To take possession of space is the first manifestation of life, of people and animals, plants and clouds... To prove one's existence means to master space.

—Le Corbusier

The spaces—outside and inside us—flow from one into another, and that moment is the highest gift...

—Shandor Veresh

LA SERING
LASER LIGHT AS ART • ART AS LASER LIGHT
BY DMITRY MIKHALEVSKY

THE CURRENT STATE

A completely new means of artistic expression rarely emerges. Coherent light began to be such a means in the early 1970s. In a short period of time, artists and technicians developed detailed techniques for the generation of dramatically new types of laser visual images and effects. Laser shows have since become a serious international business, and consumers' and manufacturers' markets have been formed. Laser light effects are most advanced in the USA, where up to three dozen firms specialize in laser light show design, equipment production, and promotion.

Laser light effects are now being used to solve artistic problems for stage, television, rock shows, advertisements, and exhibitions, both indoors and in the open air. They are used as decorative elements or as pieces of art. Laser effects form the base for new types of shows, such as those outdoors, where buildings or clouds are used as projection surfaces. Shows of light set to music held in planetariums—"Laseriums"—continue to be popular all over the world.

But the pragmatic, commercially oriented style typical of show business restricts the artistic progress of laser light effects. A new artistic form has been born, but the full potential artistic possibilities of the method are yet to be revealed. Serious genres still do not consider laser light more than special effects. Theatre avoids it. And those in the laser show business feel this sentiment better than anybody else. That is why Ivan Dryer, the creator of Laserium and the president of the International Laser Display Association, expressed a belief that, "We don't get enough respect in the marketplace—laser effects are usually lowest on the producer's list... Some of our clients often do not consider "laser people" to occupy a lofty position in their vendor hierarchy..."

Laser light effects have not been really artistically assimilated, demonstrated by the fact that even now there are no definite boundaries to the sphere, and it remains nameless. Each laser light
PREFACE

When a new result is reached, a new phenomenon is discovered, we try to identify its position within the existing context, to attach it to the old coordinate system. Sometimes it takes time to find these correlations and, until then, this result, this phenomenon, seems to be falling out, and it becomes something revolutionary and new that has no connection with tradition. When this happens, the only form of connection is opposition to that which exists. The new result gets isolated and starts being an object of different sorts of speculations—some deliberate, some unconscious, but all, in any case, unprofessional—that impede its further development. This happens because there exists a lack of vision of the number of coordinates or dimensions under consideration. But even the most revolutionary discoveries are, in fact, nothing but links in the chain of knowledge.

Light visual effects have flourished on the edge of high technology experimentation for many years. From the physics laboratory they splashed out onto the stage. Born as a revolutionary new genre of entertainment, they broke through into a new dimension of visual art. Up until now, this area has accumulated significant practical experience, achieved certain results, and developed a technical basis of its own, but it has somehow become self-enveloped.

A complex analysis of the contemporary situation of laser light, its position in the context of traditional arts development, and the deepest general cultural tendencies is needed to guarantee its further practical development. Only such a weighted approach to the problem will allow the full potential of the method to be realized in an optimum way. This approach will also help to form a new perspective, under which previous approaches to traditional arts study may be seen in a new light, revised and enriched providing an opportunity to interpret old facts in a new way and to find new links.

—Dmitry Mikhailovsky

Excellent pieces of art are the essence of their form, which was born before them.

—Paul Valery

The effect that has been developed exists as if by itself and methodologically remains in a class with no specific generic designation. Contemporary laser terminology is based on particular characteristics and does not reflect the inner essence of the phenomena. This situation is the result of a failure to approach the problem systematically.

Popular names, such as "laser art" or "coherent optical art," claim the existence of a revolutionary new art long before it has assumed such a status. Parallels between the development of "laser art" and other technical arts now considered to be traditional are taken as a given. But comparison of these spheres reveals a dramatic difference. For other technical arts—such as photography, film and TV—despite individual differences, the following relationship exists: "Each rather well-developed information communication system, as its structure increases in complexity, has the tendency to enrich its own aesthetic potential and to develop from a means of delivery of art into a form of artistic cognition and expression." 2

History demonstrates that this process of development has always been complex and contradictory. When first designed, photography, cinema, and TV were considered mere novelties. Little by little, as the technical quality of image transmission improved, they overcame the absence of an artistic tradition through imitation of the traditional fine arts, and began to form their own language of aesthetic expression. At what point does a form of data communication become an art? When does this phase change take place and creative activity acquire aesthetic content?

A. Leontyev, an outstanding Russian psychologist, in his brief but deep analysis of the functions of art, came to a conclusion that it is the only activity to answer "the problem of discovering, expressing, and communicating the person's sense of reality." 1 An unconscious necessity to share this "sense of reality" with others drives an artist to create and makes this sense the essential content of any work of art; the author's message to his public. This "person's sense of reality" cannot be delivered through any other form of communication. Leontyev thought the "discovery of life" to be the central goal of art.

