



# Light in Architecture

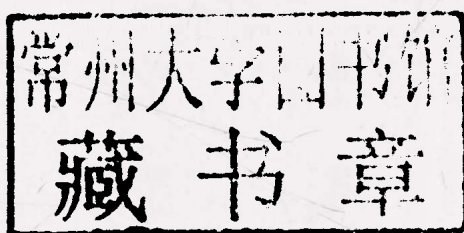
Chris van Uffelen

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Chris van Uffelen



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The Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliographie; detailed bibliographical information can be found on the Internet at <http://dnb.ddb.de>

ISBN 978-3-03768-092-6

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[www.braun-publishing.ch](http://www.braun-publishing.ch)

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1st edition 2012

Editorial staff: Julia Chromow, Lisa Rogers

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Graphic concept: ON Grafik | Tom Wibberenz

Layout: Julia Chromow, Lisa Rogers, Sarah Schkölziger

Reproduction: Bild1Druck GmbH, Berlin

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8 Preface

Flowing Mood

14 Holland Casino

Lighting Design office: Arup Lighting

18 Beijing Noodle No.9

Design Spirits co.

22 Chinar Bar Lounge Dining

Blue Sky Hospitality

26 Supperclub Singapore

Concrete Architectural Associates

30 Conga Room

Belzberg Architects

34 The Club

Ministry of Design

38 CitizenM Hotel

Concrete Architectural Associates

42 The Penthouse

Studio RHE

44 Wings Airline Bar and Lounge

studioforma associated architects

48 Snog Chelsea

Cinimod Studio

50 Cienna Ultralounge

bluarch architecture + interiors + lighting

52 Pipe House

Sergey Makhno, Butenko Vasiliy

54 Scenography

aa studio

58 Cisco Systems' EBC

HOK

60 Gamers' Paradise

Abelardo Gonzalez Arkitektbyrå

64 Job Lounge

Studio Job

68 Andel's Lodz

Jestico + Whiles

72 Watt Sustainable Dance Club

Kossmann.dejong with  
Döll - Atelier voor Bouwkunst

76 Lightfall

Astrid Krogh Design

82 Muziekgebouw Fritz Philips

Van Eijk & Van der Lubbe

84 Sushi Samba

Focus Lighting, NYC Architectural  
Lighting Design

86 World Hockey Bar

Abelardo Gonzalez Arkitektbyrå

90 Butterfly in Flight

Cinimod Studio

94 I-Way

Cyrille Druart

98 Underground

Elliott + Associates Architects

102 Caramello Lounge

Abelardo Gonzalez Arkitektbyrå

104 Amococo

Architects of Air

108 Ojalá Awareness Club

Andrés Jaque Architects

110 La Gaité Lyrique

Manuelle Gautrand Architecture

114 W London

Jestico + Whiles

118 Teatron

Albert France-Lanord (A)rchitects

122 Arrangement of H Apartment

Re-Act Now Studio

Continuous Ambience

126 Café Ludwig

Kiessler + Partner Architekten

130 Hopfenburg

spine architects

132 Silvera Wagram

Agence Jouin Manku



- 136 Refurbished 1980s**  
Group A
- 140 Azure Ukraine Design Factory**  
Sergey Makhno, Butenko Vasiliy
- 142 Loft MVA**  
dmvA
- 146 Civic Hall Renovation**  
4a Architekten
- 150 Prado Museum**  
Lighting Design Collective
- 152 Maier Orthodontic Practice**  
[lu:p] Architektur
- 154 Pinta Acoustic GmbH**  
aigner-architecture
- 158 Capricornhaus**  
Gatermann + Schossig
- 162 City Gallery Aschaffenburg**  
Kramm + Strigl Architekten und Stadtplaner
- 164 Exedra Boscolo**  
Iosa Ghini Associati
- 168 Sempachersee Golf Club**  
Smolenicky & Partner
- 172 Cineplex Memmingen**  
Anne Batisweiler
- 176 LJMU Art & Design Academy**  
Rick Mather Architects
- 180 Showroom A[r]telier**  
aa studio
- 182 Twister**  
Sergey Makhno, Butenko Vasiliy
- 184 CPM Offices**  
Arkenspaces
- 186 The Wright**  
Andre Kikoski Architect
- 190 Château d'Eau**  
Bham design studio
- 192 House BVA**  
dmvA
- 196 Burg am Rhein**  
Keggenhoff | Partner (Architektur,  
Innenarchitektur, Design)
- 200 Yi-spa Studio**  
plajer & franz studio
- 204 Pink Bar**  
Jakob + MacFarlane
- 208 Murgels Spielhaus**  
partnerundpartner-architekten
- 210 Collector's Loft**  
UNStudio
- 214 Bea's of Bloomsburys**  
Carbon
- 218 Holiday Home I**  
Möhring Architekten
- 222 Chapel Utrecht**  
Zecc Architecten
- 226 Café 501**  
Elliott + Associates Architects
- 228 San Telmo Museum**  
Nieto Sobejano Arquitectos
- 232 Blob VB3**  
dmvA
- 234 Pharmacy at La Puebla 15**  
Buj+Colón arquitectos
- 238 Mazzo**  
Concrete Architectural Associates
- 242 Chimney House**  
Studio MK27
- 246 Giacomo**  
plajer & franz studio
- 250 Tartinery Restaurant**  
SOMA
- 252 The Palace of International  
Forums Uzbekistan**  
Pfarré Lighting Design with  
Ippolito Fleitz Group
- 256 Casa Son Vida 1**  
tecArchitecture
- 260 Dolce Munich**  
JOI -Design Innenarchitekten



