

LIGHT SIDE OF DESIGN: PROFESSIONAL VECTOR

Elena A. Zaeva-Burdonskaya¹ and Yuri V. Nazarov²

¹ *Moscow State Stroganov Academy of Design
and Applied Arts (S.G. Stroganov MGHPA)*

² *National Design Institute, Moscow*
E-mail: lenartt@gmail.com

“The main enemy of knowledge is not ignorance, but the illusion of knowledge”
Stephen Hawking

ABSTRACT

This article addresses one of the most actively developing types of design activities – light design. The article comprises quotes of the leading Russian and foreign light design specialists published over the previous five years, as well as the authors’ own conclusions. The thoughts quoted in the article are sometimes opposite to each other and reflect the wide spectrum of professional practice. They reflect the initial opinions of analysts and experts which are often diverging. All of the specialists point at the interdisciplinary nature of the new profession, which imposes additional load on a designer overloaded enough already by the scope and speed of the problems being solved nowadays. The discussion of the new profession of light designer initiated on the pages of professional publications is especially important in view of the development of professional standards and standards of design and architectural education, as well as creation of new educational programmes based on various approaches to the subject in technical and humanitarian institutions. The goal of this article is to introduce light design into the field of fully legitimate sections of design culture, to define the authentic scientific basis of the new creative profession, to initiate a foundation for self-determination of the new synthetic area, which materially affects the state of the profession as a whole and the life standards of a wide variety of consumers. In order

to reach the set goal, a comparative and analytical method of study was selected, which allows studying the problem to a large extent and from all angles and finding the ways of overcoming the challenges emerging in the area of the new activity.

Keywords: light design, design culture, comfortable habitat, creative imagination, architectural illumination, illuminating forms, video mapping, light festival, light engineer, light designer, art devices of illumination, light architecture

1. INTRODUCTION

It is probably hard to find a design sphere, which has been developing with the same speed as the light design over the recent years, except the media design, which has been steadily developing by virtue of intensive advancement of technologies. That is why the goal of this article is to introduce light design into the field of fully legitimate sections of design culture, to define the authentic scientific basis of the new creative profession, to lay a foundation for emancipation of this new synthetic area which materially affects the state of the profession as a whole and the life standards of a wide variety of consumers. In order to reach the set goal, the comparative and analytical method of study is the most appropriate, as it allows studying the problem to a large extent and from all angles and finding the ways of overcoming the challenges emerging in the area of the new activity.

The rise of the new design profession is largely related to its multidisciplinary nature originating in engineering and technical, digital and design and cultural fields. The technical component has become the initiating force, which constantly fuels, transforms, advances and enriches the design and art sphere of light design occupying new areas, changing formats and developing art devices.

The God's phrase: "*Fiat Lux!*" ("Let there be light!") would always be an invisible component of any design action filling it with sacral mysticism. The ultimate priority faced by light designers places their idea in close quarters with the unparalleled act of the Lord. According to N.I. Shchepetkov: "appearing of light design and its development in industrially-developed countries is related to sufficiency of produced electrical energy, the progress of lighting devices and constant enhancement of life standards, among which visual comfort, informative value and art perfection of the created environment are playing an important role" [1].

Self-determination of the profession remains the most important problem of the industry. Experiencing certain responsibility for the fate of the new profession, D.N. Makarov notes: "...to define the border between functional illumination designed by a light engineer and light design remains a complex and diverging problem... Who is a light designer? Is this term based on deep engineering education with addition of architectural and/or design ones or vice versa?" [2].

The discussion determining the borders of the term "light design" involves also the objects created by means of light technologies, the works of "light art" and functional light design. If we go by different art and technological factors, the problem of search for the uniform determination of the profession seems to be almost infeasible. Determining light design, a number of authors emphasises the architectural genesis of the profession studying "...interaction of light with the environment and its impact on visual perception, emotions and health..." [3], categorising the new profession as "architectural illumination" and "light architecture". According to competent authorities (N.M. Gusev, V.G. Makarevich), "light architecture" considered as the dialogue between architecture and natural and artificial light [1] has been giving way to light design which is nowadays being supported by such participants of the dialogue as, in particular, N.I. Shchepetkov, the founder of contemporary Russian light

urban studies. Besides, as a section of light design, light architecture becomes light-emitting, fundamentally differing from "daytime" architecture.

