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Bruder Klaus Chapel

Photo Felipe Camus

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WILDEBEAUTIFUL

Nipa Huts in dry landscape

Photo Heibby Cris Marvel

ARCHITECTURE, TIME AND MATURATION

Materials are the spine and flesh of the built world. Choose wisely and a building can last for millennia and grow more beautiful with time. Choose wrong and the world will huff and puff and blow your house down.

The first lesson in architecture most people today receive is in the fable *The three little pigs*. The story goes that a mama pig sends her three pig children out into the world to make their fortune. Faced with the reality that they are prey, each pig builds a house to protect them from their natural predator, the Big Bad Wolf. The first pig builds their house from straw and the Big Bad Wolf blows it down. The second pig builds their house from sticks and meets with the same sad fate. The third pig builds their house from bricks, which the Big Bad Wolf cannot blow down. Architectural lesson learned: materials matter when designing a building that is meant to last.

Today there is a fourth little piggy — they make their house out of tech. Smart glass, smart roofs, smart HVAC systems, parametrically designed shells, off-grid sustainable power sources, autonomous lighting and temperature controls. The wolf does not need to blow this house down. The wolf designed it to trap the little pig in its maze of folly. Whenever the wolf wants, he can feast on the little piggy who will be somewhere inside their tech house scrolling on a device or oblivious in a pair of VR goggles.

Finnish architect Juhani Pallasmaa describes buildings as human nests. In his book *From space to place – Existential meaning in architecture* he writes: “In a rich and humanly meaningful lifeworld, this entire scale of nesting places, one inside the other, supports a distinct sense of identity, coherence, association and meaningfulness.” Is Pallasmaa right? Is the built world just a network of elaborate nests built by and for fancy animals? Are we birds and rats, not piggies? Animal nests are ephemeral and utilitarian. They are the epitome of vernacular, more comparable to yurts than condos. Are yurts architecture? Can a form developed over millennia and made from disposable materials, that can be taken down and put back up innumerable times win the Pritzker Prize? [see p.32] It probably should!

What about that other stuff Pallasmaa said, about how our human nests support “a distinct sense of identity, coherence, association and meaningfulness?” Is that what an eagle’s nest does for the eagle? We could find out by going on a nature watching trip to one of Rewilding Europe’s 10 ongoing rewinding initiatives, which are bringing wild eagles back in droves, along with hawks, vultures, bears, lynxes, wild horses and numerous other species. The well being of those animals seems to rely on fewer buildings not more. Are humans so different from animals that we are dependent on the built world for existential things? Or is this a story architects tell themselves to justify their value?

— Phillip Barcio

> In a rich and humanly meaningful life-world, this entire scale of nesting places, one inside the other, supports a distinct sense of identity, coherence, association and meaningfulness. Buildings are human nests, layered and interconnected. Our built environment shapes who we are and how we belong. — *Juhani Pallasmaa*

If architecture actually does wield such a tremendous influence on humanity, it is notable how few people follow its trends. Ask 1,000 random people walking through Terminal 2 at Chhatrapati Shivaji International Airport in Mumbai what they think about Parametricism, one of the field's most dominant contemporary movements and maybe one will have an informed opinion [see p.80]. Yet, they are all in that moment inhabiting India's most prominent example of the discipline.

What is Parametricism? Basically, it is computer designed architecture — a human architect prompts an A.I. powered algorithm to create a design based on a given set of parameters. It is not dissimilar to a writer telling ChatGPT to write a novel about some specific topic, say, striking apple pickers. Would the algorithm have ever written such a novel on its own? Unlikely. Will it write something as good as Steinbeck's *In dubious battle*? Definitely not. Can the writer who prompted the A.I. take credit for the novel? Hardly. Parametrically designed buildings are similarly dependent on someone organising their generative parameters. Can that person, no matter how unique or artful their prompts, rightfully claim they are the architect of whatever the algorithm generates? These are big questions with murky answers for little piggies.

German architect Patrik Schumacher [see box p.82] is the leading protagonist in the Parametric Architecture movement. His day job is lead architect of Zaha Hadid Architects, the firm founded by Iraqi-British architect Zaha Hadid, the first female to win the Pritzker Prize for Architecture. Hadid died in 2016. She incorporated computers into her work, but did not design her buildings with algorithms. She said she refused to limit herself to what a computer could do. Maybe she had one foot in the past. Maybe the past, present and future are also nests.

Parametricism refuses to limit itself to what a human can do. That could make Schumacher an anti-Hadid. He recently published an essay called *The end of architecture.* The essay begins with a flurry of declarations: "Architecture, as an autonomous, theory-led discipline, has ceased to exist. The discipline has self-dissolved, eroding its intellectual and professional autonomy under the pressures of anti-capitalist politicisation and woke virtue signaling. Academic institutions, biennials and professional *critiques* have abandoned their roles as incubators of architectural thought, instead engaging with tangential sociopolitical issues that stray from architecture's core competency."

Later in the essay, Schumacher states that "the bulk of architecture designed in 2024 could have been designed in 1974 or indeed in 1924. It is not only stagnant but positively regressive. All styles, with the exception of parametricism (with Tectonism as its most recent and most advanced and sophisticated subsidiary style), are retro-styles." That last remark was meant as an insult. But to proponents of Indigenous architecture, Folk architecture, Vernacular architecture or adaptive re-use, it was a ho-hum acknowledgement of the obvious. Retro in architecture almost always equates to something beloved. The oldest buildings in the world are also the most visited and most cherished. They were not designed by architects. That word did not exist when they were built. They were designed by master builders. That designation just meant that the person had been around a long time and had learned a lot about how to make buildings that did not fall down. In olden times that was important.

If the word architect is made up, is architecture also imaginary? If our hair grows too long, we cut it. Hairstylists invented hair styles. They know we can take them or leave them. That is why they also gossip with us, massage our heads and make us smell good. That keeps us coming back and paying handsomely for the unnecessary service they provide. Shelter is at least as necessary as good grooming. But do we need an architect to shelter us? In a pinch, a hole in the ground will suffice. If you prefer sheltering above ground, a cave will do. If there are no caves, you could climb a tree. No trees? Maybe you could build a primitive hut. French Benedictine monk Marc-Antoine Laugier wrote in his series of 18th century essays that the roots of architecture were in simple huts made from natural materials. Laugier would say if you need a building, build one. If you need status, call an architect.

New York

Photo Mickaël Pijoubert. © Art Media Agency

Falling water

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Manuela Lucá-Dazio

Courtesy Pritzker Architecture Prize

One of the central conceits of Parametricism is that architecture must reflect its time. This is why Schumacher disparages old styles. Copying the past, he says, reduces architects from artists to mere craftspeople. But were they ever artists? Donald Judd said art is useless. Has any architect ever admitted the same about their work? It is a fun game to make up new ways to build things, but is it necessary? Are we just filling the world with future ironic ruins, parodies of the values their designers supposedly espoused? Time is cruel to nowness. That is why nature's architecture is timeless — forests; caves; holes in the ground; nests.

The more buildings architects build with our newest building material, tech, the more cheers go up from the elites who have access to these buildings and win awards for their designs. Are the inhabitants of nearby tent villages also proud? Will smart buildings tolerate war and climate change better than vernacular buildings, indigenous buildings or the architecture of "1974 or indeed 1924"? [see p.22] What happens when, like so many of Frank Lloyd Wright's buildings, the roof of our Parametric world starts to leak? Are there enough buckets to go around?

People build things that can be inhabited. Some of those things last. Some are useful. Some are beautiful. If a building lasts a long time, it can be useful to innumerable generations of people, and over time can become more beautiful because of their shared remembrances of it and because it has proven to fit the definition of good architecture — *utilitas*, *firmitas* and *venustas* (utility, strength and beauty) — established by the oldest known book on the subject: *De architectura* (c.30 BCE) by Marcus Vitruvius Pollio. (That is also the motto of the Pritzker Prize, which bestows US$100,000 on a living architect, or architects, each year.)

3 questions to... Manuela Lucá-Dazio

Manuela Lucá-Dazio is the Executive Director of the Pritzker Architecture Prize.

What is the meaning of the Pritzker Prize motto?

The *motto* "*firmitas*, *utilitas*, *venustas*" refers to Roman architect Vitruvius' fundamental principles of architecture of "firmness, commodity, delight", as well as to the criteria that since 1979 represent the unchanged mission of the Pritzker Architecture Prize: to honour a living architect (or architects) whose body of built work has generated constant and consistent benefits to humanity and the built environment through the art of architecture. For nearly five decades, these two parameters have been interpreted differently by the evolving juries. Yet, they remain ever-present, never mutually exclusive. They serve as enduring references for the jury, measuring the impact of each deliberation — not only as a reflection of the present but as an anticipation of the times to come: for the laureate, the Prize carries with it both the recognition to be a catalyst in the current historical moment and the responsibility for the future of the profession.

How has the Pritzker Prize helped bring architecture to the forefront of public conversation?

Each year, we receive a significant number of spontaneous submissions, each considered with the utmost attention in the jury evaluation process. In parallel, nominations are actively solicited from an ever-expanding network of professionals — architects, scholars, cultural figures and experts across diverse fields — who contribute their knowledge and perspectives to the discourse on architecture. This open nomination process has brought to the jury's attention many remarkable architects, offering not only an expansive view of contemporary architectural trends [see box p.56] but also insights into the evolving expectations surrounding the Prize. Architects bear the privilege and responsibility of shaping the built environment, yet architecture does not exist in isolation — it requires demand, commitment and vision from those who inhabit it. Decolonisation, decarbonisation, and social and environmental justice have become defining imperatives of our time, urging architecture to serve as a means of progress and shared responsibility. The future is not to be passively delegated to others but actively shaped by all. The Prize stands as a testament to this principle, underscoring that architecture is more than an object of admiration or utility — it is an intrinsic part of everyday life. As such, it must be a conscious and deliberate choice, one that defines the world we aspire to build.

How sustainability or ecology factor into selecting Pritzker Prize winners?

Architecture is never independent of its surroundings. Benefits to humanity and the built environment cannot be achieved without referring to the concept of landscape, whether natural or built and ecology at large. With this principle in mind, an analysis of the past five laureates reveals that sustainability has not only been a fundamental criterion in their selection but has also been progressively expanded in scope. Sustainability, ultimately understood as pertinence, emerges as a unifying thread connecting the works of the most recent laureates. Liu Jiakun's approach to sustainability is deeply rooted in cultural continuity, resource efficiency and social responsibility [see box p.35]. His architecture embraces local materials, traditional craftsmanship and vernacular techniques, ensuring that his projects are both environmentally and contextually responsive. By designing with an awareness of local conditions — both natural and socio-economic — he creates spaces that are not only ecologically responsible but also accessible and meaningful to the communities they serve. This aligns with the broader evolution of sustainability in architecture, where relevance, longevity and community engagement are as crucial as material and energy efficiency.

Finally, whatever else it is or does, the built world sends coded messages to the humans who inhabit it. Big box stores are designed to imitate warehouses. Their form suggests to us that we are buying products directly from manufacturers, rather than from a retailer. But big box stores are retailers. Their architectural code is a deceit. Urban bodegas occupy the vernacular architecture of their neighbourhood. Their interior is like a cramped, overstuffed domestic pantry. The architecture suggests to us we are safe and that the products for sale have been selected especially for us by neighbours with similar tastes and needs. Bodegas charge higher prices but their form sends the message that it is worth it because the money supports the local community.

Big box stores are a product of their time. Bodegas are survivors of time. Architectural choices are ingrained in the battle. Will we choose to hand over control of our built world to a global, elitist artificial intelligence? Will we allow “smart” to be redefined as “controlled by a brain other than our own”? Or will we embrace the vernacular, the Indigenous and the natural, architecture’s bodega model? If time is any guide, the bodega model is probably built to last. It is the brick house where the piggies are most safe. Throw a little bit of rewilding into the mix and who knows? We might really have a built world we could call smart. [see p.46]

Photo Helena Janković Kovačová

Mareterra neighbourhood, Monaco

Photo Mickaël Pijoubert. © Art Media Agency

ANALYSIS

Garden of the former Boucicaut Hospital

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RETHINKING THE WAY WE LIVE

Land use planning, ecosystem protection, restoration of old buildings, eco-construction, sustainable materials, green energy and gentle mobility solutions — architects, urban planners and public officials strive, with varying degrees of success, to reshape the built environment for a liveable future in the age of climate crisis.

Urban growth has reached unprecedented levels. Today, 57% of the world's population — 4.4 billion people —live in cities. By 2050, the number of city dwellers will double, with seven in ten people worldwide residing in urban areas. Bit by bit, concrete spreads across the globe. The climate emergency demands a complete rethink of the built environment, not just in cities but everywhere. Infrastructure, transport networks, land use — beyond the buildings themselves, every physical space, even those that appear natural, bears the mark of human activity. This concept stretches far beyond traditional urban planning and brings its own set of challenges. "Unlike urban planning, which mainly focuses on the spatial organisation of cities, the built environment considers the interactions between buildings and their natural surroundings, as well as their impact on public health and wellbeing," explains Dr Mazri Benarioua Mouna, architecture and urban planning specialist at the University of Constantine.

"Urban planning that ignores ecological constraints"

Relentless urbanisation fuels unprecedented urban sprawl, with dramatic consequences for land, energy, and resource consumption. The spread of peri-urban areas — those zones between city and countryside — creates new demands for transport infrastructure, driving up CO2 emissions. Construction, too, stands at the forefront of the carbon economy. In France, where 85% of the population lives in cities, the building sector alone accounts for 43% of annual energy consumption and generates 23% of the country's greenhouse gas emissions, according to the Ministry of Land use planning.

"Cities consume vast natural resources and produce ever-increasing pollution. This is not inevitable but the result of urban planning that ignores ecological constraints. Transforming cities into part of the solution to the global ecological crisis is now urgent — a political agenda," writes sociologist Saskia Sassen, professor at Columbia University.

In light of these findings, the question of sustainability in the built environment — and the eco-responsible future of cities — has become deeply ideological. Two opposing visions have emerged. On one side, advocates of the "compact city" champion a dense, vertical model designed to curb urban sprawl and reduce travel. On the other, supporters of the "spread-out city" warn that densification could lead to congestion, pollution and land speculation. "The compact city offers significant environmental advantages," argues urban planner Jean Haëntjens. "Living in a dense urban area requires about four times fewer resources, energy

— Carine Claude

and building materials than dispersed housing. Flats in multi-storey buildings can use up to 70% less energy than detached houses."

To limit urban sprawl, smart densification is increasingly seen as the way forward. This approach takes many forms: building upwards, filling in urban gaps or redeveloping disused industrial sites. The conversion of the former LU factory in Nantes into the cultural venue Le Lieu Unique, and the transformation of Marseille's docks into commercial and office spaces, both illustrate this trend of recycling existing structures rather than consuming new land.

Inspired by the living world

Once considered fringe, architectural projects that draw directly from nature are now flourishing [see p.46]. Biomimicry — taking inspiration from strategies developed by the natural world, such as thermoregulation — first captured the imagination of German architect Frei Otto in the 1960s. Few designers followed his lead at the time. Today, however, everyone seems to be turning to bioplastic mycelium, hydrophobic lotus-effect coatings or self-healing bacterial concrete.

"Living organisms optimise energy management through insulation and thermal regulation mechanisms that we can adapt to our buildings," explains Alain Bornarel, an engineer at École Centrale and a specialist in ecological construction. In 2023, the new International Agency for Research on Cancer (IARC) building in Lyon unveiled a *façade* inspired by flower petals, which open and close to regulate the interior temperature. In Paris's 13th *arrondissement*, Algo House features a 900-square-metre bio-*façade* that uses micro-algae to generate energy. In Harare, Zimbabwe, the Eastgate Centre borrows from termite mound architecture to maintain constant indoor temperatures without air conditioning. Meanwhile, Zaha Hadid's studio designed Beijing's new airport in the shape of a starfish. While this last example is more about form than function, it demonstrates how the aesthetics of the living world are now fully embraced in the new urbanism of high-density areas.

Eco-districts

BedZED: British pioneer

In south London's suburbs, a former landfill made way in 2002 for a bold new architectural complex. Named BedZED (Beddington Zero Energy Development), this development of 82 flats embodied a revolutionary ambition: to create housing entirely independent of fossil fuels. Instantly recognisable by its red brick *façades* and timber cladding, BedZED features triple glazing, ultra-insulated 50 cm-thick walls and photovoltaic panels. Residents' carbon footprints are offset by extensive green roofs.

Swedish revolution

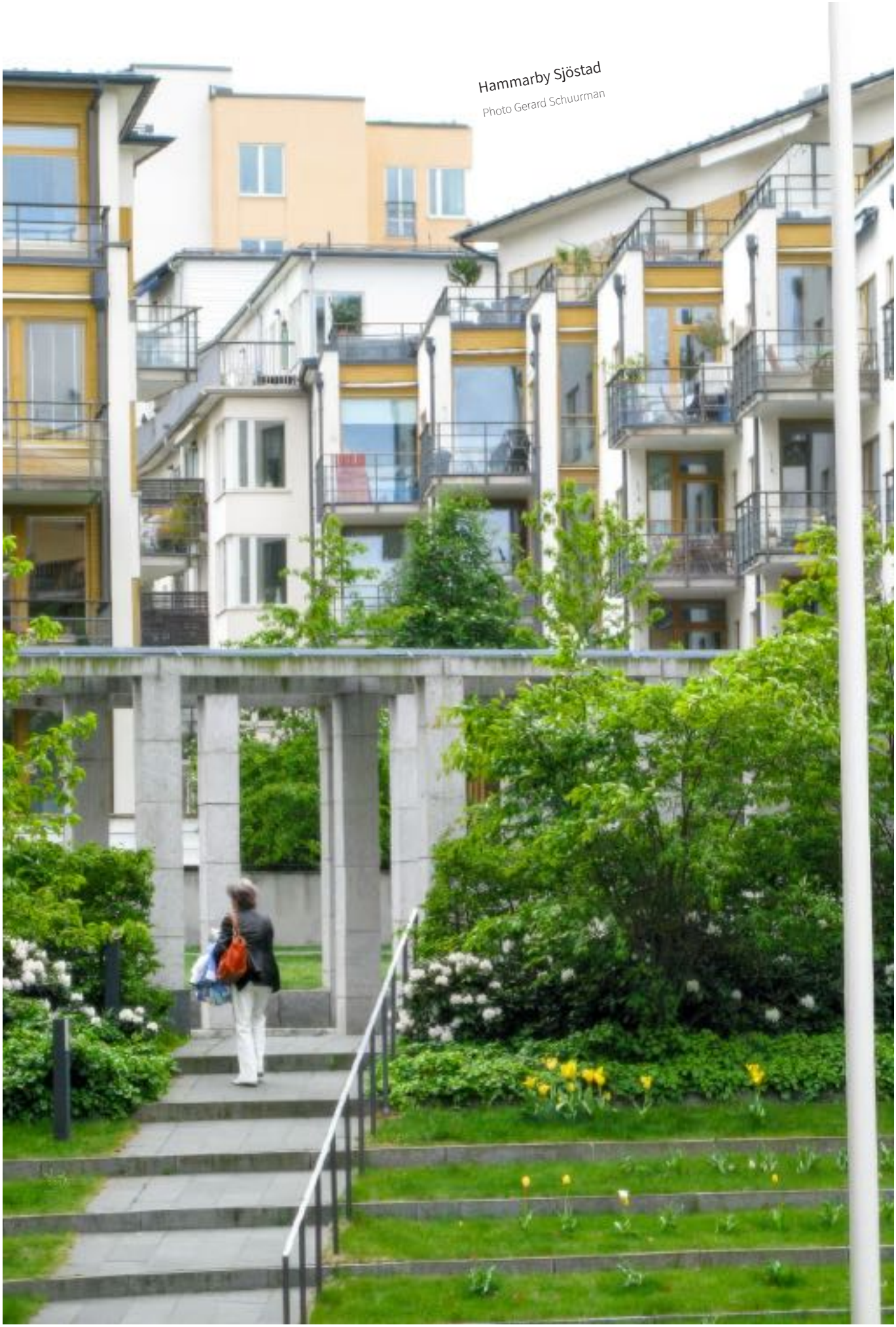
Sweden stands out with two landmark eco-districts. In Malmö, the BO01 neighbourhood transformed former docklands into a global showcase for future living. Powered entirely by renewable energy, it prioritises quality of life with green spaces, a dense network of cycle paths and silent electric buses. In Stockholm, Hammarby Sjöstad is one of Europe's largest ecological redevelopments. Designed for 30,000 residents, it has become a laboratory for electric mobility, including an innovative car-sharing system.