The artist's message reaches its audience enveloped in an outer form of the work of art. The audience has to decode it through their own interpretation of what they may perceive—what they see or hear. This process has been analyzed by many authors, but Leontyev considered the process of "penetration through the meaning" of the artistic outer form to be the primary content of aesthetic activity. He wrote: "One should get rid of the indifference of the meaning, should go through it, and here, naturally, the activity gains the character of a struggle, a collision, of wrecking this, maintaining that, and thus the dynamics which used to be the dynamics of the inner life of consciousness and its drama are reproduced by the aesthetic activity in its product, crystallizing and accumulating in it." 3

This means that any method of visual image production, reproduction, or data delivery to the audience (if we consider the visual form of information as communication) becomes an artistic form when it presents a certain technology of image creation developed and versatile enough for an artist to express his personal sense of life; to contain and deliver it to the audience; and for the audience to be able to understand it—to receive the artist's message at a level other than the level of data. But on both ends of this connection, the technology should guarantee an ability to go through the meaning of the visual image proper, thus rejecting that which was the very first goal and has to be the very essence of the information communication technique.

In summary: Data communication becomes an art when physically communicated data turns from an object of communication into a means of communication of a person's sense of reality. Thus the partial description of life is substituted by the "discovery" of life as a whole. Information of a higher level is communicated through the same channel and the recipient gets data in considerably larger amounts and more connected volumes. This is a good example of how quantity development leads to a new quality.

For laser-light effects—unlike photography, cinema, and TV—the path from the physics laboratory to the artist's workshop was short. That means that laser light visual effects from the very beginning had this "new quality" that put them into a special separate group.

The laser light effects could not play a role in any sort communication system in a traditional way, since laser image generation technique of that time was primitive. At first, artists used nothing but narrow laser output beams. The main scenic method was the demonstration of volume (which the viewer did not pay any
attention to before), its “visualization,” the “materialization” of stage space, and the act of space reorganization. Later, other laser light effects were added to develop this method of working with space. Though this method was absolutely new, artists, directors, scenographers, and audience members immediately understood and accepted its artistic convention.

What should we call this new artistic phenomena? What should be the generic designation for laser light effects? This issue is not another word game but the serious identification of the new field of activity, its real role, and its connection with existing practice.

Ivan Dryer considers that “the foremost among the terms, and the guiding philosophy of our approach, was ‘choreography’; we have always considered our craft a ‘ballet of light’ in which soloists and the supporting corps de ballet perform various movements and transformations in a visual realization to music.” And consequently he trademarked the term “ChoreoGRAPHICS.” If we look at the semantics of this word, it means the “dancing graphics.” But neither of these words reveals the true artistic convention of the method, or addresses the basics of its technology. How may one know that “graphics” in this case means “laser graphics” and includes all the variety of laser visual effects? These terms appeal more to a certain genre of a show; they perfectly describe Laserium but not the method with which it is produced. One should keep in mind that laser visual images may be demonstrated without music and may have more than the artistic application. But still, in any case, the method of their generation will be the same and should have the same name.

Then why not “Laser Art” or “Coherent Optical Art”? These terms are being used rather often. But can one imagine painting described as “Paint Art” or “Oil-Paint-Brush Art”? How can the name of a method contain such a categorical claim that the result will be of artistic value? That should be the prerogative of the audience to which the work is addressed, and of the critics. A new term is needed, one that will name the method and be connected to the very essence of all the effects which constitute it.

Let’s look at the traditional arts as an example. Painting is a class of visual art, pieces of which are created by an artist—in the process of painting. Painting is the process of putting paint on a canvas or some other surface.

In our case, the artist works with laser light. The term “light painting” is used sometimes, but it is not really painting with light. Besides the difference in techniques, the term “painting” refers to a definite set of artistic conventions. “Lighting” also has some rather concrete meanings—here arise the terminological problems of lighting designers, who have to call their product “artistic lighting,” or “lighting scenography.” When we refer to the creation of lighting effects based on the fundamental physical parameters and visual characteristics of coherent light, it may be “coherent lighting.”

Another approach is demonstrated by the modern words derivative from the device—the object of the activity: yachting, cycling, computing, for example. And in this case the most accurate name for the method of laser light effects generation is “lasering”—the process of operating with laser irradiation to obtain specific visual images.

Just as with “painting,” for example, the term “lasering” does not ensure that the result will be a work of art. But if it is, then the product has a very special sort of artistic convention connected with the phenomena of Space. Lasering can become the Art of Lasering after it realizes in practice certain artistic content through its artistic conventions. This will entail an essential change in the equipment in order to transform it from a generator of special effects into a means of artistic expression.