A number of specialists consider the architectural component of the profession the main one using such expressions as "light architecture", "architectural light engineering" and even "light science" [4]. Determining the new profession, A. Kovshova writes: "...a light designer is a mix of the professions of architect, light engineer and artist" [5]. Supplementing his colleagues, D.N. Makarov notes: "...it's a person who is able to paint with light but at the same time understands the nature of his/her "brushes" [2] and, at the same time, it's "a specialist who is in charge for design of a lighting installation for... the environment where people are present for a long period of time", who acts within the framework of an architectural project, in close contact with, and under supervision of an architect [2]. All of the above unites the description of the "contemporary view on matters of illumination" (A.G. Khadzhin [5]). The master of the light design N.I. Shchepetkov draws the line: "...to sum up, light design is just a visual component of architecture with artificial light... It has originated, exists and is developing in the fold of architecture,... a part of material and engineering structure of an architectural, engineering or landscape object. It is fundamentally wrong to set light design apart out of architecture" (N.I. Shchepetkov [6]).

2. FACTOR MODEL OF THE PROFESSION

Nowadays, the planet of artificial illumination is based on three pillars, the three main basic aspects of light design: aesthetic perception, ergonomic component, i.e. functionality of illumination, and energy efficiency [7]. The light design is recognised as the interdisciplinary specialty requiring fundamental knowledge of engineering, architecture, history, design and culture (V.P. Budak [5]). "Nowadays, light design has been becoming the most important element of visual culture integrating artistic expression and compositional vehicles, functionality aesthetics, which design objects are distinctive for, as well as the newest scientific and technical advances in optics and engineering", justifiably states N.V. Bystryantseva [8].

The authors consider the project component of "architectural lighting" or "light design" proposed

by Ju.B. Aizenberg, as the most appropriate basic definition. It is the intersection of science (light engineering), visual arts, engineering work and architecture; “a designer is not an artist at all; *design* means drafting, fabrication, and *lighting design* means lighting decoration¹” (Ju.B. Aizenberg [6]). “Light design is designing of light or is designing by means of light,” where the bivalence is expressed in priority of sometimes aesthetic component and sometimes of functional component of light design [9].

Still the profession of light designer is not able to find necessary stability. Over the first two decades of the new century, still without complete self-determination, it was forked at different directions aiming at occupying new spheres. The priority of design approach to variable format of light design has helped the authors to express its most important vectors of development.

The variability of **design strategies in light design** is directly related to dramatic change of the light paradigm itself in design culture. That is where the problems of light environment organisation the scientific and practical community faces derive from. The light is used as a tool to form and space modelling in visual arts, architecture and design at the level of experimental and practicable designing. The precise order of the light design process is a methodological support here: from “light plastics”, “light form” and “light area” (N.I. Shechetkov), to the concept of designing of an urban light panorama as a large-scale light and silhouette component (V.E. Karpenko).

The contemporary potential of light technologies assisting in appearing of new methods of work with “light-bearing matter” is based on a wide range of materialised innovations. Primarily, these are the products based on energy-saving technologies (luminaires with LEDs). However, the process of light design development in Russia in the area of energy-saving technologies was distinctive for “extremely low price of electric power, which created favourable background for inefficient solutions based on incandescent lamps, halogen and fluorescent lamps with primitive luminaires...” [10], unlike the European countries and the USA where, thanks to expensiveness of power and extreme level of competition, the energy-saving programmes

with LED lighting, being appropriate to a large extent, have spread. Since 2011, the projects based on organic LEDs have started appearing, namely the technologies of shadow-less light sources (in particular, displays made of organic carbon molecules), which are much cheaper in production than LEDs, and these light sources themselves provide a full scope to designing imagination [11].