French innovations

In Grenoble, the ZAC de Bonne (2003) proves that ecology and economy can coexist in a dense urban setting. Spread over 8.5 hectares, with 40% green space, the district combines low-energy buildings powered by solar energy with social diversity — over 40% of homes are social housing. Outdoor parking is limited in favour of car-sharing services at the foot of each building. On the banks of the Seine, the ZAC of the Olympic and Paralympic Village — host to athletes in Saint-Ouen-sur-Seine and Saint-Denis — is now being transformed into an eco-district. Plans include 2,800 bioclimatic homes, 770 of which will be sold to the public, with the remainder comprising social housing, student residences and 20 public and sports facilities set among 6 hectares of green space planted with 9,000 trees.
Inaugurated on 7 October 2017, Boucicaut eco-district — entirely pedestrian — was built on the site of a former hospital in western Paris. The mixed-use scheme offers 510 homes (60% social housing) across 3 hectares, designed for 1,300 residents. Launched in 2002, the project took 15 years to complete, delivered in several phases.

German-style participatory democracy

In Germany, Vauban district near Freiburg covers 40 hectares and is home to more than 5,500 dwellings. Architecturally, its buildings are long and feature south-facing sloped roofs to maximise solar panel efficiency. Participatory democracy thrives here, as shown by the creation of a resident-run car-sharing service established in the early 2000s.



Hammarby Sjöstad

Photo Gerard Schuurman

Vauban district

Photo Andreas Klug

Eco-districts: rethinking community living

Before (re-)building, we must first consider the fate of what already exists. Brownfield sites, industrial buildings and port areas are gradually transforming into eco-districts. Since the 2000s, these new spaces have served as laboratories for sustainable urban living across the globe. Their aim? To reduce residents' carbon footprints, particularly through the use of locally produced renewable energy. Photovoltaic panels, vehicle-to-grid systems that allow cars to feed electricity back into the grid, and self-consumption setups are redefining how energy is produced and distributed at the neighbourhood level. Eco-construction forms another pillar of this "urban revolution", incorporating sustainable materials from reclaimed and recycled sources, along with high-performance insulation techniques that dramatically cut a building's energy use. Promoting a more communal — or at least convivial — way of life, these eco-districts often share waste management through collective composting and resource recovery systems that turn rubbish into valuable materials. Across Europe, several eco-districts stand out as models. BedZED, located in Sutton near London, exemplifies this approach [see box p.24]. Opened in 2002 on a former landfill, this neighbourhood of 82 homes for 250 residents was designed to operate without fossil fuels. The results speak for themselves: a 90% reduction in heating needs, 60% less electricity consumption and 50% less water use compared to the UK average.

The specifications for these eco-districts often prove strict, as seen with the redevelopment of the former Boucicaut Hospital site in Paris. Here, 30% of floor coverings use renewable materials and insulation comes from plant or animal sources. Certain restrictions also apply. The use of render or PVC, for example, is banned, while materials such as terracotta, wood, concrete, glass or metal are encouraged for roofs and terraces. Water consumption targets remain below 80 litres per person per day, thanks to 4,500 square metres of green roofs that manage rainwater in alternative ways and promote biodiversity. "Let us highlight the modernity of the buildings, the care taken in their construction and the site's environmental quality," enthuses Eva Andréani, project manager at SemPariSeine, the organisation overseeing the Boucicaut eco-district. "The project is exemplary in both its intentions and its execution. It is a showcase of sustainable innovation: respect for the neighbourhood's history and heritage, social diversity, biodiversity development (local species, beehives, nesting boxes) and careful management of energy and resources (solar panels, on-site rainwater treatment). Two major points stand out: the wide variety of housing within a single district (traditional ownership, social housing, capped-rent lettings) and the integration of facilities and structures with a social purpose."

> The more our cities lead the way in energy transition and reducing greenhouse gas emissions, the better their prospects for the future. The entire urban economy must mobilise around a kind of "Green Deal" that can harness the benefits of less energy-intensive, more environmentally friendly innovation.
>
> — *Catherine Charlot-Valdieu*

A hint of greenwashing

Yet eco-districts remain far from universally popular. In June 2024, the *Monde Diplomatique* launched a fierce *critique* of their proliferation: "Building at all costs, while cloaking oneself in the virtues of nature and technological modernity, has become the new *credo* for many French municipalities. Rhetoric tinged with environmentalism and a new language brimming with concepts that celebrate a supposed return of nature to cities — these tricks serve to mask the gentrification processes affecting poorly housed populations." He, too, pulls no punches. The renowned architect Rudy Ricciotti, winner of the Grand Prix National d'Architecture and designer of the MuCEM, brands eco-districts an "abominable" concept, arguing: "It is a vague political slogan, built on ignorance and cynicism."

> A sustainable city cannot simply be declared; it emerges from a collection of individual initiatives that take on collective meaning. It is built together... Sustainability is, above all, a mindset that shapes behaviours and can lead to the creation of a lasting environment. — *Cyria Emelianoff*

Failures in the world of eco-districts almost rival the successes. Touted as a flagship of urban eco-design, London's BedZED neighbourhood has faced a string of setbacks — from the bankruptcy of its management company to repeated breakdowns of its biomass-powered combined heat and power plant in 2005, which was meant to supply the district with energy. In the end, the buildings had to connect to the conventional grid for electricity. Another stumbling block: the high cost of sustainable construction, as BedZED's €22 million investment demonstrates. Social accessibility also remains a pressing issue: how can we ensure these new built environments do not become enclaves reserved for the well-off?

In France, Lyon's Confluence district — once hailed by late mayor Gérard Collomb as the "flagship of the city of tomorrow" — continues to draw criticism. The original vision was ambitious: social diversity, WWF certification and exemplary energy performance, with 80% of consumption covered by locally produced renewables. This was a French take on the micro-grid concept pioneered in Brooklyn since 2016, where neighbours buy and sell locally generated electricity through smart micro-networks and blockchain technology. Yet, more a political showcase for the Lyon metropolis than a true eco-citizen project, the "eco-district-sustainable city-smart city" layer cake of Confluence has come under fire for its lengthy construction — planning permission was granted in 2003 but the project only finished in December 2014 — and for the fourfold gap between projected and actual costs (€61 million forecast, €330 million spent). "At Confluence, we are witnessing the 'enrolment of the environment in urban competitiveness strategies' (*Béal et al.*, 2011, p.95), a form of sustainable development perfectly integrated into the neoliberal production of the city — technological, measurable and marketable," writes Matthieu Adam, CNRS researcher and author of a thesis on the subject. Not to mention the district's relative failure to achieve social diversity, as it mainly attracts affluent professionals.

Towards a holistic approach

Renovating the existing, often energy-hungry, building stock is a colossal task. In France, an estimated 7 to 8 million "thermal sieves" require urgent work. Construction regulations now demand ever-higher energy performance, with financial incentives for renovating or building efficiently and a push for positive-energy and low-carbon buildings. The RE2020 (Environmental Regulation 2020), in force since January 2022, marks a major shift by considering not only energy performance but also the carbon footprint of buildings across their entire life cycle.

For Professor Vincent Renard, land economist, "the future of the built environment depends on an integrated approach that goes beyond the traditional silos of architecture, urban planning, transport and energy." This systemic vision echoes the concept of urban ecology, first developed by the Chicago School and later enriched by the environmentalist thinking of the 1970s and 1980s. Today, this discipline examines the direct and indirect impacts of cities on ecosystems and seeks to establish the conditions needed for a new mode of urbanisation — one that preserves biodiversity and quality of life. "The ecological transition involves public action in urban planning and the transformation of urban infrastructure," writes economist Catherine Charlot-Valdieu in the *Cahiers du développement urbain durable*. She lists: "The production of renewable energy, reducing reliance on fossil fuels, greater energy sobriety, spatial organisation that enables more energy-efficient lifestyles, the development of public transport and gentle mobility, the expansion of smart networks, the creation of strategies for the energy renovation of buildings and changes in the behaviour of socio-economic actors." This last point, without doubt, will prove the most challenging to put into practice.


BedZED
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Bonne eco-districts

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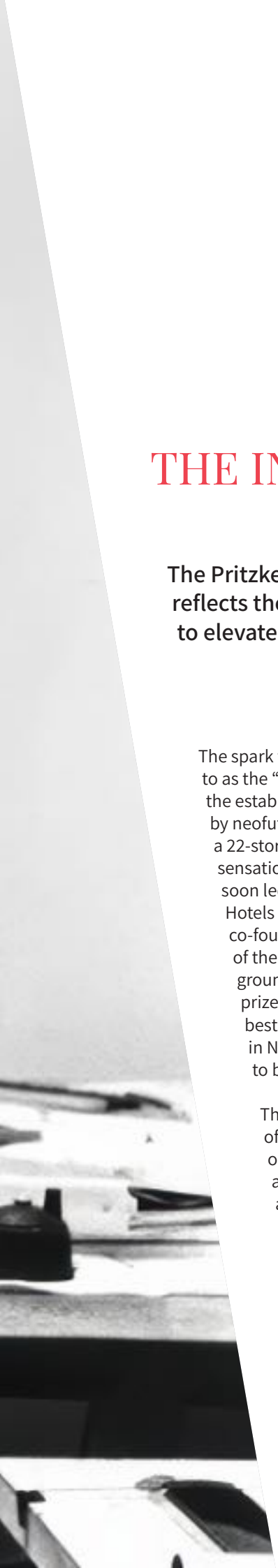
AWARD

Denise Scott Brown and Robert Venturi

Photo George Pohl



THE INDIVIDUAL OR THE COLLECTIVE

The Pritzker Prize, one of the world's most prestigious architecture prizes, reflects the field's longstanding history of inequity and tendency to elevate the "starchitect" *in lieu* of creative collaboration.

The spark for the Pritzker Architecture Prize, frequently referred to as the "Nobel Prize of Architecture", first caught in 1967 with the establishment of the Hyatt Regency Atlanta. Designed by neofuturist architect John C. Portman Jr, the hotel features a 22-story atrium and following its grand opening, the uplifting sensation the atrium imposed on the hotel's guests and staff soon led it to become a signature design element of Hyatt Hotels worldwide. As told by Hyatt Hotels Corporation co-founder Jay A. Pritzker, he and his wife's new cognisance of the psychological impact of architecture laid the groundwork for the establishment of an architectural prize. Modernist architect Philip Johnson, who is perhaps best known for his 1949 design of The Glass House in New Cannan, Connecticut, was the first to be awarded the Pritzker Prize in 1979.

The Hyatt Foundation states the current purpose of the prize as follows: "To honour a living architect or architects whose built work demonstrates a combination of those qualities of talent, vision and commitment, which has produced consistent and significant contributions to humanity and the built environment through the art of architecture." Like the Nobel, laureates are awarded a medallion and a grant, currently amounting to $100,000 (€88,000), in a private ceremony at a different site of architectural significance each year. Past ceremony sites include the Palace of Versailles, the Guggenheim Museum Bilbao [see p.70], Tōdaiji in Nara, Japan and, for 2025, the Louvre Abu Dhabi. The bronze medallion, adorned with a design based on the work of Chicago architect Louis Sullvian, was introduced in 1987 and is inscribed with the words "firmness, commodity and delight," a nod to the Roman architect Vitruvius' three principles of architecture: "*firmitas*, *utilitas*, *venustas*".

Laureates are selected from an array of nominees by a jury of five to nine members made up of fellow architects, historians, critics, curators, educators, as well as the occasional business magnate. No members of the Pritzker family hold positions on the jury or are present for jury meetings. Nominations are solicited by the Executive Director [see box p.17] from individuals with a demonstrated expertise in architecture. In the past this has included previous winners, academics and politicians. Unsolicited nominations are also accepted from any licensed architect.

As can be expected of any major award, the Pritzker Prize jury has undergone substantial criticism over the course of its history. Often functioning hand-in-hand, the most glaring of these *critiques* centre around the upholding

— *Jeune Tresch*

Jinhua Architecture Art Park Teahouse No. 5

Courtesy Jiakun Architects

Liu Jiakun

Born in 1956 in Chengdu, People's Republic of China, Liu Jiakun deviated from his family of medical professionals at a young age with an early onset pull towards the arts. Following a period partaking in China's rural youth educational program where he was assigned to farm work, Liu enrolled in the Institute of Architecture and Engineering in Chongqing (later renamed Chongqing University), graduating in 1982. He went on to work for the Chengdu Architectural Design and Research Institute, a state-operated agency, where he was amongst the many architects tasked with China's reconstruction. He soon grew disenfranchised with the adherence to a culturally standardised approach to design. It was not until attending the solo exhibition of a former classmate at the Shanghai Art Museum in 1993 that Liu became reinvigorated with the potential of architecture as a form of creative expression, empowering him to deviate from societally-determined norms. He founded Jiakun Architects in 1999, holding true and consistent to his core belief that in addition to being a form of creative expression, architecture is a reflection of the community, seeped in its histories and traditions. Exploring notions of identity, his work lays bare the inherent hybrid of the individual and the collective.

Amongst Jiakun Architects' earliest commissions was the Luyeyuan Stone Sculpture Art Museum in Chengdu, Sichuan. Responding to the museum's collection of stone sculptures, Liu endeavored to design a built environment that would "tell people a story of an artificial stone." Throughout the complex, water and bamboo are employed as aesthetic elements that help the buildings camouflage with the natural environment. Liu noted at the time that his goal included the need to "satisfy aesthetic and spiritual pursuits of the architect, at the same time, to solve various problems we face as architects in China today." Other notable projects include the Jinhua Architecture Art Park Teahouse No. 5 (2006); Shanghai Xiangdong Buddhist Statue Art Museum (2008); Nanjing "International Architectural Art Practice Exhibition" Guest Room Centre (2012); and Reconstruction of Tianbao Cave area in Erlang (2021). Liu Jiakun continues to live and work in Chengdu, China.

of gender and racial inequities, as well as the promotion of architecture as an individual-conceived commodity. Laureates of recent years have notably deviated from the perceived former biases of the Pritzker jury, signalling a potential endeavour to progress from the award's controversial past. It was not until 2004, when Zaha Hadid was presented the medallion, that a woman was awarded the Pritzker, and not until 2022, 43 years into the award's history, did a Black man, Diébédo Francis Kéré, become the laureate. Kéré hails from Burkina Faso where many of his public structures are intrinsically enmeshed with local communities. Although maintaining his signature design elements, Kéré's community-based practice highlights a shift in Pritzker laureates towards a hybridisation of service and artistry, rather than lauded individual vision.

Although the Pritzer has largely focused on modernist and postmodernist styles, it is worth noting that unlike other prizes the jury has never awarded a winner posthumously. The American Institute of Architects (AIA), founded in 1857 by thirteen architects, awarded its Gold Medal to its first Black and female recipients, Paul Revere Williams (1894-1980) and Julia Morgan (1871-1957), long after their deaths. These gestures worked to aid in acknowledging the contributions of underrepresented groups in architectural history. In addition to its Gold Medal, the AIA also hosts a range of honours with notable focuses in judicial buildings, education facilities and spaces for the elderly. These prizes, which focus on singular structures rather than singular architects, acknowledge the societal function, the subsequent activation or inherent collaboration in successful architecture. As awards, importance is assigned via a holistic lens to a range of contributors, a critical difference from the often singularly awarded Pritzker.

Disparities amongst race and sex are hardly issues independent to the Pritzker Prize. According to the 2023 Annual Report on Architecture Education conducted by the National Architecture Accreditation Board, African American students made up 7% of those enrolled in a graduate or doctorate architecture program while White students came in at 41%. 16% of the student population identified as Hispanic or Latino and 8% as Asian. This imbalance is not dissimilar from countless other professions and is reflective of the systematic racial inequities that have long run through Western societies.

In regards to gender balance, the percentage of female architecture students has risen steadily over time from 25% in 1985 to 53% by 2023 (0.5% identified as non-binary). This increase is reflective of significant progress made by women in the field. However it must also be stated that amongst the profession's highest honours, female recipients had reached just over 20% by 2020. Research conducted by the Association for Collegiate Schools of Architecture has found that the longer a woman works in architecture, the narrower her scope of opportunities becomes.

Cumulating in what could be seen as a synthesis of these race and gender-based inequities, the Pritzker Prize has also faced criticism for its upholding of an firmly-established figure in architecture: the "starchitect" — the lone genius, the individual creative force, the charismatic but enigmatic artist. Frank Lloyd Wright is often cited as an early example of "starchitecture". Alongside his cultivation of a uniquely identifiable style, Wright fostered a cult-of-personality topped off with long draping coats, canes and a porkpie hat. The fandom that followed Wright in life has continued to persist in death, notable in his recognition as "the greatest American architect of all time" by the AIA in 1991.

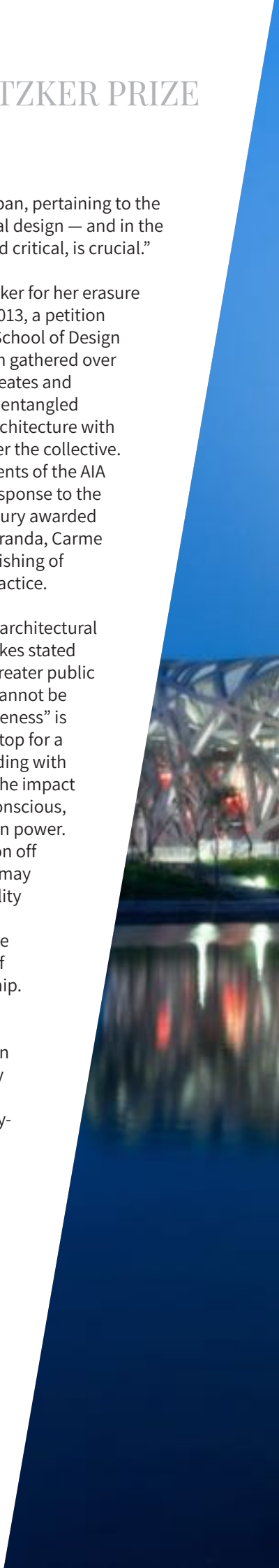
The Pritzker Prize tends to honour only a single architect each year. This was the declared precedent up until 2001, when the prize was taken home by Jacques Herzog and Pierre de Meuron. When Robert Venturi became the laureate in 1991, his long-time collaborator and wife Denise Scott Brown was pointedly excluded, a decision that caused an enduring backlash against the Pritzker jury. Venturi and Scott Brown met in 1960 and have since been so intrinsically intertwined creatively, any attempt to analyse their careers separately would require two blind eyes. In addition to their co-design on numerous buildings, most notably the Sainsbury Wing of the National Gallery in London, the pair provided seminal theoretical building blocks to postmodernism with their 1972 book *Learning from Las Vegas*, co-written with Steven Izenour.