**264 Face to Face**  
Ministry of Design

**268 Conservatory House**  
Ignatov Architects

**272 Red PrimeSteak**  
Elliott + Associates Architects

Experimental Design

**278 Rootz**  
Design Spirits co.

**282 Kaleidoscope of Faith**  
arsluminis lighting design

**286 C42**  
Manuelle Gautrand Architecture

**290 Greenpix – Zero Energy Media Wall**  
Simone Giostra & Partners

**294 The Armed Man**  
arsluminis lighting design

**296 Mini Roof**  
Hollwich Kushner (HWKN)

**300 Interactive Wall**  
Hyperbody, Faculty of Architecture,  
Delft University of Technology

**302 DJ Light**  
Cinimod

**304 Ave Maria University Chapel**  
Carpenter Norris Consulting

**306 Cromosaturación**  
Carlos Brillembourg Architects

**310 Science Storms, Museum  
of Science and Industry**  
Focus Lighting, NYC Architectural  
Lighting Design

**314 Heaven is a Place on Earth**  
drdi

**318 Teardrop Park**  
Carpenter Norris Consulting

**320 Operation Blade**  
Rousseau

**322 Air Traffic Control Tower**  
Zechner & Zechner

**326 Lightform Panels**  
Studio Lilica

**328 Elastic Plastic Sponge**  
Ball-Nogues Studio

**332 Genzyme Center**  
Behnisch Architekten

**334 Galleria Centercity**  
UNStudio

**338 Transitions: Light on the Move**  
AS.Architecture-Studio

**340 Mirazozo**  
Architects of Air

**344 o-24 Licht**  
stagno/van der straeten

**346 Les Moulins de Lumière**  
Eric Michel

**348 Skywedge**  
Carpenter Norris Consulting

**350 Zeilgalerie – Redesign Façade**  
3deluxe

**352 Philips Lighting | Light+Building**  
D'art Design Gruppe

**356 MTA Fulton Street Skydome**  
Carpenter Norris Consulting with James  
Carpenter Design Associates and Grimshaw

Rhythmic Character

**360 Animalation**  
Hollwich Kushner (HWKN)

**364 School and Neighborhood Center**  
dl-a, Devanthery & Lamunière Architectes

**368 Yazuzu Restaurant**  
SOMA

**372 Chesapeake Fuel**  
Elliott + Associates Architects



- 374 Rira**  
Suppose Design Office
- 376 Smallest House in Antwerp**  
sculp(IT) architects
- 380 Naya Restaurant**  
SOMA
- 384 Spectr[a]um**  
LAB[au]\_laboratory for architecture  
and urbanism
- 388 Deloitte**  
3XN
- 392 Morild**  
Astrid Krogh Design
- 394 Zebar**  
3Gatti
- 398 Chesapeake Blue Room Theater**  
Elliott + Associates Architects
- 400 Kremlin Theater**  
Otako+Otash studio
- 404 Mar**  
Suppose Design Office
- 406 Koukjian Jewelry**  
SOMA
- 408 Civic Center Parking Structure**  
Moore Ruble Yudell Architects & Planners
- 412 Teeq**  
Design Spirits co.
- 416 Dynamic Lightwave, Mercedes-Benz  
Galleries**  
Four to One: scale design
- 420 AMC Cinema Pacific Place**  
James Law Cybertecture
- 424 Color Kinetics Headquarters**  
Focus Lighting, NYC Architectural  
Lighting Design
- ////////////////////
- 428 Architects Index**
- 439 Picture Credits**



# **Light** in Architecture







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8 Preface

Flowing Mood

14 Holland Casino

Lighting Design office: Arup Lighting

18 Beijing Noodle No.9

Design Spirits co.

