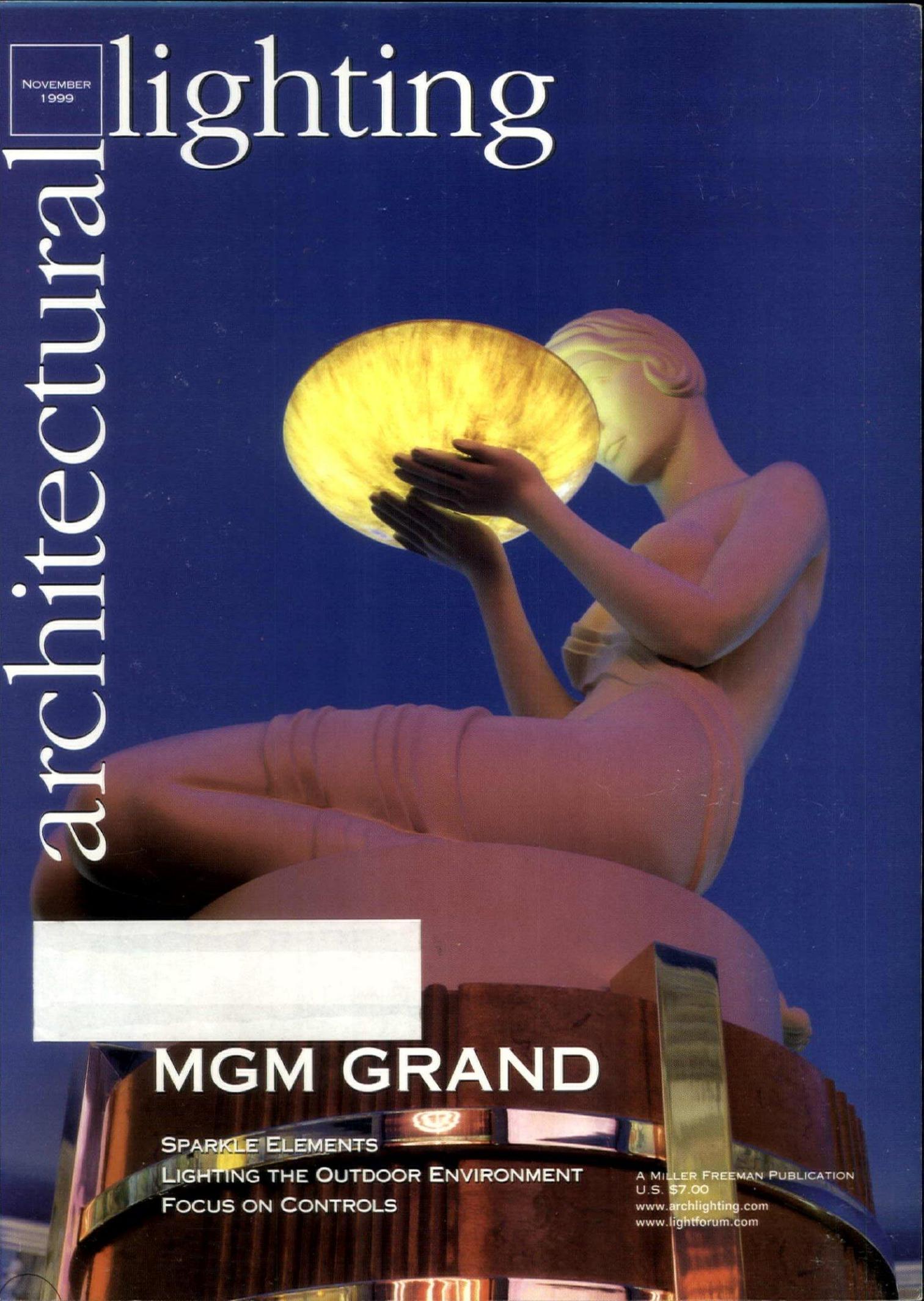


NOVEMBER
1999

architectural lighting

A photograph of a woman in a white dress holding a glowing golden orb against a dark blue background. The woman is seen from the side, her hands cupping the orb. The orb is a bright, textured yellow-gold color. The background is a deep, dark blue. The woman's dress is white and appears to be made of a soft fabric. The overall mood is serene and ethereal.

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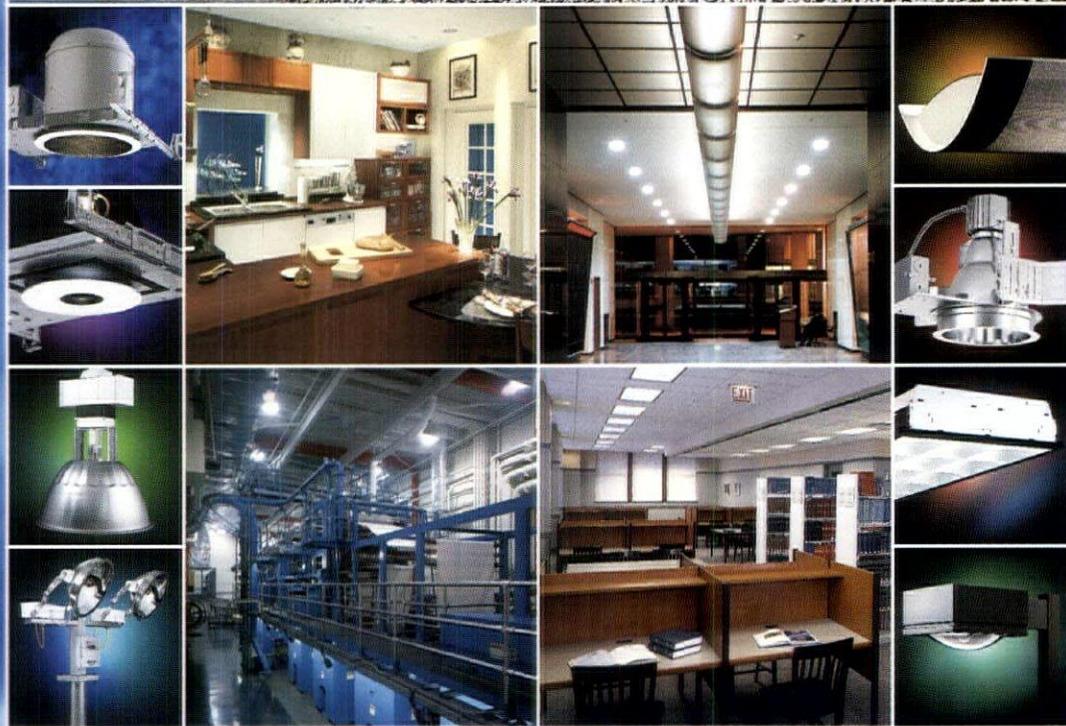
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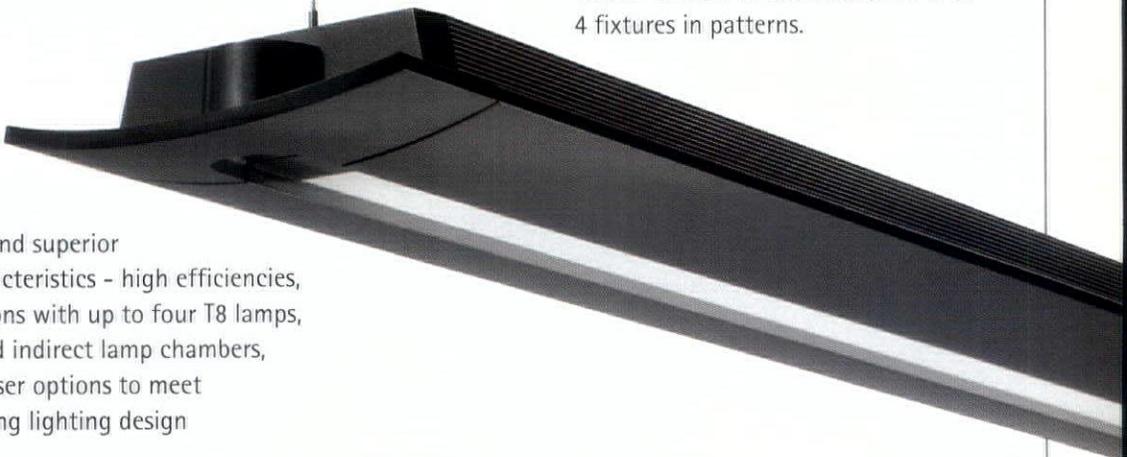


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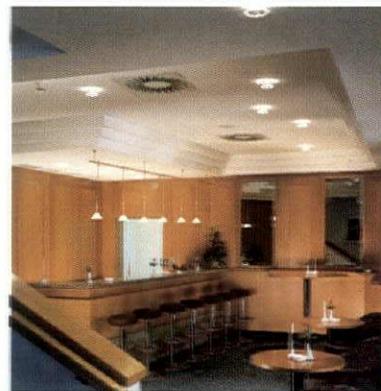
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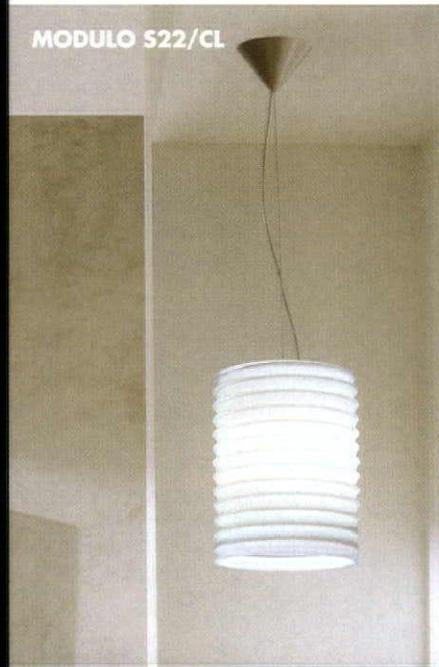
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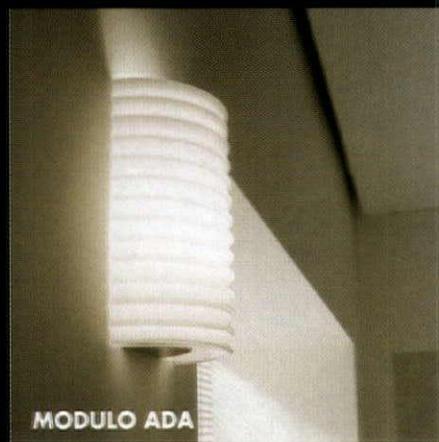


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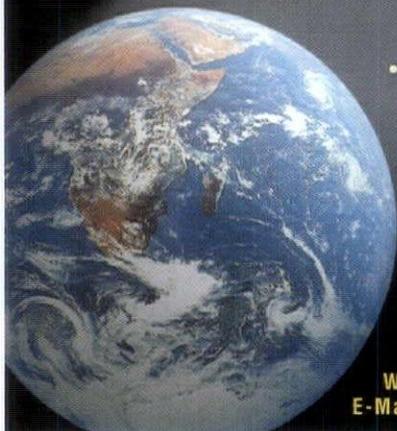
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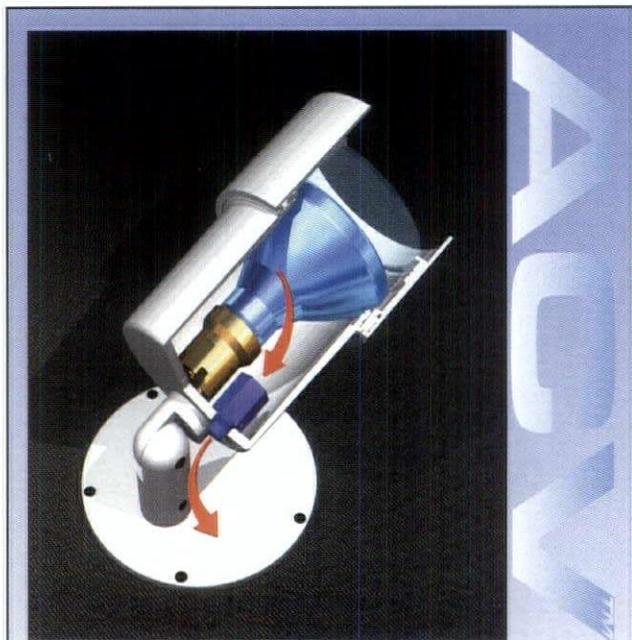


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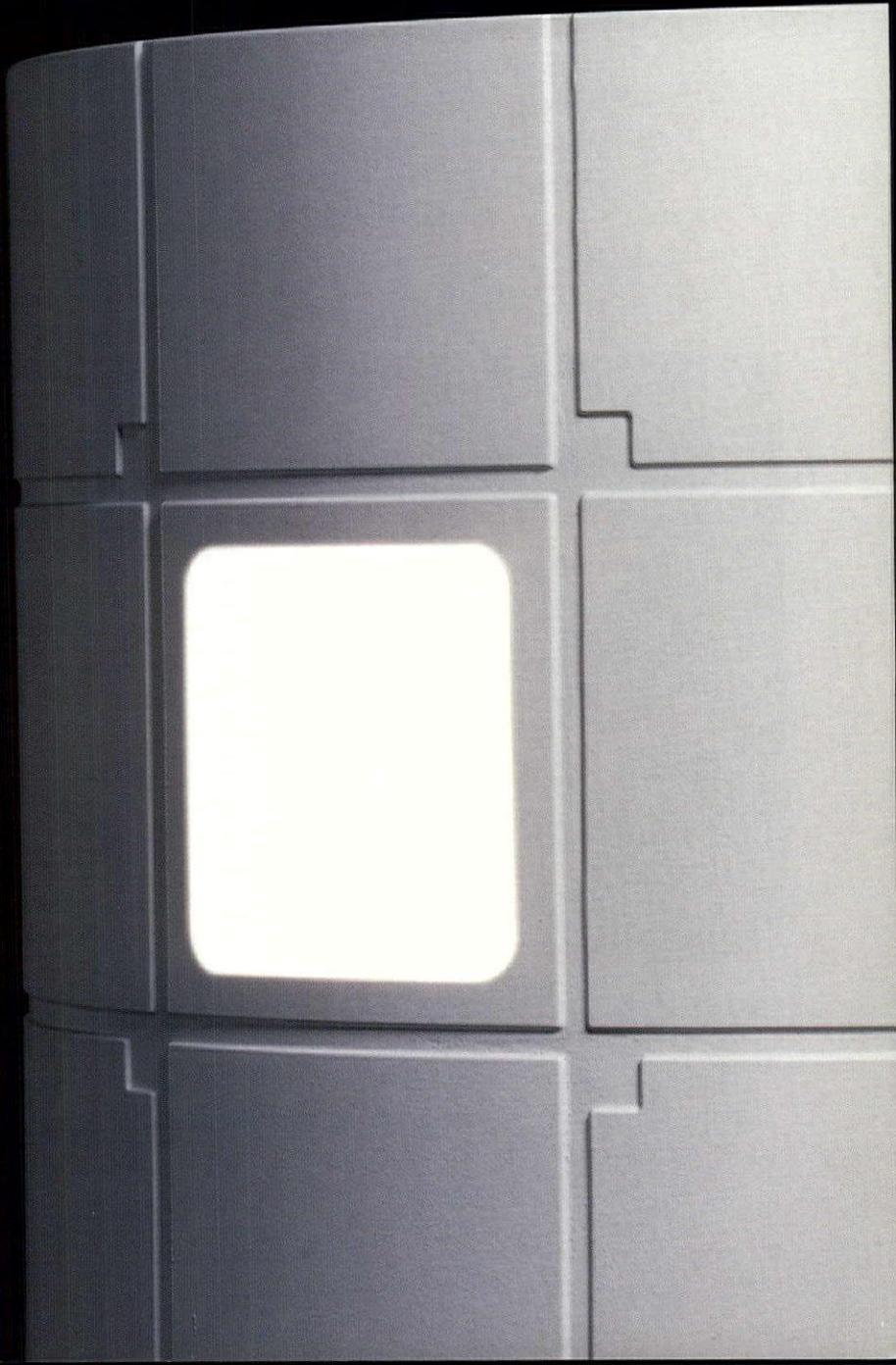
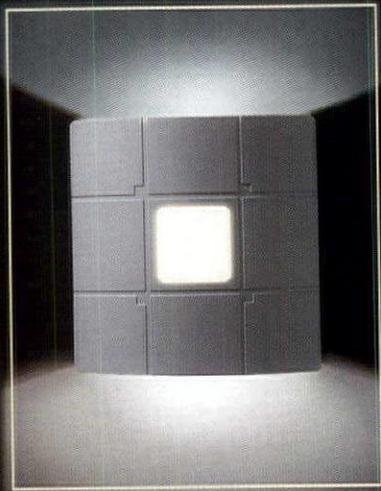
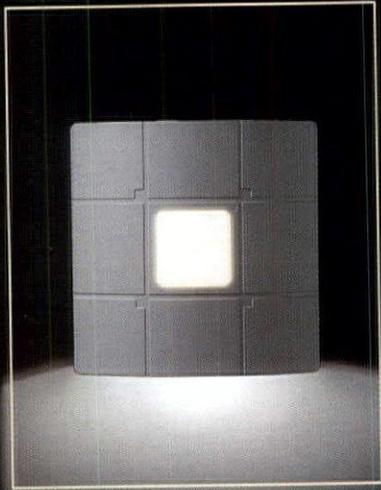
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COLLECTIVE VISION

In preparing this month's editorial, I was reminded of my interview with Francesca Bettridge, subject of this issue's Insights column, and in particular her strong emphasis on the importance of teamwork in achieving successful results and a sense of camaraderie: "I hope those who have worked for me or with me have a firm understanding of how we work on a team and the responsibilities we bring to it..." Her dedication to collaboration—whether with her lifetime business partner Carroll Cline or partner Stephen Bernstein—is evidenced by her commitment to all of her employees and to developing the talents and honing the skills of junior designers and offering a mentor-role in nurturing their abilities. The significance of teamwork is a sentiment often echoed by many of the lighting designers who have lent their "insights" to the pages of *Architectural Lighting*, and in fact, is the topic of this month's Perspectives, in which the authors encourage their peers to investigate the benefits of an integrated approach to design.

Probably one of the best examples of this concept can be found in the man to whom we owe credit for laying the roots of our industry, and one whose perception as a lone wizard, toiling in his laboratory, is far from reality: Thomas Edison.

The following is an excerpt from a summary written by Cory Scruton on Thomas P. Hughes' "Edison and Electric Light," in which the "father of electric light" transcends myth as a simple inventor to one of pure genius. His systematic approach, drive to step over normal boundaries, innovative skills, problem-solving abilities and vision of collaboration are attributes that we should aspire to possess, incorporate into our professional lives and readily bring to the table.

"In the late 1870s, electric light and power were only at inventive stages. At that time, Thomas Edison, with his ideas and abilities, aggressively attacked the problem. Edison understood that electric light and power had to be viewed as an important innovation for it to evolve. His bold and encompassing inventions along with his promotional efforts brought the growth and history of electric light into use.

It was Edison's interest in technological systems that led him to a general system of incandescent lighting in the fall of 1878. At that time, Edison had a concept and plans for an underground distribution of electric light into private houses, which would replace the gas burner. It was this 'early vision, far in advance of realization' that propelled Thomas Edison's inventions into everyday life.