In Venturi's speech accepting the Pritzker, he reflected on his legacy in the plural with words like "we" and "our", rounding out with a verbal bow to Scott Brown. "There would be significantly less dimension within the scope and quality of the work this award is acknowledging today — including dimensions theoretical, philosophical and perceptive, especially social and urban, pertaining to the vernacular, to mass culture, from decorative to regional design — and in the quality of our design where Denise's input, creative and critical, is crucial."

Following remarks by Scott Brown calling out the Pritzker for her erasure at an awards ceremony for women in architecture in 2013, a petition was launched by two students at Harvard's Graduate School of Design to call for a retroactive acknowledgement. The petition gathered over 9,000 signatures, including multiple Pritzker Prize laureates and Venturi himself, only to be rejected by the jury. Tightly entangled with sexism, this refusal continued the conflation of architecture with "starchitecture", with the uplifting of the individual over the collective. Scott Brown and Venturi were later named joint recipients of the AIA Gold Medal in 2016, a decision largely regarded as a response to the Pritzker Prize's rebuff. The following year, the Pritzker jury awarded their prize to the first and only group of three, Rafael Aranda, Carme Pigem and Ramon Vilalta, perhaps signalling a relinquishing of the notion of architecture as a singularly-conceived practice.

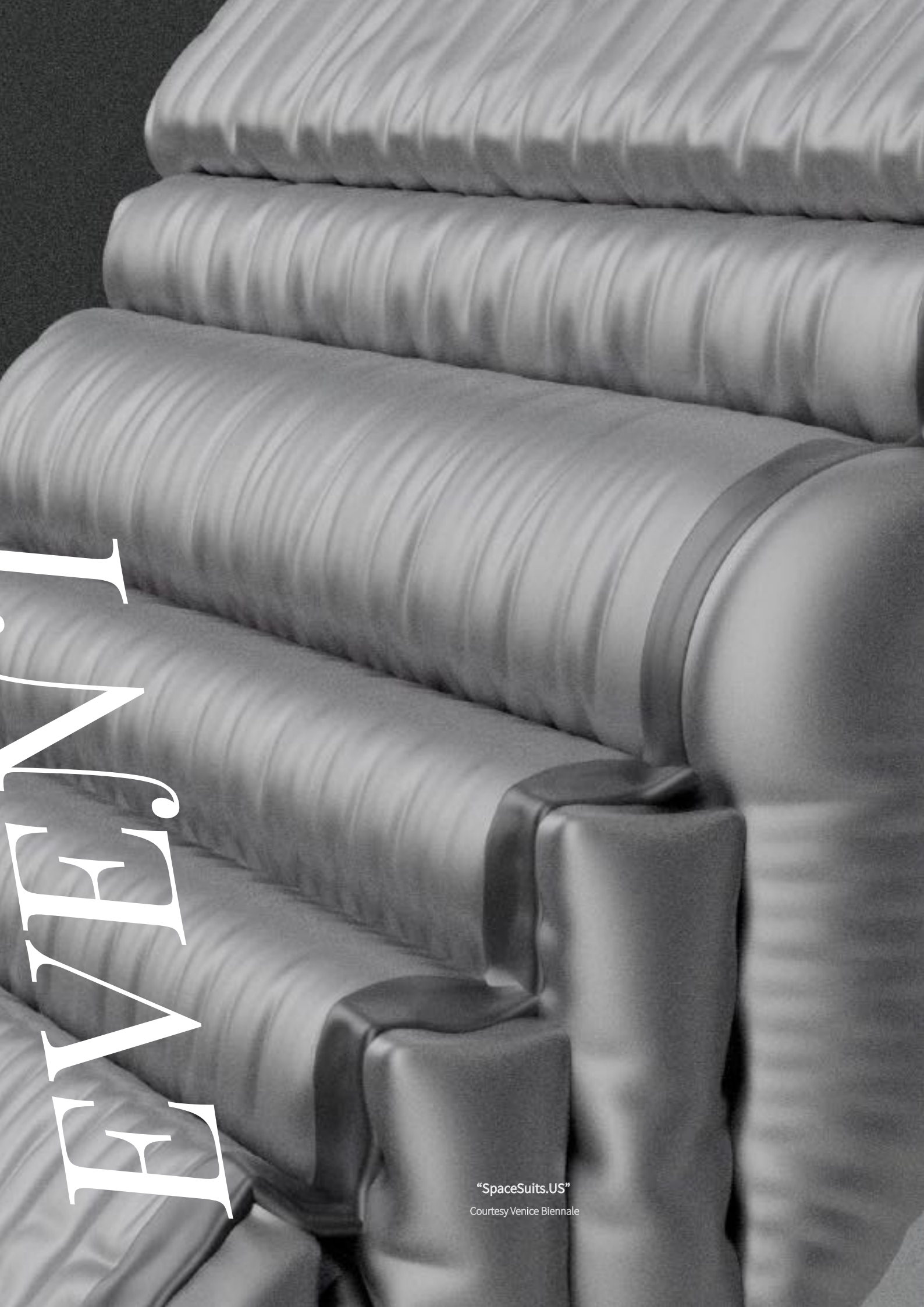
In addition to promoting "greater creativity within the architectural profession", upon establishing the Pritzker, its namesakes stated that introducing a prominent prize would support "a greater public awareness of buildings." This intention both can and cannot be considered somewhat futile, depending on how "awareness" is meant to be interpreted. The average individual may stop for a moment to gaze up at a beautiful or domineering building with that often being the extent of attention paid. It seems the impact of architecture on the everyday person is largely subconscious, imbuing feelings of calm, security, order, status or often power. It is a support to daily life, a tool to organise and section off the needs and activities determined by culture. Some may consider that the true efficacy of a building is in its ability to service its cities and inhabitants, with perhaps the people becoming actants and in that sense, small-scale collaborators. This musing further erodes the notion of the "starchitect" and by extension traditional authorship.

The Pritzker Architecture Prize is as its name suggests: a prize — an assignment of importance, with this action applying to the architects who receive it and the family that bestows it. This is not to negate its cultural and professional significance, but to ponder an individually-granted award's function within a field so interwoven with various forms of labor and culture. To attribute a project to a single architect, who frequently represents the labor of a firm of professionals, can be seen as reducing it to a branded commodity (not dissimilar from the Hyatt Regency Atlanta) and in a field already laden with inequities, erasing its many contributors. Ponderings of this nature appear to be on the minds of the Pritzker jury as well, with laureates of recent years often tending towards an approach of societal service, rather than one of personal vision. Perhaps the further this mode of thinking is embraced by the jury, the more heightened the previously mentioned "public awareness" of architecture will become.



Beijing's National Stadium

Photo Iwan Baan. Courtesy Herzog & de Meuron



“SpaceSuits.US”

Courtesy Venice Biennale

BETWEEN WATER AND WISDOM

As Earth's climate deteriorates we can no longer predict the future using past models. This Venice Biennale is a choral adaptation in a time of crisis.

Suspended between water and wonder, Venice finds itself at the intersection of art, science and urgent environmental reckoning. As the host city of the 19th International Architecture Exhibition – Biennale Architettura 2025, Venice does not just open its palaces and pavilions to architecture; it calls on designers, planners and cities to create a circular exhibition, hosting 762 participants from 10 May to 23 November.

Not a theme, a framework

Curated by architect, MIT researcher and urban visionary Carlo Ratti, this year's Biennale carries the Latin-infused title: "Intelligens. Natural. Artificial. Collective." Marked by wildfires in Los Angeles, floods in Valencia and droughts in Sicily, these are not exceptions but heralds of a new normal. "Architecture has always been a response to a hostile climate," explains Carlos Ratti. This statement becomes the pulse of the entire exhibition. Ratti suggests shifting focus from mitigation, which aims to lessen damage, to adaptation. This involves creating solutions that acknowledge the new realities of our altered world. "In the time of adaptation, architecture is at the centre and must lead with optimism. Architecture must become as flexible and dynamic as the world we are now designing for", he insists, and to do so, architecture must expand its lexicon beyond traditional disciplines and embrace a symphony of intelligences.

In expanding the lexicon, "Intelligens" takes us back to Latin, while being the exhibition's core: embedded within is the word *gens*, meaning "people". The curator uses this as a conceptual springboard to invite collective creativity, from the natural and ancient to the digital and algorithmic. The subtitle reveals a structure: "Natural intelligence, Artificial intelligence and Collective intelligence", each forming a significant section of the exhibition, culminating in the provocative finale: "Out".

Innovation is balanced with Natural intelligence. The exhibition's *Circular economy manifesto*, written with guidance from Arup and input from the Ellen MacArthur Foundation, is the backbone. Most panels used in the Biennale are recyclable, designed to be shredded and reborn, echoing the exhibition's ethic of transformation. The *manifesto* is a consequence of the architecture sector being responsible for 40% of global energy-related carbon emissions and consuming 40% of all raw materials. Moving away from a "take, make, dispose" model, the *manifesto* urges designers, planners, cities and participants to eliminate waste by designing out waste and pollution from the outset, circulate materials by keeping products and materials in use through "reuse, repair and recycling", and

— Nahir Fuente

Carlo Ratti

Photo Andrea Avezzu. Courtesy Venice Biennale

regenerate natural systems by enhancing the natural environment and promoting biodiversity. Among the design principles are maximising the use of renewable materials for more than 50% of the structure's weight, modular and nature-positive designs and the reuse of materials after deconstruction. The Biennale is also committed to eliminating hazardous materials and promoting carbon neutrality [see box], as well as zero waste and the efficient use of water.

This commitment to a circular mindset also shapes the exhibition's broader exploration of intelligence itself. The Biennale is also about reframing intelligence as a distributed phenomenon, found in forests, neural networks, collective behaviours and even bricks of recycled elephant dung. Indeed, intelligence here is not something to be merely simulated; it is something to be interwoven, collaborated with and occasionally humbled by. There is, however, an Artificial intelligence section, which stretches beyond silicon dreams and GPT hallucinations. One standout moment is the Ukrainian exhibit where AI-generated cityscapes are overlaid on bombed-out ruins, not to whitewash trauma, but to project resilience.

If Natural and Artificial intelligences explore "what we know", Collective intelligence examines how we know. From Rio's favelas to Bangladeshi refugee camps, this section reveals architecture not as an elite artefact, but as social choreography. Tosin Oshinowo'swork on Lagos' informal markets demonstrates this principle: here, intelligence is not codified in blueprints, but in behaviours, adaptation and improvisation. Above the Collective space hovers the Speakers' corner, a forum designed by Christopher Hawthorne and Johnston Marklee, echoing Hyde Park's tradition of open dialogue. This physical elevation symbolises the metaphorical lifting of diverse voices, often excluded from the architectural canon.

The Biennale concludes with "Out", a segment that asks: "Can space save us?" The answer is a resounding "no". Astronomer Royal Martin Rees cautions that space is not a refuge; even the most habitable extra-terrestrial environments are unimaginably hostile. Instead, we are reminded of the old truth: the Earth is not just our home, but our only viable one.

762 narratives

Experts across various forms of intelligence converge in this edition, all committed to creating pavilions and spaces that are not just temporary showcases but bold examples of circular design. The contributions of numerous participants cannot be evaluated entirely; however, these include Pritzker laureates [see p.32], Nobel winners and recent graduates alike. Among these are also 250 women-led teams and hundreds of multigenerational, transnational collectives. One of the most radical aspects of "Intelligens" is its stance on authorship. Inverting the traditional "starchitect" model, contributors are listed alphabetically, as in a scientific paper. This deliberate move, notes Ratti, "seeks to reflect how breakthroughs now come from cross-disciplinary constellations, rather than solitary genius."

This collective spirit extends into the exhibition spaces, where collaboration and experimentation take centre stage. The Corderie dell'Arsenale, the long, cathedral-like hall that once made ropes for the Venetian navy, now houses speculative blueprints for planetary survival. The journey begins with a stark dialectic: "Temperatures rise, populations fall." This haunting juxtaposition sets the stage for the first thematic chapter, Natural intelligence. Here, visitors encounter Kengo Kuma's *Living structure*, a poetic ode to Japanese joinery and AI-assisted timber transformation, where irregular pieces of wood are fitted together not despite their imperfections, but because of them. In the Matter makes sense installation, a materials alchemy unfolds. Bioconcrete, banana fibre

Carbon neutrality

Since 2021, La Biennale di Venezia has been working towards fighting climate change, promoting more sustainable design models and consolidating principles of environmental sustainability. In 2022, La Biennale obtained the carbon neutrality certification for all its events. This was made possible by collecting data on the causes of CO_2 emissions generated by the events and on the subsequent measures adopted. The entire process for achieving this was conducted in accordance with the international standard PAS 2060. For the year 2025, the goal is to obtain carbon neutrality certification according to the new ISO 14068 standard for all scheduled activities, including the 82nd Venice International Film Festival, the Theatre, Music and Dance festivals, and particularly the 19th International architecture exhibition.

La Biennale has integrated the principles of environmental sustainability into every phase of the event life cycle. The main actions taken include using energy from renewable sources, reducing the use of materials and reusing exhibition materials and equipment, increasing the number of vegetarian options for food service, with a preference for zero-kilometre food products, and reducing the impact of logistics by optimising travel routes.

and graphene jostle with artisanal tradition. Nobel laureate Konstantin Novosëlov joins scenographer Margherita Palli Rota in asking: can we engineer beauty at the molecular level?

With the Central Pavilion in the Giardini under renovation, the city of Venice itself becomes a laboratory. Several projects will be included in the Venice living lab, primarily consisting of experiments centred on water. These initiatives will extend into the Giardini, the Arsenale and across the city's labyrinth. The Norman Foster Foundation, in collaboration with Porsche and Aerotrope, reimagines aquatic mobility with clean boats gliding along restored canals. Meanwhile, Diller Scofidio + Renfro purify canal water to brew espresso, blurring the line between environmentalism and lifestyle. Fashion icon Diane von Fürstenberg explores how "Venetian femininity" can be transformed into architectural resilience. It is part of the GENS public program — not just events, but cultural conversations that treat space as both metaphor and matter. But even as we look upward, we do so with clarity, not delusion. *Oxyville*, a sonic experience by Jean-Michel Jarre, invites visitors to close their eyes and imagine not escape, but planetary empathy — a future built not by fleeing Earth, but by finally listening to it.

New participants

The Biennale has also extended its participation to other countries, including Azerbaijan, Oman, Qatar and Togo. The four of them leveraged their cultural heritage for sustainability through preservation, tradition and resilience. Azerbaijan's debut pavilion explores the fusion of cultural heritage, modernism and sustainability. "Equilibrium" delves into how the Azerbaijani people have overcome challenges through collective strength, as reflected in the forms on display. It emphasises the balance between innovation and preservation, showcasing designs that embody this fusion. Oman's first participation is organised by the Ministry of Culture, Sports and Youth. The exhibition focuses on the integration of human and artificial intelligence technologies in architecture, aligning with the Biennale's theme. Qatar is establishing a permanent national pavilion in the Giardini, marking the first new addition to this historic venue in over 50 years. Designed by architect Lina Ghotmeh, the pavilion's inaugural exhibition is titled "Beyti Beytak. My home is your home." It features a major installation, *Community centre* by Pakistani architect Yasmeen Lari and includes contributions from over 20 architects from the Middle East, North Africa and South Asia. The exhibition explores themes of hospitality and shared spaces, reflecting on how architecture can embody traditions of welcome and community. Lastly, Togo's inaugural pavilion, curated by Studio NEiDA (Jeanne Autran-Edorh and Fabiola Büchele), presents "Considering Togo's architectural heritage". Commissioned by Sonia Lawson, Founding Director of Palais de Lomé, the exhibition explores Togo's architectural narratives from the early 20th century, with a focus on conservation and transformation. It examines traditional building practices, such as the Tatas Tamberma in northern Togo, and their dialogue with modernist construction techniques, highlighting the evolution and resilience of Togo's built environment.

This Biennale extends beyond the lagoon. In addition to the main venues, the 19th International Architecture Exhibition spreads throughout the city, with independently organised exhibitions officially part of La Biennale's programme. These collateral events include the Docks Cantieri Cucchini showcasing "Catalonia in Venice_ Water parliaments", Palazzo Zorzi presenting "Deep surfaces" on the experience of UNESCO sites, and Palazzo Mora hosting "Intelligens. Talent – EUmies Awards." At the Palazzo delle Prigioni, precariousness is explored through "NON-Belief: Taiwan intelligens of precarity", while the Abbazia di San Gregorio presents "Rooted Transience: AlMusalla Prize 2025." On the Island of San Giorgio Maggiore, the Fondazione Giorgio Cini hosts the Fondation Cartier "Pour l'art contemporain" exhibition curated by Jean Nouvel. Meanwhile, at Palazzo Diedo, "The Next Earth" reflects on computation, crisis, and cosmology. Together, these collateral events expand the reach of architectural experimentation across Venice, spreading the Biennale's themes like seeds throughout the city. With the support of partners such as Rolex, Bloomberg Philanthropies and Rai, the Biennale's message extends far beyond its physical boundaries.

Prize and youth as catalysts

This year's Biennale College Architettura is more than academic enrichment; it is a *manifesto* in training. Eight projects led by students under 30, from Finland to Syria, receive €20,000 each to prototype new adaptive designs. The diversity is remarkable in terms of geography, gender and disciplines, showcasing the exhibition's conviction that wisdom arises not from age, but from perspective. These young minds, mentored and supported, may hold the keys to solutions we cannot yet conceive. And they do so in a Biennale that recognises their voice as essential, not a future contributor, but a present one.

As for the prize, the Golden Lion for Lifetime Achievement will honour two figures: American philosopher Donna Haraway and, posthumously, Italian architect Italo Rota. Donna Haraway, renowned for her seminal work *A cyborg manifesto*, has influenced contemporary thought

Donna Haraway

Photo Clara Mokri. Courtesy Venice Biennale

by exploring the intersections of technology, feminism and ecology. Her concept of the “Chthulucene” advocates for a symbiotic relationship between humans and non-human entities, challenging anthropocentric perspectives. Haraway’s inclusion in the Biennale reflects a shift towards embracing diverse intelligences — natural, artificial and collective — in architectural discourse. Curator Carlo Ratti emphasised: “Donna Haraway is one of the most influential voices in contemporary thought… Her work and philosophy, radically critical but simultaneously optimistic and imaginative, are distinguished by their commitment to creating alternative worlds.”

Italo Rota, who passed away in April 2024, is awarded the Golden Lion for his visionary contributions to architecture. His projects, such as the restoration of the Musée d’Orsay in Paris and the Museo del Novecento in Milan, showcase his ability to blend historical context with modern innovation. Rota’s collaboration with Ratti on projects like CURA — a modular intensive care unit developed during the COVID-19 pandemic — exemplifies his forward-thinking approach. Ratti reflected on Rota’s impact: “Italo Rota was a forerunner… a man of boundless culture, a passionate collector and researcher…” His cultural legacy is well expressed by the title of his last monograph, *Solo diventare natura ci salverà* (*Only becoming nature will save us*).

