

Growing a building like a mushroom

CRA-Carlo Ratti Associati, together with global energy company Eni, has developed an architectural structure made of mushrooms, installed in the center of Milan for Design Week 2019. Grown from soil over the past six weeks – and to be returned to the soil at the end of the month in a fully circular manner – the project is composed of a series of arches, made from a record 1-kilometer-long mycelium.

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Hi-res images and more information are available upon request. Please write to pr@carloratti.com

CRA-Carlo Ratti Associati, in partnership with global energy company Eni, has developed an architectural structure made of mushrooms, to be unveiled today at Milan Design Week 2019. The installation, called “The Circular Garden,” was grown from soil over the past six weeks – and will be returned to the soil at the end of the month. It is composed of a series of arches, adding up to a record 1-kilometer-long mycelium, and experiments with sustainable structures that can grow organically and then return to nature in a fully circular way. The project will be showcased during Milan’s Fuorisalone at Brera’s Orto Botanico, the city’s botanical garden. The installation, part of the INTERNI Human Spaces exhibition, will be open to the public from April 9th to 19th 2019.

The Circular Garden pushes the boundaries of using mycelium – the fibrous root of mushrooms – in design. In recent years, mycelium has been employed for sustainable packaging and small brick-like objects. The Circular Garden engages with mycelium at the architectural scale – with a series of 60 4-meter-high arches made of mycelium scattered around the Orto Botanico, for a total of 1 kilometer of mushroom.

In order to create self-supporting mycelium structures on such a scale, the project takes inspiration from the great Catalan architect Antoni Gaudí. It was he, while designing the Sagrada Família in Barcelona, who resurrected the “inverted catenary” method pioneered in the 18th-century by polymath Giovanni Poleni. According to this method, the best way to create pure compression structures is to find their form using suspended catenaries and then invert them. The same applies to the Circular Garden, where the catenaries compose a series of four architectural “open rooms” scattered throughout the garden.

The mycelium was grown in the two months preceding the opening of the Circular Garden with the help of leading experts in the field of mycology – particularly the Dutch Krown.Bio lab. Spores were injected into organic material to start the growth process. In a similarly organic manner, all the mycelium will be shredded at the end of Milan Design Week and go back to the soil, in a circular way. The cycle is similar to what has happened since ancient times in small town or city gardens, through the production of food and the composting of organic waste.

“Nature is a much smarter architect than us,” says Carlo Ratti, founding partner of CRA and director of the MIT Senseable City Lab: “As we continue our collective quest for a more responsive ‘living’ architecture, we will increasingly blur the boundaries between the worlds of the natural and the artificial. What if tomorrow we might be able to program matter to ‘grow a house’ like a plant? Milan’s amazing botanical garden, in the center of the city, seemed the ideal place for such an experiment”.

“There’s a whimsical short story written by Italian writer Italo Calvino in the 1960s that tells of the wonder of the urbanite Marcovaldo when he suddenly discovers some mushrooms growing in the middle of the city. During our first visits at the Botanical Garden in Milan, we felt a similar amazement,” comments Saverio Panata, project manager at CRA: “We

discovered how many varieties of mushrooms were naturally growing in the garden. After that encounter, we thought that mushrooms, with their adaptability and speed of growth, could become our perfect building material.”

Many pavilions designed for temporary exhibitions and fairs – such as for Milan Design Week – end up generating large amounts of waste. The Circular Garden project will be reused in a circular fashion – mushrooms, ropes and wood chips will go back to the soil and small metal elements will be recycled. “Life is more important than architecture,” Oscar Niemeyer famously said, a dictum that is at the center of this year’s theme at the INTERNI Human Spaces exhibition. “It is certainly about human life – but it is also increasingly about the life of our planet, intended in a holistic way,” adds Ratti.

CREDITS

The Circular Garden

A project by CRA-Carlo Ratti Associati for Eni

Part of “INTERNI Human Spaces” exhibition

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Photo credits: Marco Beck Peccoz

Video credits: Edithink

Where: Milan’s Orto Botanico, Milan, Italy

When: April 8th- April 19th, 2019 (h.10:00-22:00)

ABOUT CRA-CARLO RATTI ASSOCIATI

CRA-Carlo Ratti Associati is an international design and innovation office, based in Turin, Italy, with branches in New York and London. Drawing on Carlo Ratti’s research at the Massachusetts Institute of Technology, the office is currently involved in many projects across the globe. Embracing every scale of intervention – from furniture to urban planning – the work of the practice focuses on innovation in the built environment. Among recent projects there are the master plan for Milan’s Science, Knowledge and Innovation Park (MIND-Milano Innovation District); a 280-meter tall green skyscraper in Singapore co-designed with BIG; the redesign of the Agnelli Foundation HQ in Turin; the requalification of the Patrick Henry military village for IBA Heidelberg in Germany; the Pankhasari retreat in India’s Darjeeling; and the concept for a human-powered “Navigating Gym” in Paris. CRA is the only design firm whose works have been featured twice in TIME Magazine’s Best Inventions of the Year list respectively with the Digital Water Pavilion in 2007 and the Copenhagen Wheel in 2014. In the last years, the office has also been involved in the launch of start-ups, including Makr Shkr, a company producing the world’s first robotic bar system, and Superpedestrian, the producer of the Copenhagen Wheel. www.carloratti.com