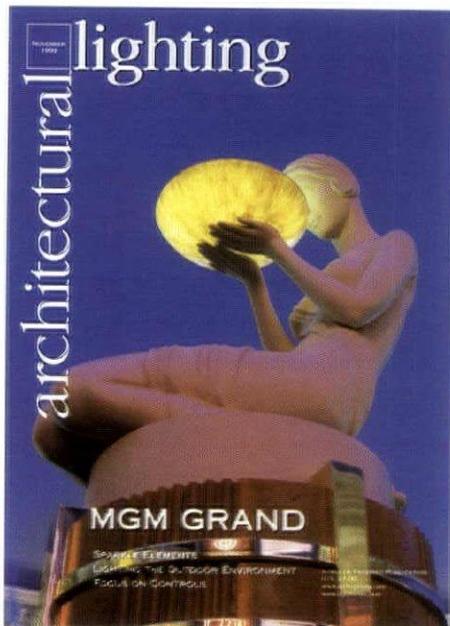
Edison had great support and help throughout the electric light system evolution. A variety of highly talented people with various fields of specialization were the ones whom Edison integrated. He turned to these men often, but they always experimented and calculated within his guidelines. Thomas was the organizing genius and brainchild of the electric light system, but he assigned others to work on various components. The Menlo Park laboratory was where most of the work was accomplished; it was state of the art and before its time. The workers lived very close to the facilities as it was like a community. Edison also left other matters, such as financial and political, to other experts.

Thomas Edison used a systematic approach that dealt with every problem that surfaced. He knew that the cost of his new invention had to be economically competitive with gas. This was a key factor that led him to make calculations on every part and cost during the development of the electric lighting system. When Edison was certain there would be economic gain, he then turned his attention towards the Pearl Street lighting system. In 1882 the Pearl Street lighting system became a success and provided light to the Wall Street district." ■



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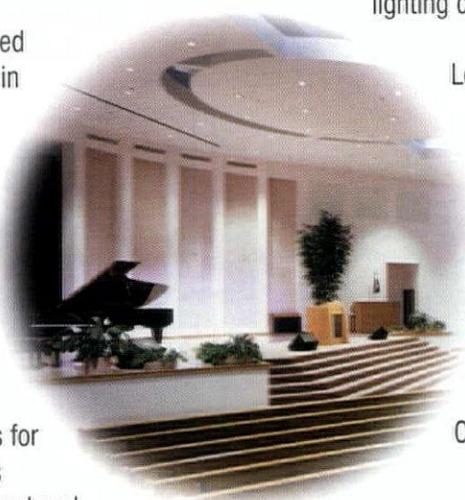


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To the Editor: It is always exciting to see new lighting innovations such as the T5 fluorescent lamp. This lamp already promises to be a potential leader in fluorescent technology because of its help in providing highly precise fixture optics. As I explained in the July 1999 issue of *Architectural Lighting*, we shouldn't expect any one lamp or light source to be the answer for every application. The shorter T5 lamps can be appropriate in linear runs in an open space; however they may not be as suitable when used in an application such as perimeter trough systems, where an increased number of lamps and socket shadowing would be a problem. Like anything else, no one lamp is appropriate for all situations. As a lighting expert with years of lighting design, engineering and manufacturing experience, I am excited about the new T5 technology. It is a great light source if installed in the right application.

—Stephen Blackman, Principal, Blackman Design Associates

To the Editor: After reading the neon primer in the August/September issue, I felt compelled to respond by providing some additional information on neon, which may be of interest to your readers.

Firstly, I wonder why Mr. Oberkircher states that "HVT" is the correct term. "HVT" may be in use, but I don't find it a common term for neon tubing. I have several books and trade publications about neon and while I have not seen the term "HVT," neon is often referred to by other names.

Although since 1996, the National Electric Code has called neon "neon" in some parts of their code, previously, the NEC referred to neon as "electric discharge tubing" and "electric discharge lighting." UL 48 Standard for Safety/Electric Signs refers to neon as "gas tube" and "electric discharge tube." The *Neon Installation Manual* published by the International Sign Association and the International Association of Electrical Inspectors defines "Neon Tubing: Electric discharge tubing...." quoting the NEC definition in Article 600-2.

The *IES Lighting Handbook* (8th Edition) barely mentions neon lighting. The book lists neon tubes at the bottom of a chart on page 247 as an "enclosed electric arc source." On page 840, "luminous-tube signs" are mentioned with a poor illustration of a channel letter sign presumably with Luminous-Tubes (neon) inside. Why in their only photo of neon tubing don't they show the neon tubes?

As to U.S. companies that produce neon tubing, Corning, to my knowledge, no longer sells glass for neon tubing and Sylvania sells glass for others to coat and sell. I would suggest contacting a distributor of EGL, Voltarc, Masonlite, FMS, Eurocom or Technolux tubes. The beautiful colored glass tubing is, unfortunately, only manufactured abroad. A distributor may call some of this colored glass "Euro Glass," but it is not a generic name. Imported colored glass is often sold in 5-ft. lengths. Additional colors may also be achieved with pigments coating the interior of the glass.

Tubing for neon typically comes in diameters from 5 to 18 mm, and 18, 20 and 25mm for cold cathode. The labels in Figure 2 are incorrect. The second column "15 mm" refers to traditional "neon" tubes, the third column refers to "cold cathode" tubes. In addition, the ends of the tubes may or may not be bent back depending on the design, and glass-enclosed electrodes must be welded to the neon tube. "Long runs" are typically done with more than one tube and midpoint grounding used in wiring the tubes. Transformers used for neon increase voltage; current, of course, decreases. Sizing transformers for neon is more complex than for low-voltage lighting. Tubing diameter, length, transformer secondary current, gas, ambient temperature, presence of mercury and gas pressure must all be considered. I always specify that an AC millimeter be used for sizing transformers. Electronic transformers are also available for use with neon tubes.

Designing with neon adds complexity to a project because most neon installations are custom made. Designing with neon is like designing custom lighting fixtures rather than using stock luminaires. Designers should be especially familiar with UL 48 and Articles 410 and 600 of the NEC. *Neon Techniques* by Wayne Strattman, an update of Samuel Miller's 1935 book, is also an invaluable resource.

—Daniel Sack, Lighting Consultant, Pataphysics



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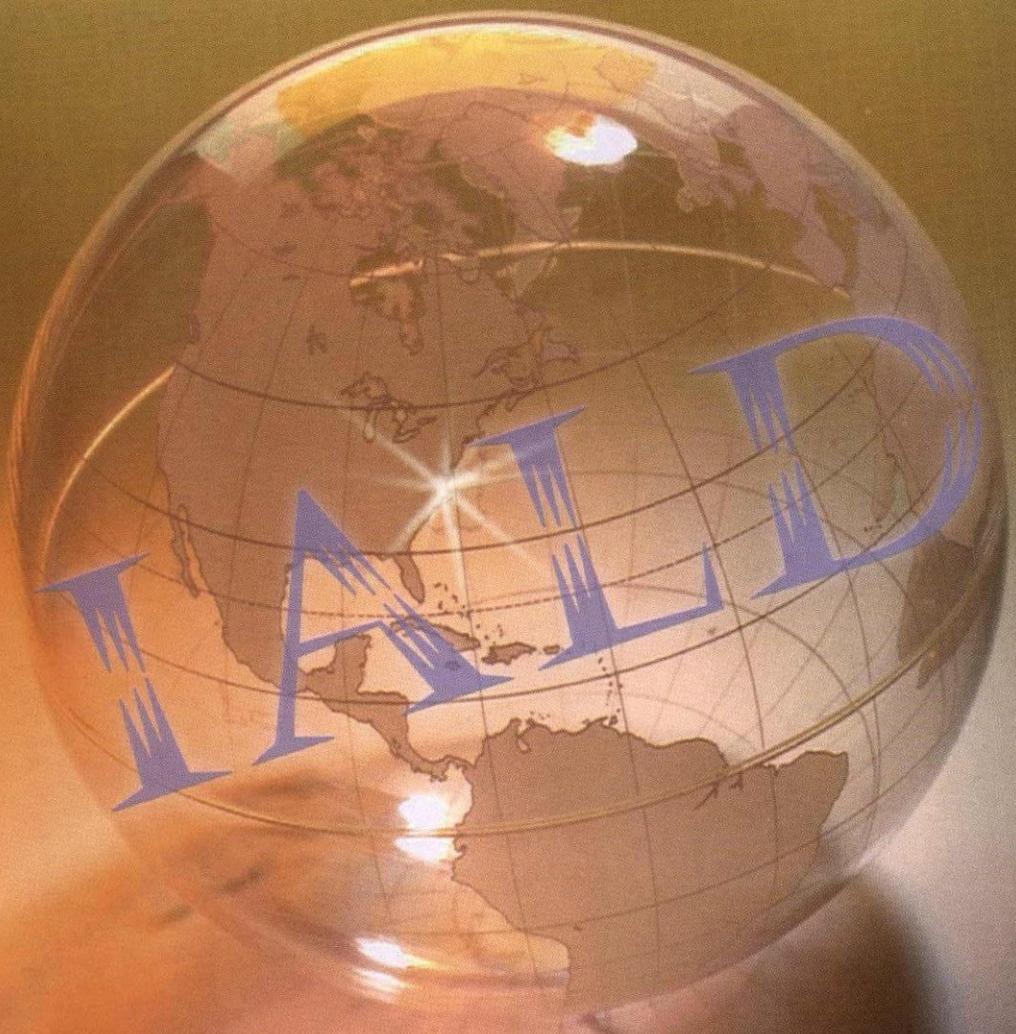


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Projects will be judged individually based on aesthetic achievement and technical merit in accordance with the designer's concepts and goals. The IALD encourages submissions of all types and sizes of projects. This is not a competition. There is no minimum or maximum number of awards granted. Each project will be judged on its own merits, not against other projects. Judging will take place over two days in February.

Awards

There are two types of awards, Awards of Excellence and Awards of Merit. Special recognition may be given for certain unique solutions. Award winning projects will be recognized at the IALD Awards Dinner and Presentation on May 10, 2000, in conjunction with LIGHTFAIR INTERNATIONAL in New York, New York. Winning projects will be published in leading architectural and design publications and included in the IALD slide library.

Submission Requirements

All text submissions must be in an 8-1/2 x 11 inches or equivalent format. No mention or identifiable illustration of a specific lighting design firm or designer may appear as any part of the presentation except the cover page.

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- Location of Project
- Date of Completion of Project
- Lighting Designer on Project
- Size of Project (in square feet or meters)
- Installation Cost of Project
- Watts per Square Foot or Meter



Written Brief: A synopsis of the special challenge(s) or restraints of the project and a description of your design solution (75 word max.) This is a critical part of your submission and is the only written information read in the first round of review.



Keyed Description: A technical description of the project, cross-referenced by number to each slide you have submitted (50 words per slide max.). The descriptions should include types of fixtures used and reasons for their selection.



Slides: A maximum of ten (10) 35mm slides of the project. Originals or high quality duplicates are required. The quality of the photography is important in the judging process. Avoid the use of fill light. Enhanced or retouched photographs are not allowed. Entrants are encouraged to include photographs which show the project in use, in context with its surroundings and from a human vantage point. Professional photography is advisable. Smaller scale projects should show more detail rather than reducing the number of slides. The IALD recommends a minimum of six (6) slides per project. If plans and drawings are required to describe the lighting solution, we recommend photographing essential information and including them as slides. If the project is a renovation, an image of the project before changes is recommended. If the project includes exterior lighting, at least one daytime photograph is recommended. All slides must be labeled with project and firm name and numbered to correspond with the keyed description. With slides positioned right reading, number each slide in the upper right corner and place project name in the upper left corner of the slide. Photographs, drawings and/or magazine articles will not be considered.

Return of Slides: The IALD will retain the slides of all entries for educational purposes unless you specifically request that they be returned. If you wish your submission to be returned, please indicate so in writing and include a return self-addressed envelope with the submission.



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Incomplete or late entries will not be considered.

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light points

In the last issue of *Architectural Lighting*, readers were asked: What would be on your wish list to manufacturers?

There is an old adage, "perception is fact." Well, the same applies when it comes to the lighting business; a product is only as good as the person who represents it.

When I first started in this business 25 years ago, the industry was staffed with a good number of knowledgeable technical sales staff. Over the years, several recessions and modifications to management philosophies have caused manufacturers to reduce or remove service to the engineering community.

Information may be available on the Internet, but the response for technical information is sometimes days away. In some cases in Canada, we have one individual representative for major product lines covering half of the country. With the pace of projects today and more technical design requirements, there is a need for bright and informed individuals to talk to engineering and lighting personnel.

The few manufacturers who have good representation and who have people who are able to spend the time with our staff are normally considered as potential vendors for our projects, when their products fit the specification, of course.

Why aren't the manufacturers spending time to train bright young graduates in the art of selling and marketing their products?

The manufacturers must not forget the engineering community and should spend time trying to familiarize specifiers with their products. Manufacturing management must see that there are potential rewards in having specifiers being knowledgeable about their products. The results are obvious.

Just remember, the product is only as good as the person who represents it.

W.G. Eley, PE, IC
Crossey Engineering Ltd., North York, Ontario

I feel that manufacturers must have educated representation. They need to invest in lighting "reps" who can answer or get answers quickly to the consultant. If I don't get the answers I need about a product, due to poor representation, I will go to an equal product where I can get a quick response. Also having the reps keep us and our literature up to date with the most current fixture information is crucial.

Kristina Martin, PE, IC
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ACQUISITIONS & AGREEMENTS

Holophane Europe, a wholly-owned subsidiary of Holophane Corporation, has announced the acquisition of **C & G Carandini SA** of Barcelona, a family-owned and operated lighting fixture manufacturer in Spain. Julio Carandini, grandson of C & G Carandini's founder, will continue to manage the business as part of Holophane Europe.

Super Vision International Inc. has acquired **Oasis Falls International, Inc.** of Sanford, FL. The company was purchased for 31,250 shares of Super Vision stock. The acquisition was structured as an asset sale, including Oasis Falls' products, patents and tradenames. Oasis Falls manufactures sheet flow waterfalls for residential and commercial pools, fountains and water features. Many of the designs have been adapted to be used with fiber optics. Super Vision will manufacture the fiber-optic units at

its Orlando headquarters under the name Oasis Waterfalls LLC.

Fiberstars, Inc. has announced that it has signed a letter of agreement to acquire selected technology and other assets of **Unison Fiber Optic Systems**, a joint venture company owned by Advanced Lighting Technologies (ADLT) and Rohm & Haas. Under the proposed agreement, Fiberstars will acquire patented and patent-pending technology in lamps and optics designed to deliver fiber-optic light as well as patent rights on large core plastic optical fiber. Fiberstars and ADLT intend to enter into a technology exchange agreement covering lamps, ballasts, optical coatings and fixtures for fiber-optic applications on an ongoing basis.

Lighting companies **Wila** and **Bruck** have joined forces. **Wila Leuchten GmbH** has acquired 50 percent of the shares in **Bruck**

GmbH and Co. KG of Herne. Both companies believe that technical cooperation in the compact and accent light sectors will boost their range of products. In the U.S., Michael Collett, CEO of Wila Lighting, Inc. and Alex Ladjevardi, president of Bruck Lighting Systems, have agreed to look at areas of joint development.

Lighting industry veterans Ken Reinhard and Nick Baker have acquired the assets of the lighting business of **Tarrant Interiors**, a Leggett & Platt Company. The acquisition of the company was finalized on July 15, 1999. A lighting management firm focused exclusively on national retail and hospitality clients, the company, which will operate as Tarrant Lighting, provides design consultation, product and project management and lighting maintenance services. Tarrant Lighting is based in Fort Worth, TX.

PRAIRIE LIGHTS SHOW

The Illuminating Engineering Society of North America, North Central Region held its first bi-annual Prairie Lights Regional Lighting Show and Conference September 17-18 at the Hyatt Regency in Chicago. Hosted by the IESNA Chicago Section, the two-day event was attended by over 80 percent of the 800 registered attendees and featured product displays from over 45 manufacturers. Prominent speakers conducted eight specification-oriented seminars that covered such topics as "Emerging Trends in Lighting Technology," "Dimming and Controls for the 21st Century," "Mesopic Vision," "The Quality of Lighting," "Zen and the Art of Ethics in Lighting Design" and "Fiber Optic Lighting."

Exhibitors at Prairie Lights included: Advance Transformer Co., Amerlux Lighting Systems, Aromat, B-K Lighting, BEGA, Bruck Lighting, Capitol Lighting Design & Restoration, Con-Tech Lighting, Cooper Lighting, Electronic Theater Controls, Elliptipar, Fiberstars, Inc., Focal Point LLC, Forum Lighting, General Electric Lighting, Holophane Lighting, Hydrel/Lithonia, Juno Lighting, Kenall Manufacturing, LCA C&I Division, Ledalite Architectural Products, Leviton Mfg. Co., Lighting Services Inc, Lightly Expressed Ltd., Lightolier, Lithonia Lighting, Gotham Downlighting, Lucifer Lighting Co., Lutron Electronics, Magnetek, Motorola Lighting Inc., Osram Sylvania, Philips Lighting Co., Poulsen Lighting Inc., Public Access Lighting, Quality Lighting, Rambusch Lighting, Ruud Lighting, SPI Lighting Inc., Skandall Integrated Lighting, Times Square Lighting, Vantage Controls Inc., Venture Lighting International, Lighting Controls Division, The Watt Stopper, Inc., Wiko Ltd., Winona Lighting and Visa Lighting.



1999 IALD AWARDS—ADDITIONAL CREDIT

The Hall of Bio-Diversity in the American Museum of Natural History in New York won an Award of Merit in the 16th annual IALD Lighting Design Awards. The winners of that award were Chou Lien, IALD, Richard Dorfman and Jung Soo Kim of H. M. Brandston & Partners. They were recognized for creating a

harmonious environment in which to experience and interpret the displays in the museum.

The winners would like to acknowledge an additional credit for the project, which was omitted in the original publicity.

Technical Artistry designed the lighting for the Rainforest Reconstruction and the three-

dimensional cases, both of which are shown in the photographs in the awards brochure. The designers at Technical Artistry are Kyle Chepulis, Henry Chepulis and Matthew Smith. Technical Artistry received a Lumen Award, along with H. M. Brandston & Partners, for the Hall of Bio-Diversity.

1999 RICHARD KELLY GRANT RECIPIENT

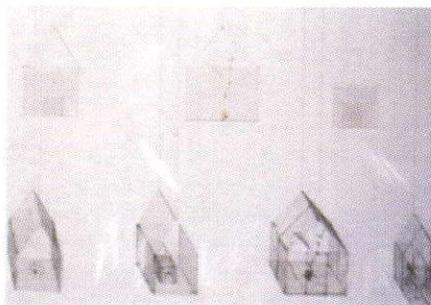
The 1999 Richard Kelly Grant has been awarded to Julianne Swartz for her piece, "Shadow House" (right). As an award winner, Swartz will receive a financial grant to continue exploring light as sculptural material, focusing on positive forms, reflections and brilliance.

In "Shadow House," thin glass sculptures of houses are suspended in front of a white wall and act as a conductor for the light source. The light shining through the sculptures projects "drawings" on the wall,

and the glass houses, overpowered by shadows and reflections, become only intermittently visible. Swartz's work will be on exhibit from December 12, 1999 through February 27, 2000 at the Robert Lehman Gallery, UrbanGlass, 647 Fulton Street in Brooklyn;

phone (718) 625-3685.

Judges for the Kelly award included: Philip Cialdella, Frank Conti, Melissa Gould, Addison Kelly, John Lasiter, Thomas Thompson, and Mimi Weng.



DESIGN FIRMS MERGE

Domingo Gonzalez Design has merged with **AC Hickox Lighting Design** to become Domingo Gonzalez Associates. As a result of the merger, Ms. Hickox will serve as senior theatrical associate and continue to design for entertainment in addition to architectural projects.

DGA has also moved to new offices at 25 Park Place, 5th floor, New York, NY 10007; phone (212) 608-4800, fax (212) 385-9160.

Harley Ellington Design and **Ellis/Naeyaert/Genheimer Associates** have announced plans to merge into what would become one of Michigan's largest architecture and engineering firms. Harley Ellington Design CEO Dennis King and Ellis/Naeyaert/Genheimer Associates CEO James Page made the announcement. The merger is expected to be finalized in January 2000.