The 2025 Venice Architecture Biennale is not an answer — it is a question framed through experience, collaboration and urgency. Can architecture help us adapt — not abstractly, but materially, ethically and emotionally — to a transformed world? Carlo Ratti does not promise salvation. Instead, he offers a framework: think with trees, with robots, with elders and children, with farmers and philosophers, with dolphins and data scientists.

Venetian arsenal

Photo Andrea Avezzu. Courtesy Venice Biennale

ZOOM

Apennine chamois, Apennine mountains, Abruzzo, Italy

Photo Bruno d'Amicis. Courtesy Rewilding Europe

THE DE-DEVELOPED WORLD

Humanity's built environment has wreaked havoc on our natural environment. Rewilding offers hope that nature can again coexist with the built world.

In season five, episode 11 of *The Simpsons*, a group of characters digs themselves into a hole looking for money that is not there. After realising they are now trapped in the deep hole, someone asks how they are going to escape. Homer Simpson proudly and stupidly exclaims, "We will dig our way out!" It is an apt metaphor for the building crisis humanity is facing. The world we have allowed to be built around us now has us trapped in an unsustainable, toxic, sprawling, ecologically disastrous hole. Meanwhile, billionaires keep hiring "starchitects" to deploy energy-gobbling supercomputers to fill every empty remaining inch of our world with over-design mega-complexes wired with every conceivable "smart" function, giving little thought to vernacular architectural heritage, indigenous lifestyles or wildlife. When anyone asks the architects, developers and politicians for an alternative to our over-built world, like Homer Simpson they have little to propose except, "We will build our way out!"

Laurien Holtjer, Director of Engagement and public relations for rewilding Europe, has an alternative proposal: "Give nature space and let it go." Rewilding is a way of restoring the balance between the natural and human-built worlds by relinquishing control and letting nature guide our next steps. A non-profit based in Nijmegen, the Netherlands, Rewilding Europe is currently involved in ten rewilding initiatives spanning across 12 European countries [see box p.49]. One of those initiatives is unfolding in the Danube Delta, a wetland area straddling Moldova, Romania, and Southern Ukraine where the Danube river meets the Black Sea. The front line of the war in Ukraine is about 200 km away.

"War is an awful situation, but we are still working in the delta area, Holtjer says. It is a crucial component in the area's economy and nature. Despite the proximity to the conflict, work continues where safely possible — restoring water systems and supporting the comeback of keystone wildlife species remains vital to the region. It shows how resilient nature is. If we give it space, even in war time it will bounce back. There is a limit to what we can do, but trusting nature is what keeps us going."

The Danube Delta is a crucial habitat for migratory birds and it hosts more fish species than anywhere else in Europe. It is also home to the Letea and Caraorman woodlands, some of Europe's last "grazed mosaic landscapes". A mosaic forest is one that is composed of multiple species and micro-habitats. Grazing is a way of maintaining the health of the forest. Long ago, ancient forests were naturally grazed by wild horses and bovines. Re-introducing wild or semi-wild grazing animals into European landscapes is one of many strategies Rewilding Europe deploys.

— Phillip Barcio

Serrano horses in the Dehesa de Solanillos in Mazarete, Molina Alto Tajo Geopark

Courtesy Rewilding Europe

Five Rewilding Europe ongoing initiatives

Iberian highlands, Spain
A 850,000-hectare rewilding landscape where land abandonment and depopulation has been an ongoing trend since the 1960s. The initiative is returning scavengers to the landscape, including the Cinereous vultures, predators, including the Iberian Lynx, natural grazing processes with semi-wild and wild horses, *tauros* and other large herbivores and protecting old-growth forests.

Rhodope mountains, Bulgaria
Spanning a mixture of open landscapes, oak and beech forests, grasslands, rivers, rocky slopes and cliffs between European and Asian, this initiative is restoring food webs to accommodate return of vulture populations, boosting biodiversity — including the return of European bison — and boosting nature tourism to the area.

Greater Côa valley, Portugal
This diverse landscape that includes deep river valleys between Portugal and Spain is dominated by small farms that have been abandoned. The initiative is introducing "Grazing fire brigades" supporting nature based tourism enterprises and developing a 120,000-hectare wildlife corridor between the Malcata mountain range and the larger Douro Valley. There has seen substantial wildlife comeback, including Iberian wolf, Iberian ibex, red deer and roe deer.

Southern Carpathians, Romania
This initiative includes more than one million hectares of protected areas including old-growth forests, wild mountains and a patchwork of open and farmed landscapes. A combination of reduced farming, better wildlife protection and rewilding interventions has fostered nature tourism and increased wildlife, including the return of the European bison to Romania after a more than 200year absence.

Central Apennines, Italy
Known as "the wild heart of Italy", Central Apennines mountains have become a biodiversity hotspot. They include some of Europe's oldest beech forests and grasslands inhabited by the Marsican brown bear, grey wolf, Apennine chamois, red deer, golden eagle, vultures and an array of endemic flora. The initiative is establishing "coexistence corridors" spanning more than 100,000 hectares, boosting the Marsican brown bears population and fostering "wildlife watching" tourism.

"Even after wild grazes ended, many of these places had livestock that took over the role of wild grazers, Holtjer says, But with land abandonment, livestock is also disappearing." Land abandonment is a common phenomenon across Europe and much of the world. It can occur when the economics of a place no longer sustain human society and is particularly prevalent in agricultural areas. "People are moving to cities, young generations especially, Holtjer says. Many rural areas face steep depopulation, with declining services and infrastructure — but this also opens the door to new, nature-based economies." In such areas, where grazing has disappeared, there are more intense and more frequent natural fires, Holtjer says. "Fires are natural, but intensity and frequency is a different thing. So with rewilding, we bring back the function of natural grazing. We call wild horses the grazing fire brigade. It is very cost efficient, so there is also an economic advantage."

In addition to old forests and relatively untouched marshlands, the Danube Delta also includes a patchwork of human-built environments, including farms, villages, cities and industry. The goal of rewilding, Holtjer explains, is not to eliminate those built worlds, but to reimagine the relationship they have with their wild surroundings. "We are not bulldozing the built world and we do not aim to create wilderness, Holtjer explains. We look at what we can add. Rewilding is a holistic view. We see a well functioning ecosystem as a jigsaw puzzle. We ask what piece is missing. Maybe a river has dams so there is no free flowing water, or it could be a keystone species missing. So we engage the natural process to help nature to heal itself. That way we aim to build well functioning ecosystems, which include humans and their built environment."

In rural regions experiencing depopulation and land abandonment, rewilding offers opportunities to revitalise both natural ecosystems and human communities. "We see it as an opportunity to change something in a systematic way by building nature-based economies, based on wildlife tourism for example. In some places where nature is coming back, young people are returning, renovating houses and turning them into bed and breakfasts or other businesses, Holtjer says. That is a very important part of the process, she notes, because the built environment is part of the culture and identity of every

Letea forest, Danube delta, Romania

Photo Staffan Widstrand. Courtesy Rewilding Europe

place. There is often a distinct vernacular architectural style in an area, or a way of living unique to that community. If that can be maintained by transitioning the economy to something nature-based, it can help preserve a community's heritage long term. The last thing we want is to protect an area, put a fence around it and kick people out. These landscapes include everyone who lives there."

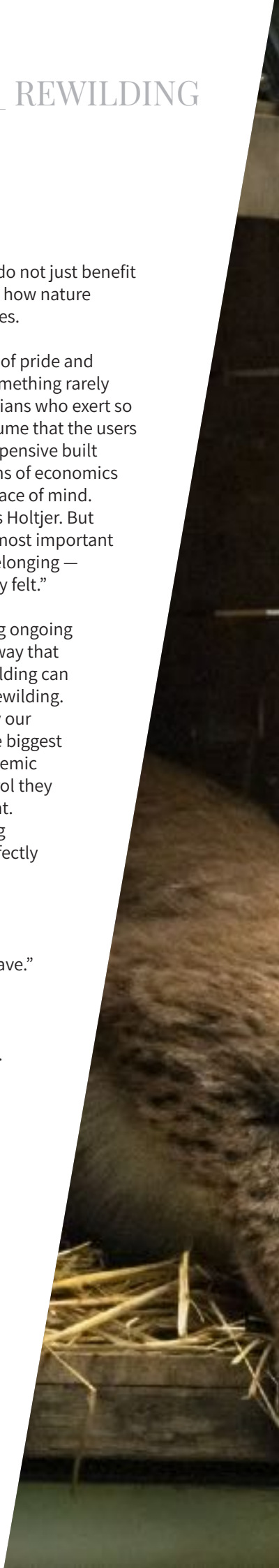
When it comes to urban environments, Holtjer suggests it is more important to think in terms of wild nature rather than true wilderness. Architects, developers and city planners should look at rewilding as something that exists on a sliding scale. On one end of that scale is a place like the Danube Delta, where large connected landscapes allow nature to take the lead with minimal human intervention — a form of passive rewilding. At the other end are highly urbanised spaces, where nature is nearly absent and rewilding requires a more active, intentional approach. "Imagine a parking lot, Holtjer explains. There is hardly any nature there. But what if you make a small change thereby removing asphalt and letting plants grow? You are already rewilding by giving space to nature. It is about gradually moving up the scale, giving more space to nature and allowing natural processes to return, even in the most built-up environments."

Rewilding is ultimately about restoring connections — between habitats, species, and people. "It is all about connections, like building corridors between protected areas so wildlife can move between those parts." When fragmented landscapes are reconnected — whether through river restoration or wildlife corridors —, natural processes can shape our landscapes once again. These connections do not just benefit biodiversity; they also help people see and experience how nature and human life can thrive together in shared landscapes.

Having wildlife running around can even instil a sense of pride and wonder and increase our mental well being. That is something rarely discussed by the developers, "starchitects" and politicians who exert so much influence on today's urban built world. They assume that the users of their projects want the newest, biggest and most expensive built world possible. Building projects are measured in terms of economics and job creation rather than human happiness and peace of mind. "We look at jobs created and income created, too, says Holtjer. But how do you quantify the wider benefits? Some of the most important benefits — like pride of place, community spirit and belonging — are not easily captured in numbers, but they are deeply felt."

In the end, rewilding is about people. It is about having ongoing dialogue, listening and engaging in communities in a way that ensures they feel part of the process and see how rewilding can enrich their lives. "It is not about us buying land and rewilding. It is about building trust with stakeholders. This is why our teams are locally based and live in the landscape." The biggest challenge to getting more people to accept such a systemic change to their built world is the inherent loss of control they will have to accept over every part of their environment. "In Europe we are so used to managing and controlling nature, mowing and pruning," she says. "Nature is perfectly fine to take care of itself. Without us it would thrive. But we can build landscapes where nature thrives and people also thrive. Instead of a thing we have to control, we see nature as our ally that we trust and should give space. That is a long term vision that we have."

There are two groups Holtjer says this message must be shared with going forward. "First we have to show this to everyone who is influencing land," she explains. That means politicians, landowners, lobbying groups, architectural interests and developers. At least as important are everyday people who simply inhabit the built world. "We think the change should come from the bottom up. Rewilding is a social movement as well. Younger generations see rewilding as a way forward. It is about the economy, about culture and about people. They are fighting for their own future as well." Meanwhile, Holtjer says it is important to keep telling positive stories of successful rewilding initiatives big and small. "People are focused on doom and gloom announcements, she says. They think that if we do not act now nature will go down the drain. But I truly think it will be us going down. Nature is incredibly resistant and we have a chance now to shape a world where both people and nature thrive together. All we need to do is give it space."



Lynx relaché en Pologne par Wiebke Brenner

Photo Neil Aldridge. Courtesy Rewilding Europe

INTERVIEW

wareHOUSE (1)

Courtesy Matt Berry

SHAPE SHIFTER

Between the A.I.-fueled realm of Parametricism [see p.80] and the heart-fueled practice of rewilding, a boutique architecture firm in middle America embraces the middle ground of Adaptive reuse.

Evanston, Illinois is an American outlier. It was the first city in the US to implement a reparations programme for Black residents to address historical inequities. Its Climate Action and Resilience Plan places it among the top environmentally sustainable cities worldwide. It is home to Northwestern University, one of the world's premier research institutes. And the city has done a notable job maintaining its historical architectural identity, with more than 60 properties on the National Register of Historic Places. Its architectural character is, in fact, why most people know Evanston — its historic neighbourhoods were used as locations in several films by John Hughes, including *Home alone*, *Uncle Buck* and *Sixteen candles*.

Lately, however, city officials have been pushing for an increase in local housing. Urban infill is rampant, with new units going up on every unbuilt lot and single-family tear-downs being replaced by multi-unit apartments. The recent housing policy changes have turned the city into an architectural battlefield. In the middle are people like Matt Berry, a LEED accredited protagonist in an architectural approach known as Adaptive reuse. Berry's first professional experience was with David Libeskind's studio in Berlin in the 1990s. Libeskind is a leading global protagonist within the Deconstructivist movement. That experience informs his current understanding of contextual architecture and his enduring belief in the need to balance the new and old built worlds — issues he discusses in this interview.

What is Adaptive reuse?

For me, Adaptive reuse [see box p.56] is taking a valuable asset that has intrinsic worth and repurposing it to find new programmes. It is a way to accommodate changes in culture and in the way people work and live. For several reasons it makes sense to keep these old buildings. Obviously there are environmental reasons, you have all these embodied costs in the existing materials. So as much as we can preserve, it means we are not gathering new materials from the Earth. That is the sustainable aspect of it. And also financially, adaptive reuse is always the best way to go. If we had to tear down an existing structure, clear the land, pour a new foundation, build a shell, walls, roof — all that is time and money intensive. Adaptive reuse projects usually come in at 50% less than starting from scratch. And construction times are shorter. We also find that the building contextually makes more sense. We are working typically in urban settings where people have gotten used to certain building heights,

— Phillip Barcio

certain setbacks, certain characteristics that are inherent in those older buildings. These are our neighbours. So we try to be good neighbours first and foremost, and we want everything we do to be contextual.

What does that mean, to be contextual?

When things have value, you want to respond to that. I feel like any good building any good piece of architecture, has to be contextual with the existing environment. That being said, it is very site specific. Maybe the context is terrible and the way you respond to it is by saying "hey, I am going to turn my back on all of this and do something internalised or completely remote from what is going on around it." But if you do not take into account context, I feel like you are doing a disservice to your neighbours, to your community. Buildings do not exist in a vacuum. Architecture exists in the real world and people occupy it and use it. And not just the users, but people who walk by it or pass by it, it becomes part of their neighbourhood too. So I think it is respectful of the community to go about designing in that way.

Is Contextual architecture similar to Vernacular architecture?

It can be. Vernacular exists because it is the easiest way to put things together. It works. It is commonplace. But because something is commonplace does not mean it is bad — vinyl siding notwithstanding. There are certain things that are cheap and bad, and certain things that are common because it is the most efficient way to do something. Vernacular to me is not a bad word and to not understand it is to limit yourself. It would be foolish to turn your back on 1,000 years of discovery and say that has been done before, so I am not going to do that any more. It was done that way for a reason. I think it is more exciting to understand why that vernacular exists, and maybe you can riff on it or tweak it or use it as a device in a building. I also have a lot of reverence for the process of how a building gets built. In school that is not really a priority. You are taught to think broadly and push creative thinking. But in practice, a building that is really complex and beautiful on a piece of paper does not become a building if nobody knows how to put it together.

What is the difference between an architect and a builder?

I think it is a lot of the same skill set. In medieval times, the 1400s through the 1600s when a lot of these huge monumental chapels were built in Europe, the architect was called a master builder. The word architect did not exist. There was a little more of a premium put on someone who could take what was on the paper and make it a real thing. I think a lot of innovative ideas can happen

Know your contemporary architectural trends

Parametric architecture

An approach that deploys computer algorithms to design advanced architectural forms based on a set of predetermined parameters prompted by the architect.

Adaptive reuse

The practice of redesigning existing buildings or landscapes in order to adapt them for new programmes or uses.

Deconstructivism

A creative approach that intentionally disrupts other existing styles or approaches, which first arose as a reaction against the structured approach of Modernism.

Contextual architecture

Designing new parts of the built world in ways that harmonise with existing buildings and environments.

Indigenous architecture

Any of several hundred idiosyncratic architectural styles and methodologies developed and still utilised by Indigenous cultures around the world.

Modular architecture

The design and deployment of prefabricated building components that can be assembled in various ways onsite, often resulting in cheaper and more efficient construction that maximises advanced industrial technology.

Smart buildings

Any built environment that incorporates technology, including advanced communications systems and tools that remove human decision making and action from the functions and systems needed to regulate the building, such as lighting and temperature control.

Green architecture

Any of a range of approaches that incorporate ecological sustainability in the design of the built world, including green roofs, sustainable building materials and rewilding.

Matt Berry

Courtesy Matt Berry

AFZ + 3

Courtesy Matt Berry

in those environments, like where you have somebody building yurts and they become proficient at it, and through trial and error they develop practices that would not be discovered in another environment. Same with the Amish. The Amish did not have nails, so they learned to put things together with what they had. A lot of innovation can come out of that. In music, when you have a self-taught player sometimes they can write songs that maybe a technically proficient player would not put together but they push us into a new area and we can discover new combinations of things.
An architectural education does teach broad based problem solving. And it creates accountability because it is our responsibility to make sure the building is sound structurally and has a long life and delivers the qualities the client was interested in. But I would not discredit anybody just because they are building on their own.

Is architecture an art?

That is a great question. There are certainly moments where it is. To do it well it is a combination of art and technical promise, and then perseverance and orchestrating the entire process from beginning to end. It is very similar to music. Is music art? Most people consider it an art. But there are very different modes of music where some are expressive and soulful and you are getting an insight into somebody's emotions. And then there is music that is very technical and it can be appreciated on that level, where "wow, they changed that key at that moment and it really had an effect." So I think architecture is similar to that. Is it art everyday? No. It can be a slog. But there are moments in it that are very rewarding.

Is there a danger in the rise of A.I in architecture?

I am of the opinion that architecture is a human endeavour. Technology has changed like crazy. But we are still living on the same planet. We still need the basics: food, shelter and safety. While technology is moving at warp speed, our relationship to the built environment is pretty consistent. We value light, fresh air, spaces that are made from materials that are not harmful to us, views, spaces that make us feel something emotionally, spaces that are inspiring. Anybody that gets into the field is always trying to scratch that itch. Form is part of architecture and it is exciting. I can look at a building and be blown away by what has been achieved, but only if it makes me feel something and only if the building works. When the process of architecture becomes overly technical or relies on the tools of the trade to generate new forms, I do not find that incredibly interesting. To me you are building a toy really — a machine. Architecture is a reflection of a culture and right now our culture is very tech forward. We are all on our phones and our computers. We have an innate belief that technology is the answer to our problems. Buildings are tapping into that tech environment and becoming giant cell phones that are on display. These things are not necessarily advantageous over a long period of time. Some buildings that have been around for hundreds of years still look and work amazing today. A lot of those true great masters were able to build buildings that did not rely on gimmicks or gadgetry but were trying to be reflective of the people who were using them.

What can Evanston's development teach the rest of the world?