ABOUT ENI

Eni is an integrated energy company with around 33,000 employees in 71 countries globally. It operates in the oil and natural gas exploration, development and extraction industries in 46 countries; trades in the oil, natural gas, LNG and electricity sectors in 30 countries; and sells fuels and lubricants in 32 countries. It also produces crude oil and semi-finished products to be used in the production of fuels, biofuels, lubricants and chemicals that are then distributed through either the wholesale or retail markets, through various refineries and chemical plants. The company is contributing to the energy transition to a low-carbon future, by promoting the development of energy produced from renewable sources. It is doing so by using new and increasingly efficient clean technologies and by applying the principles of the circular economy to all aspects of its activity. Having completed the transformation of its own business model, which is now more straightforward and faster, with a more efficient value chain, Eni has consolidated its own organic growth across all of its businesses by capitalizing on three main strengths, namely integration, efficiency and use of technology. Technology in particular plays a strategic role in all sectors, helping to achieve global recognition for Eni’s operational excellence, promoting the decarbonization of all of the company’s operations and developing industrial efficiency through the circular economy model. Investing in technology and knowledge has enabled Eni to achieve one of the fastest times to market in its sector, as well as one of the lowest break-even points. From upstream operations to renewables, downstream operations to natural gas, the circular economy to asset management, Eni has managed to differentiate, strengthen and integrate each of its businesses thanks to an operating model that systematizes all of its operations. Integrity when it comes to business management, support for the development of the countries in which we operate, operational excellence in managing the group’s various activities, innovation in the search for competitive solutions and renewable energies, the inclusion of

individuals and the promotion of professionalism and expertise, and the taking into account of both financial and non-financial aspects when it comes to business processes and decisions are our drivers to create sustainable value. Eni is working to build a future in which everyone has access to efficient and sustainable energy resources. The Company bases its work on passion and innovation, on its unique strengths and skills, and on the value it places on people whose diversity is considered a resource for all.

ABOUT ENI GAS E LUCE

Eni gas e luce, a wholly owned subsidiary of Eni SpA, is a provider of gas, lighting and energy solutions for the retail and business markets. The Company operates in four European countries and has 1,600 employees. With 8 million customers in Italy, it is the leading supplier of natural gas to households, apartment blocks and small businesses, and the second largest supplier of electricity in the free market. Eni gas e luce also has a network of Energy Stores in Italy, with 150 points of sale offering personalized consulting. Since the end of 2016, Eni gas e luce has been present on the energy solution market in partnership with leading companies in their relevant markets, offering a range of energy efficient products and home services beyond gas and energy supply.

ABOUT INTERNI HUMAN SPACES

INTERNI, The Magazine of Interiors and Contemporary Design, has been fortunate enough to share the fantastic, adventurous history of the Italian furniture and interior design industries for more than 60 years, closely following the growth that design has been able to express thanks to the work of brilliant cultural figures, architects and designers and brave, intuitive entrepreneurs. INTERNI has, in effect, grown with design, which has spread and infected all of daily life. The magazine has assumed, over time, an increasingly decisive commitment to communicate the culture of design at an international level, promoting new creative alliances between designers, companies, representatives of culture and project operators in the broadest sense, and has developed, under the direction of Gilda Bojardi, a network of parallel publications that have transformed the monthly magazine from niche to mass media. INTERNI continues to be an attentive and up-to-date observatory of the design world and a forerunner of trends in the fields of design and architecture. From the first half of the nineties, the magazine became part of the Mondadori Editore Group, the most important Italian publishing group. The activity of INTERNI also includes the conception and coordination of events and exhibitions, organized in order to facilitate encounters between those who design and those who produce. The themes of experimentation and ephemeral production led, in an effort to broaden the culture of design to the general public, to the events organized in the late 1990s on the occasion of Milano's FuoriSalone. This famous urban phenomenon that animates the city of Milan during Milan Design Week was born thanks to the initiatives of INTERNI in 1990; the magazine today coordinates the communication of about five hundred events. After the launch of the INTERNI publications in China (2015), the magazine plans to extend the international editions elsewhere.

"HUMAN SPACES" is the title of the much-anticipated exhibition-event conceived INTERNI with the support of the City of Milan, which will take place during the FuoriSalone, from 8 to 19 April, in the courtyards of the University of Milan, at the Orto Botanico di Brera with ENI and at the Audi City Lab at the Arco della Pace. The Mondadori Group magazine, edited by Gilda Bojardi, asked leading protagonist of Italian design, as well as international designers and architects to address the issue of "Human Spaces", in collaboration with companies, multinationals, start-ups and institutions. The result is an extraordinary collection of installations and design islands, micro-architecture and macro-objects, all site-specific, that interpret the places, landscapes contexts and, by extension, media and objects that place at the center of their vision the wellbeing of people. Consequently, the human being and human needs are back at the center of creative thought for a new quality of life, in harmony with the environment.