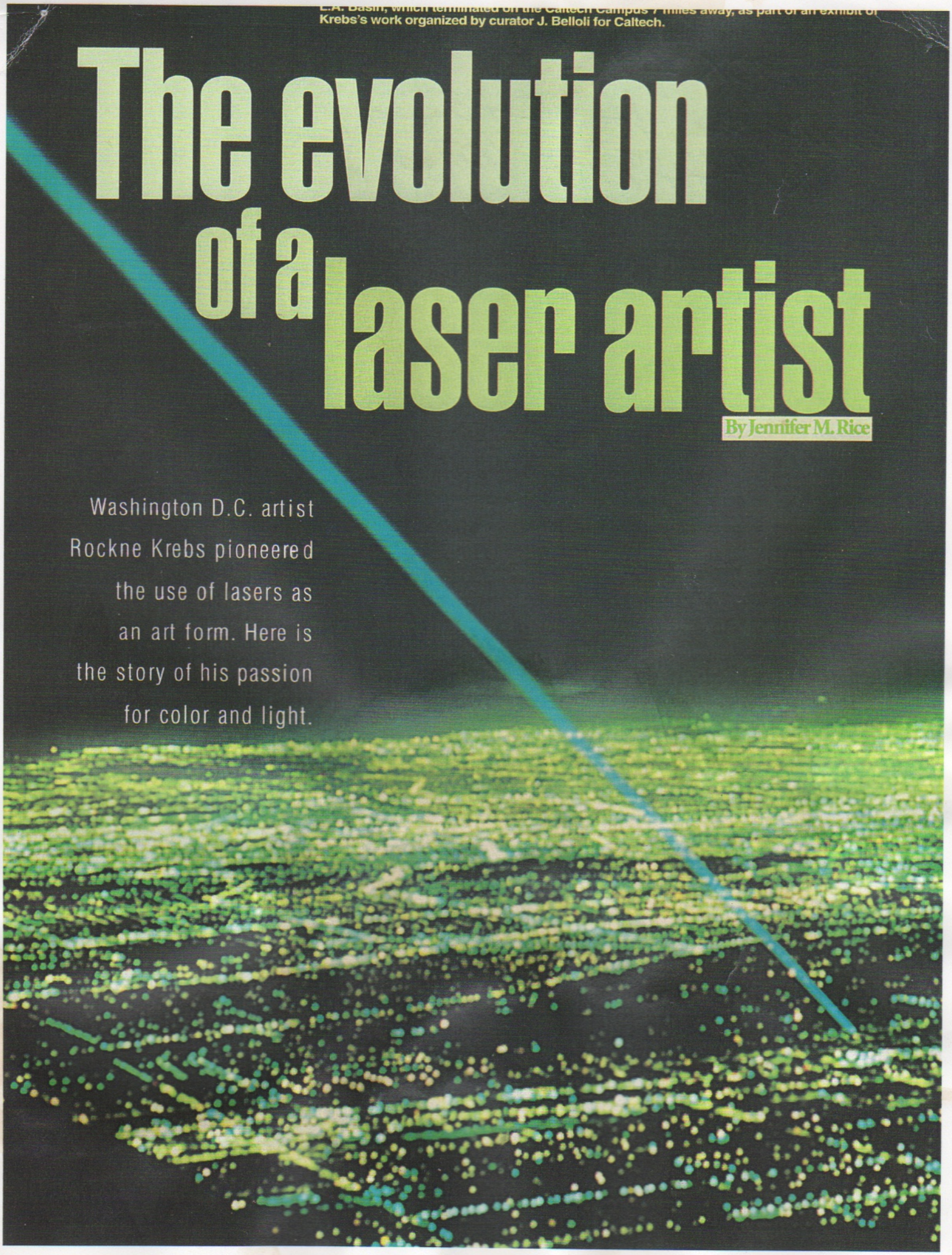


L.A. Basin, which terminated on the Caltech campus 7 miles away, as part of an exhibit of Krebs's work organized by curator J. Belloli for Caltech.

The evolution of a laser artist

By Jennifer M. Rice

Washington D.C. artist Rockne Krebs pioneered the use of lasers as an art form. Here is the story of his passion for color and light.

The Blue River didn't close after the Labor Day weekend like the public swimming pools. As the river lay naked in bed, still asleep at noon indifferent to the day stars hot light overhead covered in cool dark transparent sheets of shade from the dense canopy of trees it fed . . . I saw a star breathe life into translucent glowing white columns, that pranced effortlessly over the Rivers surface. And watched their distorted reflections dive deep into its brown water. The Blue River's tree tunnel Showed Me the architecture of light! Showed Me the sun dancing with the planet! Showed Me why the brown shadows of earth colors love sunlight.