Minimisation and energy saving have formed a section of a fashionable and innovative industry. “Integration of technological innovations, including light design, with the morphology of modern costume, use of retro-reflective fabrics, LEDs and other technological methods assisted in enhancement of aesthetic and ergonomic features of costume: refreshing the thesis of the post-industrial society “*the form follows the emotion*” as well as just ergonomic reasons related to higher visibility of an illuminated costume during night time.” [12]

3. LIGHT ART SHOWS

The festivals and competitions are becoming the media for the newest trends of the profession. The most integrated picture of the newest design trends in the sphere of light design is provided by conventional contest programmes such as Russian Light Design and a number of other projects. The scientific and creative subject of the Light Architecture festival and contest organised by the Moscow Union of Architects with support of the Government of Moscow and the Architectural and Town-Planning Committee of Moscow in 2015 as part of the International Year of Light and Light-based Technologies was architectural lighting and interaction of light and architecture on the basis of contemporary light engineering solutions. It is LED technologies that the most of the noted contemporary professional trends in the sphere of form making derived from as they provided portability (minimalism of a LED module) and flexibility of structures capable to change form and assisted in invention of a brand new light source with corresponding potential of decorative lighting (priority of lighting element, the “form” of light).

According to the experts of the competition, the potential of light as an object and subject of design included a number of parameters:

- Environmental friendliness;
- Integration of light into different surfaces of design and architectural objects;

¹ As it is noted below, *lighting design* is primarily understood as illumination design. – Ed. Note.

- Perception of light as a material: the newly designed construction and finishing materials are already the sources of light;
- Adjustment of luminous flux and chromaticity of radiation, temperature settings, light spectrum and intensity dynamics, control of emotions;
- Capability to control light devices using scripts and different technical units including remotely-operating ones [13].

4. CONCEPTUAL APPROACH TO LIGHT DESIGN

Light design approaches have been increasingly basing upon the concepts, which blaze a trail towards new solutions. Gradual complication of the goals of light environment design has required a more convincing elaboration of both art and content-related components of any object. Over the last five years, the requirements to projects have significantly risen in the international market: now customers are attracted by “comprehensiveness” of solutions. “Now it is not sufficient just to create a design of illumination, now it is necessary to work out its integration into urban environment as well as the scenario of the area being created” [14]. The era of light scenarios witnesses emancipation of the profession, indicates transition to captivating, theatrical lighting projects.

Interest in scenarios marks the transition from “sense-based architectural lighting (light design) to entertaining commercial and advertising light design” [6]. Visual environment of events acted as a catalyst for development of one of the areas of light design related to show business, museum and exhibition spaces, city festivals, etc. Multimedia developments of light scenarios of the era of digital technologies still remain an experimental area of work with light as a form, actively creating new forms of light presentations. This includes video mapping based on 2D and 3D projections (architectural structures, natural objects, water fog, waterfalls, etc. act as a screen), laser installations, holographic sculptures, art objects based on light and colour dynamics, etc. Light becomes a part of a director’s game with a spectator, means of communication and orientation. A convenient scenario may be selected for each form of leisure. At the same time, scenarios are appropriate anywhere, even in the bathroom... [15]

5. DIGITALISATION OF LIGHT DESIGN

Scenarios added dynamics to perception of originally static “light architecture”. The pursuit of form-creating potential of light on a kinetic basis in art practice which had been initiated by designers of the avant-garde era had been continuing during the whole 20th century and transformed into experiments with light based on the newest digital methods. A wide range of light media objects finds real contours in the creative dialogue between the engineering, directing and art components dynamically actualising technical innovations of media and light industry. This shining planet may be identified by the term “intelligent light”.