Evanston is a complicated place. It wants everything. Right now the big push from the local government is for more housing, and in particular affordable housing. Some structures are going to be reused and new structures will have to be built.
We are seeing our open lots starting to get in-filled. Houses are being demolished and multi-family houses are being built. Evanston's new building code is very divisive. They want to undo single family zoning and allow up to four unit buildings on any site. In doing that, they are going to remove parking requirements and open space requirements. They are trying to pack the density in, which is going to change things. It is really a balancing act to preserve the wonderful things that make a place great to live in versus providing more housing. That is the part where we need to look deeper.
I worked with Daniel Libeskind in Berlin. He was working on the holocaust museum there, his first major civic work. The city was a fun place to be. So much energy, so much change. You would look out across the skyline and see 40 or 50 cranes. Old churches were hosting raves. There was a lawlessness and a freshness that made it a fun place to be. I lived in East Berlin and the office was in West Berlin. So it was a 45 minute train ride from idyllic West Berlin, very luxurious, into the old East Germany. I really got an appreciation for it. My neighbourhood was not so warm and inviting. There were a lot of these soviet era buildings that were three and four blocks long, where everything looked the same. It was like the United States' failed attempt at urban housing, these monumental towers. It is the most efficient way to warehouse people, but they forgot about the way of life of those people. When people are feeling bad and cramped and depressed, bad things are going to happen. We have learned from that.
In Evanston there are a few historic districts — the lakeshore historic district and North Evanton, where a lot of things were built between 1910 and 1930. And in that time every house was different. It is really a delight to walk through these neighbourhoods and appreciate the variation. That is what makes a neighbourhood interesting to live, work and be in. A lot of attention has been paid to scale, green space, amenities that everyone can enjoy. These things make a space a place we want to be. Moving forward we need to be really thoughtful about how we develop. I do not think you can be a good architect without holding yourself to those standards. We should leave the world a better place.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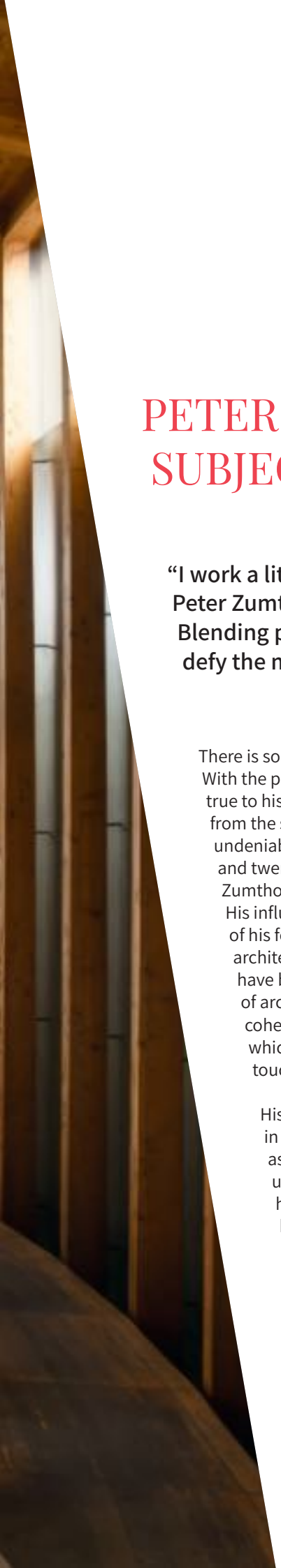
wareHOUSE (2)

Courtesy Matt Berry

PORTRAIT

Saint Benedict Chapel

Photo Felipe Camus



PETER ZUMTHOR'S SUBJECTIVE ARCHITECTURE

"I work a little like a sculptor." Unconventional and essential, Swiss architect Peter Zumthor stands as one of the most influential figures of his era. Blending philosophy and poetry, his restrained yet striking creations defy the mainstream trends of international architecture.

There is something almost mystical about Peter Zumthor. With the patience of a Cistercian monk, he works in seclusion, true to his craft, far from media clamour and at a safe distance from the starchitects of his generation. Yet, he remains undeniably one of the most significant figures of the twentieth and twenty-first centuries. Awarded the Pritzker Prize in 2009, Zumthor is often described as "an architect's architect". His influence runs deep — some even compare it to that of his fellow Swiss, Le Corbusier. His writings, Thinking architecture and Atmospheres, collections of his lectures, have become essential reading for an entire generation of architects. His body of work, sparse yet exceptionally coherent, reveals a relentless pursuit of "silent beauty" which, as he himself puts it, "when it appears, touches us all, each and every one of us."

His path is anything but conventional. Born in Basel in 1943, son of a cabinetmaker, he began his training as a joiner, inheriting from this craft an intimate understanding of materials that would become his hallmark. This tactile approach, where the hand knows before the mind and touch precedes concept, forms the foundation of his creative process. After studying at the Kunstgewerbeschule in Basel and then at the Pratt Institute in New York, Zumthor worked as a conservator of historic monuments in the Swiss canton of Graubünden. This experience shaped his sensitivity to heritage, the memory of places, and the temporal dimension of architecture. He only established his own practice in 1979, in Haldenstein, a village in the Swiss Alps where he still lives today. This physical distance from the world's major cities mirrors his deliberate marginal position within the architectural sphere.

Atmosphere, atmosphere

"For him, to think architecture always means to think in architecture, that is, to truly use the language unique to the architectural discipline," explains philosopher Mickaël Labbé in his essay The architectural thought of Peter Zumthor: Lyricism without exaltation. Zumthor avoids hazy speculation and abstract ideas. In his intimate and poetic quest, he explores the very essence of architecture — its reality, its concrete language of volumes, forms and materials. His approach, pared-back and distinctive, stands in stark contrast to the sometimes overblown rhetoric of other stars in the field "who, for reasons of legitimacy and media posture, feel compelled to reference abstract philosophical theories which their buildings supposedly embody," the philosopher asserts.

For Peter Zumthor, architecture belongs to the realm of emotion.

— Carine Claude

Peter Zumthor's materials

While much of contemporary architecture tends towards dematerialisation, Peter Zumthor celebrates substance. Every material possesses its own "presence" and its own language. Wood, stone and concrete are not simply means to an end, but ends in themselves — carriers of stories and emotions.

Stone is perhaps Zumthor's most emblematic material, especially at the Therme Vals (1996). For this project, he used local quartzite, quarried just a few kilometres from the site and cut into thin, stacked slices. This choice creates an organic dialogue with the surrounding mountain. Stone is explored in all its sensory dimensions: visually (natural striations), tactilely (polished or rough surfaces), acoustically (resonance) and even olfactorily (the mineral scent heightened by humidity).

The son of a cabinetmaker and a former joiner himself, Peter Zumthor maintains a special relationship with wood. In the Saint Benedict Chapel at Sumvitg (1988), he uses larch to create a teardrop-shaped shell, its colour naturally evolving over time. At the Swiss Pavilion for the Hanover World Expo (2000), he constructs entirely from pine and larch planks, stacked using the traditional drying technique of Swiss foresters. In his own house and studio in Haldenstein, wood structures the space and creates a warm atmosphere.

For Zumthor, concrete is never treated as a mere industrial material, but as a noble substance with expressive qualities. At the Bruder Klaus Field Chapel (2007), he pours concrete in twenty-four successive layers over an inner framework of tree trunks. Once the concrete sets, the trunks are burned away, leaving a charred imprint on the interior walls. At the Kunsthaus Bregenz (1997), he uses in-situ concrete of extreme precision, forming perfectly smooth surfaces that capture and diffuse light.

The Kolumba Museum in Cologne (2007) showcases his masterful use of brick. Zumthor specially designed a pale grey, elongated brick (54 × 21 × 4 cm), laid with thin, irregular joints. This "Kolumba brick" creates a perforated wall that filters light above the church ruins, allowing natural ventilation while protecting the archaeological remains.

Finally, in his interior designs, Zumthor sometimes incorporates textiles for their acoustic and tactile qualities. At the Serpentine Pavilion in London (2011), for example, he created an enclosed garden surrounded by taut black canvas.

He places particular emphasis on the notion of atmosphere — the sensory dimension through which we interact with a place and the mood it evokes. "Designing a project is, for the most part, about understanding and organising. But I believe it is emotion and inspiration that give rise to the fundamental substance unique to architecture," he explains. The architectural gesture or discourse fades into the background, giving way to feeling and the subjectivity drawn from direct experience. "I enter the building, I see a space, I sense the atmosphere and, in a split second, I feel what is there," the architect writes in his book Atmospheres. In this architecture of perception, he questions beauty and presence, the status of the work and its creator.

Light as material

To create this atmosphere, Peter Zumthor works intensely with light, especially natural light. As Le Corbusier once said, "architecture is the learned game, correct and magnificent, of forms assembled in light." This particular attention finds its perfect expression in his design for the Kunsthaus Bregenz in Austria (1997), a museum project that always presents a challenge for architects, who must strike the right balance between the power of the building and the quality of the display. On the shores of Lake Constance, the exhibition building stands out

> What, in essence, is architectural quality? For me, it is relatively simple. Architectural quality is not about being featured in an architecture guide, in the history of architecture or being mentioned here and there. For me, a building only possesses architectural quality if it moves me. But what is it in these buildings that can move me? And how can I design it?
>
> — *Peter Zumthor*

Therme Vals

Photo Fabrice Fouillet

Peter Zumthor

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> Does beauty exist? Is beauty a tangible quality that an object or a thing possesses, something that can be described and named, or is it a state of mind, a human sensation? Is beauty a particular feeling evoked by a certain form, a specific composition? What is it that causes something to awaken in us the sensation of beauty, that feeling of knowing, of seeing, at a certain moment, beauty? — *Peter Zumthor*

for its elegance — a near-opaque, cubic glass block nicknamed "the glass lantern".

"The Kunsthaus is enhanced by the light from the lake, explains Peter Zumthor. It consists of glass panels, steel and a mass of cast concrete stone that gives the interior its structure and space. Seen from outside, it resembles a light diffuser. It absorbs the changing light of the sky, the lake's mist and reflects lights and colours, while hinting at something of its inner life depending on the angle, the time of day and the weather conditions." Fittingly, the museum's inaugural exhibition in 1997 was dedicated to James Turrell, the renowned American artist who has made light and space his exclusive mediums of expression — a fine example of dialogue between artist and architect.

This use of natural light as a material in its own right takes on countless forms in Peter Zumthor's projects. In the Saint Benedict Chapel at Sumvitg in the Swiss Alps (1988), he creates an interior space filled with mystical luminosity, thanks to strategically placed windows. Here, natural light, filtered and transformed, becomes a structuring element that sets the rhythm of the spatial experience. Even more radical, the Swiss Pavilion at the Hanover World Expo (2000) — now dismantled — stood as a true "cathedral of wood". Stacks of untreated planks, arranged using traditional drying techniques, formed a labyrinth of corridors and chambers. Light entered through the gaps between the boards, creating a play of shadow and brightness that shifted throughout the day. The scent of wood, the muffled sound of footsteps, the coolness of the air — all the senses came alive in this ephemeral work, which celebrated the ancestral skills of Swiss foresters.

The song of materials

Wood. Glass. Stone. Peter Zumthor's work can also be seen as an act of resistance — through gesture and material — against the digital tide and the spectacle of architecture too often reduced to photogenic Instagram posts [see box p.64]. Rejecting digital tools, he favours physical models, hand drawing and direct contact with materials. "Architecture is made for our use. It is not a free art. The highest mission of architecture is to be an applied art," he says. Each project matures over a long period, sometimes for years. This deliberate slowness stands in stark contrast to the "more, always faster" pace of contemporary architectural production.

The Bruder Klaus Field Chapel (2007), built in a field near Wachendorf in Germany, perfectly illustrates this artisanal approach. Its construction relied on age-old methods: an inner framework of tree trunks arranged in a tipi, over which twenty-four layers of concrete were poured. Once the concrete set, the wood was burned away, leaving its charred imprint on the interior walls. This tiny chapel, reached by a path across the fields, offers a spatial experience of rare intensity, where the roughness of the concrete, the lingering scent of burnt wood and the oculus open to the sky create a place of contemplation unlike any other.

Peter Zumthor's art lends itself remarkably well to the sacred. Built on the ruins of a Gothic church destroyed during the Second World War, the Kolumba Museum in Cologne (2007) weaves archaeological remains into its very architecture. Pale grey bricks, specially designed for the project, rise above medieval foundations, creating an architectural palimpsest where different eras coexist. Inside, perfectly proportioned spaces, bathed in gentle light, house the diocese's collection of religious art. The atmosphere verges on monastic, inviting visitors to contemplate the works in silence.

At times, nature itself becomes the architect's raw material. Nestled in the Grisons mountains, the Therme Vals (1996), built from local quartzite quarried just a few kilometres from the site, establishes a profound dialogue with the landscape. Stacked stone blocks appear to emerge from the mountain itself, creating a labyrinthine space where water, light, and stone intermingle. "Mountain, stone, water — building in stone, building with stone, in the mountain, building from the mountain, being inside the mountain — how can one interpret, architecturally, the implications and sensuality of these words combined?" he wonders. He considers every detail: the tactile sensation of polished stone beneath the bathers' bare feet, the sound of water echoing through monolithic chambers, the density of steam rising from the pools — each element contributes to an almost ritual experience that transcends mere function. A masterpiece.

Bruder Klaus Chapel

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NOTEBOOK

Jewish Museum

ARR

BUILT TO INSPIRE

Few creations redefine cities and transform architectural history. These structures serve not merely as museums; they stand as testaments to creativity, pushing the boundaries of what *can* be.

Museo de Niterói. Flying saucer

Perched on the cliffs of Niterói, the Museu de Arte Contemporânea de Niterói (MAC) is a sculptural phenomenon. Designed by Brazilian architect Oscar Niemeyer and completed in 1996, the museum is a testament to the power of architecture as public art. Often likened to a UFO for its otherworldly form, the museum's saucer structure sits atop a narrow cylindrical base, rising 16 meters above the ground. With a diameter of 50 meters and sweeping 360-degree panoramic views, the building floats above a natural rocky foreland. The iconic red-carpeted ramp spiralling upward to the entrance adds a cinematic sense of arrival. The museum's interior is intentionally minimalistic; expansive glass walls flood the space with natural light, inviting the landscape inside. Beyond its aesthetic boldness, the museum is also a masterpiece of engineering. Structural engineer Bruno Contarini translated Niemeyer's audacious sketches into a functioning masterpiece. The cantilevered disk required innovative structural solutions to make the museum's gravity-defying posture possible and permanent.

Guggenheim Bilbao. Transformative architecture

Completed in 1997, Guggenheim Bilbao in Spain, is one of the most iconic architectural creations of the late 20th century. Designed by Frank Gehry, the museum is a testament to his visionary approach to design and a symbol of architecture's transformative power. "There were a lot of reserve in the Basque Country about bringing in someone like me. I was seen as a renegade because I was using cheap materials. But people accepted once the museum was designed and built because it represented a change," Gehry once reflected. Its organic forms — inspired by the natural flow of water of its neighbour, the River Nervion — contrast with the industrial background of Bilbao, a port city once dominated by steel factories and shipyards. Clad in 33,000 titanium tiles, the building skin creates an iridescent effect, shifting in colour and texture depending on the weather and time of day. The building's interior is equally ambitious: dynamic walkways, curved glass walls and irregular gallery spaces that break from traditional museum layouts. Often regarded as a masterpiece, the Guggenheim Bilbao has become an emblem of contemporary architecture. It gave rise to what is now known as the "Bilbao Effect" — the phenomenon where bold, iconic architecture can drive economic and social transformation.

— Nahir Fuente

Heydar Aliyev Centre

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He Art Museum. Philosophical composition

Designed by Japanese master Tadao Ando, this museum is an architectural meditation on unity, balance and the power of quiet space. From the air, HEM is a composition of overlapping circular forms, exploring the centripetal force of circularity — a motif rarely explored in Ando's portfolio. The design is built around a central double-helix spiral staircase, a sculptural centrepiece that connects the building's multiple floors in a fluid movement. Though monumental in scale, the museum feels contemplative, almost spiritual. Its circularity reflects the Chinese concept of "he" (和), which means harmony — a fitting foundation for a museum built by the He family and dedicated to cultural dialogue. One of the most particular aspects is the use of light as an architectural material. Natural light filters through precisely designed openings and skylights, creating a luminosity pattern that varies throughout the day. Since its opening in 2020 in the dense urban fabric of Shunde, China, the He Art Museum emerges like a meditative pause.

Heydar Aliyev Centre. White wave

Rising like a wave from the urban fabric of Baku, Azerbaijan, the Heydar Aliyev Centre is a masterpiece of fluid form and futuristic vision. Designed by Zaha Hadid, the building serves as a cultural hub, housing a museum, exhibition halls and an auditorium. Characterised by sweeping curves and the absence of sharp angles, Hadid created a structure that appears to rise organically from the ground. But achieving the seamless, undulating skin of the building was one of the most remarkable engineering feats. The structure was built using a complex system of space frames and reinforced concrete. Engineers had to custom-fabricate many of the structural joints and panels — in some cases, by hand — because nothing off-the-shelf could accommodate the design. The building's skin — smooth, white, with an almost surreal appearance — is made from glass-fibre-reinforced concrete (GFRC) and glass-fibre-reinforced polyester (GFRP), materials chosen for their flexibility and ability to mimic the flowing form of the design. Despite these hurdles, the Heydar Aliyev Centre was completed in 2012 and quickly earned global recognition. In 2014, it won the London Design Museum's Design of the Year award, making Hadid the first woman to receive the honour.

Jewish Museum. Memory carved in zinc

In the heart of Berlin, where history intertwines with modern life, the Jewish Museum is an architectural landmark that embodies loss, memory and the quest for identity. Designed by Daniel Libeskind, the bold, zigzagging structure of zinc and concrete deliberately resists traditional museum architecture. Its jagged form, often compared to a deconstructed Star of David, has earned it the nickname "Blitz". One of the most powerful architectural features of the museum is the concept of voids — long vertical empty spaces that slice through the building, representing the absence left by the Holocaust. The most haunting of these spaces is the Holocaust Tower, an unadorned, concrete void with only a sliver of light entering from above. Libeskind referred to the building as "Between the lines" — a space between the visible and the invisible, the present and the absence, the living and the memory of the dead. Over two decades since its opening, the Jewish Museum continues to offer an experience that is both intellectually challenging and emotionally profound. Even when empty, the museum is never silent.

MARTa Herford Museum. A building that dances

The name MARTa is a layered acronym: Museum, ART and architecture — a conceptual trinity that reflects the museum's purpose and design. Designed by Frank Gehry and inaugurated in 2005, this sculptural *manifesto* is a striking collision of curves, chaos and creative energy. Unlike the reflective titanium panels of Gehry's Guggenheim Bilbao, the museum combines local materials with Gehry's signature sculptural style. The building wraps a traditional red-brick shell — a nod to the industrial past of the small village of Herford — around an explosion of curving stainless steel and dynamic rooflines. Inside, the flowing volumes continue. Spaces twist, narrow and suddenly expand, creating a sense of discovery. The architectural concept is complemented by the work of curator and critic Jan Hoet, who was the founding director of MARTa. The building challenges traditional white-box logics, instead creating an experience that demands spatial awareness. Visitors do not just look at art; they move with it.