That was the day I fell in love with the art of light, by Da Vinci I did it right! The Blue River wasn't Showing us the drama of Rembrandt's light or Caravaggio's chiaroscuro. The Blue River was in Missouri! . . .

At the Blue River I witnessed the Sun Reigning twenty years before I made RA, my first solar Art work! I was exhilarated by light as structure decades before Sculpture Minus Object, my first laser sculpture. This is what Leonardo de Vinci meant, when he advised artists to find their art in nature. Not in other art.[1]

Above, in his own words, Washington D.C. artist Rockne Krebs describes the day his love affair began with color and light. His description of sunlight dancing on Missouri's Blue River allows a glimpse into what has driven Krebs's long and successful artistic career. His work has appeared worldwide in venues ranging from the World's Fair, to the Washington Gallery of Modern Art. Journalists have captured his essence in *Time* magazine, *The Washington Post*, and the *LA Times*. But despite the recognition and acclaim, Krebs has remained true to his original goal—to present light as a means of art. And while his career spans over 40 years, it was during the 1960s and 1970s when he began his fascination with lasers and subsequently pioneered an art form.

Color painters and laser light

It was the 1960s, and an artistic revolution was taking place in Washington D.C. Local painters, later dubbed the "Washington Color Painters," were applying bold, primary colors of plastic-based acrylic paint to unprimed raw fabric. By rejecting the use of traditional oil paints, the artists found new ways to emphasize the importance of color in contemporary painting.

The results were paintings of profound color. Art critic Clement Greenberg, quoted by the National Museum of American Art in a 1995 press release, described the work of the color painters. "Colors are leveled down as it were, to become identified with the raw cotton surface as much as the bareness is. The effect conveys a sense not only of color as somehow disembodied, and therefore more purely optical, but also of color as a thing that opens and expands the picture plane."[2]

The world took note of this exciting new artistic trend and Washington Color Painters such as Gene Davis, Kenneth Noland, Morris Louis, Thomas Downing, Howard Mehring, and Paul Reed received national attention.

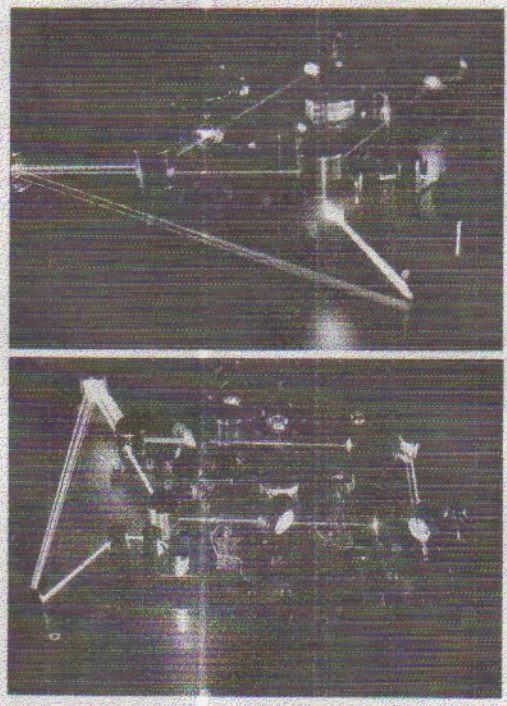
Krebs was one of the artists impressed by their paintings. Because he also was living in D.C., he was very familiar with the color painters—even though he was primarily focusing on sculpting, and not painting. At the time, Krebs was exploring the possibility of using non-traditional materials such as Plexiglas to make sculptures. He exhibited at the Byron Gallery in New York and the Jefferson Place Gallery in D.C., and in 1965 he won the Corcoran Gallery of Art's sculpture prize.

But Krebs kept returning to the ideas of the color painters. One evening in 1964, he met with the English sculptor Anthony Caro and color painter Kenneth Noland. Caro painted his sculptures and this fascinated Krebs. "Caro's painted sculptures successfully presented color in the third dimension and stood on the floor with me like a cubist quartet without a pedestal to separate the art from life," he says.

"I was influenced by Caro and the color painters and I was trying to find a way to define the three-dimensional space that makes sculpture different from painting," he explains. "It was the sheer light and beauty of color and the way the color painters used it and presented it that reinforced my desire to see color in sculpture and three-dimensional space." But Krebs couldn't figure out how to go about doing this until 1966 when he envisioned structures in space made with light. He tried developing artwork centered on light produced by the sun and slide projectors, but wasn't satisfied with the results.