Enhancement of software creates opportunities for creation of interactive objects where a human is integrated into a dialogue with a “smart” light source. Here are some examples. The *iBar* technology is an intelligent surface of a bar counter with an integrated video projector, intelligent object-tracking system for dynamic interaction with movements on the counter, illuminated or virtual sensor objects, etc. The *Light ID* intelligent light technology by *Panasonic*, which allows information reading from any object illuminated by a LED light source, was used in The Pushkin State Museum of Fine Arts in Moscow. The mobile application designed for this purpose includes a multilingual database of exhibits.

The Smart City project opens large opportunities for enhancement of the intelligent light. “In the standard of a smart city developed by the Ministry of Construction of Russia in October, 2018, the criteria of “smart” cities include modernisation of street and indoor lighting; at technological level, a city is made smart by means of a complex multi-level system... The first and the largest Russian product developed with fully-featured application of digital content of smart city technologies was the Light City project (Ivanovo)” [16]. The innovative technologies of light design with computerised illumination system were applied to famous architectural objects of Rostov-on-Don.

Development of interactive, multimedia light models and selection of a smart design solution requires development of a new and more perfect **software and technological support** (IT and multimedia technologies). In his comment to the design specification for the best concept of exterior facade of the General Staff Building on the Palace

Square in Saint Petersburg, V.P. Budak notes that the *DIALux* software as a project modelling tool should be replaced by *Lightscape* and similar software [17].

Despite the importance of the engineering and technical component of the profession, according to the Dutch light designer Rogier van der Heide, creative impulse retains its priority: “You have to discover new methods of lighting, to understand optical properties of the Sun and artificial light sources to find new solutions. Also, never reject good ideas if you think there are no appropriate technologies for them. These technologies, sometimes, just need to be searched...” [14].

6. LIGHT DESIGN AS ART

Recognition of light as a tool for artistic form-making takes light design to the level of genuine art. According to G. Nelson: “...when it comes to creation of a work of art, *technical enhancements*, whether they are related to the process of processing or to materials, *absolutely don't affect the final goal...*” [5]. Technological breakthrough in light design has allowed us to create new genres in the multimedia format. Video mapping is a genre of audiovisual art which uses visual illusions projected onto different surfaces. The *LUX AETERNA* Light Theatre (established in 1982) functions on the basis of unique light technologies and creates a light and music show comparable with limitless outer space by means of a light brush and lasers in total absence of actors. The director Daniil Fridman based his light and music visions addressing sensory perception of spectators on the idea of composer Alexander Skryabin on colour perception of music.

Experimental searches of light designers related to technical know-how are based on emotional nature of light visions, which allows viewers to recognise them as related to the sphere of artistic creativity. In the A. Walter's theory, “emotional design” (similar to the Maslow's hierarchy of needs) occupies its lawful “superstructural” position: “the product shall become functional, reliable and convenient before it is able to give pleasure” [18]. According to the Russian light designer S. Sizy's interpretation of the emotional design theory, any light environment is created not only to implement the necessary functions but also with consideration of perception experience of users, their emotions and the mood appropriate in the given context [19]. The emotional

and artistic aspect opens a wide field for original versions of light design.

In 2017, in his lecture “Concrete, Steel, Light and Emotions”, light designer D. Skira (the founder of the *Skira* studio) claimed that “customers are attracted by comprehensiveness of solutions, today it is not enough just to create a project of illumination, it is necessary to work out how it is integrated in the urban environment as well as the scenario of the space being created” [14]. The emotional setting of illumination becomes a part of comprehensive light design solutions at the same level with functional requirements of work processes acting as a motivating factor.

The original version of stylisations in light design is closely related with the concept of emotional design. The methods of form-making in design of luminaires of the *Radio Lamp* collection are based on constructivism approaches, transformation of the shape of the Shukhov tower in Moscow. Designer O. Podolskaya creates luminaires using stylistic reminiscences of the spires of Stalin's skyscrapers. Stylizations of visions of nature supported by high technological level open the “bionic direction” of light design “providing creation of complex bionic forms” [13].

The enhancement of social status of light design, increase of its role in arrangement of public interior and urbane spaces, turn a designer into a subject of the new cultural tradition. Creative space of light design becomes an area for solving of current problems of modern society.