Museo Soumaya. Contemporary Mexican architecture

Located in the revitalised district of Nuevo Polanco in Mexico City, Museo Soumaya stands as a symbol of architectural ambition. Completed in 2011, the museum was designed by Mexican architect Fernando Romero in collaboration with OMA, and commissioned by business magnate Carlos Slim as a tribute to his late wife, Soumaya Domit. The location is part of the story: an industrial zone that has transformed into a hub for design, commerce and the arts. But what makes Museo Soumaya instantly recognisable is its sculptural, non-linear form. Eschewing conventional

He Art Museum

Courtesy He Art Museum

MARTa Herford Museum

Photo Martin Foddanu

geometry, the building appears to twist and swell organically, as if frozen mid-movement. Its *façade* is clad in over 16,000 hexagonal aluminium tiles — some polished, others matte — creating a shimmering skin that reflects sunlight throughout the day. The shape has no obvious front or back, enhancing its fluidity and inviting curiosity from every direction. Inside, the museum features a continuous vertical circulation anchored by a helical ramp, guiding visitors through six floors of gallery space. The top floor opens into a vast, column-free room naturally lit by a skylight. Museo Soumaya's uniqueness lies in its fusion of technology and craftsmanship, form and function and its refusal to conform to expected museum typologies.

Kunsthaus Graz. **The friendly alien**

In the medieval heart of Graz, Austria — a UNESCO World Heritage city defined by its Baroque facades and red-tiled roofs — an organism stands out from the urban fabric. Designed by Peter Cook and Colin Fournier, the building was completed in 2003 and does not pretend to blend in. The structure is composed of a steel space frame wrapped in a high-tech skin made from iridescent blue acrylic panels, known as *BIX* — short for "Big Pixel". This innovative *façade* doubles as a media display system, integrating 930 fluorescent light rings behind the acrylic panels, turning the museum into a giant urban screen. The integration of media, architecture and public engagement reflects the museum's dual identity as a space for both exhibition and expression, connecting contemporary art and the city. Inside, Kunsthaus offers non-linear spatial volumes, with curved walls, sloped floors and a seamless flow of spaces. This spatial fluidity aligns with the museum's curatorial focus on contemporary and experimental art. The two main exhibition levels connect *via* a "travelator" — a slow-moving escalator that enhances the sense of entering another world. Daylight is carefully controlled, and the lighting strategy supports multimedia installations, projections and nontraditional artworks. The "friendly alien" may look like it crash-landed in Graz, but is deeply rooted in its urban and cultural role.

MuCEM. **Between land and sea**

MuCEM (Musée des Civilisations de l'Europe et de la Méditerranée), occupies a site of immense historical weight. Located on the edge of the J4 pier, at the entrance to Marseille's Vieux-Port, the building is directly adjacent to the 17th-century Fort Saint-Jean. Rather than compete with it, this design frames it, linking the old and the new with a 120-meter-long footbridge that spans a narrow sea channel. This bridge is more than a connection — it is an urban choreography, inviting visitors to cross water, shadows and time. Designed by Rudy Ricciotti and Roland Carta, the museum opened in 2013 and serves as a space that does not just house artefacts of civilisation, but enacts the very principles of it: connection, dialogue and openness to the world. From the outside, the building appears to be a square box, measuring 72 meters on each side. The cube is wrapped in a double skin: an inner box of glass enclosed by an outer veil of reinforced concrete lace, inspired by Mediterranean *mashrabiya* screens and the interplay of light and shadow in Arab vernacular architecture. This perforated concrete screen is the museum's most iconic feature. The building is porous, allowing light, wind and people to move freely through its structure. It does not seal itself off from the city, but opens itself to it.

Louvre Abu Dhabi. **Desert masterpiece**

Born from a historic partnership between the governments of the United Arab Emirates and France, Louvre Abu Dhabi stands as a symbol of global unity through art. Crafted by French architect Jean Nouvel, its giant silvery dome spans 180 meters and appears to float above the museum complex. The structure is composed of 7,850 metal stars that create a dazzling effect known as the "rain of light", where sunlight filters through in shifting patterns. Nouvel was inspired by the way light filters through the palm trees of an oasis, a nod to Arabian heritage. Each piece of the dome had to be individually fabricated and positioned, and the entire structure weighs around 7,500 tons — about the same as the Eiffel Tower — supported on just four hidden piers. The gallery interiors are both monumental and modular in design. Over 6,400 square meters of exhibition space is divided into twelve chapters. The walls and flooring are made of locally sourced white stone. Soft greys and earth tones dominate the palette, allowing the art — and the play of light — to stand out. The museum's elegance lies in its restraint, with quiet walls, a dome that does not scream for attention and light always leading the way.

MUCEM

Photo Alexandre Trouvé

OPINION

Guangzhou Opera House

Courtesy Hufton + Crow. Zaha Hadid Architects

WHAT IS PARAMETRICISM... AND SHOULD WE CARE?

The architecture field is engaged in an internal battle pitting protagonists of Parametricism and its latest manifestation Tectonism, against believers in literally any other approach.

Patrik Schumacher [see box p.82] is the world's leading protagonist of an architectural movement called Parametricism. Hyper-simplified, it is the practice of prompting artificial intelligence to develop design solutions based on a set of predetermined parameters. But the reality can be much more complex. Schumacher coined the term in 2008 to describe a tendency that had already been underway for decades, really since the advent of computers. He has recently been proclaiming it the only way anyone in the contemporary age should be designing architecture. In 2016, after the death of Zaha Hadid, Schumacher took over as lead architect at Hadid's firm. He has since parlayed the position into a powerful platform for the dissemination of his ideas.

At the same time as it has made Schumacher into a celebrity in the field, his outspoken defence of Parametricism has caused many of his compatriots to view him as a villain. Anyone working in almost any other professional field might wonder why this should be. What could be controversial about advocating for the use of the most advanced tools available to solve problems when designing a building, or doing anything else? Indeed, many of the most beautiful, functional and acclaimed buildings built in the past decade and a half have been designed this way. Look at Terminal 2 of Chhatrapati Shivaji International Airport in Mumbai, Dongdaemun Design Plaza in Seoul or Dalian International Conference Center in China. The results are clear: Parametric architectural design exceeds what the human mind alone can achieve.

From the outside looking in, it almost seems like the reason Schumacher is on the receiving end of so much hate has less to do with the method he is advocating for and more with his delivery and inflexibility. Schumacher has infamously called on the entire field, across the globe, to immediately transition to Parametricism and its latest manifestation Tectonism. He has belittled the notion that any other method of architectural design is inappropriate today, insisting such approaches are not only backwards, but harmful. In digital parlance, this is a user error.

When asked why it is important for there to be a unified, global contemporary architectural approach, Schumacher offered the following response: "There are two compelling reasons: First of all, we should seek out a global best practice for architecture — at least with respect to the most advanced arenas of world society — a best practice that addresses the current architectural tasks posed by our advancing civilisation with the

— Phillip Barcio

most recent computational tool sets available to the designer. Architecture's problem space, the solution space and the tools of elaborating solutions have all evolved with the technological and socio-economic transformations of recent decades. This requires a new paradigm and best practice. Once such a best practice has been elaborated it makes sense to see to it that the field converges to adopt such a practice and its underlying principles. The paradigm of parametricism/tectonism is — uniquely — such a highly elaborated and corroborated paradigm that deserves to become the unified approach within contemporary architecture and urbanism."

"The second reason is: Even if there remains uncertainty and unresolved controversies about the paradigm around which architecture should unify, it makes sense to see a critical mass of protagonists converge to establish one of the competing paradigms as hegemonic, rather than allowing the discipline to remain fragmented. Unity has its own inherent advantages. A certain critical mass of protagonists within an innovative, research-based development trajectory is required to achieve cumulative advances. Furthermore, the city is an integrally functioning system. It is difficult to upgrade a city via several development paradigms and trajectories that get in each other's way rather than building upon each other

3 questions to... Patrik Schumacher

Patrik Schumacher is the principal architect of Zaha Hadid Architects.

When should designers take general public reaction to their work into account?

Complex, sophisticated societies like our current most advanced societies rely on an extensive division of labour. One aspect of this is the differentiation of professions backed up by academic disciplines and discourses. When it comes to innovative adaptations to changing conditions the disciplines must lead. However, market feedback (which is different from mere applause) is very important too. Sophisticated clients allow their architects and expert consultants to guide them and propose solutions to their requirements. The clients set the agenda with respect to the life processes they would like to see accommodated and facilitated by the built environments they commission. It is the architect's task to translate these requirements into spatial constructs that indeed maximise the facilitation of the client's purposes. Whether these purposes are being fulfilled is finally judged by the client and the end users the client invites and draws in. However, since new and enhanced purposes are usually being pursued by major clients, innovation is called for and the client relies on the architect to develop these. Rather than talking about "the general public" as if architectural projects should be subject to a general popular approval, I would like to emphasise that buildings are designed for specific publics selectively addressed by the client or urban entrepreneur. A direct engagement with or influence from "the general public" is probably counterproductive with respect to the rational advancement of the built environment.

If you are right that architecture is now a craft, why should that matter to everyday people?

This degenerate state of affairs in architecture and urban development should be a concern for all, especially for each in their specific set of newly developed environments, because this craft-like production of stereotypes implies missed opportunities for life enhancing environmental upgrades. Over and above everybody's specifically missed opportunities, all should worry about how all these missed local opportunities accumulate to an overall architectural and urban stagnation with serious consequences for the overall productivity losses of the prosperity engine that our cities might otherwise be. Everybody's standard of living is being compromised.

Is there a place for architects who do not incorporate digital tools or strive to avoid them?

No, such avoidance is idiosyncratic self-indulgence and indefensible stubbornness, and its survival relies on a professional and disciplinary culture of complacency and regressive tolerance, a culture where frank and confident criticism is seen as violating rules of modesty and politeness. "Live and let live" is not a viable recipe for discourses tasked with steering a profession.

Chanel Mobile Art Pavilion

Photo Virgile Simon Bertrand. Courtesy Zaha Hadid Architects

Zhuhai Jinwan Civic Art Centre

Courtesy Optogram Studio. Zaha Hadid Architects

Patrik Schumacher

Photo Kim Mun. Courtesy Zaha Hadid Architects

The highest and best each other."

To a novice, Schumacher's two reasons seem compelling. First, he says, "we should seek out a global best practice for architecture — at least with respect to the most advanced arenas of world society — a best practice that addresses the current architectural tasks posed by our advancing civilisation…" It is hard to find fault with the idea of best practices. However, there is an inherent elitism in terms like "the most advanced arenas of society" and "our advancing civilisation". Advanced in what way? Advancing where? Every nation is advanced in some ways and primitive in others. Sometimes the less developed aspects of a society are intentional and even preferable to citizens. Even within a single so-called advanced nation there are large swaths of society that lack access to those advancements. It is unreasonable to think everyone in a given community shares the same ideas about where the society is advancing towards or whether that so-called advance should continue. This is one reason Schumacher is accused by some critics of being elitist. He seems to be advocating for global best practices for a privileged and intellectually like-minded minority regardless of whether these practices work best for everyone.

Schumacher's second point about unity within the architectural field also seems compelling. He says, "it makes sense to see a critical mass of protagonists converge to establish one of the competing paradigms as hegemonic, rather than allowing the discipline to remain fragmented. Unity has its own inherent advantages." That word, unity, has a history in the architectural field. It was a fundamental priority of the 19th century Romanticists, who influenced Frank Lloyd Wright. It was also a powerful influence on Le Corbusier, who viewed collectivism as an essential driving force of urban design. Wright and Le Corbusier used the word unity in different ways, however. Wright sought unity within a particular design and sometimes, though not as often as people think, considered it important that his buildings expressed unity with their surroundings. Le Corbusier was thinking about a different kind of unity, which assumes that all people can be served by the same design principles or aesthetics. Wright's unity imposed a type of oppression onto a building and perhaps its inhabitants. Le Corbusier's unity imposed a type of oppression onto entire communities.

Both Wright and Le Corbusier were so successful in their approaches that they sped up the destruction of Modernism by the reactionary force of Postmodernism. The sympathies of architects striving to break free of the simplified unities of Modernism were summarised in 1966 by architect Robert Venturi in his book *Complexity and contradiction in architecture*. Instead of the less is more mentality of his predecessors, Venturi wrote that "less is a bore". So began a procession of architectural movements including Structural expressionism, Deconstructivism [see box p.55] and Neo-futurism that allow for ambiguity and a diversity of ideas, without enforcing unity.

Adaptive heuristics

Schumacher's idea of unity deserves its own consideration separate from his predecessors. What he is really talking about is not so much rooted in the desire to make everyone think or do the same thing. Rather, it is rooted in something called adaptive heuristics. Oversimplifying again, heuristics are intellectual shortcuts. Sometimes organisms have to make complex judgments quickly in order to survive. Mental shortcuts are developed over generations and are helpful. Most of all they are pragmatic — empirically known to work, regardless of whether they fit in with academic theories.

"Adaptive heuristics" describes the accumulation of pragmatic mental shortcuts related to a specific type of problem. This is the arena in which Parametric architecture thrives. Every parametric architectural project results in a massive new body of heuristic knowledge that can be fed into a database of existing heuristic knowledge, which can then be adapted for use in future projects. It is the superpower of machine learning and artificial intelligence applied to architectural design. The more architects who use Parametric tools, the more heuristic knowledge can be accumulated and adapted, and the better Parametric design tools can become at solving the specific problems of architecture.

Schumacher is arguing that unity, in this context, has the potential to make everyone in the field better at what they do. It is a convincing argument. The problem, again, is in the delivery. Schumacher seems to belittle any architect who rejects being part of Parametricism's unified global march towards advanced adaptive heuristics. Meanwhile, the same argument is underway in many other creative fields. Why should a musician not use artificial intelligence to analyse every great song, then apply adaptive heuristics to the creation of the greatest song ever? Why should a novelist or a painter or a choreographer not do the same? The answer is that music, literature, visual art and dance are creative pursuits. Greatness in these fields is determined by the ability a human

artist has to use their imagination to create something that is meaningful to other humans. Perfection is not needed and not wanted. Authenticity is what matters most in art.

If architecture is an art, Parametricism is the death of its authenticity. Here is where the persona of Patrik Schumacher becomes muddy. He recently published an essay bemoaning the death of the art of architecture. He says that the field has devolved into mere craft. A lot of the current negativity directed at him is connected to this essay — not least of which because it is debatable whether architecture ever was an art. Architecture is the design of enclosed space. It is almost always done for utilitarian purposes and in service to the demands of a particular client. It can be a creative endeavour and a business. But when is it art? Frank Lloyd Wright often referred to himself as an artist, but then again… his roofs famously tend to leak.
Is that what we get when architecture becomes art? And in those cases when an architect is producing art, how could surrendering decisions to an artificial intelligence possibly make the art more artful? Artifice is the opposite of authenticity.

It is easy to get in the weeds on this topic. Even Schumacher is still working through his ideas, and may not be clear on his own contradictions. Either way, Parametricism is hardly the threat some people are making it out to be, any more than ChatGPT is a threat to the future of writing. It is a tool that can make some things better and other things worse. Considering architecture is already a flawed field, why not give Schumacher and his cohorts a little space to enclose, where they can figure out

London Aquatics Centre

© Hufton + Crow. Courtesy Zaha Hadid Architects

DISCUS

Sor Jerónima de la Fuente, Velázquez

Courtesy Institute of Old Masters Research

MICHELANGELO IN BRONZE

The Institute of Old Masters Research has rediscovered a Renaissance bronze crucifix, cast from Michelangelo's original model. The artefact was unveiled at TEFAF 2025.

Few rediscoveries in the world of art have generated as much excitement and debate as the bronze *Corpus Christi* unearthed by Carlos Herrero Starkie, director and founder of the Institute of Old Masters Research (IOMR). Documented in Seville in 1597 and believed lost for centuries, this four-nailed crucifix was cast in Rome in the 1560s, likely by Jacob Cornelisz Cobaert under the direction of Guglielmo della Porta, using a wax model created by Michelangelo himself. The crucifix, measuring just 25 cm in height, bears all the hallmarks of Michelangelo's design: heterodox design, anatomical precision, spiritual poise and emotional restraint.

According to Francisco Pacheco, Velázquez's teacher and one of Seville's most prominent art theorists, Michelangelo's four-nails bronze Crucifix was brought to Spain from Rome in 1597 and used to produce a series of early casts in silver and polychromed bronze that transformed the iconography of the Crucifixion in Spain and New World. This long-lost original bronze Corpus, now rediscovered, was presented at TEFAF 2025 Stuart Lochhead stand, in a landmark display that paired it with Velázquez's *Sor Jerónima de la Fuente*, which depicts the very same model in painted form. The exhibition was more than a curatorial coup; it was an interplay across centuries of two works that had long been separated but deeply entwined.

Could you share your experience at TEFAF and your impression of the exhibition?

It was an extraordinary experience. The stand designed by Stuart Lochhead was a piece of art in its own right. I had not seen it until the fair and it was a triumph of design and curatorial vision. Stuart created a space that was both modern and reverent, with a subtle Japanese aesthetic. The centrepiece was, the bronze *Corpus* attributed to Michelangelo, presented in conversation with a painting that depicts the very same model by Velázquez. This juxtaposition, divided by an elegant screen, offered a strong dialogue between sculpture and painting, as well as between two masters of the Renaissance and Baroque periods. Beyond the visual impact, what struck me most was the atmosphere around the stand. The Spanish and international press extensively covered the presentation. Many people seemed surprised, especially since the presence of the Velázquez and Michelangelo pieces was not revealed until just a few days before the opening, and TEFAF provided the perfect stage for this unveiling.

How did you manage to bring together Velázquez and Michelangelo's *Corpus*?

It was a matter of personal trust and long-standing relationships,

— Pierre Naquin and Nahir Fuente

Corpus Christi, Michelangelo

Courtesy Institute of Old Masters Research

but also of shared conviction. I have been friends with the Araoz family since school — our ties go back generations; my grandfather, Walter Starkie, was a great friend of their grandfather Gregorio Marañón — they were aware of the crucifix from the very first moment I discovered it. They recognised its importance and were informed about the academic and technological grounds that support the discovery, published in our book, *Michelangelo's bronze corpus, documented in Seville, rediscovered* (IOMR, 2024). I was convinced that a grand performance exhibiting both Masterpieces at such an international venue as TEFAF would offer the opportunity to experts, curators and academic researchers to discuss the discovery and, by inspecting the piece in flesh, appreciate, both the minute quality in itself of a Renaissance masterpiece bronze crucifix and the importance of such a heterodox design that could only be conceived by a genius as Michelangelo. Indeed, I was also aware of the strict TEFAF's vetting committee, though, as I was fully confident on the solid grounds of my discovery, I consider a positive factor a first-hand inspection of the piece by the most knowledgeable curators in sculpture and fine art. Hopefully everything went as expected and after reading all the technological tests, inspecting the piece and comparing academic reports, they confirmed what Stuart Lochhead prudently proposed as cataloging entry of the piece: the newly discovered bronze was the result of a fruitful collaboration between Michelangelo as the designer of the model and Guglielmo della Porta as the bronze-smith sculptor who supervised in Rome the cast, likely crafted by Jacob Cornelisz Cobaert, his most talented assistant, during 1560s.

Stuart Lochhead, who had fallen in love with the piece since seeing the Crucifix in the institute's library, also believed in the presentation from the start. His support was indispensable, as he covered the high insurance and transport costs for the Velázquez. As we expected, press media gave duly resonance to the venue and researchers, conservators, collectors and museum professionals quietly contributed their insights, making it a collective achievement.