22 Chinar Bar Lounge Dining

Blue Sky Hospitality

26 Supperclub Singapore

Concrete Architectural Associates

30 Conga Room

Belzberg Architects

34 The Club

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38 CitizenM Hotel

Concrete Architectural Associates

42 The Penthouse

Studio RHE

44 Wings Airline Bar and Lounge

studioforma associated architects

48 Snog Chelsea

Cinimod Studio

50 Cienna Ultralounge

bluarch architecture + interiors + lighting

52 Pipe House

Sergey Makhno, Butenko Vasiliy

54 Scenography

aa studio

58 Cisco Systems' EBC

HOK

60 Gamers' Paradise

Abelardo Gonzalez Arkitektbyrå

64 Job Lounge

Studio Job

68 Andel's Lodz

Jestico + Whiles

72 Watt Sustainable Dance Club

Kossmann.dejong with  
Döll - Atelier voor Bouwkunst

76 Lightfall

Astrid Krogh Design

82 Muziekgebouw Fritz Philips

Van Eijk & Van der Lubbe

84 Sushi Samba

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Lighting Design

86 World Hockey Bar

Abelardo Gonzalez Arkitektbyrå

90 Butterfly in Flight

Cinimod Studio

94 I-Way

Cyrille Druart

98 Underground

Elliott + Associates Architects

102 Caramello Lounge

Abelardo Gonzalez Arkitektbyrå

104 Amococo

Architects of Air

108 Ojalá Awareness Club

Andrés Jaque Architects

110 La Gaité Lyrique

Manuelle Gautrand Architecture

114 W London

Jestico + Whiles

118 Teatron

Albert France-Lanord (A)rchitects

122 Arrangement of H Apartment

Re-Act Now Studio

Continuous Ambience

126 Café Ludwig

Kiessler + Partner Architekten

130 Hopfenburg

spine architects

132 Silvera Wagram

Agence Jouin Manku



- 136 Refurbished 1980s**  
Group A
- 140 Azure Ukraine Design Factory**  
Sergey Makhno, Butenko Vasiliy
- 142 Loft MVA**  
dmvA
- 146 Civic Hall Renovation**  
4a Architekten
- 150 Prado Museum**  
Lighting Design Collective
- 152 Maier Orthodontic Practice**  
[lu:p] Architektur
- 154 Pinta Acoustic GmbH**  
aigner-architecture
- 158 Capricornhaus**  
Gatermann + Schossig
- 162 City Gallery Aschaffenburg**  
Kramm + Strigl Architekten und Stadtplaner
- 164 Exedra Boscolo**  
Iosa Ghini Associati
- 168 Sempachersee Golf Club**  
Smolenicky & Partner
- 172 Cineplex Memmingen**  
Anne Batisweiler
- 176 LJMU Art & Design Academy**  
Rick Mather Architects
- 180 Showroom A[r]telier**  
aa studio
- 182 Twister**  
Sergey Makhno, Butenko Vasiliy
- 184 CPM Offices**  
Arkenspaces
- 186 The Wright**  
Andre Kikoski Architect
- 190 Château d'Eau**  
Bham design studio
- 192 House BVA**  
dmvA
- 196 Burg am Rhein**  
Keggenhoff | Partner (Architektur,  
Innenarchitektur, Design)
- 200 Yi-spa Studio**  
plajer & franz studio
- 204 Pink Bar**  
Jakob + MacFarlane
- 208 Murgels Spielhaus**  
partnerundpartner-architekten
- 210 Collector's Loft**  
UNStudio
- 214 Bea's of Bloomsburys**  
Carbon
- 218 Holiday Home I**  
Möhring Architekten
- 222 Chapel Utrecht**  
Zecc Architecten
- 226 Café 501**  
Elliott + Associates Architects
- 228 San Telmo Museum**  
Nieto Sobejano Arquitectos
- 232 Blob VB3**  
dmvA
- 234 Pharmacy at La Puebla 15**  
Buj+Colón arquitectos
- 238 Mazzo**  
Concrete Architectural Associates
- 242 Chimney House**  
Studio MK27
- 246 Giacomo**  
plajer & franz studio
- 250 Tartinery Restaurant**  
SOMA
- 252 The Palace of International  
Forums Uzbekistan**  
Pfarré Lighting Design with  
Ippolito Fleitz Group
- 256 Casa Son Vida 1**  
tecArchitecture
- 260 Dolce Munich**  
JOI -Design Innenarchitekten

**264 Face to Face**  
Ministry of Design

**268 Conservatory House**  
Ignatov Architects

**272 Red PrimeSteak**  
Elliott + Associates Architects

Experimental Design

**278 Rootz**  
Design Spirits co.

**282 Kaleidoscope of Faith**  
arsluminis lighting design

**286 C42**  
Manuelle Gautrand Architecture

**290 Greenpix – Zero Energy Media Wall**  
Simone Giostra & Partners

**294 The Armed Man**  
arsluminis lighting design

**296 Mini Roof**  
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**300 Interactive Wall**  
Hyperbody, Faculty of Architecture,  
Delft University of Technology