Urban holiday environment is one of the examples of use of different light scenarios. New Year's performances of the recent years provided examples of art objects representing Christmas trees, Christmas fairs, examples of New Year illuminations of outstanding architectural and engineering objects (e.g. the Eiffel Tower), illumination of ice figures. In Moscow, the Christmas Light annual festival has become a tradition. Big cities, such as Moscow, St. Petersburg, Ekaterinburg, develop special programmes for creation of architectural illumination under the “Light City” slogan.

Creation of new behaviour scenarios introduced into the urban culture promotes active lifestyle. Popular online magazine *4living* provides an example of Sweden where a programmed interactive light installation has solved several tasks at once: illumination of a dark district eliminated the problem of attacks on cyclists and creation of a light dom-

inant element helped hooligans become admirers of street art, and popularity of evening running and cycling of urban citizens has increased at the same time. Interactive elements of a costume form new culture sets: additional functions stimulate an active life because activation of built-in gadgets often directly depends on physical and social activity of their owner. “Being an irreplaceable tool of artistic expression in... spatial, temporal, and spatial-temporal arts, light is a potential medium for a number of such properties, as... picturesque, architectonics, graphics, scenarios, etc. Therewith, it may be considered as a cultural phenomenon in which the dialectical conflict between design as understanding/constructing of objective and social world surrounding human and “high” art as artistic and visual understanding/exploration of reality has been manifesting itself to the fullest extent” [9].

The phenomenon of light filled with social-cultural senses was reflected in the proceedings of the conference “Light Design 2015. Light Culture”. The agenda was opened by the speech of N.I. Shchepetkov (MARH (GA)) who indicated the recurrent theme of the conference: “Light design and light culture” [20]. Light design has found its place in the informational and cultural space of the Internet. Based on the *LightOnline.ru* project of 2004, in 2009, the portal <http://lightonline.ru/svet> appeared, which is represented by a team of professional light engineers who have many years of experience in the Russian light engineering market.

7. LIGHT DESIGN AND LIGHT ENGINEERING: DIALECTICS OF INTERCONNECTION

Since the first decades of the 20th century, light design has acquired a stable theoretical basis in light engineering. However, the scientific ambitions of the profession have turned out to be much wider over time. The scientific component of the profession developed gradually filling with knowledge of allied disciplines such as architecture, art history, etc.

Part of the authors is depriving the design and artistic components of the profession of scientific basis. “The utility nature of light design is the share of science whereas the artistic one is the grand purpose of the new art” [21]. Some authors unite the terms “light designer” and “light engineering” saying that “the former implies transition to the internation-

al light engineering language and the latter implies transition to the regional one” [2]. In Dr. Aizenberg view “You have to discover new methods of lighting, to understand optical properties of the Sun and artificial light sources to find new solutions. Also, never reject good ideas if you think there are no appropriate technologies for them. These technologies just need to be searched...” [14].

Ju.B. Aizenberg: “...the considered field of activities is by no means based on any scientific foundation apart from the laws the “light engineering” is based on, so it cannot be called a scientific discipline. ...architectural lighting (“light design”) stands at the interface of two interesting and important sciences: light science and architecture...” [6]. Priority of architectural scientific basis for light design is confirmed by definition of “light design... as its new section... a light designer should know the basics of light engineering and architecture. Light engineering studies not only the physical laws of optical radiation but also psycho-physiologic basics of visual perception of light by human. And almost the whole assessment base of architecture as expressive art rests on visual assessments impossible without light in its theory and practice. Light design hits the “bull’s eye” of the synthesis of these scientific disciplines and their practical application...” [21].

The era of digital design has supplemented light design with new theoretical achievements of computer modelling. This opens prospects of studies not only in the sphere of technical aesthetics but in the allied sphere of physiology of vision, new energy-saving technologies, etc. It becomes necessary to establish an integrated infrastructure of the theoretical base of the discipline, namely “...technical committees, conferences, professional communities and research facilities which provided the authorities and business with information for making correct, scientifically and technically grounded decisions...” [10].