Then in the spring of 1967 he saw a picture in a magazine of what would later define much of his artistic endeavors—the fierce color of a laser. "The influence of the color painters allowed me to use the absolute red of the helium-neon (HeNe) laser light," he says. It was one of the first lasers ever produced, and Krebs wanted one.

He purchased a HeNe laser from University Labs in Palo Alto, California, and began experimenting with it in his studio, but didn't feel he was getting very far. "I was using mirrors and trying different things with the atmosphere to make the little 1 mW HeNe laser visible," he says. Krebs wanted to learn everything he could about this new technology and knew that in order to develop his art, he had to turn to experts for help.



Figures 1 and 2. The prototype optics system created by Hewlett Packard Research Labs in Palo Alto in 1969 split the beam of one argon laser into three beams, and separated the blues and greens. It allowed a structure of laser light to switch from blue to green without moving, as well as switch off and disappear or combine with the two other 3-D structures in the same space.

Figures 3 and 4. THE MIAMI LINE took the notion of assembling laser beams into urban vistas that Krebs pioneered into the more permanent neon. The 1/4-mile long line of neon gave him the chance to use color like the Washington Color Painters who inspired him two decades earlier.

Laser researcher to the rescue

The laser was still relatively new, and Krebs didn't know where to look for advice. He finally met University of Maryland laser researcher Paul Haldemann, who helped develop the cold cathode laser.

Haldemann guided Krebs through basic engineering concepts such as how to make the laser beam visible, how to mount the mirrors, and what kind of mirrors to use. "At first he was using HeNe lasers that were relatively weak and less than 5 mW," says Haldemann. "Later on, he began using argon lasers which had more power and different light frequencies; but I always warned him that he couldn't use argon lasers to make a sculpture of shining light because they don't last very long without resupplying the active medium with gas."

Around this time, Haldemann and the research group he worked with developed the cold cathode laser which could operate between 3,000–5,000 hours and proved an ideal tool for Krebs's art. "Haldemann really made it possible for me to develop and show my art," says Krebs. "I had no confidence that I could keep these lasers running, and he could."

After a year of studio experiments, Krebs exhibited his first laser art piece "Sculpture Minus Object" at the Washington Gallery of Modern Art in 1968. With just two mirrors in the room, Krebs had developed a seemingly limitless laser line by drilling holes in the mirrors, and allowing the laser light to pass through. "The first laser came out of the mirror and you didn't know if it was a reflection or the laser coming out of the mirror," says Haldemann.

According to Krebs, "all of the early pieces were very temporary and not very good. I was having to learn in public so they were all very much experiments." But Haldemann disagrees. "To me [that first sculpture in 1968] was one of the most beautiful sculptures he created. Today one doesn't appreciate that this was a brand new thing. Engineers would always play with lasers, and shine them through space. But Rockne was the first to make it into an art form."

"The optics system was an absolute prototype," says Krebs. "No one had ever thought about doing something like that. It ran for 7 days a week for 6 months [at the World's Fair] and never failed. What we did with that was the prototype of what would eventually become the laser light show."

An exciting time at Hewlett-Packard

The excitement of what he was doing started to catch on. The general media was especially curious about his work because it was a new art form. But there were also many skeptics who were afraid that lasers might be harmful.

That didn't stop Krebs who continued to nurture and pursue his own ideas. However, he began to realize that even with Haldemann's help he had reached a point where he needed additional technological insight. "My background was strictly as an artist," he says. "As a sculptor, I was used to learning complex techniques like bronze casting; but lasers and optics was a whole arena of technology that I had no background in at all."

In late 1968, Krebs learned about a program sponsored by the Los Angeles County Museum of Art that matched artists with high-tech companies to promote the use of technology in art. The program, titled Art & Technology, greatly interested Krebs who immediately contacted Maurice Tuchman, the museum's curator.

By the summer of 1969, Krebs was assigned to work in Hewlett-Packard's laser lab with a host of researchers that included administrative manager Dan Lansdon, physicist Larry Hubby, and optical engineer Bruce Ruff. "The lab was a very high security place," says Krebs. "I went in to the lab, and left when they did. I came up with the idea of creating a structure that would change because light lends itself to that."

During that summer, Coherent Radiation developed a 500 MW argon laser that was relatively inexpensive for the time. The potential of the laser excited Krebs and his Hewlett-Packard collaborators. "Bruce Ruff and I went over to Coherent Radiation and saw the laser. I realized that I could get two colors out of it. I went back to my little Hewlett-Packard cubicle and described a projection system that could change color without moving. The colors blue and green could be switched on and off and reappear somewhere as another structure." The entire structure would light up an indoor room.