NEW FIRM

Marsha Stern has launched Marsha Stern Lighting Design & Consulting, Inc.; phone (212) 579-5167, email: marsha@msldc.com.

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COURSES IN ARCHITECTURAL LIGHTING DESIGN

Through a conversion and enhancement of existing course materials, Penn State Architectural Engineering program is offering Architectural Lighting Design courses through the World Campus delivery system. Taught by faculty from the Penn State College of Engineering, Department of Architectural Engineering, the courses are offered in cooperation with the Illuminating Engineering Society of North America (IESNA) and the American Institute of Architects (AIA). Courses offered are: Architectural Lighting Design Practice I and Architectural Daylighting.

Developed to benefit those in the lighting industry who need formal lighting education, the courses can help prepare for certification by the National Council for Qualification for Lighting Professionals (NCQLP) as well as provide CEUs for NCQLP recertification. The instruction is also helpful in preparing for various certification examinations. Credits obtained may be applicable toward a graduate degree in architectural engineering. For more information, phone (800) 252-3592, email: lighting@psu.edu or visit: www.worldcampus.psu.edu.

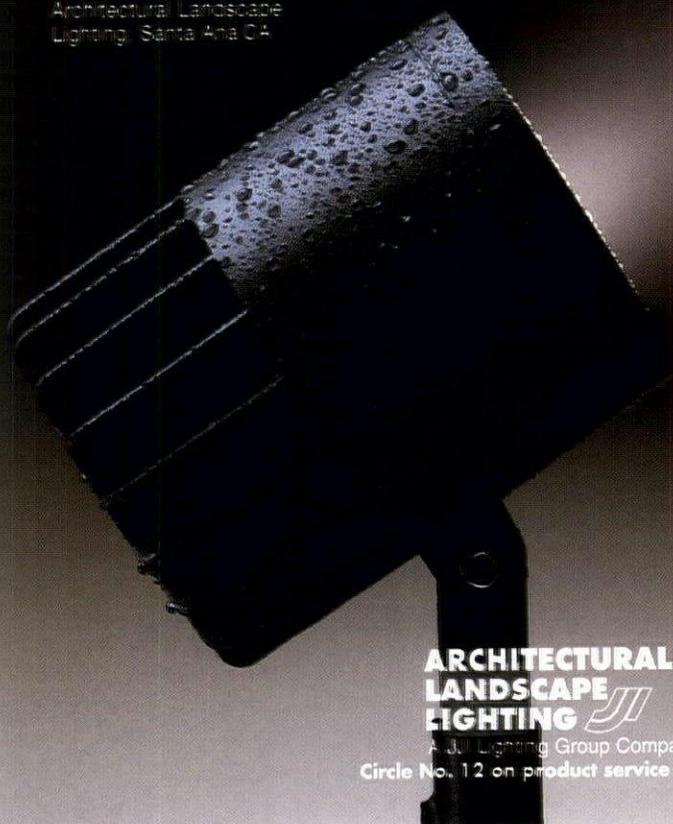
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NEW IES COMMITTEE FORMED

The Illuminating Engineering Society of North America has announced the formation of a new Lighting for Multi-Media Presentation and Video Teleconferencing Facilities (MMVT) committee to provide a forum for establishing lighting standards and recommendations for multi-media presentation, distance learning and video teleconferencing facilities. The committee will develop and publish competent and objective lighting information related to these technology-intensive, state-of-the-art facilities. Andrew Beldecos, a senior lighting consultant with CDAI, has been named chairperson of the MMVT committee.

Committee goals include: to gather, develop and organize a body of knowledge about lighting for multi-media presentation, distance learning and video teleconferencing facilities; to publish a recommended practice for lighting these spaces that addresses issues such as light sources, color, direction, quantity, quality and control requirements; and to coordinate committee work with other IESNA committees and related industries and organizations. The MMVT committee also plans to address specific issues such as lighting control systems and zone lighting requirements, integrating lighting systems with other technical systems, fenestration treatments for daylight control, acoustical and noise issues related to the lighting system, video camera image and recording requirements, video projector light output and current ANSI measurement standards and projection screen performance and the effects of ambient room lighting.

For more information on the MMVT, call (212) 248-5000 or visit the IESNA website at www.iesna.org.

RAMBUSCH CELEBRATES INTERIOR ART AND LIGHTING

Rambusch—the Art of Craft,” a comprehensive overview of 20th century interior arts and lighting produced by four generations of the Rambusch family, will be the centennial and holiday exhibition at the National Arts Club in New York City.

Opening December 7 and running through January 1, 2000, the exhibition will chronicle a century of work by Rambusch Studios, which was founded in 1898 and still produces custom interior arts and lighting today. Projects and objects on exhibit will include drawings, models, period photographs as well as metal, stained glass, mosaics and lighting, all of which were culled from over 45,000 custom orders and commissions. For more information, contact (212) 779-4949.

HIGH END FORMS ARCHITECTURAL DIVISION

High End Systems has announced the formation of a new architectural division using the Lightwave Research brand. Following the formation of this new architectural division, the High End Systems brand will be used with entertainment lighting products, and the Lightwave Research brand will be used for products developed specifically for the architectural lighting market.

...uses form
...action, subtle
...y (illumination)
...parate-source,
...ustable
...ng... both
...ed in its own
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BROADWAY LIGHTING MASTER CLASSES SCHEDULED

Tony Award-winning lighting designer Jules Fisher will head the faculty for the seventh annual Broadway Lighting Master Classes, which will be held December 8-12 at Fordham University's Lincoln Center campus in New York City. The program focuses on the design philosophies, trends and techniques in lighting plays and musicals on Broadway. This year, participants will attend an evening performance of "Cabaret" at Studio 54 and take part in discussions about the design and programming for the award-winning revival directed by Sam Mendes.

Since its inception, Fisher has served as creative consultant to the Broadway Lighting Master Classes seminar, which was started in 1993 by Sonny Sonnenfeld; Sonnenfeld continues his involvement in the program as a consultant. For additional information, contact Greg Havas at (212) 229-2965 ext. 829, fax (212) 229-2084, email: blmc@intertec.com. Information is also available at www.etcnyc.net.

BULBS.COM IS PARTNER STORE OF QUIXTAR

Bulbs.com, an online light bulb supplier, has announced that it is a partner store of Quixtar, a newly launched e-commerce business whose website is at www.quixtar.com. The Quixtar version of bulbs.com will be getbulbs.com. Bulbs.com's website at www.bulbs.com provides browsers with a complete purchasing process with a searchable database and reordering technology. The website also includes photos, specifications and alternative selections.

UPDATE: VISION 2020—THE LIGHTING TECHNOLOGY ROADMAP

Since its launch last September, "Vision 2020—the Lighting Technology Roadmap" has conducted three workshops involving experts from more than 60 companies and increased efforts to reach industry people through conference presentations, trade journal

articles and a newly redesigned website. The website, located at www.ere.doe.gov/buildings/technology_roadmaps/lighting, provides detailed information about the technology roadmapping process, workshops and a copy of the latest progress report avail-

able in .pdf format.

The results of the third and most recent workshop are also accessible at the website under Draft Roadmap Activities. At the workshop, held July 14-15 at Battelle's Breakthrough Center in Columbus, Ohio, a small group of

experts representing various lighting and building disciplines analyzed the trends affecting buildings, such as urban planning, computer technologies, interior environment design, and how the trends will impact the function of buildings. The group focused on the lighting system and conceptualized the new technical attributes and capabilities that these systems will need over the next twenty years. The group developed lists of technical attributes for future light sources, ballasts, light delivery systems and controls. They also discussed the needs for education, human factors research and increased focus on the use of daylighting.

Other notable events included a keynote address delivered on August 9 by Mark Ginsberg, Deputy Assistant Secretary for the U.S. Department of Energy Office of Building Technology, State and Community Programs. The speech was delivered at the Opening Session of the IEA Annual Conference and featured "Vision 2020—The Lighting Technology Roadmap." DOE's other lighting roadmapping activities. The text of the speech is now available in .pdf format on the website under Latest News.



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SHOWS TO CO-LOCATE

George Little, Inc. and Decorex USA Ltd. have announced plans to co-locate the International temporary Furniture Fair and Decorex USA at New York's Jacob Javits Convention Center beginning in May 2000. The shows will run May 20-23, 2000. For exhibitor information, contact Phil Robinson at (914) 421-4211 or fax (914) 948-6180. For additional information, phone (800) 421-4211 or (914) 421-4211. Information is also available at www.glmshows.com.

WATT STOPPER WINS COMPETITION

The Watt Stopper has been awarded a contract by the Energy Ministry of Sweden (Nutek) to supply up to 20,000 wall-mount PIR occupancy sensors to a buyer's group in Sweden. This contract resulted from a global competition to find an easy-to-install and reliable occupancy sensor for private office rooms. The program is part of an ongoing technology procurement program designed to develop markets for products that save energy. Occupancy sensors from American, European and Asian companies were submitted for testing by the Lighting Research Center in Troy, NY.

ON THE WEB...

Construction-Zone has launched a commercial construction product information search engine at www.c-z.com. The search engine indexes a databank of information and is currently strengthening its lighting content. The information that is presently available is provided in a Product Data Sheet template, which includes product images, descriptions, limitations, warranty information and certification references. After reviewing the data sheets, lighting specifiers can directly access a manufacturer's website for further information.

COMPANIES ON THE MOVE

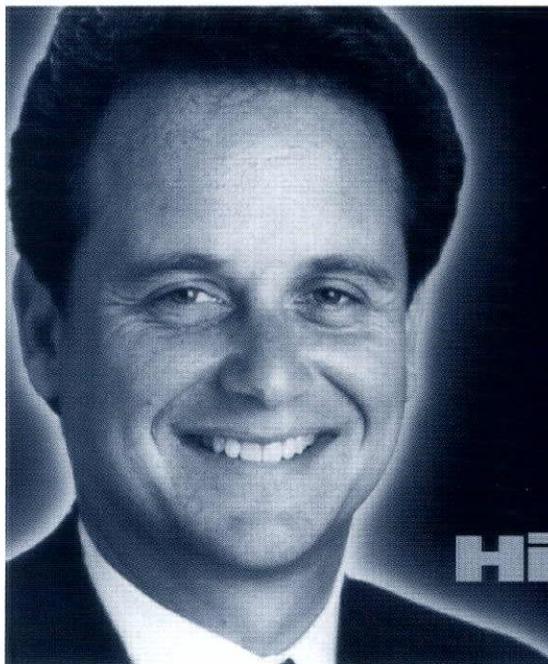
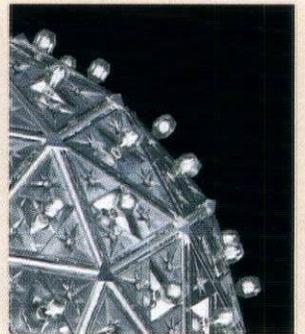
Fiberstars, Inc. has announced the relocation of its company headquarters to a new 60,000-sq.ft. facility in Pacific Commons, a 746-acre development. The new facility is double the size of the previous building and will house the distribution, warehousing, manufacturing and assembly, research and development and administration divisions. The company, still based in Fremont, can be contacted at (510) 490-0719. Their website is located at www.fiberstars.com.

Luminae Souter Associates, LLC has relocated to 504 Roosevelt Way, San Francisco, CA 94114. To contact the firm, phone (415) 863-8800 or fax (415) 863-8808. Launched December 1, the company website address is www.luminae-souter.com.

The Farrington Design Group has relocated its New York offices to 444 Madison Avenue, 7th floor, New York, NY 10022-6903. They can be contacted by phone at (212) 752-4004, fax at (212) 752-4114 or on the Internet at www.farrington.com.

Did You Know....?

Philips Lighting Company's Halogena 2000 lamp will be the official light bulb of the Times Square New Year's Eve Ball in New York City. Philips developed the specially-designed lamp to be used in the ball for the next four years. 180 Halogena 2000 lamps will light the exterior of the Times Square New Year's Eve Ball, which measures 6 ft. in diameter and weighs 800 lbs., while an assortment of colored and specialty lamps will illuminate the interior. The lamp debuts December 31, 1999 in Times Square as the culmination of the celebration.



"Low profile designs help us save space while staying visually creative. The lighter weight also gives us many more options."

Stephen Margulies, President
Cosentini Lighting Division

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CALL FOR SUBMISSIONS

The IESNA is inviting submissions of technical papers for the **IESNA Annual Conference** scheduled to be held July 31-August 2, 2000 in Washington, D.C. Accepted papers will appear in the 2000 Conference proceedings. The Papers Committee especially encourages the submission of papers on lighting design and application, daylighting and innovations in lighting education.

In addition to the formal technical papers, the committee has established a new classification of paper presentations called, "Lighting Updates," or short reports, to be considered for presentation at organized paper sessions. While the formal technical papers are considered for IESNA Journal publication following the conference, the short reports will appear only in the Conference Proceedings.

The deadline for abstracts in both categories is December 3, 1999; the deadline for submissions is February 25, 2000. For more information, contact Steve L. Martel, IESNA Papers Committee Chair, phone (508) 679-8131, fax (508) 674-4710, or Rita Harrold, Director, Educational and Technical Development, phone (212) 248-5000, ext. 115, fax (212) 248-5017/5018, email: rhiesna@aol.com.

World Workplace and the International Facility Management Association (IFMA) is inviting presentation proposals for **World Workplace 2000**, which will take place September 17-19 at the Ernest N. Morial Convention Center in New Orleans, LA. The deadline for submissions is November 29, 1999. For information, contact the IFMA Education Dept. by phone at (713) 623-4362 or fax at (713) 623-6124 or email: education@ifma.org.

The Washington University School of Architecture in St. Louis is accepting submissions for **The Steedman Fellowship in Architecture International Design Competition**, open to graduates of accredited degree programs in architecture from all countries. The program for this year, "Bridging the Gap, Architecture in the Shadow of the Arch," involves ideas for reconnecting Eero Saarinen's Jefferson Memorial Arch and its park with the downtown district of St. Louis, MO and providing a proposal for a Museum of American Architecture.

The competition advisor and members of an international design jury of architects and designers will meet at Washington University School of Architecture in February of 2000 to select the competition winner. The winner will

receive a \$20,000 traveling fellowship. Registration forms and a \$75 application fee are due December 6, 1999. For more information, please contact the Steedman Governing Committee, Washington University in St. Louis, School of Architecture, One Brookings Drive, Campus Box 1079, St. Louis, MO 63130-4899; phone (314) 935-6293, fax (314) 935-8520, email: steedman@arch.wustl.edu. Registration information can also be accessed at www.arch.wustl.edu/steedman.

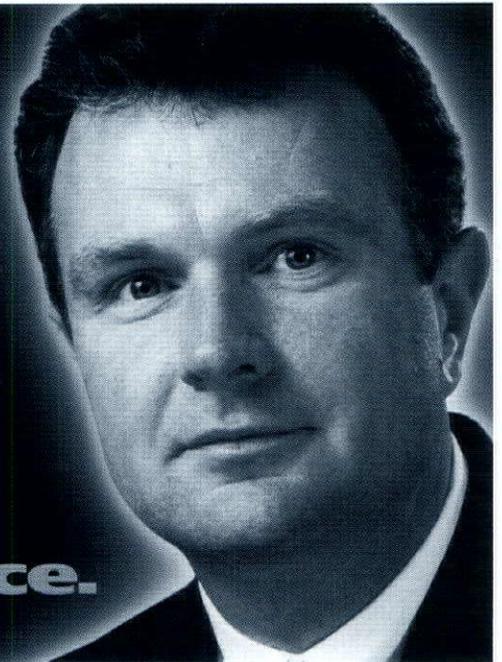
The International Illumination Design Awards (IIDA) program of the IESNA is accepting project submissions for the awards program in 2000. Both IESNA members and nonmembers may nominate or enter a project for an award. However, lighting designs of current members of the IIDA Committee, regional and section IIDA chairs, members of the international judging panel and employees of the Society are not eligible. Project entries and a \$10.00 entry fee are due at section level January 21, 2000. Awards will be presented at the IESNA Annual Conference. For information, contact the IESNA, phone (212) 248-5000 ext. 117, fax (212) 248-5017, website: www.iesna.org.

"By some estimates, half of U.S. businesses are still using T12 lamp technology. The evolution of the electronic ballast into a low profile design, combined in a system with a T8 lamp, is another example of the development of advanced lighting systems that provide the high quality, energy-efficient solutions demanded by our customers."

John Krenicki, Jr.
Vice President & General Manager
North America Lighting, GE Lighting



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Mark W. Harris has rejoined Horton•Lees Lighting Design's New York office as design principal.

Michelle Wilson has joined Burke Lighting Design.

Domingo Gonzalez Associates has named **A.C. Hickox** senior theatrical associate, **Deborah Tulchin**, senior associate and **Mario Merza**, associate.

John Moynahan, ASLA and **Alan Bowman, AIA** have joined Design Collective, Inc.

Stephen Q. Whitney has been elected president of Albert Kahn Associates, Inc.

Perkins & Will has named **Charles Alexander, AIA** and **Arthur Hoey, AIA**, principals; **Kirsten Abrahamson, AIA**, associate principal; **Jennifer Sowman** and **Kong Tse**, associates.

Dale Ciapetti has joined KA Inc., Architecture as design projects director.

Gina Heumann, LC, has rejoined Schuler & Shook, Inc. as project lighting designer.

TVS has promoted **William R. Halter, AIA** and **R. Scott Sickeler, AIA** to principal; **Bonau Barker, Don Benz, Karen Choate, Teresa Edmisten, Liz Neiswander, Jay Thomson** and **Nick Wolfcale** to associate principal; **Mike Azumi, Virginia Gaeblein, Bill Garcia, Mac Hicks, Kevin Gordon, Peter Green** and **Chris Johnson** to senior associate; **Billy Adkins, Leslie Cash, Lucy Aiken-Johnson, Matt Boorstin, Jan DeLong, Holley Henderson, Richard Simonton, Lisa Steffee, Gloria Stephens** and **Brian Sweny** to associate.

Paul J. Rode, AIA has joined Hammel, Green and Abrahamson, Inc. as senior project designer and associate VP.

Howard Hough has been named national sales manager at Murray Feiss.

Duro-Test Corp. has named **Richard J. Crossland** president and CEO.

High End Systems has promoted **Patrick Bouchard** to regional manager, Canada and **Charlie Hulme** to sales manager, Lightwave Research Architectural Products.

Jimmy Barnett has rejoined Vari-Lite International as general manager of European operations for Vari-Lite Production Services Europe. **Ken Matthews** joins as VP of sales and marketing for Vari-Lite, Inc.

Leviton Manufacturing has appointed **Scott Robbins** district sales manager for the Florida district; **Bill Donahue**, district sales manager for the Pacific Southwest district; and **Mike Evert**, district sales manager for the East Central district.

Lutron Electronics Co. has named **Jason Craze** and **Bill Little** senior sales representatives for the northeast region.

Luxo Corp. has appointed **Darrick Gurski** national sales manager of the company and **Larry May** manager of products, technical sales and training.

Alkco Lighting has appointed **Gedra Mereckis** director of architectural sales.

Engineered Lighting Products has appointed **Bruce P. Jahnig** general manager.

"The industry will move to low profile because the benefits are clear. The smaller ballast allows fixture designs to be optimized around the T8 lamp, providing greater efficiency and superior lamp image in a shallower overall fixture depth."

John Morgan
Executive Vice President
Lithonia Lighting



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1999 SCHEDULED EVENTS

December 6-10 AEE Comprehensive Five-day Training Program for Energy Managers, Memphis, TN; (770) 925-9633.

December 7-January 1, 2000 "Rambusch—The Art of Craft": Rambusch Studio's Centennial Exhibit, National Arts Club, New York; (212) 779-4949.

December 8 IESNY: "In the Dark About Lighting—Lamps, Ballasts, Systems and Controls," New York; (800) 217-5445, www.nyies.org.