**302 DJ Light**  
Cinimod

**304 Ave Maria University Chapel**  
Carpenter Norris Consulting

**306 Cromosaturación**  
Carlos Brillembourg Architects

**310 Science Storms, Museum  
of Science and Industry**  
Focus Lighting, NYC Architectural  
Lighting Design

**314 Heaven is a Place on Earth**  
drdi

**318 Teardrop Park**  
Carpenter Norris Consulting

**320 Operation Blade**  
Rousseau

**322 Air Traffic Control Tower**  
Zechner & Zechner

**326 Lightform Panels**  
Studio Lilica

**328 Elastic Plastic Sponge**  
Ball-Nogues Studio

**332 Genzyme Center**  
Behnisch Architekten

**334 Galleria Centercity**  
UNStudio

**338 Transitions: Light on the Move**  
AS.Architecture-Studio

**340 Mirazozo**  
Architects of Air

**344 o-24 Licht**  
stagno/van der straeten

**346 Les Moulins de Lumière**  
Eric Michel

**348 Skywedge**  
Carpenter Norris Consulting

**350 Zeilgalerie – Redesign Façade**  
3deluxe

**352 Philips Lighting | Light+Building**  
D'art Design Gruppe

**356 MTA Fulton Street Skydome**  
Carpenter Norris Consulting with James  
Carpenter Design Associates and Grimshaw

Rhythmic Character

**360 Animalation**  
Hollwich Kushner (HWKN)

**364 School and Neighborhood Center**  
dl-a, Devanthery & Lamunière Architectes

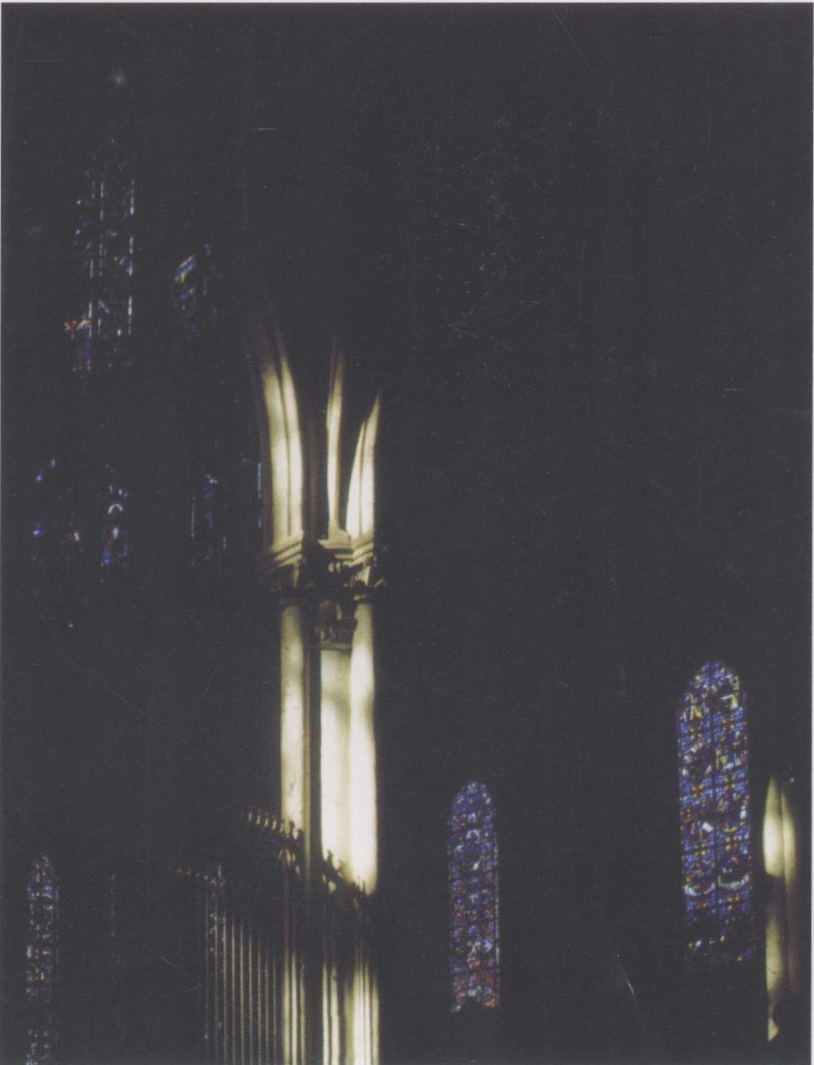
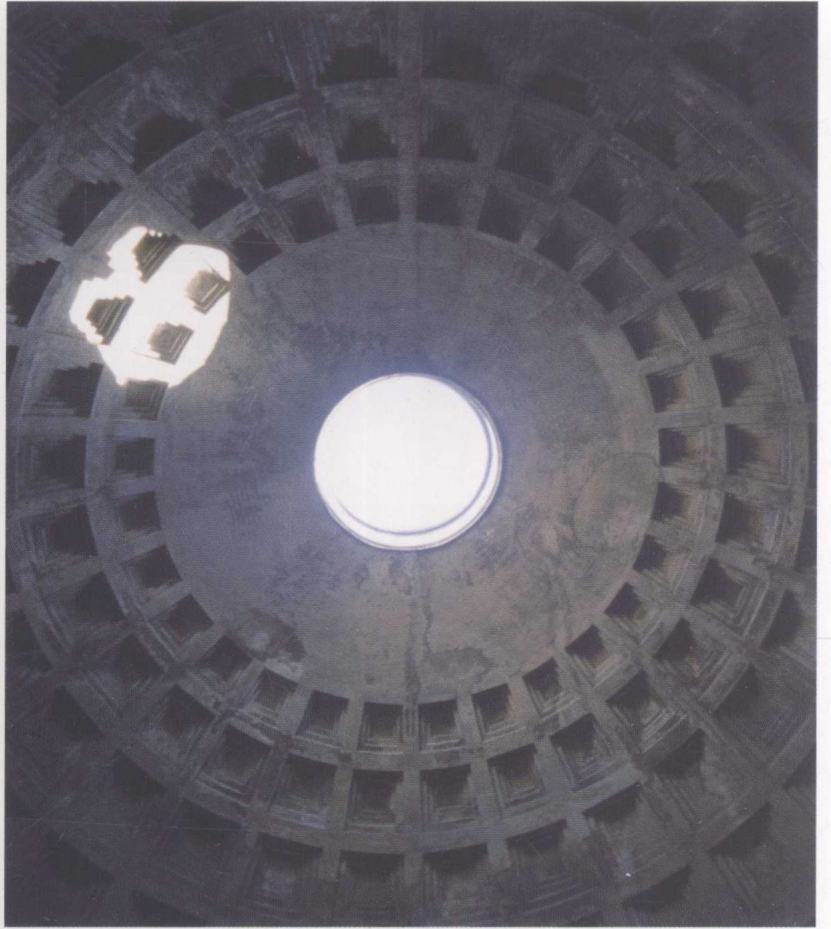
**368 Yazuzu Restaurant**  
SOMA