Music is beautiful because of its transparency, poetry because of its reflectivity. Light implies the first, and is implied by the second.

—Paul Valery

THE ABC BOOK OF LASERING

First of all, let us outline the major types of laser visual images and effects.

SPACE BEAM ARCHITECTURE (SBA), the first laser-light effect to be used on stage, is the combination of stationary and/or movable laser beams with surfaces and tunnels built in space. Even one beam can produce a strong effect of volume visualization, giving the spectator a feeling of space which he did not previously perceive. Though simple, this effect may give quite a new dimension to a performance.

COMPUTER LASER GRAPHICS (CLG) are images built using the vector method of deflecting a laser light beam with a computer-driven scanner system. CLG look like a contour drawing done with a single line, as if by the stroke of a pen. This is the only representational technique in the repertoire of laser effects. CLG make it possible to build both single pictures and logos, pieces of animation, decorative images such as Lissajous figures, and light-to-music compositions, as well as representing text information with “letterline.”

Two points should be made about the visual parameters of CLG. First, they are too simple to be of value in traditional information systems, because of scanner frequency band limitations. Second, laser line contour is so bright that CLG images appear somehow detached from the screen, and produce the illusion of floating in the space (especially when the spaciousness of this visual image is produced by 3-D computer design or by its physical nature, as in the case of Lissajous). The technical base of CLG is most complicated and requires the most advanced software. From a technological point of view CLG has the great advantage of providing an opportunity to verify a visual program utilizing opportunities of the same hardware and software.

INTERFERENCE STRUCTURES (IS) are non-representational, abstract images projected onto a screen by use of a laser beam that passes through a transparent substance containing optical inhomogeneities. In dynamics they produce a strong illusion of space.

The characteristics of IS are revealed even with the simplest laser effects generator, and so they were the second effect, after SBA, to be used in artistic practice. Today, they continue to be the background for most laser-show programs.

IS are not only visually interesting, but actively captivate the spectator and exhibit almost hypnotic powers. In the beginning of the 1980s, a series of experiments was carried out in the field of perception psychology, and IS were found to be the most complex artificial images, characterized by a complexity of outline and a highly developed inner structure. That inner structure presents a system of planes, each built of elements of a different scale, that is organized in depth. The number of planes in depth approaches the limit which can be humanly perceived at once. This gives the eye of the spectator the possibility of moving from one element to the other and from one scale to the other gradually, without discontinuities or abrupt “changes.” On the
other hand, IS are characterized by a certain balance between the unexpectedness of the initial form and the predictability of its transformation, their nonaccidental, non-casual connection. This connection is due to the fact that IS images are mathematically rigorous representations of a single volume of a physical body. The above mentioned structuring of IS produces a sort of “capturing” and “retaining of attention.”

The influence of laser light images on the spectator is so strong that there occurs a sort of identification. In the strange, unknown space of IS, the spectator seems to watch his own subconscious, which was previously closed to him—outer space meets inner space. Herman Hesse described this state as a result of watching complex natural forms:

The surrender to odd, irrational forms in nature produces in us a sense of harmony of our inner being with the will which has been responsible for these shapes. Soon we become aware of the temptation to think of them as being our own moods, our own creations; we see the boundaries between ourselves and nature quiver and dissolve, and we become acquainted with the state of mind when we are unable to decide whether the lineaments of our body result from impressions received from outside or from within us. In no other practice is it so simple to discover how creative we are and to what extent our souls participate in the continuous creation of the world…

There are some other types of laser light effects, but they are rarely used and we will not consider them here, especially as they may add nothing to the study of artistic convention of lasering.

Now let us have a look at a laser show as a piece that may be produced as a combination of these effects. Here we need to make an analysis of some basic concepts. To be precise, we need to form perspectives of these concepts through results attained by different areas of knowledge. These areas use different terminology. We would not try to introduce new jargon or develop a universal language, but it is necessary to point out the “terminological” problem to avoid misunderstanding. For example, such terms as “spaces” and “dimensions,” which in the following context will have the same meaning, will be used in parallel with each other.

Any work of art has a multileveled structure to carry out its main function—to communicate to the audience the message from the artist, his “personal experience of life.” In this structure three levels may be defined—representation, expressiveness, and sense—that create a certain unity. They also may be looked upon as different “spaces” or “dimensions” of the work of art given. The level of representation is formed by data communicated physically—the outer artistic form. The level of expressiveness contains information physically present in the work of art in the form of minor aberrations of the original image that are produced by the artist consciously or unconsciously to form the “feeling,” the emotional content of his work. The level of sense contains the author’s message to his audience. If we look upon a work of art as a separate file, the level of representation should be considered as a cover, a shield that may be physically delivered to a recipient. The level of sense is the inner content that may not exist without being attached to some outer form. And it is the level of expressiveness, that belongs to the outer form, that attaches the inner content to the shield.