December 8-12 7th Annual Broadway Lighting Master Classes, Lincoln Center Campus, Fordham University, New York; (212) 229-2967 ext. 829, fax (212) 229-2084, email: blmc@intertec.com, www.etcnyc.net.

December 15 Boston Society of Architects Lecture Series: "Built in Boston 2000: Machado and Silvetti, the New Moderns," Rabb Lecture Hall, Boston; (617) 951-1433, fax (617) 951-0845.

December 21-January 2, 2000 BSA International Architecture Tour to Thailand with an optional extension to Singapore; (800) 272-8808, (415) 955-2753, email: info@arctour.com.

2000 SCHEDULED EVENTS

January 19 Designers Lighting Forum of New York: "Making History Come Alive with Light!" New York; (212) 613-1599.

January 19 Boston Society of Architects Lecture Series: "Classical Architecture Today," Rabb Lecture Hall, Boston; (617) 951-1433, fax (617) 951-0845.

January 19 IESNY: "Lighting This Old House—Lighting for Historical Renovation," New York; (800) 217-5445, www.nyies.org.

February 9 IESNY: "Is Your Superior Colliculus Better Than Mine?" New York; (800) 217-5445, www.nyies.org.

February 16 Designers Lighting Forum of New York: "Mastering Photometrics," New York; (212) 613-1599.

March 8 IESNY: "Filing for Chapter 10—Intro the New IES Handbook," New York; (800) 217-5445, www.nyies.org.

March 9-10 DesignFest/NeoCon South, Miami Beach Convention Center; (312) 527-4141.

March 15 Designers Lighting Forum of New York: "Lights! Camera! Action!" New York; (212) 613-1599.

March 19-23 Light + Building, Frankfurt am Main, Frankfurt, Germany; (+49) 69-75-75-0, fax (+49) 69-75-75-6612.

March 20-25 Hannover Fair 2000, Hannover Fairgrounds, Hannover, Germany; (609) 987-1202, fax (609) 987-0092.

March 26-28 Enlightening America 2000 Conference and Trade Show, Adam's Mark Hotel, Philadelphia; (609) 799-4900, fax (609) 799-7032, email: lrusso@eela.com.

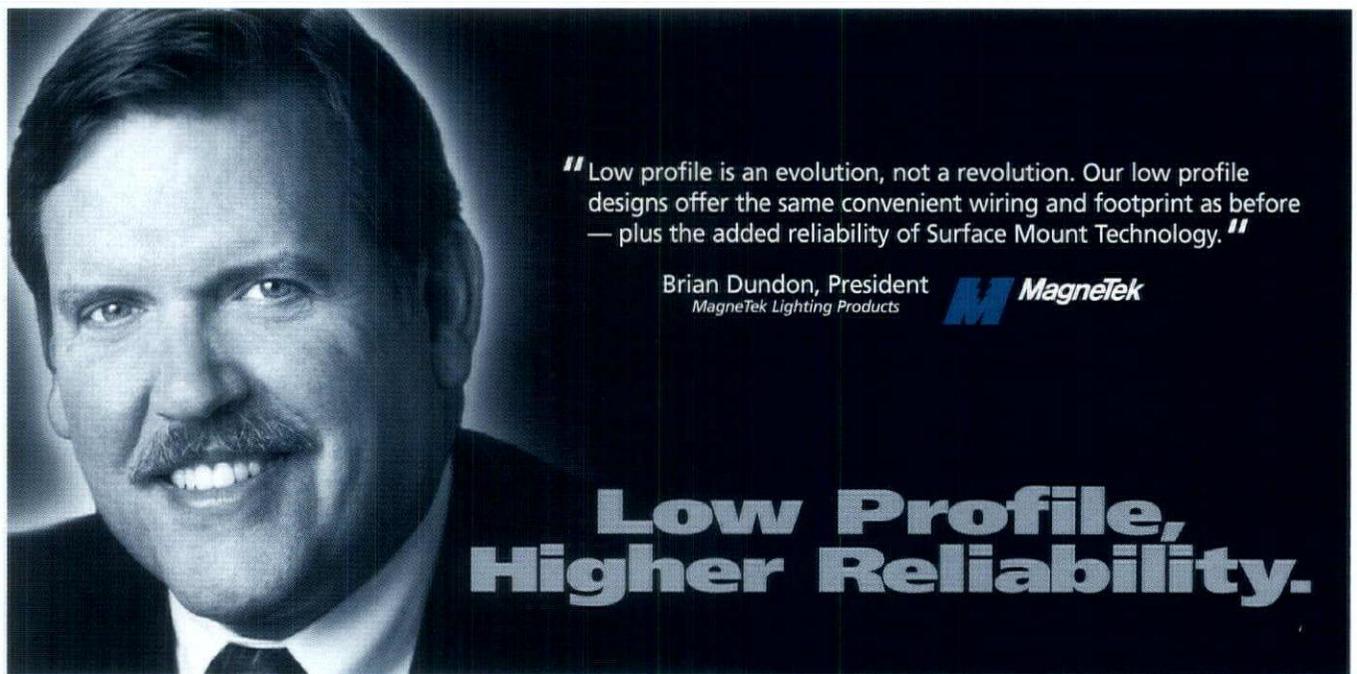
April 12 IESNY: "Master of Light," New York; (800) 217-5445, www.nyies.org.

April 15-29 BSA International Architecture Tour to Australia with an optional extension to New Zealand and New Caledonia; (800) 272-8808, (415) 955-2753, email: info@arctour.com.

April 19 Designers Lighting Forum of New York: "Lighting Sets the Stage," New York; (212) 613-1599.

May 3 IESNY: "ABC's of Light," New York; (800) 217-5445, www.nyies.org.

May 9-11 Lightfair International, Jacob Javits Center, New York City; (404) 220-2221, www.lightfair.com



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Brian Dundon, President
MagneTek Lighting Products

MagneTek

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Higher Reliability.**

BALLAST

When It Comes To Low Profile, Nobody Stacks Up To MagneTek.

MagneTek makes it easy to start enjoying the many benefits of low profile. Our new low profile ballasts easily retrofit into any T12 or T8 fixture because they have the same wiring and footprint as standard ballasts. And our low profile High Performance models offer installer-friendly universal input voltage (108V to 305V). Let MagneTek meet your high expectations in low profile.



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**How
Low Profile
Is Taking The
Industry To
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In this issue, Architectural Lighting interviews Francesca Bettridge, partner in the lighting design firm of Cline Bettridge Bernstein Lighting Design Inc. in New York City. Bettridge is a graduate of Barnard, and studied at Parsons and at the Open Atelier of Design, which she helped found. She has taught lighting at New York's Fashion Institute of Technology and at Parsons. Bettridge began working with Carroll Cline in 1978 and soon joined him as a partner in Incorporated Consultants Ltd. In 1985, she formed her present firm in collaboration with Cline and Stephen Bernstein. She has been involved in a wide range of projects from the New York Times Building to the renovation of the Santa Fe Opera House. She is currently working on BankBoston in Buenos Aires, Argentina, the New York Public Library of Fine Arts at Lincoln Center in New York City and the Kurayoshi Library in Japan. Bettridge is a professional member and former secretary of the IALD, has served on the Board of Managers and the Richard Kelly Scholarship Committee of the NY-Section IES and has received numerous Lumen, IALD and IIDA Awards and the Edwin Guth Memorial Award.

—Christina Trauthwein

AL: How did you get started in lighting design?

Bettridge: Throughout my career, many opportunities have been presented to me and I have chosen to take

them. I was attending a school, which I also helped to found, called the Open Atelier of Design. At the end of a semester, the students presented their projects to a design jury—Carroll Cline was a member of this particular jury. Subsequently, he called me and asked if I would like to come work for him. I honestly didn't even know that lighting design was a profession at that time, but the faculty at the school encouraged me to pursue the offer, saying it was a young but growing field and that it would be a wonderful opportunity to work with Carroll Cline. So I started working for Carroll and then became his partner.

AL: How has the profession changed over the past 20 years or so?

Bettridge: I think one significant change since I was a fledgling is that back then, there was a limited number of architects who used lighting designers. A tremendous effort to educate was paramount to getting the lighting design profession notice and acceptance—to let people know what we did and that we were necessary. The clients' attitudes were that the architect or interior designer should know how to—and could—do everything. So, it's been quite a movement from having to convince people that we *should* be on the team to the realization today that we *are* on the team. Today, most substantial jobs include a lighting designer, as well as other specialists. I don't feel that much of my energy is spent educating people as it used to be. And certainly the professional societies and the different magazines that have grown in the last 15 or 20 years have assisted in the educational process.

Another marked change is that there used to be a number of small manufacturers, which permitted more intimate relationships with each one; many of them would do custom work, collaborating with the lighting designer to develop a fixture on a per job

basis. Some of that individual attention is a thing of the past.

AL: Earliest influences?

Bettridge: I have been fortunate to have worked with many gifted people, and I believe the combination of their personalities and styles has impacted my career greatly. Carroll Cline has been my biggest influence. We've had a very creative partnership that I



enjoy. And I have that with Stephen (Bernstein) also. I think the collaborative effort of my partners has been invaluable.

Another person that has influenced my career—and my vision—was Beppe Zambonini, an Italian architect who founded the Open Atelier of Design. He was a brilliant designer and, unlike Cline who is very low key and a man of few words, Beppe was very expressive and exuberant. But both of them approached design within the context of our culture and architectural history.

Jim Nuckolls was one of my early partners and he was very important as an educator. I think in many ways, Jim was a visionary in the way technology and computers would be used in lighting design. He had visions of what is now Lumen Micro and the software for specs. Both Carroll and Jim encouraged me very early to become active with the IES and IALD. Through these organizations, I got to know some of the real originators in the lighting world such as Lesley Wheel, Howard Brandston, Jules Horton and Jeffrey Milham. I know I'm a

richer person for knowing these people—yet, if you say those names to some of the young designers today, they seem uninformed, which is truly unfortunate for them. It's almost like kids today not knowing who some important political and cultural figures were in the 1960s and '70s. And a lack of cultural education is a large obstacle to advancing our field. It astounds me what people don't know—references to architects and great monuments or to plays or history often draw blank stares. In the schools, emphasis is no longer placed on that. So a lot of it has to be initiative and curiosity on the individual's part. It's important to be around teachers and mentors who will take the time to nurture you and encourage a strong historical context and foundation.

AL: Other obstacles to advancing the field?

Bettridge: Everything is so speeded up, that this constant race against time becomes an obstacle to thinking. We often rely on being smart and experienced to get a job done; but there seems to be an absence of time for *thoughtful* design. And that's certainly a result of fax, e-mail and the like. Our businesses would suffer without these high-tech services, but the expectations for immediacy are unrealistic.

I also think there needs to be more of an emphasis on teaching people to draw—the drawing process slows the designer down just enough to put thought into the process and to figure out solutions. But it seems these days to be a lost art. Let's go back to thinking and drawing with a pencil to express something visually to ourselves and others.

A hands-on approach, when it comes to drawing or examining and turning on lamps and fixture samples, is often the most satisfying and effective approach. There's a whole generation that doesn't even know this. Younger designers are so unused to using their hands in this way that they really need the guidance of older, more established teachers to open their eyes to the importance of this and to develop a better understanding of the lighting design process.

(Continued on page 24)

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(Continued from page 22)

AL: *What beliefs or professional values do you hope that you've instilled in those who've worked for you or with you?*

Bettridge: I hope that they have a firm understanding of how we work on a team and the responsibilities that we bring to it, which is to be proactive and to make sure that everybody's communicating and doing what they have to do. That's a big challenge, especially when we're all so busy. I hope that they're looking at the lighting in terms of how people are going to be experiencing it in the space, so that it is as comfortable or as exciting as it's meant to be. I hope they're still writing everything down. That's the hardest thing to teach people, but it is invaluable.

AL: *Tips for those entering the profession?*

Bettridge: Try to work for a good firm. Investigate the work and the reputations—not only the quality of the work that they do and who their clients are, but the quality of the people who hire you and the atmosphere of the office. It's critical to remember that recently graduated students still must be trained. Whenever someone interviews with us—especially fresh from school—Stephen and I tell them that they should view the opportunity as post-graduate work, that they're still in school and that it's going to take a good two years until they're fully able to become involved with the activities of the firm. There is a learning process: You must pay attention, ask the right questions and participate. And the learning process should extend outside the office walls—always note, wherever you go, the lighting, what's good about it, what's bad, how it can be improved. There are real-world experiences all around us.

AL: *What technological/product advancements would you like to see?*

Bettridge: I would like to see refinements of things that already exist. I'd like the color and the quality of the light from HID and fluorescent sources to improve. I'd like it to be easier to control them. For example, I'd like there to be more of a match-up—within the same manufacturer—where their fluorescent lamps are actually the same color as each other, or their HID lamps at different wattages are truly the same color, not the "acceptable envelope," as they call it. There have been a number of times when the color of the lighting was particularly critical and we had to use color lenses just to match one lamp to the next from the

same manufacturer; or to insist that we use one manufacturer's 250W HID source and another's 400W because they're closer to a match than two of the same.

AL: *How does the continuing wave of mergers and acquisitions and the formation of conglomerates impact the lighting specifier?*

Bettridge: It seems depressing sometimes. Instead of specifying immediately what we want, we can be diluting it by packaging. Another aspect of this consolidation of the

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AND FOUNDATION.

lighting industry that is disconcerting is that people move around the industry so quickly—one day they're your rep, the next they're not because they've moved on.

Large conglomerates are eating up the smaller companies, but they still seem savvy enough to rip each other off, which is kind of an ugly thing to say. They seem to be competing with each other to be making products that are comparable to each other. One of the big problems I see is an ethical issue: If you design a custom fixture or someone makes a really high-quality fixture, then there's tremendous pressure to do a knock-off version of it. We fight that all the time—the knock-off Poulsen fixtures or the knock-off Bega fixtures. And sometimes the clients and the manufacturers are really asking us to be part of that. Often, we've had to call up and protest and say that we don't want to be involved, it's not right. For

example, we might design a custom fixture and be working with a manufacturer we've chosen to work with; they work on it with us to get the price right and submit drawings for it. Then somebody else comes along and gets the job because they underbid the original manufacturer. And, we're not going to get nearly the quality we wanted.

AL: *Do you think that design is being compromised by technology?*

Bettridge: Yes. That and time. You no longer can have the same amount of detailing. We get calls regularly now from very large architecture firms that we've worked with for years who'll say, "We need your proposal right away. We're starting construction documents." What happened to the nine months we used to have for design development? There are whole phases of design that are just being pushed aside and they're grabbing us at the last minute. I'll say it again, if you're very experienced and smart with a good team in your office, you have something to go on. I don't know what the young designers are doing.

AL: *How would you define success as it relates to lighting design?*

Bettridge: A successful lighting designer is someone who can say "No." When Stephen, Carroll and I started our company, we stated our goals: One of them was just that. This allows us to get to the point where we can work on the projects we want to work on.

AL: *What's the best piece of advice you've ever received?*

Bettridge: I have two of them actually. Carroll Cline said to me, "When you're approaching a design for lighting, the question is what are you lighting?" That's a very simple question, but it really encompasses a lot. Are you lighting art? Are you lighting the walls? Are you lighting the objects? How are you lighting the space? Observe what you are lighting as a starting point to all design.

The other: Many years ago, I did Calvin Klein's apartment and he said to me in terms of the lighting, "I want people to look and feel good." My first response was—because I was very inexperienced at the time—"Well, that's kind of superficial, but okay." But I realized that it is really the most important piece of advice you can give to someone for successful lighting. Because if the people in the space look good and they feel good, then the lighting's good. ■

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MURAL OBJECTIVE

Bringing new life to a Tiffany mosaic

BY ALICE LIAO, ASSISTANT EDITOR

CHALLENGE Gracing the two-story lobby in Chicago's century-old Marquette Building and providing a stopping point on many a historical and architectural tour of the city, a Tiffany mosaic installed in 1894 depicts the adventures of French missionary and explorer Pere Marquette in the upper Mississippi Valley. Created from colored glass, semi-precious jewels and mother-of-pearl, the mosaic is deemed to be one of the most interesting in the country, but until recently, was poorly rendered by fluorescent uplights. To do justice to the exceptional work of art, Margaret F. Boersema of Continental Offices Ltd. Realty contacted Yarnell Associates, Architectural Lighting Design. Lighting designer Bruce Yarnell said, "Our goal was to have this mosaic be the brightest element in the space, so that all attention is drawn to that ultimately."

DESIGN/TECHNICAL CONSIDERATIONS In the original design and construction of the building, the mosaic was illuminated by natural light penetrating glass elevator shaftways and large rotunda windows. Commented Yarnell, "The building used to have wrought iron elevators with back walls made of glass." However, over the years, renovations and a switch to automated elevators had blocked the passages for daylight, requiring the use of artificial light in the lobby area. To compensate, brass tubes equipped with fluorescent sources were mounted below the mural to uplight the intricate artwork.

"The concept for lighting the mosaic was just wrong: Fluorescent light doesn't have the crispness of incandescent or quartz-based lamps and the direction of the light was improper," said Yarnell. "The result was that all of this faceted glass was not sparkling." The project was further complicated by a stipulation that the design leave the basic shell of the building intact.

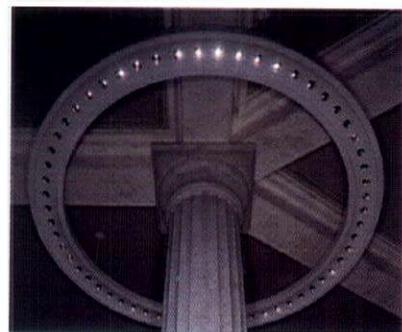


THE USE OF GALLERY LIGHTING AND NEW LAMP TECHNOLOGY HAS ENRICHED THE MARQUETTE MOSAIC, DRAWING OUT DETAILS PREVIOUSLY INVISIBLE. SUCCESSFULLY BLENDING INTO THE ROTUNDA AREA, THE FIXTURE RECALLS THE BARE-LAMP TECHNOLOGY ONCE USED IN THE SPACE. YARNELL NOTED, "THE MOSAIC IS NOW SEEN IN A LIGHT THAT RESEMBLES DAYLIGHT, WHICH WAS ORIGINALLY BROUGHT INTO THE SPACE OVER 100 YEARS AGO."

METHOD Lamp choice and fixture design played key roles in the lighting solution. "Because the mural uses an array of colors, we needed a light source that would bring out the beauty of the full visible spectrum," explained Yarnell. "Essentially, an electrical light source with the quality of daylight was required." The solution also employs art gallery lighting techniques to illuminate the mosaic from angles of approximately 20 to 40 degrees from vertical.

In choosing an appropriate light source, Yarnell tested lamps for color temperature and beam spread. Unlike most MR16 lamps, which are rated at 3000K and flatter warmer colors, the ideal source would also enhance the blues and violets present in the mosaic and produce a beam spread ensuring accurate placement of light, which is crucial to keeping the focus on the artwork. "Stray light would weaken the impact of the mural," said Yarnell, "and we wanted a more dramatic effect from the lighting." To attain the desired light level of 40 fc, the lighting solution uses 60 MR16s with a spectral curve that, through a patented process, closely follows that of natural daylight. With a color temperature of 3500K and a 17-degree beam spread, the MR16 resuscitates the cooler hues and puts sparkle in the mosaic. Added benefits provided by the lamp include low UV and IR light transmissions, which minimize damage to the art piece.