Apart from fundamental studies, annual international scientific and practical conferences “Light Design” (2014–2015) have become a part of such infrastructure. The topical issues proposed by the conferences for discussion include, among others: colour theory; light and art; light design and science; unlocking interdisciplinary potential of light design; consideration of the practice and prospects of interaction between scientific, artistic and technical components of art design.

The capabilities of the Internet become prospective for scientific discussions erasing the geographical boundaries and other barriers. The first international light design online conference “Light Ideas 2016” has gathered the best of Russian and foreign specialists on one online site.

The professional discussion of the design and theoretical situation in the contemporary light design sphere published in the *Svetotekhnika Journal* in 2018 has indicated the most acute problems noted by the professional community. And the question of the artistic strategy of light design, namely its criteria, design principles, level of the dialogue with technical and technological parameters etc. appeared to be the theme line of all of the expressed positions.

“Light design definitely may become a self-consistent creative specialty... The only problem is that the scientific and theoretical basis of this activity lags significantly” [1]. The non-stable situation in the scientific framework witnessed by confusion of basic terminology confirms non-availability of the unified system of assessment criteria of light design objects not only in objective light engineering terms (they already exist) but also in artistic and aesthetic terms. “The light, which is the fourth dimension of architecture, is much more complex than just illuminance calculated in accordance with rules and standards” [2]. The latest studies in the sphere of Technical Aesthetics and Design discipline related to light design theory are still just at the stage of gaining scientific potential. In Russia, there is still no specialist who has advanced more in the areas of light aesthetics and understanding of psychological and physiological effects of light than A.B. Matveev² and G.V. Kamenskaya³. The questions raised by these authors still have no answers. Moreover, they are accumulating given the “deficiency of the up-to-date scientific grounds” [5].

8. TRAINING OF SPECIALISTS

Any profession starts with education. The experience of Western light design schools accounts for several tens of generations of light designers. The experience of the Russian educational school, including higher school, accounts for just a couple of decades of active pursuit. Nevertheless, some methodological experience is already accumulated. First of all, a portrait of a specialist solves the issue of interactions between art, science and technologies with consideration of multi-level nature of light design. No matter whether the question is forming of the language of the profession of light designer or the training programme of a future specialist, in any case, recognition of their multidisciplinary structure is unquestionable. “The combination of elements of science and art” [Smirnov, 6], “the dialogue of visualisation, implementation of a lighting project and a set of mathematical data, quantity characteristics curves” [2], “integrative” nature where interdisciplinary and comprehensive approach combines the methods of both logical and intuitive analysis [Bystryantseva, 5].

Training of light design specialists became a part of scientific discussion in the agendas of the First All-Russian Scientific and Practical Conference Light Design 2014 and the International Scientific and Practical Conference Light Design 2015. The participants confirmed the scientific, artistic and technical components of educational methodology. Special attention was paid to development of experimental methods of education. Each school, with its own traditions and experience, has demonstrated its own “shade” and stressed a special edge of light culture. They included MARhI (GA), NIU MEI, Higher School of Light Design of the ITMO University, A.L. von Stieglitz SPbGHPA, IDI SB-GUTD, SBbGUKiT, etc. Considering the prospect of education in MARhI, Professor N.I. Shchepetkov

² **Alexander B. Matveev (2.01.1926–22.01.2008)** – Doctor of Technical Sciences, Full Member of the Russian Academy of Electrical Engineering, Professor of the light engineering sub-department of NIU MEI. His work “On Theoretical and Experimental Studies of Metrics of Colour and Light Environment in Light Engineering” is still a gold-mine of new ideas and directions of studies in light engineering.