Content, existing subtly in a work of art, is not and cannot be depicted on the representational level. Much of that which is hidden—the author’s message, which determines the degree of artistry of a work and which provides the communication of the “personal experience”—is expressed through the visual. The transition from the representational level to the level of meaning occurs when the peripient forms a certain “hypothesis,” revealing the contents of the work. Here mechanisms of indirect indication, hints, symbols, associations, and so on present in the representational level are activated.

The levels of a piece of art may be considered its “inner dimensions.” The audience deals with all of the aforementioned levels. But there may be many more of them, and the depth at which they are hidden determines the artistic potency. The “deeper” the piece of art, the more levels it should contain. The hint of a new dimension gives rise to fascination; but this new dimension, once “caught” should be formalized immediately. Each new level in this mechanism is perceived as containing sense and the previous one that provided the hint turns into a level of expressiveness.

As any work of art conveys a transference from one level, from one dimension, from one space into another, it may be considered as a “transformer of spaces (or dimensions, or levels).” From the point of view of psychology, the process of perception of any work of art is a continuous rise in the number of dimensions. From the perspective of aesthetics, it is the penetration through the meaning of one level to a higher sense, contained on another “deeper” level. From the point of view of information communication theory, each level or dimension gives a substantial rise to the amount of information being transferred. In any case, going deeper into the work of art is the way up the stairway of abstraction, the further distancing from the primary source of the information of the surface level of representation. “On reaching the higher and more abstract levels, human cognition envelopes the larger areas of reality.... In the movement along this stairway lies the source of creative thinking, that is the basis of the procedures, through which a man may create new knowledge. In this form human intellect finds its highest expression.”

The new knowledge is being developed by the audience in the space of the author’s life experience. The viewer’s interpretation of the sign system on the level of expressiveness, existing against the background of the representational image, creates the set of all possible meanings. The process of perception is realized through the spectator’s particular “trip” in this space. While trying to follow the path suggested by the author, the audience analyses its own “personal experience.” This inner “discussion” of possible ways to continue in this space, and the examination of the author’s development of the themes, creates the dialogue between the author and the audience. As a result of this co-creation which determines the success of the work, the audience should finish the trip at the point intended by the author. The artistic problem is how to bring each audience member to that point without restricting his or her freedom of interpretation, or depriving the work of subtlety. It is this problem which determines the demands placed on the informativeness of the sign system.

The language of hints should be developed with the intent of keeping the audience’s interpretations in the channel desired by the author, rather than allowing the audience to form interpretations which have nothing in common with the plot. The hints should be concrete enough to reveal the plot, but they should not be too easily read, too direct as to deprive the audience of certain freedoms. The objective rather is to stimulate co-creation, as opposed to simple consumption of the material, which is the function of educational programs and text-books, for example.

In traditional arts or means of communication, the pointers are placed on the representational basis of visual images. In a
laser show, it is vice-versa—the signs are placed on the non-representsational basis of the IS. In this case the role of the signs, the pointers, is played by CLG. So the level of CLG visual complexity is not a high priority. They should be easily read and not distract attention from the IS. Therefore, the relative simplicity of CLG images should not be considered a shortcoming, but rather an artistic convention. The main volume of information in a laser show is transmitted through IS, which act as a powerful, non-traditional channel of expressive information, perceived by the spectator on an emotional level. The CLG symbols give content to this information. CLG images do not differ from IS in visual quality, so there exists an organic affinity, a sort of visual unity, of the whole visual image. The problem, then, is to organize corresponding unity on the hardware-software level.

Two approaches to laser show design based on visual specifics of laser images may be outlined. First and most popular, close to the “effect nature” of the new phenomena, is the meditative character achieved when a laser show program accompanies music. In this case music fills the laser images with sense. The second case should demand that a laser show have dramatic content of its own.

A laser show, like any other piece of art, should provide a sort of “temptation,” without which the rise of aesthetic feeling is impossible. The show should commit this excitement, this new thirst. Only thus will it capture and involve spectators. Richness on the representational level feeds the spectator’s interest at the very beginning, and it should be followed by richness on the other levels in order to maintain dialogue between the author and the spectator. The individual’s level of attention to a show, as with any other form of art, is guaranteed by interest in the visual image, and by its potency.

The show should give rise first of all to the thirst for the show itself, the desire to see and to feel. However, though effects for effect’s sake may be the essence of rock or variety shows, dazzling with their unexpectant and pleasing the eye with their fancifulness, they are an anathema for dramatic production. The dramatic performance influences the spectator first of all on the level of imagery. Dramatic connections should be complicated and delicate. In entertainment shows, the accent is placed on representation, in dramatic production on imagery. The laser show designed for rock and variety shows should be oriented toward the number of effects possible. But for the theatre, the dominant factor should be the possibility for transformation within one or a few effects.

