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Annette Krop-Benesch, Christopher Kyba, Franz Hölker

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Abstracts

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# PLENARY TALK

## THE VALUE OF LESS LIGHT – SUSTAINABLE ARCHITECTURAL LIGHTING DESIGN

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Since its beginning, the art of external illumination has substantially influenced the creation and the perception of architecture and the night-time urban environment. In her lecture, the author examines and defines the significant interdisciplinary conditions related to architectural lighting design that have evolved over the years, starting from the first simple exterior lighting projects to the more modern, complex concepts of illumination. The first artistic experiments with the effects of lighting on architecture date back to the ancient times. However, the more mature intentions of lighting building facades for usability as well as aesthetic and artistic purposes appeared on a larger scale in the late nineteenth and early twentieth centuries. This went hand-in-hand with the invention of the electric light bulb. The significant role in the search for new directions on how to illuminate buildings played a central role at various world exhibitions, the experiences of building form using light performed by architects of modernism era as well as experiments inspired from theatre, primarily driven by Stanley McCandless, Abe Feder and Richard Kelly.

These experiments conducted mainly in the 1950s and 60s led to the birth of a new discipline called architectural lighting design. Since then many creative visions of architectural lighting started to appear in urban environments at night.

When this concept of “painting with light” seemed to be reaching its peak, a number of limitations associated with architectural lighting design emerged. The energy crisis of the 1970s forced the need to reduce the costs of lighting and led to the abandonment of costly and unnecessary elements such as exterior lighting.

Later research in seemingly distant and unrelated disciplines to architectural lighting design such as biology, medicine, ecology and environmental protection has highlighted a number of conditions and restrictions which exterior lighting projects should take into consideration. Inappropriately designed exterior lighting in cities has been identified as one of the reasons for climate change and disorders in the integrity of ecosystems. Attempts to address these interdisciplinary conditions in today’s projects of external illumination are not an easy task. However, it should be noted that the

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rapid development of innovative lighting technologies has helped in resolving these issues to a certain extent. At the same time, this development comes with its own limitations, as the necessary technical knowledge is highly complex and beyond the scope of most architects. The above issues related to interdisciplinary conditions translate directly into new research questions on whether the necessary technical expertise and complex requirements arising from the need to save energy, to protect the environment or even to fulfill political demands have a negative impact on the quality of proposed lighting design solutions. In the era of new and numerous constraints and requirements, is it still possible to not only unfold a building's forms after dark, but also to creatively complement architectural concepts? It is also important to define how to integrate specialist knowledge from the field of illumination in the process of developing the concept of an architectural building.

### Conclusion

This research reveals that despite the current new requirements of the twenty-first century that need to be fulfilled, it is still possible to complement architectural concepts and urban environments with quality projects of illumination. Despite the limitations resulting from studies on the effects of artificial illumination of building such as light pollution, human

health and ecosystem integrity, electric lighting highlights the basic elements of a three-dimensional architectural composition in a night-time environment.

Sustainable architectural lighting design does not have to be unimaginative. Lighting designers should see light as a "24-hour system" in which natural light plays the key role and which is supplemented and sometimes replaced by artificial means.

It doesn't mean that lighting design has no future due to the issues presented – quite the opposite. Skilled professionals in this field are needed more than ever; their experience and knowledge can lead to innovations, cost and energy savings and a positive environmental impact. By designing lighting with balance, intelligent thinking and awareness of environmental and civil implications, professional lighting designers actively play a role in the quality of life for generations to come.

The research study also examines the importance and extent of coordinating and integrating lighting design within an architectural project. The author provides evidence that collaboration between architects and lighting designers established adequately at the early stages of concept design is necessary in order to achieve better creative results in "painting with light" as well as to help generate original lighting solutions for external concepts of architecture and urban masterplans.