³ **Galina V. Kamenskaya (5.10.1934–9.01.2018)** – Candidate of Technical Sciences. The head of the electric lighting laboratory in CNIIEP of Engineering Equipment of Residential and Public Buildings. Developer of lighting equipment in the sphere of theatrical illumination with the Experimental Stage Laboratory of the Moscow Academic Art Theatre. The author of the unique installation for surface modelling of street and architectural illumination and the methodology of design of architectural lighting. The results of her experimental studies of street and architectural lighting have been introduced in regulatory documents and instructions on designing of electric equipment of public buildings and were taken as a basis for standardisation of outdoor architectural lighting.

sees “the architectural and artistic training as the top priority and light engineering training as allied but still fundamental field based on computer-aided design technologies” [Shchepetkov, 6]. The new approach of the light engineering department of NIU MEI offers the method of lighting installations design training by means of computer graphics software forming aesthetic background of a designer [22]. Thus the educational institutions introduce the humanitarian component common to architecture and design into the new discipline of light design.

The strategy of the Higher School of Light Design of the ITMO University (headed by N.V. Bystryantseva) is an example of methodology of comprehensive professional training of professionals aiming at solving of problem-based tasks (*Problem Based Learning*). This implies participation of different specialists such as marketers, architects, cultural scientists, artists, designers, urbanists, IT specialists, experts in the fields of healthcare, robotics and contemporary engineering in the education process [Bystryantseva [5].

The promising trends are introduced in methodology of light design schools which turned out to be more adapted for rapid change of priorities in the profession. The example of the first Russian light design school *LiDS* led by S. Sizy provides experience of a unified universal methodology in designing of light and spatial environment based on sensory perception, with consideration of recipient’s emotions and mood. This methodology is based on S. Sizy’s emotional design theory, which practically develops and provides theoretical justification of N.M. Gusev’s ideas on light formation of interior with consideration of our natural associations [2].

The school is based on an experimental programme with its theoretical basis included in the mandatory part of education. The Lighting Psychology course experimenting with colour light in human perception allows us to use this device in projects. There are also experimental courses including allied areas of light design: Light Therapy and Biological Effect of Light on Human (author: Doctor of Medical Sciences K. Danilenko). Some of the projects are without parallel: the Sketch for Designers course, the package of applied software *LightCAD* developed by *intiLED* [23].

The experience of the *LiDS* school marked with close relations between the educational methodolo-

gy and international trends, reinterpretation of the world’s experience of light design learning in the USA, England and Germany, introduction of travelling courses in different European cities, is undoubtedly a positive example. The new education forms adopted by the School such as webinars, duplicating of workshops in the form of online courses, the video library of light design presentations simplifies acquiring of information irrespective of a student’s location.

More specific matters of professional education methods are considered at the level of different workshops not aiming to become a field of serious studies. The *Artplay* centre trains to use light not only as a functional tool but also as a tool for controlling of own emotions [24].

The educational matters find solutions within the framework of the new (for Russia) format of interdisciplinary platforms. The PROJECT LIGHT special project (supervised by E. Lobatskaya) focuses on the theory and practice of light design. Apart from exhibitions, discussions, workshops and a periodic publication, it includes educational programmes. The main target of the platform is assistance in establishment of the Russian light design school and professionalization of the light solutions market.

As a result, creation of the methodology of profile education includes works in the three main directions:

- The theory of light design (according to N.V. Bystryantseva [5], not a single textbook had been published since 2006);
- Transfer of the educational process to the interdisciplinary basis;
- Development of cooperation between leading Russian (and international in the future) higher education institutions in the area of educational programmes, research and project activities, advanced training programmes. A contemporary specialist should possess knowledge and skills in “comprehensive light design” [20].

Competitiveness of the trained professionals is witnessed by their participation in serious international scientific and research works such as participation of the Higher School of Light Design of ITMO University in the *Strategic Partnership* project on an interdisciplinary (combining photonics, IT, light design, architecture and environment design) topic *LIGHT FOR HEALTH*.