Which is in fact the historical link between Michelangelo's four-nails model and Velázquez's painting?

The link between Michelangelo's model and Velázquez's painting was already historically grounded. The crucifix was documented, as brought to Seville by Juan Bautista Franconio from Rome in 1597, by Francisco Pacheco, Velázquez's teacher and an essential figure in the Seville artistic world. He expressly recognised to have polychromed a bronze cast directly moulded from Michelangelo's bronze model. Most probably, this Crucifix remained in his workshop and his pupil reproduced it in Sor Jerónima de la Fuente's portrait. Pacheco described the work in his *Arte de la pintura*, as in Seville 33 years after Michelangelo's death, providing rare documentary evidence that binds these two masters across time and medium. In a way, the connection was already there; it just needed to be physically manifested and rationally argued. Bringing the two works together into the same physical space after centuries was not merely a curatorial gesture, but a shared effort by people who believed in the importance of telling this story.

Was there much interest in acquiring the *Corpus*?

Yes, there were significant enquiries from American and Northern European collectors. However, I was expecting more interest from museums, bearing in mind we were presenting the most refined extant example of Michelangelo's four-nail Crucifix model: a real Museum masterpiece with a fascinating story to tell. Though there were great interest from curators in the bronze itself, its quality and all the documentation that surround it, Museums head of departments, for proposing acquisitions to their donors and committees, simply needed more time to process the implications of such discovery. Indeed, it is a bronze, so it is always arguable to talk of an entirely autograph work; it is more like a collaborative work. While Michelangelo designed it c.1530s, the cast of the model into bronze was directed 1560s by Guglielmo della Porta and likely executed by his assistant Jacob Cobaert, a talented goldsmith, in the frame of Roman *Gran Scuola*. Museums struggle with bronze attribution due to its collaborative character and with Michelangelo, they are even more cautious, despite a unanimous scholarly consensus on the design in this case. But I am confident that a private Museum would purchase it or an important collector would donate the piece to a public Museum, so that it can be fully appreciated in all its splendour and where the conversation about the piece would evolve freely, promoting a better understanding on Michelangelo's intimate spiritual feelings and his involvement in bronzes *œuvre* which is exactly we have done since we discovered the piece and published our book.

How did you first come across the bronze *Corpus*?

Almost by chance. It appeared in the Spanish market, coming from a San Sebastian collector and was not immediately recognised for its true value. Its small size and the

prevalence in Spain of similar pieces cast from it, made it easy to overlook. But I recognised the quality straight away. The execution, the details and the sense of pathos mixed with serenity and peaceful relief after pain, were unmistakable. I recalled Pacheco's writings and realised this could be the long-lost model. I had it examined by my restorer, who came expressly from Valladolid and crucially found traces of wax and gesso, indicating it had been used as a casting model.

What made you confident enough that Michelangelo was involved in the production of the bronze?

I realised that any claim involving Michelangelo invites scepticism, as it should. Though in this case the design was unanimously attributed to Michelangelo and its superb quality induces me to think we were facing a prototype directly cast from an original wax model. Furthermore, the historical context matched perfectly. Thus, it was just a question of proving on scientific grounds the dates and technology of the cast, to attest my first feelings about when, who and where it was crafted. In this sense, the fact that the Met had another similar crucifix of inferior quality assigned to Michelangelo design by the most honourable scholars, as Manuel Gómez Moreno, John Philips Goldsmith, Charles de Tolnay, Pietro Marani and more recently Paul Joannides, facilitated in a way my task. Although intuition plays a role at the outset, you need data to proceed. To provide evidence, we conducted technical studies at the CSIC and SGS technos that included alloy analysis and radiographic imaging using X-rays. We also consulted technical treatises from the 16th century and made comparisons with known Michelangelo models and contemporary bronzes by Guglielmo della Porta. The data alloy provided by the Rijksmuseum of bronzes cast in Rome around 1560 matched that of our Crucifix, in particular one cast by Cobaert, with a similar degree of impurities (arsenic, antimony and nickel) typical of a Tyrolean Falherz copper used in mid-16th century in Rome. The technique, including a small vent hole on top of the head for pouring the bronze, thread screws and soft welded silver joints in the arms, was consistent with methods used by della Porta's workshop. In addition, the *Corpus* bears anatomical and stylistic features consistent with Michelangelo's aesthetic — the minute and faithful description of musculature, its nudity, the natural way the lifeless body hang down, the positioning of the limbs, the original patina that still retains the indelible mark of the wax process and, above all, the intensity the expression. All this pointed towards a prototype cast directly from Michelangelo's wax model.

Was that cross-disciplinary collaboration important to you?

Absolutely. It was about understanding the object from every possible angle. We had art historians, metallurgists and even literary scholars examining the letters. The strength of this attribution stems from the convergence of numerous disciplines. When everyone across different fields starts to see the same story emerge, you know you are onto something meaningful.

Can you elaborate on the letters between Michelangelo and Vittoria Colonna and how they relate to the Corpus?

These letters, exchanged between Michelangelo and Vittoria Colonna in the late 1530s, have long been considered among the most personal and poetic documents in Michelangelo's correspondence. I have deeply studied three letters that traditionally have been read as referring to a drawing, in particular to the British Museum living *Christ crucified* drawing; however, our interpretation, supported by scholars, such as Michael Riddick, suggests otherwise, as referring to a wax model of crucifix that, according to the first letter, Vittoria Colonna received for a while, as if Michelangelo was expecting its return, likely for finishing the completion of a project which is implied in the correspondence. In the second letter, she writes about examining the piece with light, a mirror and a magnifying glass, tools that imply the observation of a three-dimensional object. She notes the piece's "unperfected" state, yet praises its beauty and minute finishing of all its details, as if she was speaking about a work of art in two different stages and doubting if Michelangelo was involved or not in the whole process. Something coherent with a bronze cast process. In the third letter, Michelangelo, on the one hand, expresses his discontent regarding how she returns the Crucifix through an intermediary and, on the other hand, uses an exculpatory tone regarding the Marchesa's disappointment due to not finishing the project he was bound to undertake. Given their deep friendship — one marked by mutual admiration, theological exploration and artistic exchange — it is entirely plausible that Michelangelo created the original model for her. This aligns closely with a model awaiting casting. The descriptions fit a physical sculpture rather than a sketch.

How do you think this discovery shifts our understanding of Michelangelo's output as a sculptor?

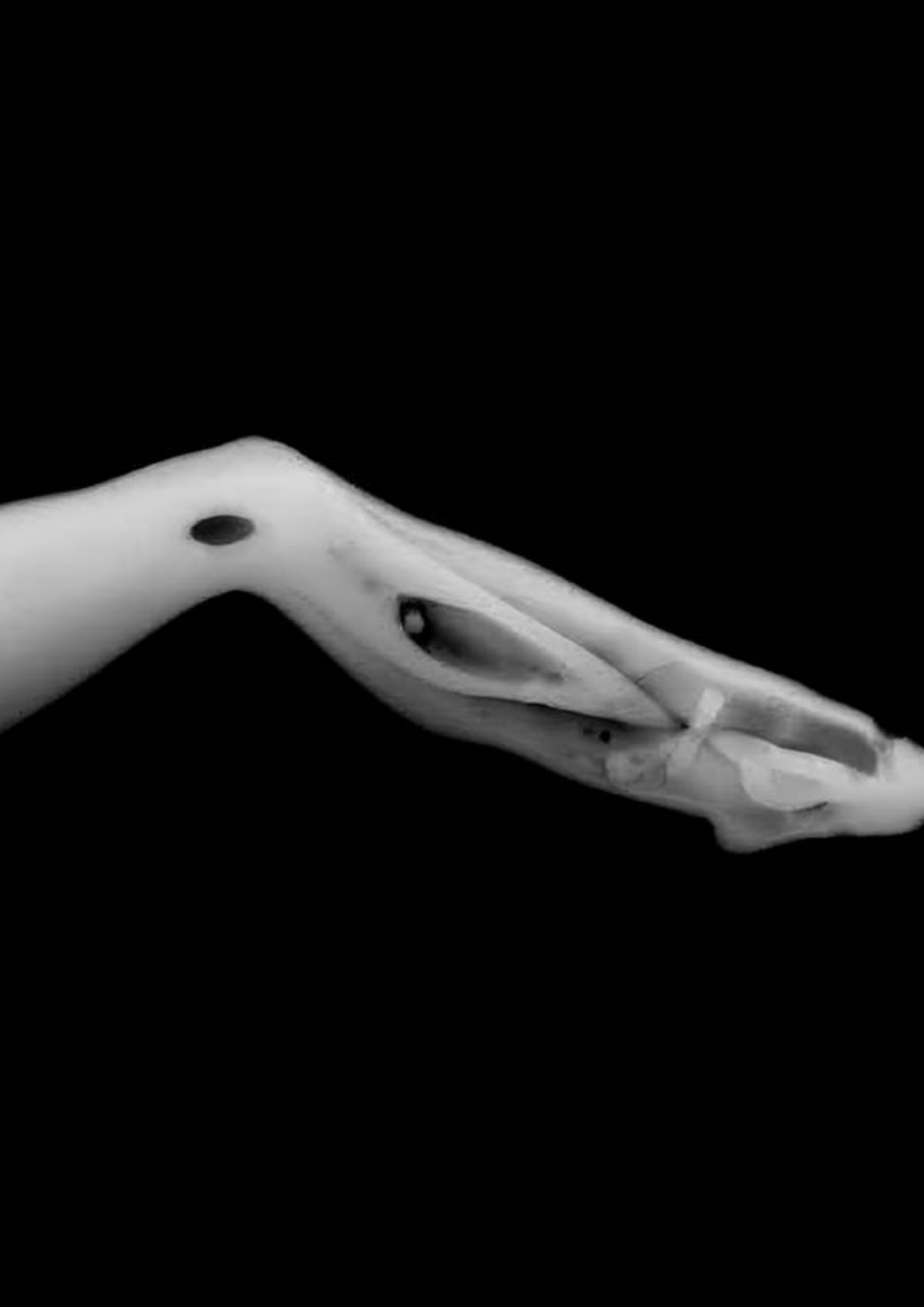
Regarding bronze, it forces a reconsideration in the same line as art historians have considered

Carlos Herrero Starkie

Courtesy Institute of Old Masters Research

X-ray of the *Corpus Christi*

Courtesy Institute of Old Masters Research



and praised Greek bronzes even though there are only a few that exist. Michelangelo was clearly not only a master of marble but also a designer of bronzes, even if he did not always cast them himself. Vasari and his biographer Condivi expressly refer to very important monumental bronze sculptural projects. The *David* was commissioned in 1502 by Pierre Royan for Louis XII of France, in 1506 the colossal seated statue of *Pope Julius II* for San Petronio in Bologna and in his late years an equestrian sculpture of King Henry II of France, commissioned by Catherine de Medicis. Unfortunately, there is no artistic result of all these artistic feats, some of them undertaken in close competition with Leonardo. All these monumental sculptures were melted to produce cannons in different military campaigns. Nowadays there are only a few small statues in bronze attributed to Michelangelo: the *Hercules Pomarius* bronze, the *Samsom and the Philistines* bronze, the Rothschild pair of bronze bacchantes on panthers and the four nails bronze Crucifix that we are talking about. All of them in a strict sense should not be considered as autograph works by Michelangelo, because there is no evidence that he intervened in the process of casting, as it is documented he did with monumental sculptures. Even though in my opinion in the case of the four nails Crucifix, Michelangelo modelled the wax model now lost, whose *primo pensiero* is the Teylers Museum drawing in which the body is rendered from different points of view, pointing to a sketch for a sculpture. His circle, particularly artists like Raffaello da Montelupo, Guglielmo della Porta, Daniele Volterra or Jacopo del Ducca siciliano, acted as executors of his designs and models during his life or just after he died in 1564. Though the level of detail and emotional intensity found in this bronze is entirely consistent with Michelangelo's vision. While it challenges the purist view of "autograph" works, it also enriches our understanding of his broader impact.

Is this why there is a certain reluctance to embrace a full attribution to Michelangelo?

Well, first of all, what we have shown in TEFAF and his vetting has accepted is the most refined example of a bronze Crucifix designed by Michelangelo and cast in Rome during his life or just after his death.

Is it sufficient to talk about an autograph work?

In my opinion, if we believe, that he has intervened in the completion of the original wax model from which he has directly cast the bronze, then the autograph character of the piece should be fully accepted. However, we have to point out that in a strict sense, an indirect bronze cannot be considered as an autograph work even though a Master has conceived the model and the cast is a prototype of the highest quality. On the other hand, if we bear in mind that Renaissance works nearly always are collaborative works conceived by a Master, we should open our minds to accept the autograph character when the work is conceived by the Master, executed during his live under his direction and shows a level of quality which respond to a master standard. The question is what is acceptable for Donatello, Giambologna, Celini or Bernini; it does not work for Michelangelo because there is a long-standing scholarly tradition universally accepted that relates Michelangelo the sculptor to marble. In modern times, where the autograph character has lost its predominance, shifting to emphasise the importance of conception and design over manual execution, one should be more prone to defining the autograph character of a work of art, reflecting a broader pattern in art history, depending on cultural and historical circumstances. For instance, scholars have long resisted the idea that ancient Greek sculptures were painted because we are still influenced by Winkelman and Classicism. In this sense, there is also a resistance to the notion of Michelangelo as a bronze sculptor; many still equate him exclusively with marble. This rigid framework can hinder our understanding of Renaissance workshop practices and the collaborative nature of many works. Ultimately, we need more open dialogue, transparency in research and the willingness to revise the canon when the evidence demands it. We hope this discovery, as fully argued in our book *Michelangelo's bronze Corpus documented in Seville, rediscovered* (IOMR, 2024), challenges long-held assumptions, being a step forward for the discipline.

Corpus Christi, Michelangelo

Courtesy Institute of Old Masters Research

ECOLOGY

Musée du quai Branly – Jacques Chirac
Photo Mikael Pijoubert. © Art Media Agency

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SUSTAINABILITY IN PRACTICE: GREENART'S PUBLIC TRAINING SESSION IN PARIS

Lead scientists and conservators on the EU's GREENART project recently offered a public update and training session in Paris, sharing the latest results from their groundbreaking research.

On 10 and 11 April 2025, representatives of EU's GREENART Project gathered at the Musée du quai Branly – Jacques Chirac in Paris to offer the latest update to their project. GREENART's stated mission is to develop new sustainable tools and methods "to preserve, conserve and restore cultural heritage". Inherent in that goal is the development of novel cleaning solutions, packaging materials, solvents and other products that could replace current non-sustainable solutions used in the field. The public training session included a comprehensive series of lectures from leading researchers working on various projects, who shared progress reports in their areas of interest — including stakeholders from various international museums where GREENART's products and methods are being tested in real world situations. Following the talks, five practical training workshops were offered elucidating the topics discussed in the talks.

Session one began with Martina Menegaldo, a PhD student in Environmental Sciences at Ca'Foscari University of Venice, Italy, giving a talk about Life Cycle Assessment (LCA) and Life Cycle Costing (LCC). These are metrics used to compare the environmental and economic impact of GREENART's solutions compared to existing products. Menegaldo outlined the steps of the assessment process as goal scope definition (the case study), inventory analysis (collecting information about the product), impact assessment and interpretation (conclusions drawn about results). The impact assessment includes 16 categories, Menegaldo said. "When we talk about sustainability, it is not only one problem like climate change, but we have several problems for the environment, such as toxicity for both human health and the environment, the use and the depletion of resources like mineral metals and fossil resources, the formation of particulate matter, water consumption, land use, land transformation and so on. It is quite a challenging assessment."

Next was a talk from Manfred Anders from Zentrum für Bucherhaltung (ZFB) in Leipzig, Germany, where conservation is done on paper-based materials for archives and libraries. Anders is specialist for paper, cellulose and textile chemistry. His talk covered intelligent and sustainable solutions for archival packaging. One of the most important aspects of packaging, they noted, is to create a protective environment for whatever is in the package to protect it from environmental fluctuations outside. In addition to using more sustainable materials to make the packaging, they cited the importance of "smart packaging" that stabilises the "microclimate" inside the box, including internal

— Pierre Naquin and Phillip Barcio

humidity sensors for packaging. This, he said, allows an institution to spend less resources on room climatisation. He reported progress in better package construction to create a tighter seal. One problem the company still faces is finding materials that will help them move away from trees, such as hemp, which grows back quickly. One challenge with hemp, however, is that the fibres are too long and they have a negative effect on the paper machines causing them to need additional clearing. These issues add to the cost and complexity of the technology.

Next was a presentation by Salvador Muñoz-Viñas [see p.108], Professor in the Universitat Politècnica de València, Spain and Head of the Paper Conservation group of the university's Instituto de Restauración del Patrimonio, and María Sobrino-Estalrich, who is pursuing a PhD in Conservation and Restoration at the Universitat Politècnica de Valencia. They offered a proposal for a "greener" mounting system for paper artworks. Their goal, they explained, is to develop a better solution for keeping "a paper drawing, map, poster or whatever, flat and nice" while on display in a museum. "The solution is usually to try to keep the room's relative humidity within a very tight range," they said, but that takes a lot of energy so is not sustainable. A better solution is to develop a mounting system that resists changes in humidity and temperature. With the help of GREENART products, the team developed a system that achieves this goal, even at extreme humidity levels. Their work was recently tested incidentally in real world conditions during the floods in Valencia, when posters mounted using their technique were partially submerged in water. Only the submerged parts showed damage — the rest were still in nearly pristine condition.

Session 2

The next session began with a presentation by Giseppe Cesare Lama, PhD, Marino Lavorgna, PhD, and Letizia Verdolotti, PhD, all from the Institute of Polymers, Composite, and Biomaterials of the National Research Council. Their talk was about eco-friendly and bio-based coatings and polyurethane foams used for packaging and transporting artworks. They discussed two applications: one that coats the artwork itself and one that protects it inside the packaging during shipping. They compared the first application to a *Torrone*, which they said is basically "an edible composite". Instead of chocolate, they use polymers, they said, and instead of pistachios, they use "mesoporous silica nanoparticles". For the second application, they reported progress on making packaging foams from food waste, in particular cashew nutshell liquid. This material can be used to create a perfect mould for the actual object in the packaging, and afterward can be reprocessed by compression moulding and used in another application.

Gabriella di Carlo, PhD, spoke next about bio-based multifunctional coatings for tailored and long-term protection of metal cultural objects. Di Carlo is a Senior Researcher at Istituto per lo Studio dei Materiali Nanostrutturati, Rome, Italy. The most important thing, she said, is to achieve high transparency with any coatings applied to metal objects so as not to alter the object's appearance. As part of her project, her team worked on the development of new solutions based on chitosan, which she said "is a biopolymer with a low cost, commercially produced from renewable sources, like for example, waste of the fishing industry." That coating succeeded in protecting metal objects on which it was tested and achieved high transparency at first, but after time a slight yellowing was observed. Di Carlo's team is working with researchers now to achieve longer term results.

