

Experience the Sky

CoeLux[®] Company Profile



Please note: the photographs in this document are real and unretouched. They are not computer renderings.



Experience the Sky Wherever you want, whenever you want.



Experience the bliss and the joy of sunny skies anywhere and at any time. CoeLux® is a scientific breakthrough, allowing you for the first time to reproduce in an interior space the physical effects and optical phenomena of natural light, specifically the diffusion and transmission of sunlight through the atmosphere. CoeLux® technology recreates the sun and sky allowing you to truly experience the outdoors while indoors. CoeLux® combines three key elements: the latest LED technology which reproduces the sunlight's spectrum; a sophisticated optical system that creates the sensation of the distance between the sky and the sun; and nanostructured materials, only a few millimeters thick, which recreate the entire Rayleigh scattering process which occurs in the atmosphere. CoeLux is an optical system based on nano technology to artificially reproduce the natural light and visual appearance of the sun and sky.

You need to experience CoeLux[®] to appreciate it.

Like trying to describe the scent of a perfume, or the colors of a tropical sun, words are insufficient to convey CoeLux®'s uplifting effects. One can say that it produces feelings of lightness and well-being, but until you've basked beneath its sunny blue sky, until you've seen for yourself how it transforms a space, the way it illuminates and enhances everything in its path, you'll never understand how CoeLux® is changing the world of contemporary lighting design.

The effect of warm, artificial, direct sunlight illuminates and enhances objects, completely transforming domestic and public spaces, giving them volume and shape through light and shadow, and creating a new relationship between people and the architectural space which surrounds them.





Minnaert's book that inspired Prof. Di Trapani

The founder and CEO, Prof. Paolo Di Trapani

CoeLux[®]: The Idea

Born from the desire to communicate natural light, CoeLux is the result of a 12-year scientific research project by Professor Paolo Di Trapani, a physicist of the Department of Science and High Technology at the University of Insubria in Como.

Intrigued by the accounts of Marcel Minnaert in the book "Light and Color in the Outdoors", in which the author takes the reader on a journey of color and outdoor light and reveals numerous and spectacular natural optical phenomena, Prof. Di Trapani attempted to capture the presence of such phenomena in nature, but without success. Vexed, he began to verify the accuracy of Minnaert's accounts in the laboratory, trying to artificially recreate the phenomena. During his experiments he became aware of the mysterious light which appears in the shadow of a branch, in the shade of a second branch of a tree, in the details of the myriad of images of the sun, projected by the spaces between foliage, reflected by dewdrops, the eyes of a girl, or the rippled surface of a lake, of the countless shadows and colors appearing from dawn to dusk in clear or stormy skies. Gradually, Prof. Di Trapani was able to reproduce these phenomena, the results occurring exactly as Minnaert had described. But the real surprise came when he again opened his own window and saw that everything described in the book truly existed outdoors. For the scientist, like the artist, reality must be represented and staged, to be perceived. From this discovery Prof. Di Trapani envisioned a technology capable of physically recreating the atmospheric optical phenomena found in nature. Experiencing details like the deep uniform blue of the sky, the direction of sunrays, the contrasting luminance of color in light and shadow, the movement of the sun across the sky, allows you live within your own space,



"One day, while admiring Magritte's painting "Empire des Lumieres", I had an amazing artistic realization when I understood the fantastic paradox the painting depicts: a house, dimly lit by a street lamp in the dark of night, and behind it, a bright daytime blue sky, streaked with white clouds. Two very realistic, seemingly trivial scenes, which together make a masterpiece.

The same evening, hours after sunset, I looked out the window of my room, and I saw a house dimly lit by a street lamp with a dark, moonless sky above it. Suddenly I realized that the sky is not black as I previously thought. Widening my eyes I could see a few glimpses of clouds capturing the very last rays of the setting sun, and shining my way faint flashes of gray, blue, pink, orange, even green. This dance of wonderful colors in the darkness has been repeating itself for millions of years, and I would have never seen it without the work of Magritte.

So I learned that art, even if surrealistic, is a 'window on the real world': an opening, through which we can look and discover, amazed like children, the reality that exists. For me, CoeLux[®] is a surreal window on the real world." - **Paolo Di Trapani**

again aware of these details which, for tens of thousands of years, have been perceived as signs of the outdoors.

In this journey, the first milestone was the exhibition "Di Luce in Luce" (www.diluceinluce.eu), presented in 2002. The show is a wide-audienceoriented theatrical performance, whose theme is light and the experience of human knowledge. For the first time in the world, it represents an indoor reconstruction of nature, reproducing spectacular optical atmospheric phenomena, in which light is diffused, diffracted or refracted by the air, the clouds, drops of rain, branches of a tree, etc.

La mise en scene "simulates" reality, thoroughly imitating the laws, which, according to the actor (the scientist conducting the show), act in nature. Using glass nanospheres for the reproduction of air and laser beams for sun rays, plexiglass spheres and cylinders as drops of rain, adding trees, pergolas, underwater sceneries and waterfalls, the scientist guides the audience through various rooms which become "natural environments" of clear skies and storms, fog and rainbows, demonstrate the colours of the sky and shadows, allow the audience to glimpse the sun through foliage and branches of a bare tree, during an eclipse or behind the shoulders of a mountain. The performance is a faithful reproduction of nature. Through a series of experiments, the actor invites us to have a glimpse of paintings, architecture, literature, photography, music and even cinema, weaving ambitious ties, suggesting original interpretations of masterpieces. "CoeLux - The sky light reconstruction in artificial illumination by means of solid transparent nanocomposites" is also a research project funded by the European Union under the 7th Framework Programme for research and development.