New arts emerge when artistic conventions are born. That means that there develops a separation between data physically transferred and information of a higher level communicated through that data. The artistic convention corresponds to a certain technique of image production. These levels should be clearly separated and belong to different spaces, otherwise there will be no artistic convention. Artistic convention presupposes a breakthrough to a new space, to a new dimension: a picture drawn on canvas should depict a spacious landscape, and sculpture of a human body should be materialized in “cold stone.”

One should not confuse CLG with laser TV, in which the picture’s main obligation is to duplicate the original image. The modern level of technological development allows for the possibility of visual images with a strong illusion of reality, but to use that sort of illusion turns a show into a mere spectacle. The garbage of artistic convention kills the form, and with it, the aesthetic content.

Laser is the method in which space itself functions as the means of information delivery. The unique characteristic of laser visual images give opportunity to reflect, to visualize the personal inner state, the personal inner space through representation of abstract non-imagery spaces. And this is the artistic convention of lasering as an artistic method. Laser visual images directly address the depths of the psyche of the spectator, the subconscious and the archetypes hidden in the mind. This is a creative method operating with imagery on large scales, compared to the existing artistic forms, and from that point of view it may be compared to ancient myths.

The best in the new is that which corresponds to the old’s intention.

—Paul Valery

SCENIC TRADITION IN LASER LIGHT

There is nothing new under the sun. The fact that laser effects became so popular in such a short period of time is the natural result of one of the main developments of culture in general and of the art of modern theatre in particular—the use of Space as a communication phenomena, as a means of internal landscape visual representation. Lasering is the method which, with the use of modern high-technology, realizes the tradition of the theatrical scenery discovered by Adolphe Appia and Gordon Craig. But to trace its roots we have to go even deeper into theatre history.

Theatre gained its modern form and means of expression during the Renaissance, the period in which human beings acquired new values. Renaissance culture was characterized by a strengthening of visual tendencies and a new interpretation of Space. While painters learned to model the outer form—the world around a person—and then to represent his inner world, Shakespeare eschewed the cultural tendency to reinforce the visual principle and instead displayed the “drama of man’s spirit,” through the non-representational approach. Just as in the canvases of his painter contemporaries, or even anticipating them, the function of Space assumed new meaning in the Globe Theatre: Space was transformed from an object of reflection into a means of reflection of the inner world of an individual character—the protagonist of a tragedy. Shakespeare brought to life the “magic of scenic metamorphosis” and began to freely manipulate Space and Time. These transformations were carried out in a subtle way—in the imagination of the audience, who, together with the artists, easily accepted this new artistic convention. Shakespeare, while staying close to the sources of the new visual Renaissance culture, could return to the more simple, rhetorical form, and so managed to overcome the imperfections of Renaissance scenography and attain the artistic (and cultural as a whole) goal of his century: to deliver to his audience larger amounts of information corresponding to the genre of high tragedy, and to turn dynamic space into the means of artist’s message carrier.

Painting, which influenced the development of the Renaissance theatre, was far along in that direction already. Dynamic space, through light modulations, appeared in canvases and reached the highest artistic level in the works of Rembrandt—“the Director, Who Did Not Need Words,” as Craig called him. But theatre itself stayed “frozen” with the conventions of Renaissance representational tradition. The bondage of the inevitable perspective scenery and the lighting designed to strengthen the visual illusion dominated the theatre up to the twentieth century. As a result, theatre as a “visual art” was incapable of properly staging Shakespeare’s masterpieces. To represent the inner drama of Shakespeare’s tragic characters, a new visual language was needed.
At the turn of the century, that language was discovered by Adolphe Appia and Gordon Craig. The key was the same as in the Globe—the Space—but this time the emphasis was visual. Up to that time world culture had accumulated considerable space-kinetic potential. It was materialized by architecture—at that time the leader in mastering Space among other art forms, in such masterpieces as the Eiffel Tower in Paris and the Crystal Palace in London for example. Craig fused that modern tendency together with his interest in oriental philosophy and meditation techniques into a revolutionary new method of scenic space formation, one which used non-representational, transformable scenery utilizing architectural forms and dynamic light.

Gordon Craig predicted that his discovery would be realized in practice in 80 years. And now many artistic designers and scenographers are attempting to carry out the realization of his principles. One of the most successful has been Josef Svoboda, who in 1970 staged Mozart’s The Magic Flute in the Munich National Theatre using dynamic laser light images as a scenery.

In the last decade, artistic forms of greater quality have developed. They work according to the following formula: “super sound plus super light.” Rock shows, discos, and variety shows were the first in this line. The high technological level reached in both the musical art and the lighting design and the equally high level of artistic professionalism insured the quality of the artistic forms that existed, and helped to create new ones.