**372 Chesapeake Fuel**  
Elliott + Associates Architects



- 374 Rira**  
Suppose Design Office
- 376 Smallest House in Antwerp**  
sculp(IT) architects
- 380 Naya Restaurant**  
SOMA
- 384 Spectr[a]um**  
LAB[au]\_laboratory for architecture  
and urbanism
- 388 Deloitte**  
3XN
- 392 Morild**  
Astrid Krogh Design
- 394 Zebar**  
3Gatti
- 398 Chesapeake Blue Room Theater**  
Elliott + Associates Architects
- 400 Kremlin Theater**  
Otako+Otash studio
- 404 Mar**  
Suppose Design Office
- 406 Koukjian Jewelry**  
SOMA
- 408 Civic Center Parking Structure**  
Moore Ruble Yudell Architects & Planners
- 412 Teeq**  
Design Spirits co.
- 416 Dynamic Lightwave, Mercedes-Benz  
Galleries**  
Four to One: scale design
- 420 AMC Cinema Pacific Place**  
James Law Cybertecture
- 424 Color Kinetics Headquarters**  
Focus Lighting, NYC Architectural  
Lighting Design
- ////////////////////
- 428 Architects Index**
- 439 Picture Credits**







# “The elements of architecture are light and shade, walls and space.”

(Le Corbusier: *Vers une architecture*, 1923)