CoeLux[®]: The Product

The light of Northern Europe, the light of the Mediterranean and the light of the Tropics are the three types of settings that CoeLux offers for you to experience, anywhere, anytime. For enthusiasts of Nordic countries, CoeLux 30 is available, with a 30 degree angle beam relative to the horizon. It is a wall window and is capable of reproducing a warm, grazing light. For lovers of the Mediterranean basin there is CoeLux 45, a skylight featuring a 45 degree ceiling beam that offers an equal balance of light and shade, best enhancing the shapes and volumes that have historically flourished in outdoor architecture. For those who prefer the more dramatic slice of tropical light, CoeLux 60 offers yet an additional solution in a skylight with cooler, vertical sunlight, and the maximum luminance contrast of light and shadow.



60° Tropical bright, cooler, high contrast







45° Mediterranean

medium and balanced



30° Nordic

warmer, more lateral light





CoeLux[®]: Applications

CoeLux[®] technology is ideal for all types of architecture, and has a particularly high impact in underground spaces. Subways, airports,

shopping malls, offices, fitness centers, hotels, museums, housing, even small spaces such as elevators or ship cabins can be transformed by CoeLux® technology to change the way they are experienced.



CoeLux[®] technology is ideal for all types of architecture: offices, spas, fitness centers, hotels, museums, housing, subways, airports, shopping malls, hospitals and more.



The official launch to the lighting-designer communities took place on April 1st, 2014 in Frankfurt, at the world-leading Light+Building fair.

CoeLux[®]: The Launch

CoeLux® was presented to the public for the first time at the "EU Innovation Convention 2014" in Bruxelles on March 10 2014, and was acknowledged as one of the 12 most innovative technologies resulting from EU-funded projects. Michael Jennings, spokesperson for European Research, Innovation and Science Commissioner Máire Geoghegan-Quinn, said: "Many areas of our lives - from energy, transportation, medicine, food safety, health and well-being - are being enhanced and even revolutionised by nanotechnology. CoeLux® is a great example of how science can turn a simple idea that is difficult to achieve – replicating sunlight – into a reality. It clearly has huge potential to make a difference in people's lives". The official launch to the lighting-designer communities took place on April 1st, 2014 in Frankfurt, at the world-leading Light+Building fair. Lux Review, the international journal of energy efficient lighting and design, nominated CoeLux® among the "10 hottest new products at Light+Building 2014". (http://luxreview.com/news/129/the-10-hottest-newproducts-at-light-building-2014) Since June 7 2014, CoeLux is participating in a prestigious installation at the Biennale Architettura 2014 in Venice, to be viewed by the international architect community. Here, CoeLux has designed and produced the skylight integrated ceiling for the "Z! Zingonia, Mon Amour" exhibit, curated by ARGOT ou La Maison Mobile and Marco Biraghi. http://www.coelux.com/en/blog/index



Portraits taken at the CoeLux® launch with 3 different lightning solutions. Left photo: tropical-type light 60° (whiter / sharper). Right photo: nordic-type light 30° (softer / warmer). Small photos below: mediterranean-type light 45° (balanced colors / shadows).







CoeLux is partecipating in the 2014 Venice Biennale of Architecture

CoeLux Srl: The Company

CoeLux Srl is a hightech start-up established in 2009 as an academic spin-off of the University of Insubria. The company is currently headquartered in ComoNext Technology Park in Lomazzo, nearby the renowned Como Lake. The mission of the startup is to bring to lighting, architecture and real-estate industries an innovative solution for creating the perception of an extraordinarily wide space, by means of a genuine physical reconstruction of optical atmospheric phenomena for the indoors. CoeLux® reproduces the true effect of natural sunlight, accompanied by a clear blue sky and its infinite space. One distinct sun bursts down into the scene through the opening(s) in the integrated ceiling. Objects shine in the exceptional light and cast sharp and blue shadows, colored by the sky. "CoeLux® – says Prof. Paolo Di Trapani, the company founder and CEO – reproduces a fictional experience of the sun and sky, and especially in a subterranean environment, the effect is so surreal and so powerful that it may radically change our perception of reality. It allows us to experience real light in the real world in a totally new and surprising way". The result is achieved thanks to comprehensive work carried on by an interdisciplinary team of researchers, with expertise in the field of optical physics, numerical modeling, chemistry, material science, architecture and design.



An example of how the bi-chromatic characteristic of light, direct and diffused, is found in art, especially in portraits. Left, Portrait of Madame Cezanne, Paul Cezanne, c.1885, Private Collection. Right, Self-Portrait Dedicated to Vincent van Gogh (Les Misérables), Paul Gauguin, 1888, Van Gogh Museum, Amsterdam, Netherlands. Fashion application for CoeLux[®] lighting – details of textiles, materials and the true intensity of colors are enhanced and made more vibrant by CoeLux[®] light. Notice also how the direct light shapes and illuminates the face of the models and how the shadows are tinged blue just like we can see in masterworks of art. The photos were taken in CoeLux[®] installation built for the "Festival della Luce" held in Como in May 2014.



Objects under direct and diffused CoeLux light are true and vivid, even grey and neutral colors and textures come alive as seen in the multiple tones and textures of the gray chair. Compare the different amounts of blue in the shadows of objects as they are close or far away from the wall.



Colors of objects under direct and diffused CoeLux[®] light are vivid and real. The CoeLux light renders skin tones natural and true.

www.coelux.com

CoeLux srl Insubria University Spin-off

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