Today, people go to a concert or a disco not only to hear, but also to see. To hear music with high-quality reproduction, one need not leave the home; one can stay in the most comfortable conditions with a minimum of disturbing factors. People do go to concerts and discos. They gather together for a communal emotional experience, both with each other and with their idols. In this situation, the spectators become co-authors of the emotional state, creating the audience-show as a single organism. Here, the psychological mechanisms of the rock show connect to the discoveries of theatre.

It was in 1915 that, having seen Craig and Stanislavsky’s 1911 staging of Hamlet in the Moscow Arts Theatre, Leo Vigotsky formulated “The Central Law of Tragedy.” He stated with scientific precision: “...Tragedy adds unity to our feeling, making it all times accompany the protagonist, and then to perceive all the rest through the protagonist.... All the characters...of the tragedy are depicted as seen by Hamlet. All the events are refracted through the prism of his soul, and so the spectator contemplates the tragedy in two planes: on the one hand he sees everything with Hamlet’s eyes, on the other side, he sees Hamlet with his own eyes. So that every spectator is simultaneously Hamlet and his contemplator.”

It is that principle on which Gordon Craig’s scenery was based. He filled the scenic space with dynamic architectural forms in order to make it express the inner world of one man: the protagonist.

At concerts and discos, the visitor is not a passive spectator, but is an active participant in the action, identifying himself with the performers on stage. The surroundings in this situation should not only build the inner state, but should also reflect it. The main scenographic method is the use of volume, the visualization of the space. Each member of the audience should feel involved. In a disco, the visitors bathe in a space brought to life by sound and light, and they are dissolved in it—this is the main appeal of a disco show.

The problem is how to realize these phenomena in a theatrical context. Up to now, the problem has been unsolvable. It was certainly unsolvable at the turn of the century. Having failed in his attempt to stage Hamlet according to the ideas of Gordon Craig, Stanislavsky wrote:

What a great distance between the beautiful, light, scenic idea of an artist or a director and its real scenic realization! How rude all the existent means of scenic realization! How primitive, naive, and insignificant scenic technique is! Why is (the) human mind so creative when dealing with the means for murdering another man in war, or with the petty comforts of daily life? Why are the same mechanics so crude and primitive when man seeks to give satisfaction not to bodily or beastly needs, but to his highest aspirations, which come from the purest aesthetic depth of his soul? In this sphere, there is no inventiveness. Radio, electricity, all sorts of beams produce miracles everywhere, but not in the theatre, where they could find absolutely beautiful applications, and force from the stage forever disgusting glue and colored cardboard. Such beams could light the human body, and give the outline the vagueness, immateriality, and illusiveness which we know in our dreams and without which it’s so difficult to fly high and away. Then, with a hardly-seen ghost of death we could carry out Craig’s interpretation of “To Be Or Not To Be” scene. Then it will be possible to have original pictorial and philosophical interpretations. But with the traditional theatrical means, the interpretation offered by Craig looked from the stage like a director’s gag, and for the hundredth time, I was convinced of the helplessness and rudeness of spectacular theatrical means."

The future of lasering is in the roots, in the tradition, in the practical realization of the ideas of those theatrical directors who were looking for a new scenic language nearly a century ago.

To use lasering for the realization of Gordon Craig’s ideas for the staging of Shakespeare’s drama is very tempting and should be a real challenge to the many theatre directors and artists still possessing a Renaissance mentality. Unfortunately there exists a widely held opinion that laser light’s texture and laser images’ visual characteristics are alien to theatre scenography, and may be used only for limited effects. Lasering is considered good enough for rock and variety shows, but not for the theatre. This point of view is due to a lack of knowledge about lasering’s real potential and an inability to overcome a stereotyped way of thinking. But practice assures me that staging high drama may fully demonstrate the possibilities, not only of lasering, but of the very art of the theatre. To reach this goal, the conceptual approach to staging should be revised.

Lasering will breathe new life into Craig’s scenography forms, giving the scenic action new dynamics. Action may be easily formed parallel to that which is on stage. Freedom in choosing and transforming the images unreachable with traditional means of theatrical expression may make possible Craig’s dream of a scene with a “dynamic face.” Together with projections and effects, the artistic result may be fascinating.

It is easy to imagine a scenic design using IS not only as a decorative background but to actively reveal the inner state of the protagonist. Together with CLG signs, it will visually represent his inner view of events. CLG’s flowing, laser light lines may outline elements of architectural forms bit by bit, and give the spectator a sense of jewel-like precision. CLG may be very effective at producing the ghost of Hamlet’s father, or creating the image of Death.... The description of concrete scenic designs using lasering is beyond the limits of this paper, but what has been said should be enough to give one the idea of techniques for lasering as the basis of a dramatic theatre performance.
Music is an arithmetical exercise of the soul, which enumerates itself without knowing it.