The 60 lamps are mounted within a custom-designed fiberglass ring suspended from the ceiling by five supporting rods. Centered around an existing marble column, the 14-ft. diameter ring not only allows the lighting to be angled according to the mockups, but also provides illumination without penetrating the basic structure of the space. Yarnell remarked, "We wanted the object to have the look of being added, yet be compatible with existing architecture." The fixture shape is composed of a set of curves to mimic the fluting on the central column. A matte white finish further integrates the fixture into the architecture. Inside, the ring is equipped with hardware for lamp rotation and tilting; removable top pieces facilitate aiming and maintenance. ■



DETAILS

PROJECT
Mosaic Lighting, Marquette Building

OWNER
John D. and Catherine T. MacArthur Foundation

LOCATION
Chicago, IL

BUILDING MANAGEMENT COMPANY
Continental Offices Ltd. Realty

LIGHTING DESIGNERS
Yarnell Associates, Architectural Lighting Design—Bruce Yarnell, L.C., IALD, IES, Mark Hershman, IES; Derek Porter Studio—Derek Porter, IALD, IES

PHOTOGRAPHER
The Studio of Photography—Jim Titschler

LIGHTING MANUFACTURERS
Solux Products Division, Wiko, Ltd (lamps); Kramer Lighting Inc. (custom fixture)

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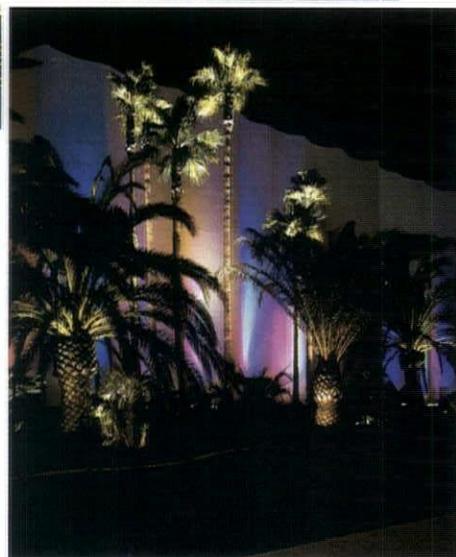
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BY JEAN GORMAN, CONTRIBUTING EDITOR

“Lions and tigers and bears, oh my,” chanted Dorothy and friends as they made their way down the Yellow Brick Road. Well, move over tigers and bears, the lion is king—and certainly here to stay for a while. You see, it’s not Kansas anymore—the MGM Grand Hotel has been transformed from the Emerald City to Hollywood gold. Classic and refined with plenty of glamour, the new design can be considered a roaring success.

“The object of the redesign was to get back to an image that reflected MGM’s role in the world of entertainment,” said Andrew Kerr, project manager for MGM. “The old scheme didn’t have enough impact—it wasn’t drawing people in the front door.” The original entrance and casino lobby, designed in the early ’90s by architect Veldon Simpson and interior designer Henry Conversano, revolved around a *Wizard of Oz* theme, with an oversized stucco-and-gypsum-board face of a lion—MGM’s hallmark—crouched around the entrance outside and a full-size set featuring a poppy field, the *Wizard of Oz* characters and the Emerald City inside. On the Vegas Strip, where a building only five years old is considered tired, this image was due for an update.

PARAMOUNT CONCERN

When you think of Las Vegas, restraint is the last word that comes to mind. But in revamping the entrance plaza of the MGM Grand complex—located on crossroads of Tropicana and Las Vegas Boulevard, the city’s most prominent corner—the owners, theme designers and lighting designers opted to rein in the urge to create a “typically Vegas,” over-the-top extravaganza yet acknowledged the need for glamour and glitz. Their idea was to develop a thematic landscape that underscored MGM’s roots in early 20th-century cinema without resorting to the design caricatures, circus tents, volcanoes and pirate ships that characterize most Las Vegas resorts. Instead, they’ve given the casino capital of the world a shot of glossy luster reminiscent of a 1930s Hollywood movie set—reinforcing, possibly, a new, more polished era in Vegas signaled by impresario Steve Wynn’s grand Bellagio Hotel and Casino, where elements of high culture abound and a high-roller can break away from the black jack table to contemplate a Van Gogh or a Picasso. The same holds true for the MGM Grand’s casino



A MIX OF DECORATIVE AND CONCEALED ARCHITECTURAL FIXTURES BRING THE GATEWAY OF ENTERTAINMENT TO LIFE. CONCEALED IN COVES, ROWS OF COLD CATHODE TUBES IN PINK, GOLD AND PALE BLUE ILLUMINATE THE MURAL CIRCLING THE BASE OF THE DOME. THE LAMPS ARE FITTED WITH ROTATING SNAP-ON REFLECTORS FOR BETTER CONTROL AND EFFICIENCY. CUSTOM RADIAL LOUVERS CONSTRICT THE LIGHT OUTPUT FROM ALL COVES AND DIRECT IT TOWARD ENTABLATURES AND MURALS WITHOUT MUTING THE RICH CEILING COLOR.

(designs were awaiting approval from local building authorities while construction was underway), a modified version of the lighting scheme Dougall had originally envisioned was produced. “The exterior screen walls we designed were illuminated with an animated LED system, which was implemented by technical wizard Larry Lester of Lester Creative to simulate backdrops for scenes in musicals,” he noted. Suggestive of elements in the set of a Deco-era musical, the gigantic 75-ft.-tall illuminated exterior walls span 1,000 ft., are accompanied by one of the largest video-showing LED TV screens in the world and stand as primary features of the overall design scheme outside. Peppered with the choreographed colored light of LED screens and framed with four colors of neon concealed along massive pilasters, they create an attention-grabbing, moving spectacle of ever-changing colors and patterns.

entrance, otherwise known as the Gateway of Entertainment, which is laced with voluptuous Deco-style details one would expect to see in a Busby Berkeley film.

Terry Dougall, principal of Dougall Design Associates, the theme design firm enlisted to give this part of the mixed-use MGM Grand complex its facelift, proposed striking the Deco keynote. “Most people associate MGM with the musicals of the 1930s and ’40s, the time when Art Deco was prominent,” said Dougall. “But Deco looks one way in New York, another way in London, another in Los Angeles and yet another in Miami. In the movies, though, it was very sleek—and to recreate the effect of a backdrop for an old MGM musical and a studio lot entrance, like that of the famous Paramount Studio, was our design intent.”

MOTION PICTURE

Multifaceted, integrated theatrical and architectural lighting of this backdrop—developed in conjunction with Ross De Alessi, the principal lighting designer on the project along with other theatrical lighting designers and technicians—was the key ingredient in generating the flash that was necessary to compete in the pulsating Vegas cityscape. The concept for the exterior entrance plaza was to set the tone with imagery that loosely echoes the entrance of the old MGM Studios in Hollywood and to punctuate it with vibrant illumination, establishing the MGM Grand as an exciting stopping point at the gateway to Las Vegas. Despite a hectic schedule

Another dominant component of the entrance plaza is a more sophisticated interpretation of MGM’s famous lion: a glorious new bronze statue (“We believe it’s the largest bronze statue in the world,” said Dougall), which rises, like Venus on a shell, from a pedestal amid balletic sprays of an illuminated fountain, choreographed to change to various movie soundtracks. Oscillating, 7 kW sky beams, set within massive Atlas bowls crowning freestanding columns and pilasters, penetrate the sky with roving four-mile-long shafts of light, adding more theatrical punch to the composition. The bronzed bowls are set aglow from below with recessed 50W quartz uplights concealed within the landscape or louvered in the tops of the columns. A series of narrow-beam recessed ceramic metal halide uplights illuminates 110-ft.-tall palm trees, and multicolored PAR uplights and robotic fixtures sweep the cyclorama wall on one side of the facade with a rainbow of light. Low-voltage striplights along the treads on the steps leading to the fountain round out the exterior lighting scheme. “The experience outside is like arriving at the grand opening of a great premiere, such as Oscar night,” said George Kurczyn, project designer at Dougall Design.

Complex construction schedule and budget constraints aside, pulling off the lighting features was no simple feat. “Ross had major hurdles to overcome,” said Dougall. “He needed to find fixtures that could be integrated in tight spaces so that they wouldn’t be visible from the street and yet be powerful enough to throw light long distances—45 to 60 ft. Also we needed to be sure that lights that frame the cyclorama wall wouldn’t wash out the LEDs,” said Dougall. “Another issue was getting FAA approval for the sky beams,” said De Alessi. The McCarran International Airport is only

one mile away and local authorities were keenly conscious of the need to squelch any potential danger to air traffic, so the lighting designers preprogrammed the control system for the oscillating beams to prevent any more than a five-degree tilt toward the airport.

WHAT A RELIEF

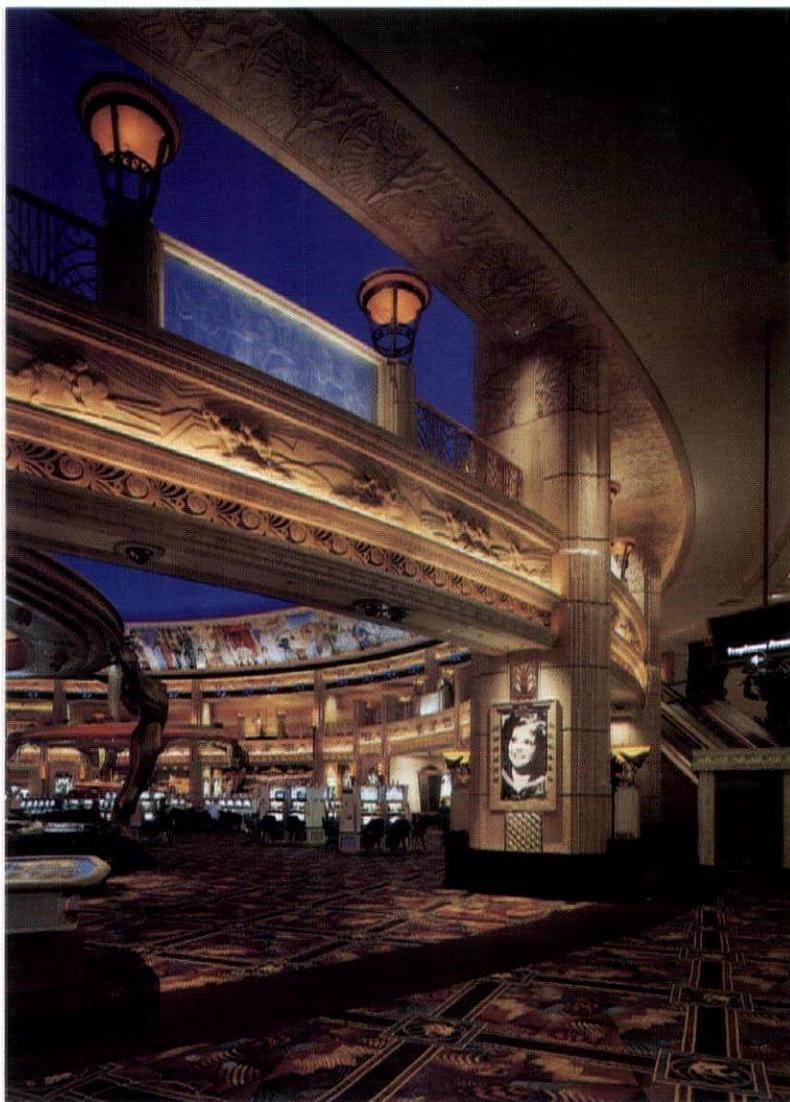
Inside, the Deco theme is more palpable—a sumptuous staircase adorned with bas-relief plaster panels and an ornate metal balustrade ascends beneath a 170-ft. dome as the centerpiece of the space. Here, both custom decorative fixtures—developed by Dougall Design—and integrated architectural lighting allow the technology of the '90s to enhance design elements of the '30s in a way that wasn't possible when the Deco style was born. The decorative alabaster sconces and torchieres, fitted with diffused neon or dimmed incandescent lamps, complement the architectural features while punctuating the space with pockets of inviting warm light. Low-voltage strips, concealed within a cove, allow for a smooth distribution of light and enhance the bas-relief entablature ringing the balcony level, while three rows of separately controlled cold cathode tubes of different colors illuminate the murals on the ceiling around the edge of the dome. The lamps were dimmed to mimic the quality of light that would have existed in the Deco period. Other hidden T8 fluorescent fixtures backlight the metal grillework at the base of the entablature, and adjustable quartz focal lights mounted atop the entablature highlight Lalique crystal panels above and allow the gray-painted dome to glow with the deep blue colored light developed in conjunction with theatrical producer Andy Behar.

All interior surveillance lighting needs are met with only the concealed architectural lighting system, and the operating requirements for the new lighting fall within the capability of the original room's power distribution system. Outside, the orchestration of the movement of the light not only creates focus and adds to the visual pleasure of the experience, it also serves to save energy and ease maintenance—only one third of the system is used at any one time. "Compared to the exposed luminaires and bright light at other Las Vegas facades," noted De Alessi, "MGM's new entry, with its concealed smaller, efficient luminaires orchestrated to the soundtracks that made the company an entertainment giant, is, indeed, an exercise in restraint." ■

LOW-VOLTAGE STRIPS, CONCEALED WITHIN A COVE, ALLOW FOR THE EVEN DISTRIBUTION OF LIGHT AND ENHANCE THE BAS-RELIEF ENTABLATURE RINGING THE BALCONY LEVEL. DECORATIVE FIXTURES ARE SHIELDED TO LIMIT GLARE WHEN VIEWED FROM ABOVE. THE NEUTRAL COLOR OF THE CEILING IS TRANSFORMED BY AN ARRAY OF MOVING MIRROR FIXTURES FITTED WITH DICHROIC FILTERS AND CERAMIC GOBOS AND LOCATED IN THE TECHNICAL BAND ADJACENT TO THE SURVEILLANCE AND SECURITY EQUIPMENT.

DETAILS

- **OWNER** MGM Grand
- **ARCHITECT** Klai Juba Architects—Troy Moser, project architect
- **DESIGNER** Dougall Design Associates—George Kurczyn, project designer
- **LIGHTING DESIGNER** Ross De Alessi Lighting Design—Ross De Alessi, IALD, LC, MIES; Trish Connor, MIES; Andrew Pultorak, LC, MIES
- **LANDSCAPE ARCHITECT** Lifescapes
- **TECHNICAL DESIGN DEVELOPMENT/SHOW PRODUCTION** Lester Creative—Larry Lester, principal
- **ARCHITECTURAL MULTI-MEDIA** Behar-Sacker Multi Media—Andrew Behar, principal
- **SHOW DESIGN** Andrew Behar
- **ENGINEER** JBA
- **FOUNTAINS** STO Design Group
- **GENERAL CONTRACTOR** Marnell Corrao
- **ELECTRICAL CONTRACTOR** Bombard Electric
- **PHOTOGRAPHER** Ross De Alessi
- **LIGHTING MANUFACTURERS** GE; North Star Lighting; Greenlee; Lumiere; Hydrel; Edison Price; Reggiani; Capri; CSL; Tokistar; Martin; Xenotech; Yesco; Lost City Iron Works; Metalux; National Cathode; Ark



Corporate Profile

GS&P RELIES ON ITS NEW SPACE TO HELP MARKET ITS LIGHTING DESIGN SERVICES

BY CHRISTINA TRAUTHWEIN, EDITOR-IN-CHIEF

In moving their corporate headquarters to a downtown-Nashville high-rise building, the design team of Gresham Smith and Partners (GS&P) was challenged not only with creating an office environment suitable for their employees, but a design environment attractive to prospective clients.

"The new office, which includes space for future expansion, was designed with the aim of displaying the architecture and engineering expertise of GS&P," said Anthony J. Denami, lighting designer for the project. "We're a full-service firm, offering services in architectural and interior design to surveying, structural engineering, civil engineering, mechanical, electrical and plumbing. We used the development of our new headquarters to demonstrate our capabilities in each of these areas and viewed our need for a new office as an opportunity to create a marketing and advertising tool."

Warm lighting highlights the neutral tones of the entire space, creating an atmosphere in which employees feel comfortable and visitors feel welcome. "We highlighted all architectural elements, artwork and items of interest to create visual contrast," said Denami. "We wanted clients to

feel at home in our offices and to recognize that our concepts and designs for our own space could be translated into developing a concept for them.

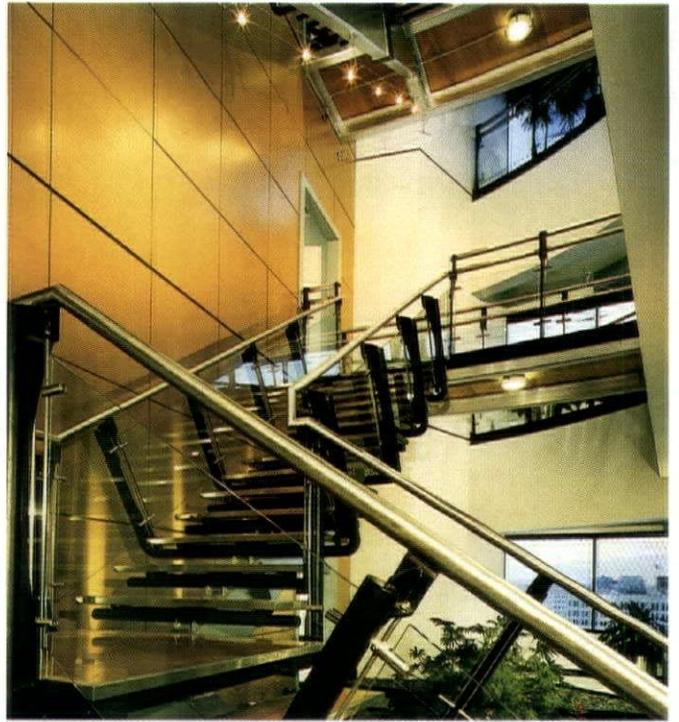
"When designing a work environment, there are a few very basic criteria to follow," said Denami. "First, if working with computers, it is essential to select a lighting system that will minimize glare on computer screens to avoid eye fatigue and keep productivity high. In this case, for the open office areas, we chose three-lamp T8 fixtures with highly specular precision parabolic louvers designed to meet IES RP-1 preferred level criteria. Secondly, offices should be a safe environment, designed with egress and emergency lighting around corridors and staircases for function. But keep in mind, functional lighting can be aesthetically pleasing so that it blends with the style of the interior. In addition, artwork and any other decorative elements should be enhanced by illumination to create visual interest. And lastly, conference rooms need flexibility. Whether used for meetings or product demonstrations, the lighting should accommodate all activities." ■



GREETED BY THE COMPANY'S LASER-CUT AND BACKLIGHTED LOGO, VISITORS AND CLIENTS RECEIVE A WARM VISUAL WELCOME IN THE LOBBY WITH AN ILLUMINATED WOOD WALL AND ARTWORK HIGHLIGHTED WITH BI-DIRECTIONAL DIMMABLE TRACK-MOUNTED MR16 FIXTURES.



CORRIDORS SHOWCASE PROJECTS DESIGNED BY THE COMPANY AND EXECUTIVES' NAMEPLATES HIGHLIGHTED WITH DIMMABLE RECESSED TRACK MR16 FIXTURES. CIRCULATION PATHS HAVE TRIPLE-TUBE PL FLUORESCENT DOWNLIGHTS—USED FOR THEIR ENERGY EFFICIENCY—WITH EVERY OTHER ONE ON EMERGENCY POWER FOR EGRESS LIGHTING.



TWO EXISTING CONCRETE FLOORS WERE REMOVED TO FORM A CONNECTING STAIRWAY. COMPACT FLUORESCENT FIXTURES ILLUMINATE THE CORRIDORS AND UNDERNEATH THE CATWALKS. "LIGHTING THE TREADS OF THE STAIRS WAS A CHALLENGE," SAID DENAMI, "BECAUSE IT'S ENTIRELY OPEN WITH NO WAY TO CONCEAL FIXTURES." MR16 FIXTURES ARE MOUNTED ON ENERGIZED STAINLESS STEEL CABLES TO ILLUMINATE STAIR RISERS FROM OVERHEAD. IN THE EVENT OF A POWER OUTAGE, THE LIGHTS WILL CONTINUE TO ILLUMINATE THE STAIRCASE SO THAT IT REMAINS ACCESSIBLE TO EMPLOYEES. INCANDESCENT FIXTURES GRAZE THE WOOD WALL FROM BELOW.



