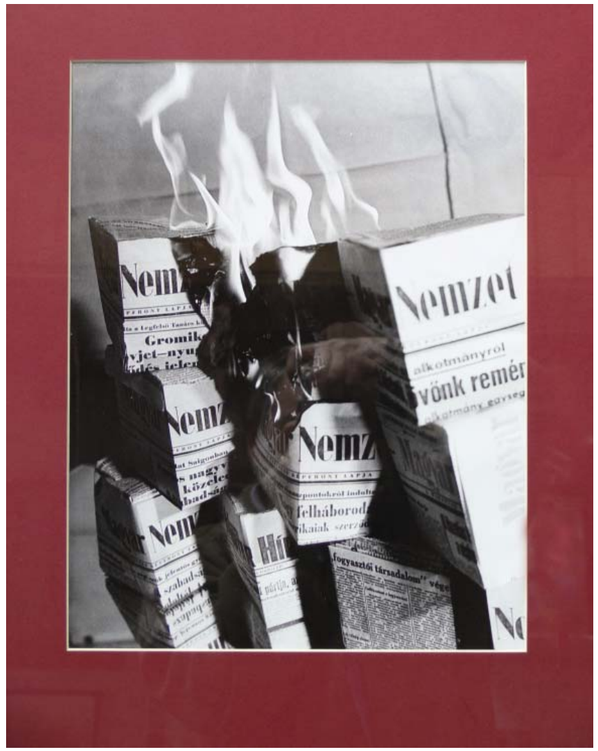
This schyzophrenic house is the objectification of our scyzophrenic Central-European existence.

To prolong an arch of absurdity: I drew a frontier sign right across the middle of the house, framed it in red, and waited until a very fat man stopped by the front door, indicating that this was no photomontage, this was the absurdity of reality.

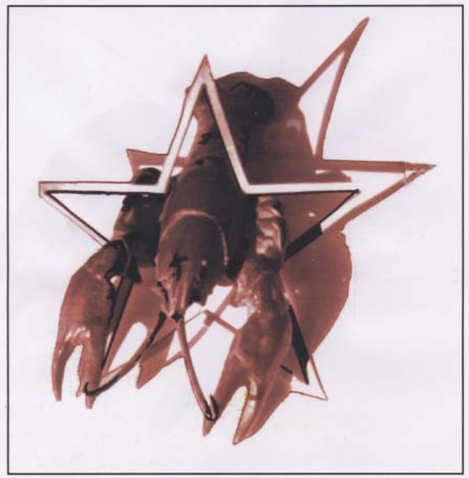
Ház.Közép Európa. XX.század második fele

**** Naplójegyzet (Pöstyén, 1973)***
Egy testvérpár örökölt egy közös házat/hazát. Az egyik testvér el akart tüntetni mindent, ami a közös házra (hazára) utalt: a timpanonokat, a klinker téglákat….Nem az a kérdés, hogy az egyik szebb, mint a másik, hanem az, hogy hamis, s a lebontott valóság mit kíván eltakarni?.
Ez a tudathasadásos ház tudathasadásos közép-európai létünk tárgyiasítása.
Az abszurdítás ívét folytatandó: a ház közepénél berajzoltam az országhatár jelzést, betettem egy vörös keretbe, s megvártam, hogy egy kövér ember az ajtó elé érjen, ezzel is jelezve, hogy ez nem egy fotó montázs, a valóság ilyen abszurd.

"A House. Central Europe. Second part of the 20th Century" 1973



In Unity there is Strength, 1970.



The Double Symbol of Progress

Force and Equilibrium

Attila Csáji

Painter (born 1939, Szepsi),
full member of the Hungarian Academy of Artists

He comes from the Highlands presently part of Slovakia. He and his family were forcibly re-settled from Kassa to Budapest after WWII. He spent a year in Holland as a child. From the mid-60s he painted plastic pictures to be interpreted with light *(Messages, Sign-Grids, Calligraphies,* and *Monochromatic Pictures*). Metallic colours and a plastic quality were prevalent in his works. In his painted reliefs emerging from a borderland of chaos and order his main concern was the peculiar orderliness and dynamics of material structures.

In the 60s and 70s, he set out to organise the new Hungarian Avant-garde (SZÜRENON series of shows in Poland and Yugoslavia, "R" exhibition, shows in the Balatonboglár Chapel, etc.) He made a major contribution to a process of fresh spirit in the arts, a process whose after-effects can be felt even today.

In the mid-70s, aided by the Central Physics Research Institute in Budapest, he started to explore the pictorial possibilities provided by laser light. His associate has been Norbert Kroó, the noted physicist. Recognising his achievements as a light artist, he was elected a member of the Center for Advanced Visual Studies (CAVS) of Massachusetts Institute of Technology (MIT). In 1987, while on a George Soros grant, he continued his light art research in Cambridge, Mass. and New York City. In the early 90s he gained the support of Interscience Technology (Los Angeles).

He organised a series of International Light Symposia (1993, 1996, 1999, 2001, 2003, 2005, and 2007). He founded the György Kepes Society, and within it, a self-sustained International Light Workshop.

Since the early 70s he has received many grants and invitations to participate at artists' workshops from Poland, Czechoslovakia, Italy, Denmark, France, the United States, Slovakia, and Holland.

After the political turnabout in 1989–1990, he was elected Chair of the Szinyei Society, the National Association of Hungarian Artists, and Curator for the Visual Arts of the National Cultural Fund. At present, he chairs the International György Kepes Society.

He has participated in 450 exhibitions including such internationally acclaimed ones as the ELECTRA 83 of the Paris Museum of Modern Art presenting artist-innovators of electricity. He was the only artist invited from Eastern-Europe at LICHTBLICKE (Film Museum, Frankfurt) where he first introduced the hologram as an artistic medium. He was a standard guest at shows organised by MIT/CAVS in the US. He attended the

György Kepes and Attila Csáji in Cambridge, Mass. In 1967.

The Media Lab of the Massachusetts Institute of Technology where Attila Csáji prepared his Light Calligraphies series.

Harriet Casdin Silver and Attila Csáji at latter's exhibition at CAVS/MIT-Cambridge,1988.

Attila Csáji, Paul Earls (MIT/CAVS-Cambridge), and Esa Laurema (Dimesio Gruope, Finland) at the I. International Light Symposium in the Kepes Museum of Eger, Hungary, 1996 where the International Kepes Society was formed.

Light and Space Exhibition at Tallin's Kunsthalle, a major encounter of technically-minded artists in the Baltic states. He was featured in the major 60s exhibition of the Hungarian National Gallery, in the "Beyond Art" show of the Budapest Ludwig Museum, and at the Copenhagen LUX EUROPAE 2002 show for light artists, etc.

He has presented many one-man shows including ones in the Adolf Fényes Gallery (1968), the Hungarian National Gallery (1977, 1960, 1983), Kassa's Jakobi Museum, MIT/CAVS (Cambridge, Mass.), the Hungarian Academy in Rome, Budapest Gallery, Dunaszerdahely's Contemporary Hungarian Gallery, etc.

In 1998, a monograph on his work was compiled from the writings of Lóránd Hegyi, Ottó Mezei, Ferenc Takács et al.

5 documentary films have been made about his art.

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„Nagy pajzs”, 1998.