—G. B. Leibnitz

How can one say
What does it mean a Heart?
Noise of a pine-tree
At sunrise.

—Ikkyu

APPROACH TO IMPLEMENTATION DESIGN

The instrument for lasering is the Laser Light Show System (LLSS). It is the tool for a creative artist, the brush of a laserist, and its expressive possibilities determine, to a large extent, the final result presented to the audience at the performance.

The production of the means of artistic activity is a very special problem. In this process, a device should be produced to operate according to the laws of the technical sphere, but when an artist starts using it, the result of its operation should answer the laws of that area—artistic. The instrument maker should know how to connect these two spheres, distant and often contradictory, and how to unite their laws in a way which will provide the artist with creative possibilities. Thus, the instrument maker is a key person in the creation of the work of art and his understanding of the subject is of major importance. It is quite clear to almost everybody what a brush is. And most schools teach what a camera is. But though the construction of the printing machine Albrecht Durer used may be quite clear to a schoolboy of today, it was not so centuries ago. And the more complex the instrument, the more important the role of instrument maker.

The real problem is that, because the LLSS is so complicated and its design creates so many technical problems, it is easy to lose the sense of the main problem—the design of the show program and the design of the technique needed to produce the show. The results of forgetting either set of problems may be seen clearly in practice.

On the one side there are technicians, who, because of their inexperience in arts, think that all that is needed for success are good enough specs. But the real problem is in the very act of formalization of artistic demands in technical terms, acting as a sort of “modem” between the artistic sphere and the technical sphere.

Going too far in the direction of technology results in technique for technique’s sake, and the artistic practice gets devices which were designed exclusively from a technical perspective, not an artistic one. In this case, artists using an LLSS have to work within the parameters set by technicians, and the visitor to a laser show has no reaction but surprise at the technological wizardry.

Technicians present the result of their design as an “instrument” that should be used by the artists, who are the last to decide how to use it. The technicians have done all that they could. But how could they know what is needed? They have the illusion that the more technically complicated the instrument, the better. But it is fair to say that today the technology of productions is often so complicated that it imposes stricter limits on quality than do the technical parameters of components, a scanner’s frequency band for example.

On the other side are artists, who rightly cannot accept shows using devices built solely on technical principals, and who begin to experiment with laser-light themselves. However, their lack of technical knowledge and experience places insurmountable obstacles in their way, and their attempts lead to crude simplifications of the technique of the instrument. It is the results of these experiments that are presented as pieces of art—“laser,” “coherent-optical,” and so forth—but regardless of the name, the artistic quality is questionable.

Both of the above examples have in common a one-sided approach to the problem, and share a lack of professional competence. That is why in both cases the artistic results cannot be satisfactory. Attempts to form a designer’s group by bringing traditional artists and engineers together are also unsatisfactory, but the objective remains—to find an optimum level of technical complexity and artistic variability.

The representatives of traditional art cannot formulate specs for a LLSS because the new technique must provide a new kind of artistic result. Traditional artists’ dreams about the future of laser light effects may have little in common with the real possibilities of a LLSS.

The problem is that, since the LLSS is a new medium, it has no tradition of design. Today a LLSS cannot be made as universal as cameras. Professional levels of quality cannot be reached through non-professional work except by luck.

The method of designing musical instruments suggests the best solution to the problem. The idea of a technician to formulate specs for a musical instrument would be considered absurd. A technical person would not be able to answer any of the following questions: How could musicians play such an instrument? What would be the after-effect for an artist and for the listeners? And for the music? These are all questions which only the artist can answer. But a musician cannot start building an instrument for himself!

For centuries musical instruments were made by masters who held a special position in the world of the arts. And nowadays, the most progressive firms working in light show technique productions employ this tradition.

The solution is not to be found either in technology, nor in the realm of art without technology, but by a union of art and technology. The characteristics of the system as a whole cannot be found in any single element, but will be only revealed by a systematic approach. A complex, systematic, and truly methodological approach to the design of a LLSS seems to be the only acceptable route. This is the only approach which gives the possibility of building a family of units, starting from the highest level, followed by lower levels derived from the top one, which allow for the artistic articulation without the loss of the main concept. The work of revealing the aesthetic potential of the LLSS should be carried out on the basis of art criticism and analysis, and should attempt to show the cultural traditions of the new method in directions marked by clear artistic reference points.

If this does not happen, a technique which restrains the development of the artistic ideas might appear, or the artist’s wishes may have no way to be realized in practice. In either case, there is a strong possibility of the method becoming discredited.

The production of a closed autonomous system of laser effects projection will limit the method’s possibilities, as well as prevent compatibility with theatre and stage technique. The result will be that the LLSS will lose their potential ability to solve new problems. The consequences of such an approach are clearly seen with the current equipment and its use which led to the present crisis in this sphere.