by Chris van Uffelen

Licht ist das erste der vier grundlegenden Elemente von Architektur, die Le Corbusier im oben genannten Zitat aus seinem Traktat “*Toward an Architecture*” aufzählt. Erst das Licht und natürlich der von diesem bewirkte Schatten, danach die beiden Elemente an die man sonst bei Baukunst denken würde: Mauern und Raum. Denn Flächen und Volumen werden erst dann lesbar, wenn Licht auf sie fällt - nicht alleine sichtbar, sondern in ihrer räumlichen Disposition verständlich. Welche Bedeutung Licht für die Wahrnehmung hat wird bei der Betrachtung jedes nachmittelalterlichen Gemälde deutlich: die Illusion von erlebbarer Räumlichkeit jenseits der mathematischen Perspektive entsteht erst durch Weißhöhlungen (gemalte Lichtreflexe), Eigenschatten und Schlagschatten, als Kernschatten oder Halbschatten. Durch sie werden die eigentlich nur taktil erfahrbare Oberflächen in ihrer Materialität erkennbar, so dass es nicht verwundert, dass Le Corbusier die Materialität gar nicht eigens erwähnt.

Die Auseinandersetzung mit Licht begann in der Architektur spätestens mit den kalen-

darischen Bauten wie der Sonnenpyramide von Teotihuacan und entsprechenden zentralasiatischen Gebäuden. Maueröffnungen als Quelle der Belichtung waren allorts bekannt. Bis weit ins Mittelalter blieben die meisten Maueröffnungen unverglast, auch wenn man bereits in Ravenna dünn geschnittene Alabasterscheiben nutzte. Wollte man in den heute romantisch verklärten Burgen nicht frieren, so musste man die Läden schließen und bei Kerzenschein oder im Licht von Öllampen arbeiten. Glas war kostbar und kaum in Scheibenform herzustellen. Erst mit den rot-blauen Kirchenverglasungen der frühen Gotik wurde es breiter verfügbar. Fast klares Glas folgte erst in der Spätgotik, die diese kostbare Errungenschaft dann auch in fragilen Glasbauten feierte, wie es sie bis zur klassischen Moderne kaum noch geben sollte.

Die Frage nach der Beleuchtung von geschlossenen Innenräumen stellte sich spätestens mit dem Bau der ägyptischen Pyramiden, in die Licht hineingespiegelt wurde. Die Geschichte der modernen Innenraumbeleuchtung beginnt jedoch erst 1879 mit Thomas Edisons elektrischer Glühlampe und der von ihm zugleich entwickelten komplett neuen Infrastruktur, sowie den langlebigeren Metallfadenglühlampen von Carl Auer und William David Coolidge. In direkter Konkurrenz zur Gaslaterne, die schon im frühen 19. Jahrhundert die Außenraumbeleuchtung

revolutioniert hatte, verbreitete sich die Elektrifizierung. Zunächst war sie noch Attraktion auf den Weltausstellungen von 1882 bis 1891, wurde in Theatern, in denen es zuvor häufig verheerende Brände gegeben hatte, eingesetzt und war betuchter Klientel vorbehalten. In den 1920er Jahren begann elektrisches Licht aber sogar schon sich in ländlichen Gebieten zu verbreiten.

Entsprechend dieser technischen Voraussetzungen beschäftigten sich Architekten durch die Jahrhunderte mit Belichtung und Beleuchtung von Architektur unter funktionalen wie unter ästhetischen Gesichtspunkten. Eines der beeindruckendsten frühen Beispiele ist das römische Pantheon, dessen Innenwandgliederung oberhalb des Hauptgesimses zahlreiche architektonische Scheinfenster aufweist, aber das nur durch einen Occulus im Scheitel der 43 Meter hohen Kuppel belichtet wird. Bei den oben erwähnten frühgotischen Bauten nahmen die Fenster umfangreiche Bildprogramme auf und projizierten diese in den (ursprünglich umbestuhlten) Innenraum, der so in ein buntes Farbenmeer getaucht wurde. Häufig nahm der Grad der Durchfensterung zu Altar hin zu, so dass der bedeutende Chor durch Licht ausgezeichnet wurde. Auf Lichtinszenierung verstand sich insbesondere der Barock. So errichtete beispielsweise der Architekt und Bildhauer Gian Lorenzo Bernini über seine Skulptur der

↖ | **Jan Vermeer:** *The Allegory of Painting*, 1667, Oil on canvas, 120 × 100 cm, Kunsthistorisches Museum, Vienna, textures by reflections.  
 ↖ | **Pantheon**, Rome, 126 AD, occulus in dome.  
 ← | **Saint-Gatien**, Tours, 13th century, stained glass windows and light cones of clear glass.  
 ← | **Heinrich the Elder and Johann Parler the Elder:** *Quire of Holy Cross Cathedral*, Schwäbisch Gmünd, 1331–1381, lights filtered by stained glass window on early 15th century mural.