9. CONCLUSION

The strategy of development of light design as a profession in Russia may be defined primarily through establishment of the Russian light design school as a priority area of activities. Its components become both basic principles and distinctive features allowing this organism to exist and develop. The school becomes an open system sensitive to rapid changes of the profession, with its parameters of “creative laboratory” where ideas are generated as a product of science, art and engineering; the integrative nature of light design implies creation of new grounds for joint development and mutual enrichment of technical and artistic potentials laying a foundation for culture of the 21st century [8]. The school is ready to unite all innovative trends of the developing profession. The unified basis of the school will promote unification of still separated endeavours thus enhancing the results of each of them.

Comprehensiveness of the approach and interdisciplinary prospects of development of light design are starting to take shape beyond the framework of aesthetics of architectural environment. Development of the profession should take into account the multi-level nature of light design (scientific, artistic and aesthetic, technological, social-cultural, environmental and other aspects). The new format of light design using psychophysical characteristics of colour (colour therapy) is treatment by means of energy of colour luminous flux. The emotional aspect of colour therapy is used for solving of physiological problems, such as healthy sleep, psychological relief, etc. Supposedly, introduction of colour therapy as a separate discipline may help challenged children and adults [25]. The discoveries of light psychology are becoming a property of design practice with consideration of functions of the environment: “...attention may be drawn by means of contrast and intensive light; warm light creates cosiness in a flat and cold light stimulates activity and is more appropriate in an office” [15]. New hybrid professional structures capable to become self consistent spheres of activity appear on the periphery of the profession. “... We consider that the Light Ecology will be developing in the two areas: environment affecting human and human as a centre of arrangement of environment” [Bystryantseva, 5]. Growing of an interdisciplinary structure should be stabilised by scientifically justified assessment cri-

teria of the product being created, be it an embodied project, service, etc.

As an open system, the school of light design becomes a space for free professional discussions. The discussions in the formats of conferences, publications in media, roundtables, etc. will be a guarantee of maximum objectiveness in selection of assessment criteria for light designer activities and self-identification of the profession: its ideology, philosophy and aesthetics, design and educational methodology.

For legal establishment of light design [6], concrete and real tactical steps are necessary, and establishment of a light engineering association may act as such step. Considered as the area of social activity of the light engineering school, this association may be a non-profit professional community, “the union of Russian light designers” similar to the “union of designers” marked with corporate independence, helpful cooperation of the leading ventures of the industry, corporate and personal membership, interaction with state structures [10], with mandatory formulation of “the membership criteria” of such organisation [2]. Establishment of such association will promote “official registration of the profession” leading to the following necessary stage, “introduction of the system of assessment of specialisation and qualification of practising light designers... by the professional community” [Prikhodko,5]. This step of professional self-identification of a light designer within the framework of the school involves formulation of competences which still require clarification, also serious elaboration of the professional standard will be necessary [21].

With all importance of the above mentioned criteria, light design should remain art. The key feature of any practising specialist including light designers is creative imagination. Without this key component, any technical, economical and business skills will not allow us to create an original and attractive design work, including in the area of light design. Each talented designer creates an own model of the profession and this is the guarantee of uniqueness and diversity of the appearing design and artistic solutions according to view of Yu.V. Nazarov [5]. According to the founder of the urban light architecture Professor N.I. Shchepetkov, modern light designers are still “swift learners”, birds “with one wing” who came to this profession from architecture, light engineering, allied specialties, the areas which still remain priorities in terms of the obtained

fundamental education. To correct this situation, the future of the Russian light design should be given to real professionals.

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Elena A. Zaeva-Burdonskaya,

Prof., Ph.D. in Science of Art, graduated from Moscow State Stroganov School of Design and Applied Arts in 1987. At present, she is the Acting Head of the department of Environmental Design in Moscow State Stroganov Academy of Design and Applied Arts, Member of Russian Designers Association and the Union of Artists of Russia, Laureate of Moscow City Award



Yuri V. Nazarov,

Prof., Dr. of Arts, graduated from Moscow State Stroganov School of Design and Applied Arts in 1972. At present, he is the President of National Design Institute, Corresponding Member of Russian Academy of Arts, Honorary President of Russia Designers Association, Laureate of the Russian Federation State Prize, Distinguished art worker of Russian Federation