THE LARGE NASHVILLE CONFERENCE ROOM, WHICH OVERLOOKS THE STATE CAPITOL, HAS SEVERAL LIGHTING SYSTEMS FOR FLEXIBILITY. THE CEILING COVE INCORPORATES CONTINUOUS STAGGERED T8 FLUORESCENT SOURCES IN 3500K.

DETAILS

- **PROJECT** Gresham Smith and Partners Corporate Office
- **LOCATION** Nashville, TN
- **ARCHITECT** Gresham Smith and Partners—Anna Roberts, AIA
- **INTERIOR DESIGNER** Gresham Smith and Partners—David Powell, Deborah McAllister
- **LIGHTING DESIGNER** Gresham Smith and Partners—Anthony J. Denami, LC, IESNA
- **PHOTOGRAPHER** Brian Robbins Photography; Nicko Young
- **LIGHTING MANUFACTURERS** Metalux; Halo; Tech Lighting; Devine Lighting; Philips Lighting; GE

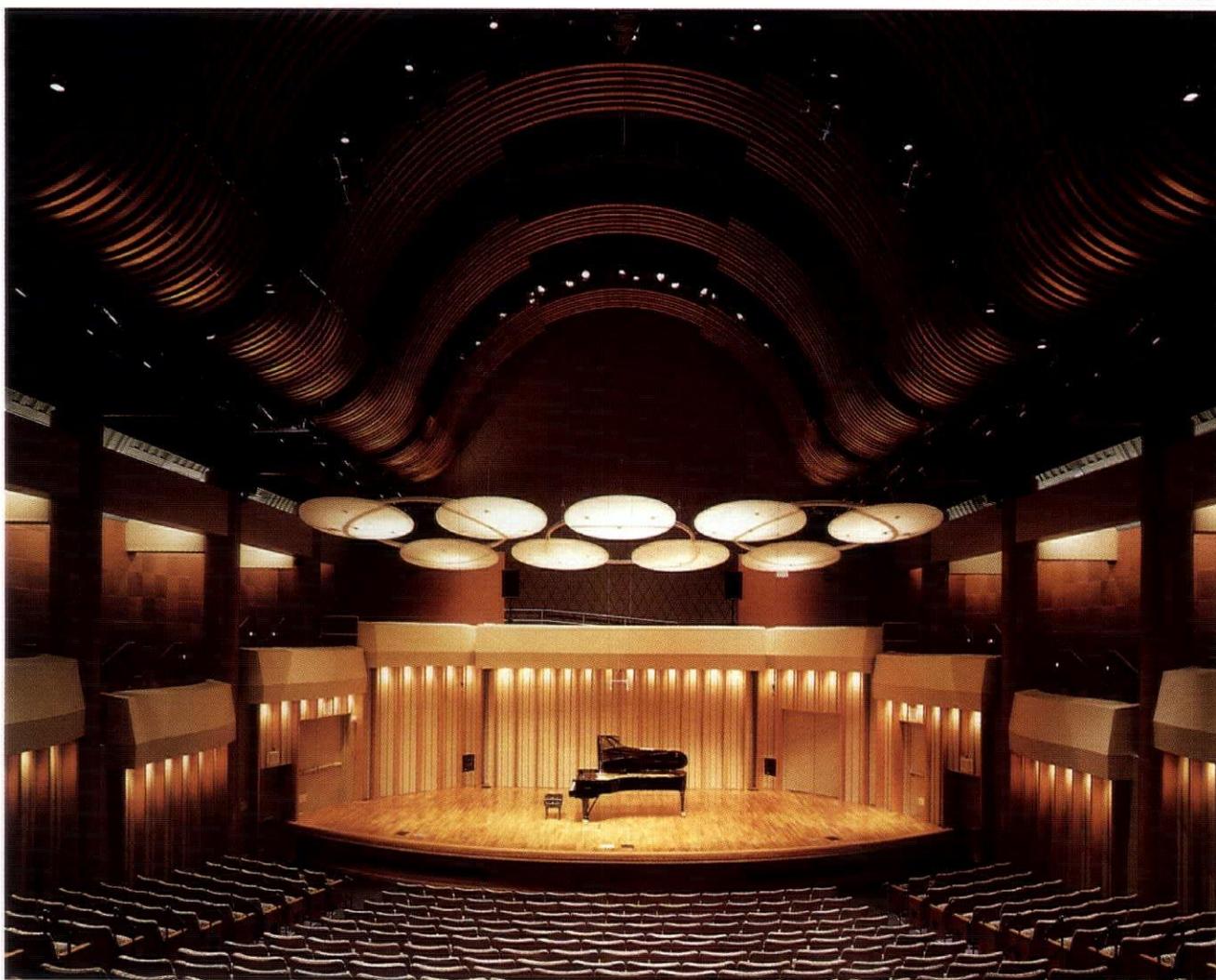


INCANDESCENT DOWNLIGHTS OVER THE TABLE AREA AND ALONG THE PERIMETER ARE SEPARATELY DIMMABLE. CORRIDOR-MATCHING RECESSED TRACK-MOUNTED MR16 FIXTURES HIGHLIGHT VISUAL ELEMENTS DISPLAYED ALONG THE WALL DURING PROJECT PRESENTATIONS TO CLIENTS.

Perfect Harmony

TEAL BROGDEN ORCHESTRATES A LIGHTING DESIGN THAT ADDS DRAMA
TO THE ARCHITECTURAL RHYTHM OF THE SPACE





OPPOSITE: LAYERS OF LIGHT DEFINE DIFFERENT ARCHITECTURAL SPACES IN ZIPPER HALL. TRANSLUCENT DISKS SUSPENDED OVER THE STAGE

(ABOVE) DIFFUSE LIGHT FROM THEATRICAL ELLIPSOIDAL FIXTURES MOUNTED ON BLACK METAL ARCHES.

BY ALICE LIAO, ASSISTANT EDITOR

Established in 1950 as the Preparatory Division to the USC School of Music and renamed in 1986 after Richard D. Colburn, philanthropist and chamber music enthusiast, the Colburn School of Performing Arts offers students aged 2 to 18 an after-school and weekend curriculum of music, dance and drama in levels ranging from the introductory to the very advanced. Last year, the school, once housed in a warehouse stripped of amenities, exchanged its spare quarters for a new 55,000-sq.-ft. facility designed by Hardy Holzman Pfeiffer Associates (HHPA). Enscenced in the heart of downtown cultural Los Angeles, the building is located adjacent to the Museum of Contemporary Art and opposite the proposed Disney Concert Hall.

When asked to illuminate the new facility, lighting designer Teal Brogden of Horton•Lees Lighting Design designed a solution that not only seamlessly marries lighting with architecture, but, perhaps more importantly, also helps create an environment conducive to the school's mission. "Because Colburn is a school of music and performance for children and young adults, the space had to be representative of the creative freedom and the inspiration that they wanted to give the attending young minds," explained Brogden. "The space had to be

uplifting and not imposingly institutional—as some schools can feel."

Colburn's new home accommodates its 1,000 students with 20 classrooms, 28 teaching studios, two dance studios, a 100-seat recital hall and as its centerpiece, a 420-seat auditorium, Zipper Concert Hall. Taking its name from Dr. Herbert Zipper, a Viennese conductor who organized a secret orchestra in a Nazi concentration camp and from 1980 to 1997 served as Artistic Advisor to the school, the large concert hall boasts a vaulted ceiling rising nearly 70 ft. high and is equipped with a series of curtains for acoustical flexibility. In lighting the hall, Brogden also considered acoustical concerns. "The lamps, the filaments and the dimming systems were carefully chosen to ensure that they didn't hum, buzz or rattle," Brogden noted. "Of course, they also had to look great and be warm and inviting."

CHAMBER MUSIC

On performance night in Zipper Hall, a succession of dimming lights helps draw the audience's attention to the stage. To create the effect, layers of light were used to distinguish the various architectural spaces. "When you first walk in, there's some light up in the upper



IN THE LOBBY, CURVED WALLS FRONTED BY CORRUGATED ACRYLIC PANELS ARE BACKLIGHTED BY FLUORESCENT STRIPLIGHTS.

Large translucent disks suspended on hoops over the stage presented the design team with a special lighting challenge. “The stage lighting and house lighting needed to work with and around those acoustical disks,” said Brogden. “Although the disks create an interesting canopy that gives the stage a little more of an intimate scale, the design team knew that light needed to filter through the acoustical pieces.” A frosted finish was used on the disks to diffuse light from theatrical ellipsoidal fixtures mounted on black metal arches above. Spaces between the disks allowed for more focused lighting onto the stage.

Described by Brogden as being “a secondary space to the performance space,” balconies with plaster railings run along the sides and back of Zipper Hall. They are lit by incandescent sconces mounted on the inner side of a beam and glow with the warmth of their terra cotta-clad walls. At the base of the wall, tiny steplights inset into the textured tiles act as a guide for late-arriving audience members.

Entry into the school is gained through a three-story lobby area that extends from the front to the back of the building. A generous stairway connects the three floors, whose

chamber, so one senses the larger scale of the space,” explained Brogden. “When the performance is about to begin, the lights on the outer perimeter dim down and the ones on the interior—the inner shell—become more apparent. So one’s focus is taken from a larger space into a smaller and more intimate space.” Added architect David Saviola, “HHPA’s goal was to create an environment that, during a performance, was not overwhelming to the youngsters on stage.”

Illuminating the perimeter of the space, linear low-voltage strips with snap-in MR16 lamps are hidden in coves beneath the balconies. Mounted between the vertical wood mullions, they bathe the plaster walls in warmth. “We carefully did a series of mockups and decided to place a single lamp between each wood mullion to give a sense of lower scale and more intimate space,” said Brogden. Also contributing to the atmosphere of warm intimacy, wood ribs curved into graceful arches form a “false ceiling” at 55 ft. Lighted by PAR30 lamps on outriggers, the wood trellis helps deflect attention away from the larger chamber above. “We wanted to stop one’s eye at the trellis,” explained Brogden, “so we put light onto the arches, leaving the backdrop in darkness.”

open spaces double as gathering areas for special events. “There are all different scales of space in the lobby—over the stairway, the space is three-stories high and then on the first level, there’s a space that’s more intimate with benches against a curving surface,” remarked Brogden. Curved walls fronted by corrugated acrylic translucent panels wind through the lobby spaces, adding visual interest. Backlit by simple linear fluorescent striplights, the walls are capped on top and on the bottom by perforated metal, which allows for easy maintenance and air passage. According to Brogden, the metal “also allows a little bit of the brighter sparkle to show.”

A reconstructed Frank Lloyd Wright interior designed for violinist Jascha Heifetz in 1947 serves as a highlight of the upper lobby. To illuminate the upper lobby, half-round direct/indirect fluorescent fixtures with perforated metal are mounted on the sides of architectural beams, while recessed downlights supply additional lighting. The lights are step-dimmed to conserve energy. “Because the project had a very tight budget, we weren’t able to have dimming in the lobby space,” explained Brogden. “But with California’s strict energy codes, the

entire building had to conform to a limited wattage per square foot. To be responsible, we put the building on a timeclock and used a dimming system for the performance spaces.”

STEPPING OUT

On the exterior, creating a signature in the Los Angeles skyline, an architectural monitor lighted by fluorescent sources behind a translucent glass glazing functions as a beacon-like element, informing passersby of performance nights.

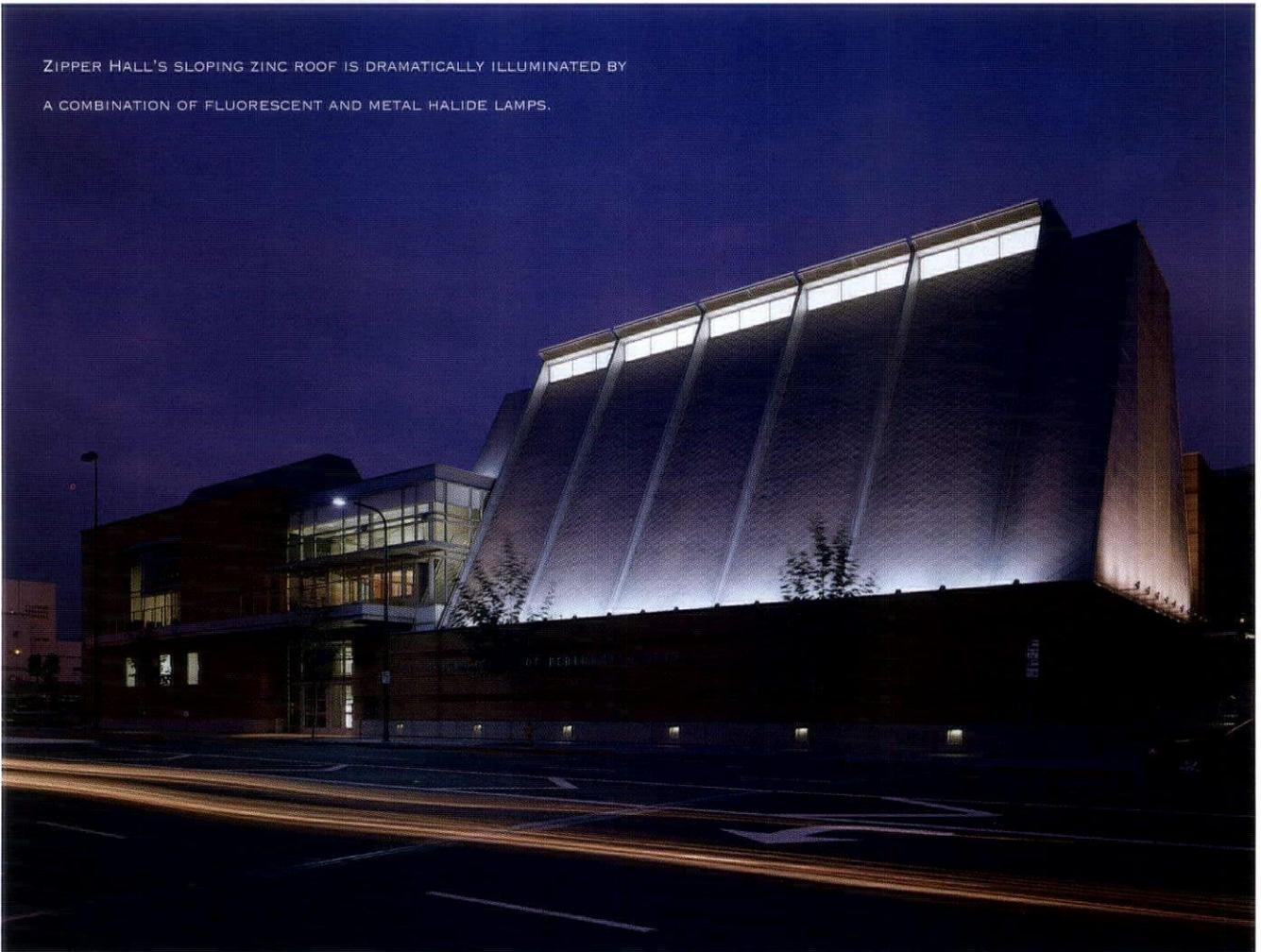
“The exterior is a pretty clear expression of the spaces inside,” said Brogden. “The major feature is the architectural form of Zipper Hall.” A combination of fluorescent and metal halide lamps grazes the sloping roof of zinc for dramatic effect. The side facade of the hall is lighted by metal halide sources. “On the side, there was no place for the same equipment,” noted Brogden. At the base of the exterior walls, a series of notches with inset steplights lights the pavement. Added Brogden, “The other half of the building is much more quiet, because that’s where the classrooms and offices are—that’s not the public part of the building.”

On the project as a whole, Brogden commented, “The architect did a remarkable job in bringing the team together to ensure a series of inspirational spaces; a lot of technical, emotional and aesthetic issues combined to make the spaces successful.” ■

DETAILS

- **PROJECT** Colburn School for the Performing Arts
- **LOCATION** Los Angeles, CA
- **ARCHITECTS** Hardy Holzman Pfeiffer Associates
- **LIGHTING DESIGNER** Horton•Lees Lighting Design—Teal Brogden, IALD, Alex Friend, John Dunn
- **PROJECT MANAGER** Stegeman and Kastner
- **STRUCTURAL ENGINEER** John A. Martin & Associates
- **MEP ENGINEER** Levine/Seegel Associates
- **GEOTECHNICAL ENGINEER** Law/Crandall
- **CIVIL ENGINEER** Psomas and Associates
- **ACOUSTICAL CONSULTANT** McKay Conant Brook, Inc.
- **THEATRICAL CONSULTANT** Knudson and Benson
- **CONTRACTOR** Bayley Construction
- **HEIFETZ STUDIO CONSULTANT** Harold Zellman & Associates, Architects
- **PHOTOGRAPHY** RMA Photography—Bret Moore; Foad Farah
- **LIGHTING MANUFACTURERS** Abolite; Ardec; Bega; Cooper Lighting; Danalite; Elliptipar; GE; Hydrel; Kurt Versen; Lightolier; Lite; LSI; Luceplan USA; Lumiere; Metalumen; Philips Lighting

ZIPPER HALL'S SLOPING ZINC ROOF IS DRAMATICALLY ILLUMINATED BY A COMBINATION OF FLUORESCENT AND METAL HALIDE LAMPS.



SPARKLE ELEMENTS—A BRIGHT IDEA

BY YUKIO AKASHI, DR. ENG.

Lighting designers have always wished to create cheerful, brightly lighted rooms, no matter how demanding the clients' requirements for eliminating glare and saving energy. This can be accomplished through the use of sparkle elements—design elements, such as reflecting rings on downlights, that take advantage of a quirk of human physiology to turn a gloomy room bright. Lighting designers typically choose fixtures with low-luminance parabolic louvers to prevent images of the fixtures from reflecting on VDT screens. They often choose indirect fixtures or downlights with black baffles to reduce discomfort glare and sometimes choose task and ambient lighting systems to save energy. Unfortunately, these choices often result in rooms that appear dark. Sparkle elements solve this problem by giving people cues for identifying how much light is coming from a fixture into the room, removing the gloomy mood from the room without the expense and increased energy use of adding more light.

DEVELOPING THE THEORY

In deciding whether a room appears brightly lighted or not, the human brain relies not only on the amount of light reaching the retina of the eye, but also on its ability to interpret cues. To understand this process, consider the Massachusetts Institute of Technology's well-known Kresge Chapel, designed by Eero Saarinen in 1955. Figure 1A shows the Kresge Chapel viewed from its entrance hallway. Looking at

the altar in the chapel through the entrance door, one can see that a large amount of directional light falls on the altar and its immediate surroundings from the ceiling. The altar area appears bright. After entering the chapel, one can verify that, as expected, a large fixture in the ceiling lights the altar (Figure 1B). The impression of brightness is caused by many small metal particles being suspended from the ceiling and acting as illumination cues. If these particles were not present, one would underestimate the amount of light falling from the fixtures.