→ | **Gustav Eiffel**: Eiffel Tower, Paris, 1889, at night during the 1900 Exposition Universelle, decorated with hundreds of light bulbs.

→→ | **Peter Behrens**: Art-Nouveau lamp, 1902, bronze-casting, 38 cm high, Großherzoglich Hessische Privatsammlung, Darmstadt.

→→→ | **Jules Hardouin-Mansart: (1678–1684)**, Hall of Mirrors in the Palace of Versailles, 1684, framing of 357 mirrors on the right, repeating windows on the left and reflecting their light. The lustres are additions of the 18th century.

↘ | **Jan Eisenloeffel**: Lamp in stairwell of the Diamond Workers' Union building (by H. P. Berlage, 1903, Amsterdam), 1919, three connected lamps, brass and alabaster-like painted glass, 12 meters high, weighting 1100 kilogramm.

↘↘ | **Erich Mendelsohn**: Lamp in stairwell of his Metall Workers' Union building, brass and clear glass, 1930, Berlin, predecessor of his lamp-chain in the De La Warr Pavilion in Bexhill-on-Sea, 1935.



the daylight from above on the figure, thus moving the religious ecstasy of the saint into the realm of reality. Illumination using mirrors also reached its peak during the Baroque era, when Jules Hardouin-Mansart set up a row of mirrors across from the garden façade in the Hall of Mirrors of Versailles Castle, which simulated illumination from both longitudinal sides of the hall.

At the outset of classical modernity, Charles Rennie Mackintosh focused intensively on the illumination of his buildings, creating rooms with bright colors and generous sunlight alternating with rooms dominated by dark surfaces and artificial lighting. As soon as electricity was invented, artists and architects sought to get in contact with the new source of energy: Peter Behrens in 1907 became the “Artistic Consultant” of the Allgemeine Elektrizitäts-Gesellschaft (AEG), designing not only the company’s products according to the (Industrial Design) requirements of the Werkbund (Work federation) for but the entire company image from the letterhead to the factories – including in 1909

the renowned turbine factory Berlin Moabit – the world’s first ever “Corporate Identity”. Walter Gropius, Ludwig Mies van der Rohe and Le Corbusier also worked for him.

The illumination of external buildings became so commonplace during these decades, that Bruno Taut in 1914 already wrote about his glass pavilion at the Werkbund fair of Cologne: “A glass house does not require `illumination` from attached light bulbs and similar devices. All that is required is to light up the rooms of the glass house and it appears beautifully illuminated from the outside.” Artificial light became the new building material for cities at night – illuminated advertisements, logos and “cornice lighting” (Ernst May 1928 about buildings by Erich Mendelsohn and the brothers Luckhardt) became the ornamentation of the new cityscape. At the same time, interior spaces were decorated with electricity and architects designed many lamps, such as a suspended lamp made of three differently orientated fluorescent tubes designed by Gerrit Rietveld (1924). Soon artificial lighting became

indispensable – after World War II, department stores were designed without windows, since the goods could be presented much more effectively in artificial lighting, while open-plan offices and the American tradition of office buildings with great depth could not be implemented without artificial lighting as they began their triumphal procession in the 1960s.

For the past few decades, artificial lighting has become available in all colors to create a spatial experience – special areas are accentuates, room units delineated, and different atmospheres created. However, no later than 1999, when Norman Foster designed the dome of the Reichtag in Berlin, the channeling of daylight into interiors has also gained great interest.