To answer the level of modern demands, the LLSS needs to be organized as an open computerized network, with the potential to include all lighting effects and other equipment needed
for the performance, all controlled from a central console. The production of such a show needs to be done in a specialized studio, equipped with an artist-oriented technique. The analogy of the LP recording sound studio may be of some value here.

Only this combination of close artistic and technical design, supported by special organized activity, will open the way for the future development of lasering.

*With faint wind, there is little harmony, with strong wind there is a great harmony. But once the whirlwind subsides, all the openings become quiet. Is this not how the trees are swinging and singing under the wind?*

—Chung-Tse

**CONCLUSIONS**

In the past 20 years, laser light effects have reached a high level of popularity and technological development, but their artistic possibilities still remain to be revealed. There can be no real "laser art" until lasering is understood, not in its current ghetto of novelty, as a new isolated visual form, but a new method of artistic expression, requiring correct identification of its place in the world of art. The generic name that outlines the class of laser visual effects as a whole is considered to be "lasering."

Lasering answers the most complicated demands of modern scenery. Laser visual effects are not only interesting to look at, but actively captivate the spectator. This unique characteristic is so strong that very soon the spectator starts to identify his inner state with these images.

Though of new character, lasering lies in the mainstream of theatre art development. Its coming was anticipated, making it easy for the artists and the audience to get used to this new language of artistic expression. Lasering is the method which, with the use of modern high technology, realizes the principle of theatrical scenography design discovered by Adolphe Appia and Gordon Craig. The key parameter in that link is spaciousness, the characteristic shared by all laser light effects.

The development of space concept is one of the driving forces of civilization. One may see easily how is has pulsed through the different forms of human activity and arts throughout the centuries. Through space and time transformations, carried out in the imagination of the audience, the "drama of the human spirit" was first presented in theatre by Shakespeare. For the first time in world culture dynamic space was used as a carrier to communicate the author's personal life experience to the audience. Shakespeare succeeded with such skill and power and put in such a huge amount of information that properly staging his masterpieces was a goal unattainable for the Renaissance theatre. To answer that principle in visual form, Gordon Craig, who belonged to another cultural era, invented the "stage with a million faces"—a scenographic method, meditative in nature, based on the reflection of the inner state of the protagonist by means of space visualized with dynamic architectural forms and lighting.

The same mechanism can be seen in rock and variety shows and in discos. To a certain extent, these genres are more active in bringing to life the theatrical principles of presentation through space operation than theatre itself. Laser images have not yet been incorporated into theatrical performance, where their presence is limited to special effects. The real future of lasering is connected with its active involvement in staging high drama. The other possibility is the production of top quality light-to-music performances. In any case, lasering should answer the demands of very deep and subtle, highly nuanced shows.

Nowadays one should not speak about a new form of "laser" art, but about a new method, an artistic technology utilizing laser irradiation for generating a new type of visual images. The products of lasering will gain real aesthetic quality only after their artistic conventions become a practical filling of space with deep dramatic content.

The artistic convention of lasering is of a very special type in comparison to the traditional arts: It is based on a direct correlation of those spaces outside and inside the human being, and it utilizes a mechanism that is close to meditation through visual images. The visual specifics of lasering allow it to address directly the depths of the psyche of the spectator, the subconscious and the archetypes hidden in his mind. This is a creative method operating with imagery and large scales, compared to the existing artistic forms. Lasering demonstrates new qualities appealing to a non-separated ancient type of culture and mythological thinking.

Gordon Craig's ideas symbolized the end of the Renaissance tradition in theatre art. Perhaps lasering is the high technology embodiment of a new artistic form that is to come.

To answer these demands the LLSS needs to reach new levels of quality and to be turned into an open computerized network with the possibility of taking in all sorts of equipment used in the performance. And very serious attention should be paid to creating a laser art studio to develop such performances.

Any one who chooses to develop lasering and LLSS design will come across serious problems, though these problems are not new. What is new is the level of complexity dictated by the necessity of a high quality final artistic result, which really could present a certain new step in world cultural development. Lasering lies on the crossroads of several spheres of human knowledge. Like different rays of light focused by a lens, it concentrates problems that were touched on by many brilliant minds at different times in art, physics, psychology, and philosophy. Many of them came to the understanding that these problems must be solved in close connection. Lasering—this new technical method of artistic expression—shows that in order to have progress in the future, it needs to be recognized in practice as a connecting point for all of them.

**DMITRY MIKHALEVSKY** is a leader in the field of high-tech scenery production in Russia and the president of a private Russian lighting equipment manufacturing company in St. Petersburg specializing in effects generation, holography, and lasers.

**Note:** All quotations, except from *Demian* by H. Hesse, were translated by the author from Russian. Special thanks to Elbin Cleveland for his assistance in the editing of this article.

**Endnotes**

4. Leonyev 237.
5. Leonyev 237.