From this example, a theory can be developed: When entering a room, a person perceives the location of the light source and the direction of the light by taking into account cues, such as the amount of light reflecting off of various surfaces. Specular or high-reflectance surfaces supply useful information for

FIGURE 1A

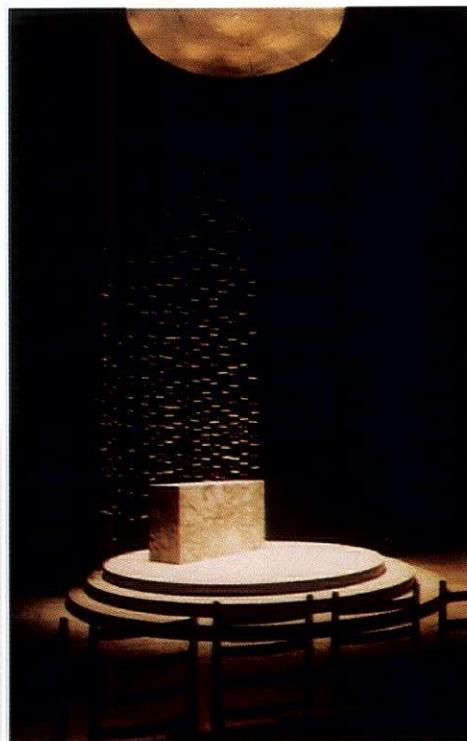
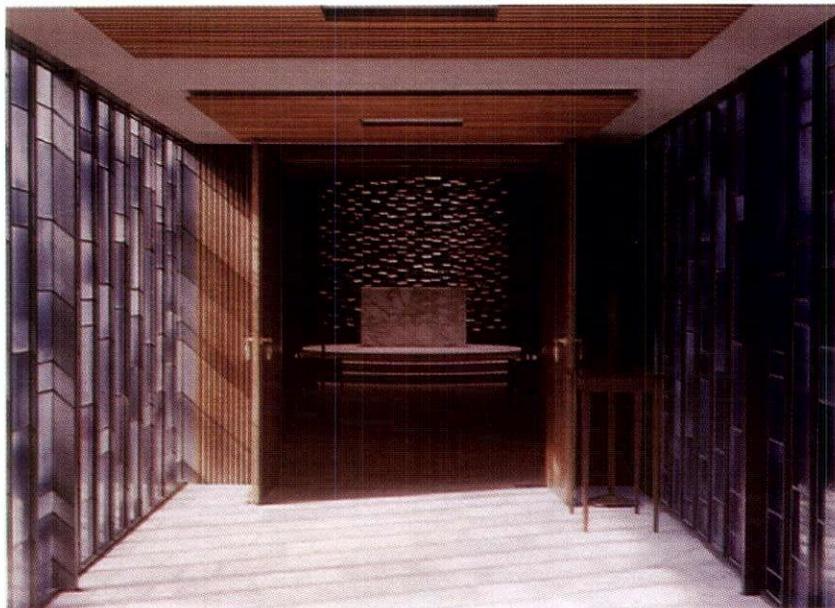


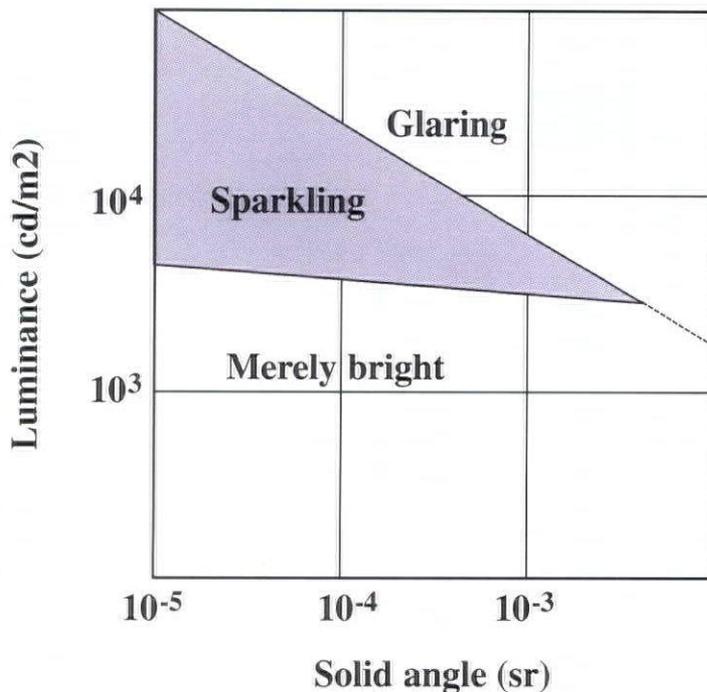
FIGURE 1B

FIGURE 1A
G.E. KIDDER SMITH, KIDDER SMITH
COLLECTION, COURTESY OF THE ROTCH
LIBRARY VISUAL COLLECTIONS, M.I.T.

FIGURE 1B
PHOTOGRAPHED BY MARY ANN SULLIVAN,
BLUFFTON COLLEGE.



FIGURE 2



estimating illumination. Shadows and shadings of objects may also suggest a lot about the direction of light. The location of the light source and the direction of the light determine the amount of perceived light in the room and the amount of light perceived to be falling on the surface of each interior element.

When one enters an office and looks at the low-luminance parabolic-louvered fixtures, their luminance is so low that the lights appear to be off. Because no light seems to be coming from the fixtures, the office seems dark relative to its actual illumination.

On the other hand, chandeliers suspended from the ceiling of a hotel lobby are obvious and easy to identify. The points of light look as though they emit more than enough light to illuminate the room. In this case, the room looks brighter than an illuminance measurement might suggest. In contrast to the office with the low-luminance parabolic-louvered luminaires, the obvious light sources in the hotel lobby provide important cues on how much light is coming from the lamps into the room. Sparkle elements work according to this same principle.

SOME RECENT RESEARCH

Recent research (Akashi et al., 1995) has shown that visible luminous elements enhance brightness impression, especially when the luminous elements appear to sparkle. For this discussion, the term "luminous element" is defined as an element of a fixture that emits or reflects light.

The experiment consisted of a test in which subjects matched brightness impression for two scale-model office rooms. One scale-model room had a visible luminous element and the other had no visible luminous element. Subjects compared the brightness impressions of the two

rooms and adjusted the illumination level on a model desk so that the two rooms looked equally bright. After each adjustment, researchers measured and recorded illuminance levels on both model desks. The subjects also evaluated the appearance of the luminous element under various conditions of luminance, size and background luminance. From these data, researchers calculated the illuminance ratio for the two rooms having equal brightness impression under each experimental condition. This ratio indicates how much the luminous element increases the brightness impression in the room.

Figure 2, derived from the experimental results, shows a guidepost for designing bright lighting environments. Solid angle 10⁻³ steradians in Figure 2 is equivalent to the apparent size of a common incandescent lamp viewed at a distance of 1.7 m and solid angles 10⁻⁴ and 10⁻⁵ steradians are equivalent to lamps at 5.3 and 16.8 m, respectively.

The two solid lines in Figure 2 show borderlines between conditions in which the illuminance ratio for the two rooms having equivalent brightness impression was more than 1.2 and those in which it was less than 1.2. Subjects reported that the luminous elements falling between the two lines appeared to subjects to sparkle and that the luminous elements above the upper solid line appeared to glare.

These results suggest that the presence of a sparkle element increases the brightness impression of a room. The results also confirm that brightness impression is not always determined strictly by the actual amount of light on the task—the luminous elements used in the experiment were too small to increase the total amount of light. The higher brightness impression comes from the sparkle elements' luminances, which are so high that observers can easily believe that sufficient light is coming from the light source. In addition, the sparkle element does not cause discomfort glare because, even though the luminance is high, the solid angle is so small that its reflected image on the VDT screen doesn't interfere with task performance.

APPLICATION OF SPARKLE ELEMENTS

Sparkle elements are easy to use, and they can be integrated into existing fixtures. In an office lighted by fixtures with specular-finish parabolic louvers with small cells, one can quickly and easily demonstrate the effect by temporarily attaching small, high-diffuse reflectance reflectors, such as white paper, on all four inside surfaces in a small cell of the louver. The fixture will look brighter.

Figures 3A and 3B show a before-and-after comparison of an office in which such reflectors have been installed into small cells of the louvers of the fixtures. In the latter image, the

FIGURE 3A



FIGURE 3B



BEFORE (LEFT) AND AFTER (RIGHT) COMPARISON OF AN OFFICE IN WHICH SMALL, HIGH-DIFFUSE REFLECTANCE REFLECTORS HAVE BEEN INSTALLED INTO SMALL CELLS OF THE LOUVERS OF THE FIXTURES. REPRINTED WITH PERMISSION FROM MATSUSHITA ELECTRIC INDUSTRIAL.

small reflectors reflect light from the fluorescent lamps behind the parabolic louvers, giving a sparkling effect and providing cues about how much light is coming from the lamps. The apparent size and brightness of each sparkle element changes with the observer's position.

Observers can see sparkle elements at the optimum solid angle and luminance described in Figure 2 from almost anywhere in the room, provided that the size of each cell is between 30 and 40 mm and the luminance of the reflectors' white surfaces is between 6,000 and 8,000 candelas per square meter. This technique provides an easy way to increase brightness impression without increasing energy consumption.

EXAMPLES OF LIGHTING DESIGN

The sparkle technique has been applied to office fixtures in real-life situations. Figure 4 shows an office lighted by a task-and-ambient lighting system with sparkle elements. In this task-and-ambient lighting system, the ambient fixtures uniformly light the entire room at about 300 lux average illuminance on the work plane. Each task fixture increases the task illuminance on a desk to about 900 lux. Two small, acrylic, pyramid-shaped panels in the louver of each ambient fixture provide the sparkle elements. The apparent size of the panels viewed by an observer naturally changes according to the observing position, so the actual size and luminance of the luminous element were chosen so that its apparent size and luminance meet the conditions required in Figure 2 when viewed from nearly all positions in an ordinary office. Although to save energy, the ambient illuminance around desks is 300 lux, the room still looks bright because of the sparkle elements—the small, acrylic, pyramid-shaped panels.

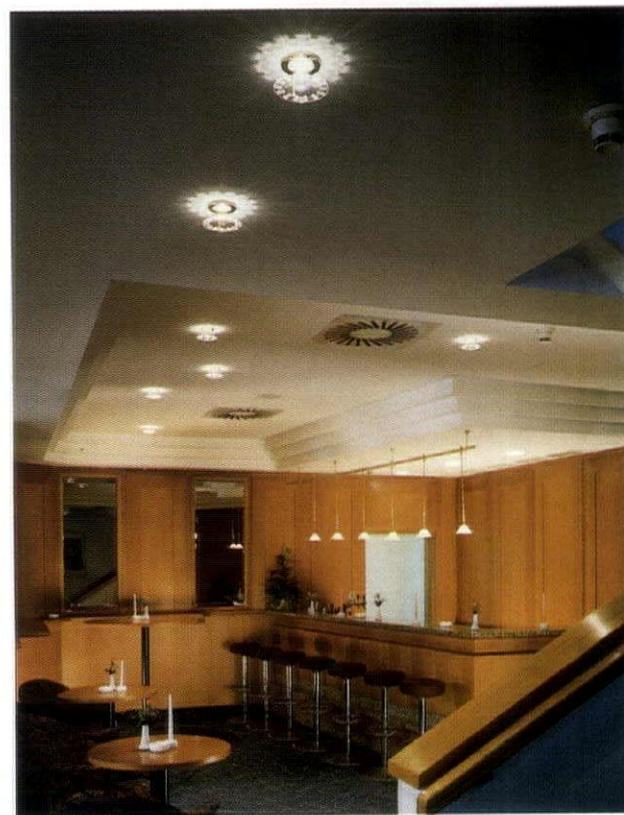
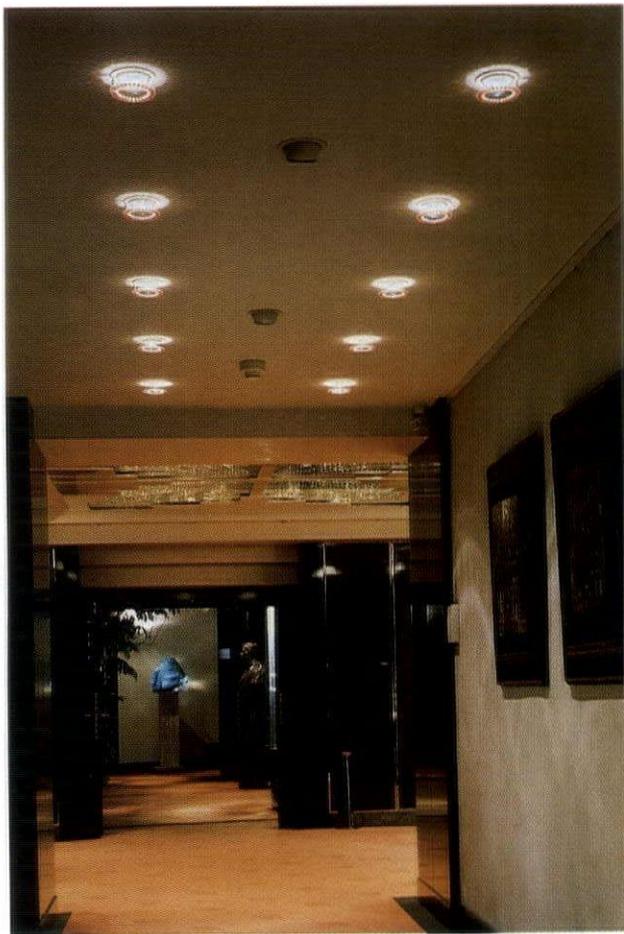
The sparkle technique has also been applied to some downlights. These downlights have a plastic or glass ring suspended below the opening that reflects light from the lamp. The photograph in Figure 5 shows a hallway and a bar lighted by downlights with reflecting rings. In a well-designed downlight of this type, the reflected light tells one how much light is coming from the light source into the room, and so one can easily see how brightly the room is lighted. ■

Yukio Akashi, Dr. Eng., is a senior research scientist at the Lighting Research Center, School of Architecture, Rensselaer Polytechnic Institute in Troy, NY. The LRC will continue to provide more data on the relationship between brightness impressions and physical factors such as luminance, solid angle and background luminance to provide a better understanding of the sparkle effect and how to make use of the technique in lighting design.



FIGURE 4—AN OFFICE LIGHTED BY A TASK-AND-AMBIENT LIGHTING SYSTEM WITH SPARKLE ELEMENTS. REPRINTED WITH PERMISSION FROM MATSUSHITA ELECTRIC WORKS.

FIGURE 5
A HALLWAY AND A BAR LIGHTED BY DOWNLIGHTS WITH
REFLECTING RINGS. REPRINTED WITH PERMISSION
FROM STARFIRE.



NCQLP QUIZ

1. Sparkle elements support energy-efficient lighting design because:

- a. They can be created using very efficacious lamps
- b. They prompt people to perceive a space as bright and cheery
- c. They add more light to the room
- d. They can be turned off if enough daylight enters the space

2. All the following are visual cues people use to determine the location of the light source and the direction of light except:

- a. Luminance on reflective surfaces
- b. Shadows
- c. Shading
- d. Color rendition

3. The photometric quality most associated with sparkle elements is:

- a. Illuminance
- b. CRI
- c. Luminance
- d. Color temperature

4. Locating a large, high luminance source in the field of view can cause:

- a. Glare
- b. Flicker
- c. Reduced lamp life
- d. Color shift

5. Sparkle elements can be created using:

- a. Downlights
- b. Chandeliers
- c. Any highly reflective surface
- d. All of the above

Responses should be addressed to Christina Trauthwein, Architectural Lighting Magazine, One Penn Plaza, 10th floor, New York, NY 10119; faxed to 212-279-3955 or e-mailed to ctrauthwein@mfi.com. All questions must receive correct responses to obtain 0.5 LEU credit.

OUT AND ABOUT—THE EXTERIOR ENVIRONMENT

BY DAVID HOUGHTON, PE, CONTRIBUTING EDITOR

Geographers tell us that two-thirds of the earth's surface is covered by water. Of the remaining third, only a tiny fraction is covered by buildings—the rest is outdoors. From fiber optics for landscape lighting to more efficient sources to more durable housings, the continuous upgrades in lamp and fixture technology for outdoor environments are equipping designers with vital tools to transform the exterior world through light.

Theatrical equipment and effects are continuing their migration to the architectural realm. "We're seeing more and more use of coloring, lenses and patterns for illuminating buildings," said Kathleen Romfoe of Phoenix Products, noting that Las-Vegas-style outdoor lighting effects are spreading to other cities and to applications such as theme parks. In addition to being the Mecca for entertainment-oriented outdoor lighting, Las Vegas has

served as a proving ground. Fixtures mounted amongst The Strip's fountains, gardens and other public spaces must survive alkali soils, thermal and moisture cycling and chlorine. "At first, people tried putting theatrical equipment in permanent outdoor installations. It just didn't hold up. We started out making fixtures for the marine environment, so we're used to corrosive environments," said Romfoe.

Other products that bring theatrical effects to building exteriors include the ETC Irideon and High-End Systems' Studio Color, which are available in weatherproof housings for permanent or temporary outdoor installations. These fixtures offer DMX-controlled pan, tilt, color mixing, high resolution pattern projection and other effects more commonly seen at



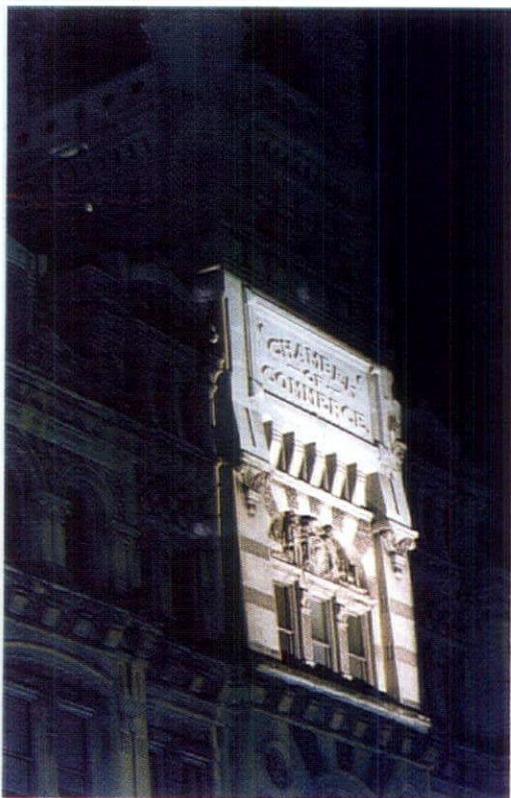
THEATRICAL EFFECTS ON THE STATE CAPITOL BUILDING, TEXAS—A FURTHER BLURRING OF THE LINE BETWEEN POLITICS AND ENTERTAINMENT.

rock concerts. Designers are using them to spray color and light on the outside of monuments, public buildings and other urban focal points. Simpler (and less expensive) fixtures, such as the High-End EC-1, are also available to project static effects on buildings.

The subspecialty of dichroic filtration has also improved the ability to provide colored outdoor lighting. "Dichroics are really beam splitters," explained Jeff Hillinger of Automated Entertainment. The filters are made by depositing very thin layers of non-conductive metals such as magnesium fluoride onto borosilicate glass. Dichroics are expensive compared to gels (the colored cellophane sheets that are the other primary way to color white light), but they are much more durable, being unaffected by heat, salt, chlorine and infrared and ultraviolet radiation. "It used to be black magic trying to come up with an accurate color using dichroics, but the technology has come a long way," said Hillinger. Today's equipment uses precise "recipes" of thin-film metals to get exact color transmission, verified by spectrophotometry. Hillinger noted that the coloring on the exteriors of Las Vegas hotels (such as Treasure Island and Excaliber) is created with dichroic filters.

FIBER SHINES OUTDOORS

Fiber optics are an important tool for outdoor lighting because they allow designers to create dramatic effects often with relatively low illumination levels (and low



DRAMATIC OUTDOOR LIGHTING EFFECTS ARE MIGRATING TO PUBLIC BUILDINGS SUCH AS THIS FRAMING PROJECTOR ILLUMINATION OF THE CHAMBER OF COMMERCE IN MILWAUKEE, WI.

energy use). Gilbert Mathews of Lucifer Lighting separates outdoor lighting into two categories—functional and decorative—and applies fiber-optic technology to both. “We think that good lensing is the key to functional outdoor lighting with fiber optics,” said Mathews. Lighting specific areas such as walkways, stair landings and doorways requires the ability to accurately target light—Lucifer’s fiber fixtures swivel up to 45 degrees and offer beam spreads of 13, 24 and 36 degrees.