Tuchman liked the idea so much that he told Hewlett-Packard

if they would support the production of the project, he would enter Krebs's piece in the 1970 World's Fair in Osaka, Japan. Hewlett-Packard agreed, and set out to design the system.

"There were physicists and technicians at the lab that were working with Rockne," says Bruce Ruff. "It was a fascinating thing. We were implementing someone's vision. For us it was reasonably straightforward in that there were a number of ways we could build the apparatus. But it was fascinating because it was going to Osaka and I wasn't aware of anything that had been done like it before."

Figure 5. "THE ONE NIGHT STAND": Baltimore, MD; 12/31/76, assembled lines of laser light into a view of the Baltimore harbor as part of the city's New Year's Eve celebration that included a Zambeli fire works display. In the first ever fireworks and laser show, Krebs planned the illumination of the buildings on the harbor front and created the scenario for the fireworks and locations to launch them.

The intricate optical system developed by Hewlett-Packard incorporated hundreds of parts. It comprised a series of small mirrors to direct the light beams, two HeNe lasers, special mounts for the HeNe lasers, the large argon laser, the fog-producing machine needed to increase the visibility of the beams, and two eight and one-half by fourteen foot plate glass mirrors made in Japan (see Figs. 1, 2).[3]

Krebs later said that the optical system itself was a work of art, and that he was affected intellectually by his experience in Palo Alto. "My mind was stimulated," he said, "in a way it never had been before, and probably never would be again the evening Larry Hubby and I steered the beam of the lab's large argon laser out a door and over Palo Alto and beyond. When Larry turned the laser's power up, I traveled with the laser beam into the future."

"The optics system was an absolute prototype," says Krebs. "No one had ever thought about doing something like that. It ran for 7 days a week for 6 months [at the World's Fair] and never failed. What we did with that was the prototype of what would eventually become the laser light show."

After the exhibit was shown in 1970 in Osaka, it returned to the L.A. County Museum of Art. Krebs was suddenly exhibiting with famous artists of the time such as Andy Warhol and Robert Rauschenberg. "It was a dream for a young artist," he says. He returned from Osaka with a whole new understanding of what lasers could do and created "STERNLINE" at the home of Phil and Leni Stern in Washington, D.C. He believes this work defined the best manifestation of the art form.

In 1971, *Time* magazine described Krebs's work: "Intense beams of red, green, and blue light slice through the darkness, rebounding from concealed mirrors to form an intricate lattice that almost abolishes any sense of bodily space."[4] But the beauty and newness of the work didn't strike Krebs as a patentable idea until he was approached by a scientist named Ebon Loebner who was an authority on patent procedure and taught a course in invention at Stanford University. With Loebner's backing, Krebs received the first patent in the field in six countries.

According to Philip M. Smith, the former director of the U.S. National Research Council, and an art collector who began following Krebs's work in the late 1960s, "the creative insight to arrive at the most fundamental patent in the field, when coupled with the most successful art, couldn't be ignored."

No regrets

Krebs went on to make several indoor and outdoor laser pieces (such as the one pictured in the opening image of this article) that lit up the sky over Mt. Wilson, California around 1983. He also has created numerous outdoor pieces using other forms of light such as neon (see Figs. 3, 4). His outdoor light pieces created in cities around the U.S. remain his favorite works of art (see opening image).

But overall Krebs is disappointed with developments since his early days in the field. "The art world was never able to see the potential of this and could not embrace it. In the end the entertainment business took it over. They took over not only what they legitimately could do better [the shows themselves], but they also took over the large-scale outdoor pieces and I don't think they can do those well."

While laser light shows today are a very lucrative business, Krebs says he never received any money on his basic patent. "A couple of times I tried to pursue it, and I hired a lawyer. But I was so involved with my work that I never followed up on anything."

"I should have though," he adds, "but in the early 1970s I made a decision after I realized the commercial potential of what I was working on. I did some soul searching and realized I never wanted to be anything but an artist and there wasn't any way I could be an artist and pursue the business of a light show company. I never regret that decision."

Acknowledgments

Special thanks to Rockne Krebs, Paul Haldemann, and Bruce Ruff for historical background. Thanks also to the National Museum of American Art for providing valuable information on the Washington Color Painters.