One of Mathews’ favorite new outdoor fiber fixtures is the Scapebeam pendant, an acrylic cone that is suspended and illuminated by a single plastic fiber. “Part of our mission is to bring verve and fun to outdoor lighting,” said Mathews. “We’re doing projects that are styled after Italian gardens, where water, light and even candles combine to create magical settings. Fiber allows us to make it happen.” Another recent application lights a 65-ft. gravel walkway with a single 75W halogen illuminator. The 90 glass fibers each terminate in a plastic head as big as a quarter, flush with the gravel layer. Mathews noted that although light loss calculations would indicate otherwise, each head appears to be the same brightness even though the fiber runs vary from 25 to 75 ft.



FIBER SPOTS RECESSED IN A GRAVEL WALKWAY. LUCIFER LIGHTING, **CIRCLE No. 41**



SCAPEBEAM. LUCIFER LIGHTING, **CIRCLE No. 40**

LAMPS PROVIDE PUNCH, LONGEVITY

Recent advances in lamp technology may help address some of the concerns voiced by lighting designer Jim Benya, who is on a crusade to correct a few fundamental flaws in outdoor lighting, the first being sodium lamps. “The single biggest problem in outdoor lighting is that we are using spectrally deficient sources,” said Benya. “Fluorescents, electrodeless and metal halides are great for outdoor lighting because their blue content aids our night vision significantly. But high-pressure sodium is bad and low-pressure sodium is worse.” Although many of the municipalities and utilities that install outdoor and roadway lighting still use sodium sources because of their long life and high (apparent) energy efficiencies, David Karp of Lumiere expressed optimism over possibilities with Philips’ expanding MasterColor line of metal halide lamps. “That part of our business is still growing tremendously,” Karp said. “It’s a very exciting area because we can see the immediate applications. It’s a metal halide technology that everybody is comfortable with—and it provides the aesthetics with the color temperatures as well as the long life and performance that people need.” As the product line moves into different wattages and different lamps, such as ED17s, Lumiere plans to accommodate the changes with new products, which Karp feels will “be readily accepted.”

Phoenix’s Kathleen Romfoe is particularly excited about GE’s CSI PAR64, a 1000W short-arc metal halide lamp that has been popular in Europe and is just picking up speed here in the U.S. “The CSI lamp packs incredible punch in a compact package,” said Romfoe, noting that it takes a lot of lumens to project through color filters, lenses and cutout patterns. Phoenix also



LAMPS SUCH AS OSRAM SYLVANIA'S ICETRON ARE BEING USED IN OUTDOOR APPLICATIONS. THE RECENT RELIGHTING OF NEW YORK CITY'S UNION SQUARE PARK FEATURES THE LAMPS, WHICH USE MAGNETIC-INDUCTION TECHNOLOGY TO GENERATE LIGHT-PRODUCING ELECTRONS INSTEAD OF AN ELECTRODE AT EACH END OF THE FLUORESCENT TUBE—BOOSTING AVERAGE LAMP LIFE TO 100,000 HOURS. THE HPS LAMPS THAT WERE USED TO LIGHT THE PARK FOR THE PAST 30 YEARS OFFERED LIFE RATINGS OF UP TO ONLY 24,000 HOURS. **CIRCLE NO. 43**

offers the Philips QL-100 induction lamp in fixtures where it fits, particularly bollards and other ground-level lighting. "Even though the QL has a high initial cost, we're seeing interest from municipalities where maintenance costs are the big driver for outdoor lighting," said Romfoe. (The QL-100, Osram Sylvania's Icetron and other electrodeless designs boast lifetimes ranging from 50,000 to 100,000 hours.)

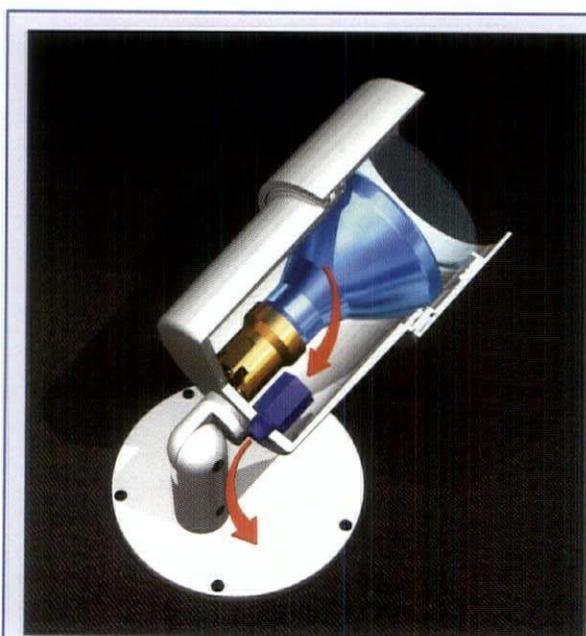
LOWER THOSE HIGH BEAMS

Next on Benya's hit list is beam control. "Unfortunately, we still haven't figured out that if light goes down, it lights something, and if it goes up, it usually doesn't," said Benya, referring to pole-mounted outdoor fixtures that contribute to light pollution. Benya would also like to see the lighting design community address the issue of "footcandle creep"—the tendency for parking lots, gas stations and other nighttime environments to be lit with ever-higher illuminances. "We've measured gas stations that have been

lighted to over 100 fc with drop-lens glare bombs." Lighting at these levels is dangerous; a driver coming out of bright light is nearly blind until the pupils can adapt to the night, which may be orders of magnitude darker.

Designer Nancy Clanton sees the same problems and is optimistic about outdoor lighting design. "The industry is starting to recognize that you can't just blast light in all directions," said Clanton. "Our firm gets phone calls every week from municipalities that are trying to deal with light pollution." One recent call came from public officials in Vancouver, BC—a local car dealership wanted to use high-tech fixtures to write slogans across the clouds. (The city denied the request using an existing signage law.)

As evidence of progress on this problem, Clanton cited the recently released IES Recommended Practice document RP-33, which includes recommendations for luminance ratios, footcandle levels and source selection, and covers key applications such as car lots and gas stations. "Finally, we have a design guideline that

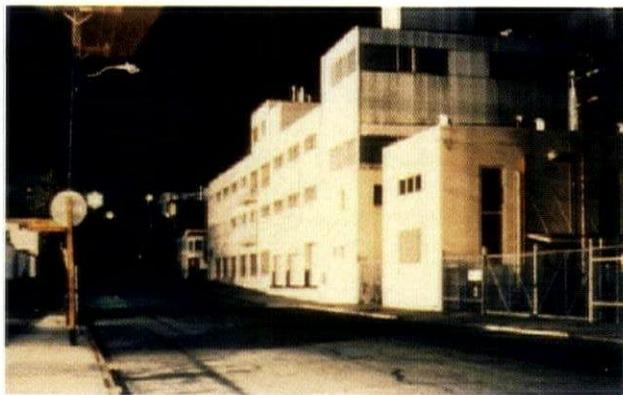


OUTDOOR FIXTURES RUN HOT AND COLD AS THE LAMP TURNS ON AND OFF. THE PRESSURE DIFFERENCES CREATED BY THIS CYCLING FORCE MOIST AIR IN AND OUT OF THE FIXTURE, CREATING CONDENSATION ON THE COOLING CYCLE AND SUBSEQUENT CORROSION. ONE MANUFACTURER, B-K LIGHTING, HAS ADDRESSED THIS ISSUE BY INSTALLING A ONE-WAY VALVE IN THEIR SEALED OUTDOOR FIXTURES. THE VALVE EXPELS AIR DURING HEATING, BUT MAINTAINS A VACUUM WHEN THE FIXTURE COOLS. "WE THINK THE VALVE IS AN IMPROVEMENT OVER VENTING OR USING DESICCANTS," SAID B-K'S JERRY CARTER, REFERRING TO THE TRADITIONAL SOLUTIONS TO THIS PROBLEM. THE VALVE HAS A PRESSURE-RELEASE BUTTON TO BREAK THE VACUUM AND ALLOW EASY RELEASE OF THE FIXTURE FOR RELAMPING.

CIRCLE NO. 42



THIS VIEW OF LOS ANGELES AT NIGHT ILLUSTRATES THE DUAL PROBLEMS OF LIGHT POLLUTION AND THE USE OF YELLOW SODIUM LAMPS. CALIFORNIA JURISDICTIONS ARE MAKING SOME PROGRESS IN ADDRESSING THESE ISSUES.



AN ATHLETIC FIELD (OUT OF VIEW, TO THE LEFT OF THIS PICTURE) ILLUMINATES THIS BUILDING, EVEN THOUGH THE LIGHTING WAS CLEARLY NOT INTENDED FOR THE SPORTS ACTIVITY. THE LIGHT TRESPASS IS SO INTENSE THAT THE STREETLIGHT ON THE LEFT SIDE OF THE IMAGE IS OFF SINCE ITS PHOTOCELL STILL THINKS THAT IT IS DAYTIME.

addresses outdoor lighting issues such as light trespass and glare," said Clanton, who also serves as the chair of the IES Outdoor [Lighting] Environmental Committee. Other activities in this area include the expansion of EPA's Green Lights program to include outdoor lighting, efforts by the California Energy Commission to draft model city ordinances that address energy waste and light pollution in outdoor lighting, and possible NEMA actions to further awareness of the problem. "Our industry needs to realize

that if we don't effectively address light pollution and trespass, regulations will be imposed on us from the outside," said Clanton.

Another resource for designers interested in controlling light pollution is the International Dark Sky Association. Their website (www.darksky.org) includes fixture cutsheets for recommended full-cutoff fixtures, photographic examples of good and bad outdoor lighting, and satellite photos of different parts of the earth showing just how much light is leaking into the sky. ■

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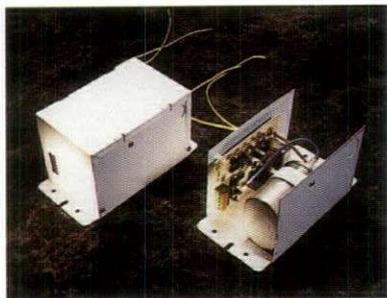
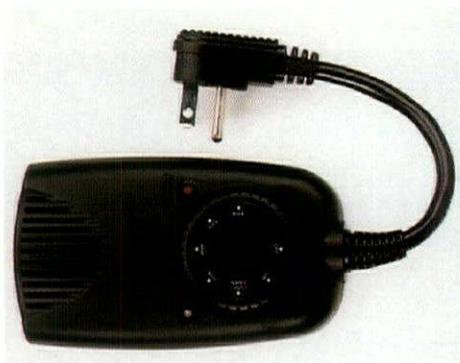
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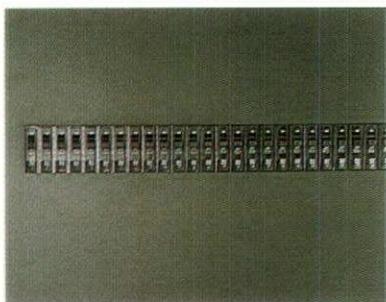
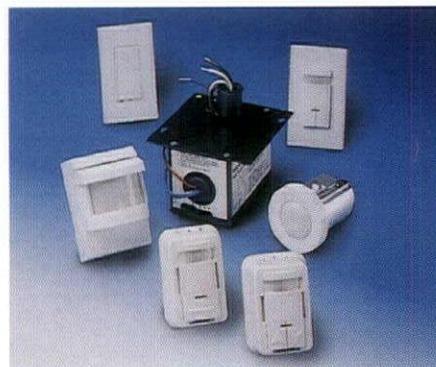
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The Model T2468 timer from **Precision Multiple Controls, Inc.** can automatically turn lighting on everyday at dusk and provides a choice of either a 2-, 4-, 6- or 8-hour turn off after sunset. A full dusk-to-dawn setting is also available. The timer plugs into any standard 120V outlet and offers a choice of several operating modes. A manual on/off allows one to override any setting. The Model T2468 is equipped with a plug-in receptacle and a grounded, 6-in. cord. The timer has a load rating of 8.3A. **Circle No. 30**



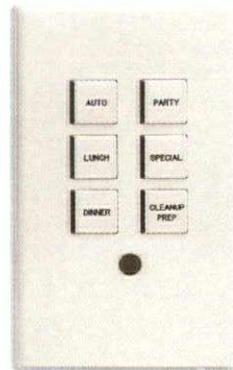
From the **Watt Stopper**, the DM-100 control module is capable of bi-level lighting control for HID lighting. The DM-100 switches HID lamps between high and low light levels, enabling energy savings of up to 50 percent while accommodating the problems of on/off control of HID lighting. The DM-100 utilizes a dual capacitor that is housed together with the control circuitry in a single unit. Multiple mounting options provide a range of installation options. For multi-zone coverage, units can be linked together as well as controlled by different signaling devices. **Circle No. 31**

Leviton Mfg. Co.'s LonWorks lighting control products for twisted pair "open" building systems interoperate on a LonWorks network, either as a complete lighting control subsystem that integrates with other manufacturers' building automation systems or as a stand-alone lighting control system. Compliant with the LonMark Interoperability Guidelines, the products provide open, seamless integration with various HVAC, security and fire alarm systems. FTT-10A Free-Topology Twisted Pair Transceivers easily integrate into a LonTalk Twisted-Pair communications network and provide cost-effective installation without topology restrictions. Free topology supports Star, Loop and/or bus wiring. Products include box- and surface-mounted passive infrared wall switches, wall- and ceiling-mount occupancy sensors as well as Decora-style switches and dimmers. **Circle No. 32**



The Two Link option for **Lutron's** GP Dimming Panel offers two distinct control links inside each GP Dimming Panel, increasing the capabilities of the panel for improved functionality on any project. Each link is capable of operating on the GRAFIK Eye 4000 and GRAFIK 6000 lighting control systems and USITT DMX512 protocol. The dimming panel is designed to "auto-detect" which system is present and operate accordingly. The Two Link option can link an architectural dimming system and a theatrical console, consolidate circuits in one panel for more than 64 zones in GRAFIK Eye 4000 and integrate two redundant architectural dimming systems. **Circle No. 33**

The Vantage Dimmer Station, the newest addition to **Vantage Controls'** flagship Q Series of home automation products, is a wallbox dimmer solution providing complete integration to the Q Series. The Dimmer Station controls from one to four zones, dimming up to a total of 2000W of incandescent or electronic low-voltage lighting loads. Mounting in a standard one to four gang wall box, the Dimmer Station allows for conventional load wiring and is controlled through Vantage's two-wire, non-polarized Station Bus. The Dimmer Station can be configured with up to six buttons and has the option of IR remote control. **Circle No. 34**



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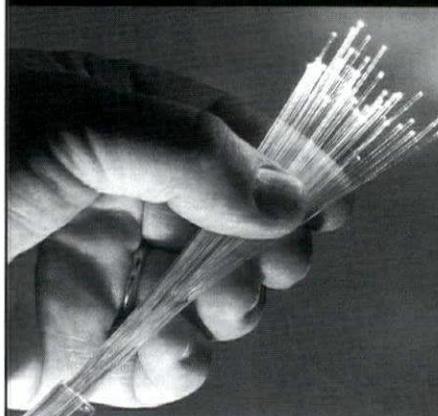
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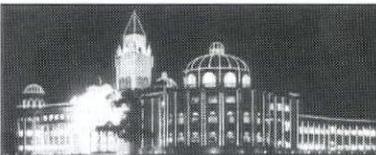
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INTEGRATED DESIGN—BRIDGING THE ENGINEER/INTERIOR DESIGNER GAP

BY COLLEEN MCCAFFERTY AND BRUCE KREKELER

The best workplace lighting designs blend seamlessly into an office's overall interior design. They draw the worker and the visitor into the environment, creating emotions and motivations that match the company's. But those of us who work behind the scenes know the difficulty that goes into creating the proper lighting design. Often, this difficulty can stem from natural differences between the objectives of the interior designer and those of the electrical engineer. This gap has its roots in the training and functions associated with each job.

The interior designer is trained to focus on aesthetics, to combine form with function, and to aim for a facility that physically represents the client's image and provides the necessary environment to facilitate the client's work process. Often, the electrical engineer brings what can be a conflicting perspective to a design concept. Focused on technical issues, their designs are meant to provide flexibility and efficiency. Standardized lighting, fixture type and placement and minimized use of different light sources create a lighting structure that promotes energy conservation and maintenance simplicity while producing the appropriate quantity of light for accomplishing tasks.

Bridging this gap between disciplines and perspectives is difficult enough, but the designer and the engineer typically make the gap even wider when they see themselves as advocates for the "clients" they're most familiar with. The designer typically works with the client's executive management team to work toward a blend of business objectives, work processes and corporate image. The engineer might never meet this team. Management wants a facility that increases productivity, supports employee recruiting and retention and expresses the company's personality. Facility managers—often the engineer's and the designer's conventional points of contact—are focused on obtaining a lighting scheme that is flexible, efficient and low maintenance. A third party, the user group—employees who will work in the space—requires a workplace that is comfortable as well as productive.

Recognizing and coalescing these distinct client "silos" are the first steps toward integrated design. Before the designer and the engineer can work effectively together, they, and all the members of the design team, must uncover and understand the needs of each client subgroup. Together they must work as a catalyst to help the client recognize and prioritize each subgroup's objectives. Only then can they create a design that truly integrates each discipline's strengths and exceeds the client's overall needs.

The power of lighting to achieve business objectives is well understood in the healthcare and the retail industries. Using light to meet business requirements is essential to these industries' success, and the same principle must be applied to office design. In our five years working together for a multi-disciplined, national firm, we've faced this challenge of integration many times. Objections to the perceived expense of integrated lighting design are usually overcome when the design is based on a clear understanding and agreement about what benefits the client most.

In a recent project, for example, a client in the computer industry asked us to transform a former warehouse into a new facility for one of its R&D groups. The executive team expressed a need for a facility that not only supported the R&D process but also supported recruiting and retention of top-notch researchers, a major challenge for a Midwest-based company competing against Silicon Valley giants.

The new R&D offices needed a state-of-the-art atmosphere that fosters collaboration and reinforces the company's high-tech creative image—not the easiest thing to create when using fluorescent-grid troffers with prismatic lenses was the established standard. And then there was the user group, independent-minded researchers who often felt they worked best when working in solitude. The answer was a design that relies heavily on the power of lighting to create common areas and casual workspaces that draw researchers out of their offices with an atmosphere of action, creativity, comfort and collaboration.

In a clear break from the "corporate lighting standard," we used indirect lighting in selected corridors to highlight suspended, perforated metal ceilings as well as provide the required footcandles on the floor, meeting facility management needs. Other corridors were lighted with 2x2 deep cell parabolics utilizing the same lamp as the indirect fixture. Low-voltage puck lights integrated into the walls accentuate massive color forms built around the former warehouse's structural columns. The columns became individually lit "torches," with light-

ing used strictly to create atmosphere, with no intended contribution to ambient lighting. Inserting natural light into the design of this building was essential in achieving the environment for the user group. Working together with our architects and our Lightscape software, we were able to achieve a truly integrated design throughout.

But selling this design was no small task. We had to convince all parties involved that the integrated solution, while sacrificing certain subgroups' objectives, met the facility's overall objectives and served the client's best interest. Using state-of-the-art animation software, we were able to gage and to calculate the lighting and to demonstrate the design for the client subgroups and ourselves.

The result is a new R&D facility that not only fosters productivity, but one that has become a major recruiting tool, supporting the company's ongoing need to increase its workforce by 15 percent per year. The facility has, in fact, become a model for future remodeling/expansion plans for the company's entire multi-building campus.

And lighting design was only one component in a total integrated design for this client—a design that successfully integrated the needs and objectives of every client stakeholder—an integrated design that truly "closes the gap." ■

Bruce Krekeler is a project electrical engineer at Hixson Architecture, Engineering and Interiors. Colleen McCafferty is Hixson's corporate workplace specialist.

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