References

1. Taken from the private writings of Rockne Krebs.
2. 1995 News Release from the National Museum of American Art and its Renwick Gallery announcing a special exhibit celebrating the Washington Color School.
3. Description of the optics system taken from an introduction of the Art and Technology show printed in the LA County Museum of Art's Catalog of the Exhibition (circa 1971). Introduction written by Maurice Tuchman.
4. "Man and Machine," *Time* vol. 97 Number 26, pp. 60–63 1971.

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Born 24 December 1938
Kansas City, Missouri

Education

1961 B.F.A. in sculpture, University of Kansas, Lawrence
1962-65 U.S. Navy Reserve, Lieutenant jg

AWARDS

1968-74 Fellowship, Washington Gallery of Modern Art, and co-director of the gallery artist workshop program
1969 Patentee laser beam reflection system - light shows and etc
1969 Award, Cassandra Foundation, New York, New York
1970 Fellowship, National Endowment for the Arts
1972 Fellowship, Guggenheim Memorial Foundation
1973-74 Research Fellowship, M.I.T., Center for Advanced Visual Studies, under Gyorgy Kepes
1987 Florida Power & Light, Night Beautiful Award and The Illumination Engineering Society Award for the Neon public art work The Miami Line
1989 Distinguished Merit Award, Maryland College of Art and Design, "Leadership in Behalf of Artists' Rights"
1994-98 Artist Equity, National Vice President
1996- Selected for inclusion in Marquis Who's Who in the World

Laser Exhibitions and Commissions (selected)

1968 Sculpture Minus Object, the first ever 3-D laser beam installation, Gallery of Modern Art, Wash., D.C.
1969 RA, the first ever solar and laser installation, Corcoran Gallery of Art, Washington, D.C.
1970 New Arts, U.S. Pavilion, Expo '70, Osaka, Japan, the first ever laser beam switching system, and prototype of the laser light show, collaboration with Hewlett Packard Corp.
1970 Stern Line, first ever urban scale laser environment, Mr. and Mrs. Philip M. Stern, Washington, D.C.
1970 69th American Exhibition, Art Institute of Chicago
1971 Art and Technology Exhibition, L.A. County Museum
1971 Rite of Passage, urban scale laser installation, New Orleans Museum, in honor of Edith Stern
1973 Sky Bridge Green, urban scale laser installation, Philadelphia Museum of Art
1973-76 Laser and Solar installation, Omni-International Complex, Atlanta, GA, developed natural light plan which was designed into the architecture
1974 Anonymous, the first ever laser scanning device with digital memory, & Home On The Range, camera Obscura Projection, The Projected Exhibition, Walker Art Center, Minneapolis, MN
1975 Green Isis, Laser installation, Art Park, Lewiston, N.Y.
1976 Sun Dog, solar and laser installation, National Endowment for the Arts, for the U.S. Bicentennial Expo of Science and Technology, Kennedy Space Center, Cape Canaveral, FL
1977 The One Night Stand, urban scale lasers, Baltimore Inner Harbor, Baltimore, MD
1978 Urban scale lasers, Fort Worth Art Museum, Ft. Worth,TX
1979 Still Green,Urban scale lasers, Disneyland Hotel, Anaheim, CA
1980 The Source,an urban scale lasers installation, The Mall, Washington, D.C.
1982 The Green Verb,Urban scale lasers, Columbus, OH
1983 The Green Hypotenuse,Urban scale lasers, Mt. Wilson to CalTech, Pasadena, CA
1984 The Green Lady,Urban scale lasers, Fountain Square, Cincinnati, OH., Cinn. Contemperary Art Center
1985 Laser Dance, interactive laser stage sets for dancers & audience environment, Lisner auditorium,Wash.D.C.
1987 The Miami Line, urban scale neon, one-quarter mile long neon in downtown Miami, FL
1987 Urban scale laser, Memorial Art Gallery and The University of Rochester, Rochester, NY
1989 Mapplethorpe Projection on facade of The Corcoran Gallery of Art, Wash. D.C., cover of ArtForum, etc.
1989 Inclined Planes, urban scale lasers, Johnstown, PA
1993 The Red River Bridge, laser, searchlights, fiber optics & neon 3500', &'95, 3500' Shreveport, LA
1994 Pegasus Cloud Projection, urban scale lasers, Sacramento, CA
1996 CNN Center, Atlanta , GA., Restored 1976 laser 'Canis Major' & added Good Luck World permanent c o Computer controlled animated laser projection on atrium ceiling.
1996 Urbanscale four laser piece & Good Luck World, Indianapolis, IN, commissioned Ind. Museum of Art

The Miami Line, 1987, Miami, FL, one-quarter of a mile long on both sides of bridge

Inclined Planes, 1989, Johnstown, PA, urban-scale laser

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