Next was a presentation from Camila Rezende and Camilla Camargos, who have been studying nanocellulose-based coatings and hydrogels for cultural heritage conservation. Rezende is an Associate Professor at the Institute of Chemistry at UNICAMP. Camargos is an Assistant Professor in the Conservation and Restoration of Cultural Heritage program at the School of Fine Arts, UFMG. They reported progress in utilising plant-derived nanostructures extracted from sugarcane bagasse, an agro-industrial residue, to fabricate protective coatings and hydrogels for cleaning cultural heritage objects. The coatings still require some development in order to become colourless, they said. And the hydrogels were highly effective for cleaning. They concluded that these products have "high potential for cultural heritage conservation", "can offer high transparency, removability, antioxidant, antimicrobial and UV shielding properties, efficient and gentle cleaning performance" and "are potentially more accessible to conservation professionals in South America and beyond."

Next, Romain Bordes spoke about the development of green dispersion for the consolidation of encaustic paintings. Bordes leads a research group in the Applied Chemistry division at Chalmers University of Technology in Gothenburg, Sweden. He spoke about the particular challenges of conserving encaustic paintings and offered a report on his team's progress developing "a family of novel consolidants designed specifically for encaustic paintings, using a microstructured dispersion system of beeswax (BW), cellulose nanocrystals (CNC) and ethyl hydroxyethyl cellulose (EHEC)." Bordes reported that he was happy with the results, concluding that the system "has a good tendency to restore the mechanical properties of, first the encaustic painting —

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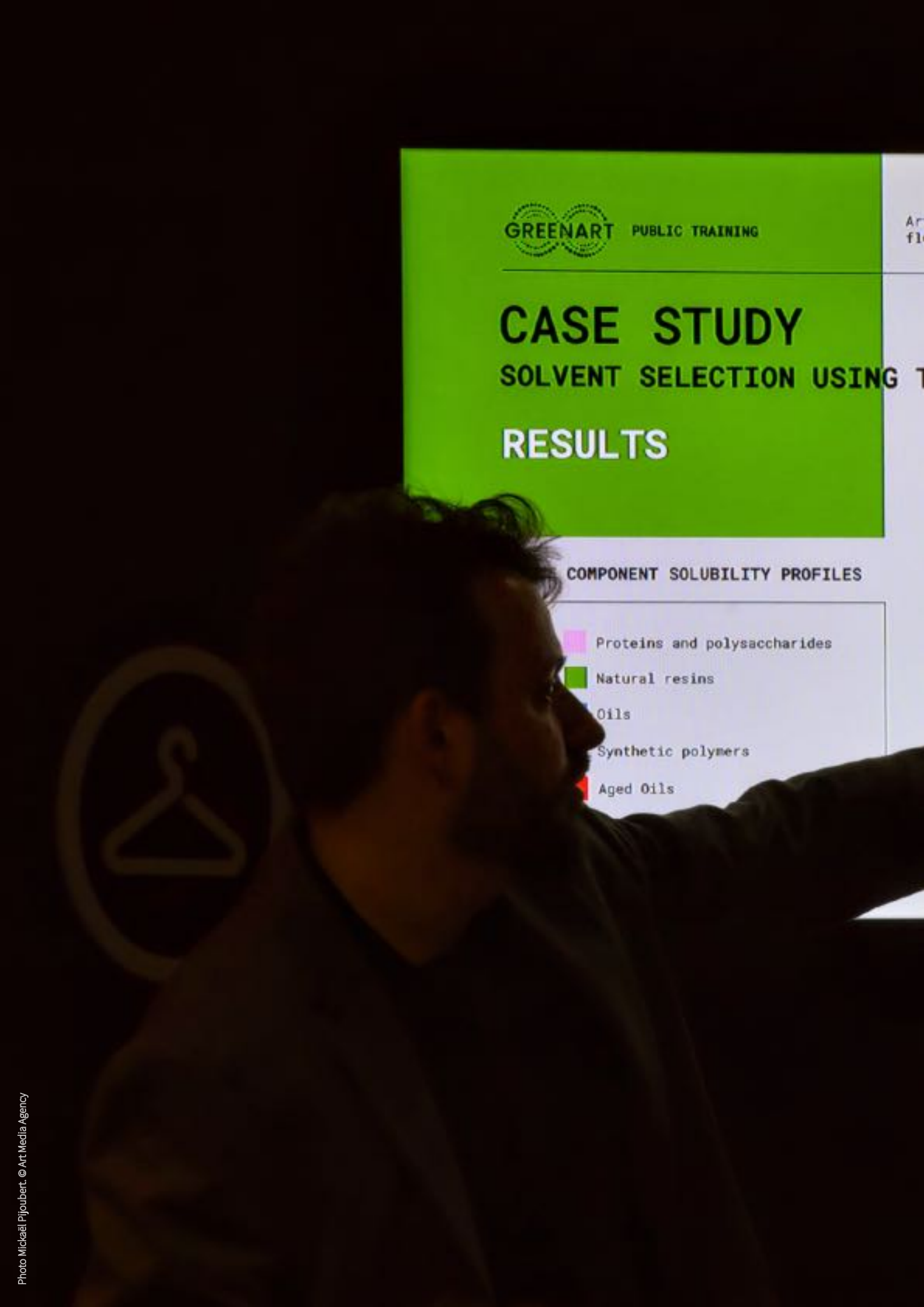

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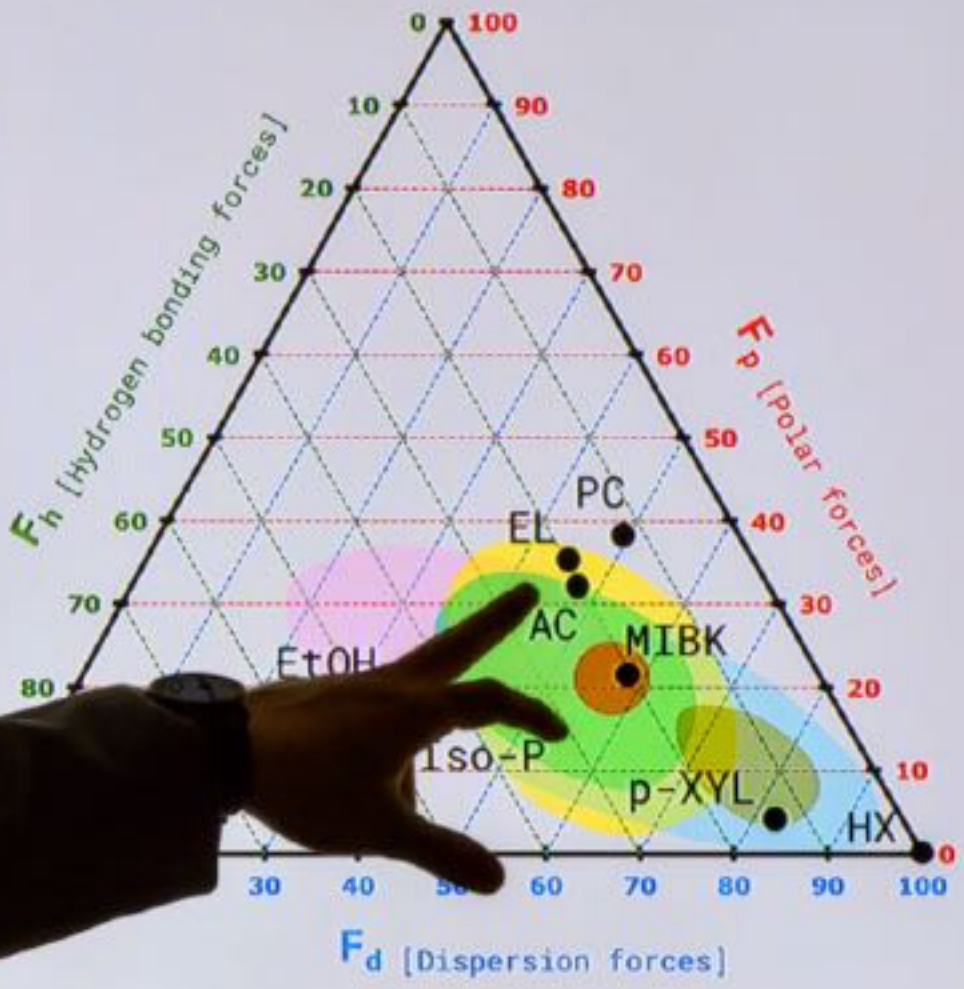
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Photo Mickaël Pijoubert. © Art Media Agency

it can work as a glue — but can also work for reinforcing textile like material."

Session 3

The third session began with a talk by Piero Baglioni on new green and sustainable materials for wet cleaning of artworks. Baglioni is Emeritus Professor of Physical Chemistry in the Department of Chemistry at the University of Florence. He discussed using colloids and soft matter solutions like gels and nanofluids "to selectively remove unwanted layers in sustainable and cost-effective interventions." He highlighted "twin-chain" polyvinyl alcohol gels, "which can be loaded with water or different water-based cleaning fluids" and concluded that much can be achieved with these new solutions that is far more difficult to achieve by traditional means.

Next, Bronwyn Ormsby, Principal Conservation Scientist at Tate, London, spoke about real world testing that the institution has been conducting on artworks in their collection. Their research is focused on the works of British painter Bridget Riley, whose paintings from the 1960s are currently undergoing conservation treatment for the first time. The two paintings they are working on are *Fall* (1964) and *Hesitate* (1963). Both are painted on Swedish hardboards using house paints and both have accumulated a layer of "gray yellow" soil which Ormsby said is common to the Tate. Preliminary testing of the gels has proven very effective in removing the soil, Ormsby said, although a complete and final cleaning and assessment has yet to be completed.

Athina Georgia Alexopoulou spoke next about the creation of more user-friendly methodologies for the evaluation of green materials. Alexopoulou is Professor at the Department of Conservation of Antiquities and works of art at the University of West Attica, Athens, Greece. She declared that "the heart of conservation restoration lies in answering critical questions. Did our treatment work? Was it the right approach? Were the appropriate materials used? And what is the impact of our treatment on the project?" Her main emphasis was on the importance of non-destructive methods of analyses prior to restoration, so that objects can be assessed *in situ* using tools such as hyperspectral imaging, colourimetry and glossimetry. These solutions, she notes, "do not require sampling, have quick *in situ* application, do not involve consumables or waste materials, have very low energy consumption as well as the ability of post-processing imaging data."

Session 4

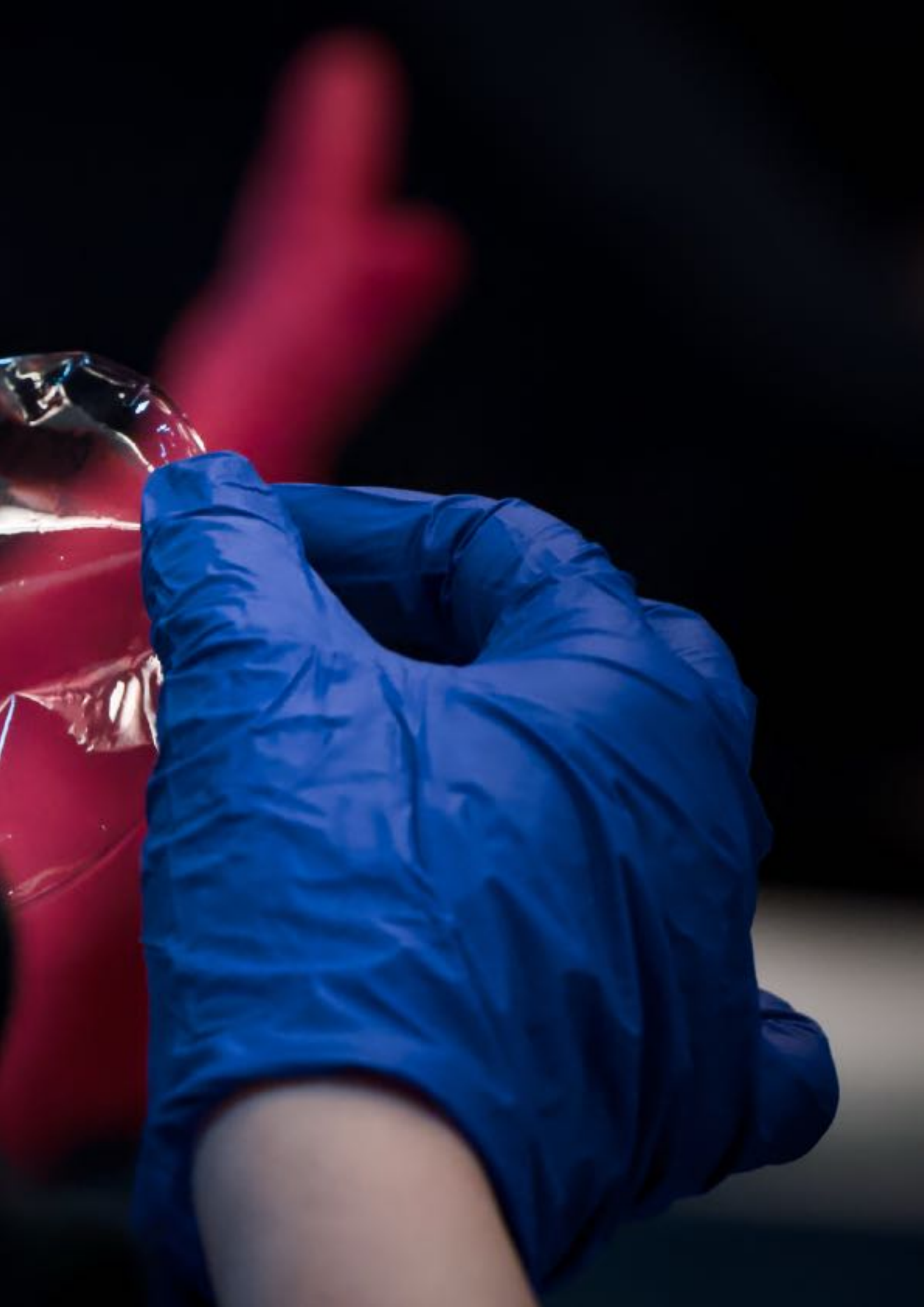
Penelope Banou kicked off session four with a talk on varnish removal on works of art on paper. Banou is a lecturer in the MA Conservation of Fine Art program, Northumbria University, UK. Her research centres on a 17th century black and white intaglio print. GREENART's organogels and nanofluids were used in the trials. Her conclusion was that GREENART's organogels were very promising, "because they managed to swell or solubilise the varnish layers adequately to be removed." More testing is needed, she said, on a range of different types of works on paper.

Next, Martina Vuga and Lucija Močnik Ramovš from the Academy of Fine Arts and Design, University of Ljubljana presented their observations on GREENART's cleaning systems for varnish removal. Their trials were conducted on a 19th-century polychrome wooden sculpture and two oil paintings on canvas. They tested GREENART's nanofluids and organogels, using multiple solutions on each artwork, and testing for different durations. Their conclusions regarding the paintings were positive, noting that varnish was successfully removed." For the sculpture, they noted that the GREENART solutions were more time consuming, required more effort and were potentially more damaging to the artwork than traditional solutions.

The final speaker was Soraya Alcalá, head of the paintings conservation lab at the Museum of Fine Arts (MFA), Houston. She delivered an update on her team's use of GREENART's solutions to clean two paintings on unprimed canvases: Kenneth Noland's *Eyre* (1962) and Morris Louis's *Slides* (1962). Her team collaborated with a team at The Peggy Guggenheim Collection in Venice, which had works by the same artists that were experiencing similar conservation issues. The results were positive, she said, but revealed that success depends on how the solutions are applied. "A well-structured protocol is crucial in achieving effective results," Alcalá said.

After the talks, on the second day of the conference, a training session including five workshops was held, during which attendees were able to see the solutions in action and in some cases test the solutions out themselves. Giovanna Poggi led a workshop on green gels for cleaning works of art; Camila Rezende and Camilla Camargos led a workshop on nanocellulose / nanolignin protective coatings and nanocellulose / biopolymer hydrogess; Francesca Boccaccini's workshop dealt with the properties and application of sustainable protective coatings for metal cultural objects; Manfred Anders led a workshop on the integration of sustainable raw materials, novel regulators and sensing devices in archive box production; and Andrea Casini a workshop on sustainable cleaning fluids with low impact solvents and surfactants.


Photo Mickaël Pijoubert. © Art Media Agency



Courtesy Polytechnic University of Valencia

ECOLOGI

FE-SEM with integrated Raman at the DINAMICO Laboratory

Photo Angelo de Simone Troncone
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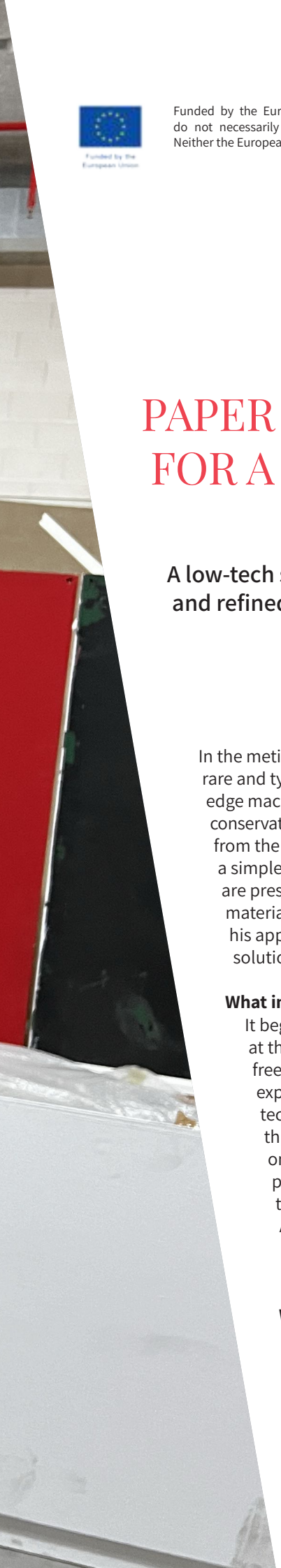

PAPER CONSERVATION FOR A CHANGING CLIMATE

A low-tech solution in paper preservation, inspired by tradition and refined through innovation, with the support of GREENART.

In the meticulous world of art conservation, breakthroughs are rare and typically reserved for laboratories filled with cutting-edge machinery. Yet Salvador Muñoz Viñas, a seasoned paper conservator and professor at the Institute of Heritage Restoration from the Polytechnic University of Valencia, has developed a simple technique that may transform how works on paper are preserved. Drawing on old Japanese methods, modern materials and an intuitive understanding of the medium, his approach offers a sustainable and globally accessible solution to keep paper stable in fluctuating humidity.

What inspired you to develop this technique?

It began back in 2008. I was working at the university at the time. One of the blessings from working there is the freedom to choose complex projects, so I found myself experimenting with a method that combined traditional techniques with modern materials. It evolved gradually, through careful testing and refinement, but I held off on publishing anything. First, I wanted to see how it performed outside the lab, in the real world, because there is always the potential for unexpected variables. After some time, I realised that the technique was actually working better than anticipated, so I started developing it further and refining the process.

What are the main problems this technique addresses?

When paper is exposed, especially in large formats, changes in relative humidity can cause it to expand or contract, resulting in wrinkles, waves or distortions on the artwork. This physical change, called “cockling”, can compromise the aesthetic and structural stability of the paper. Museums try to combat this by installing expensive air conditioning systems to keep humidity within a very narrow range. However, those systems are costly and not always the most effective. My technique helps maintain the paper smooth and visually appealing across a broader range of humidity levels, reducing or eliminating those distortions.

And how does the technique work?

The concept is relatively simple. It involves mounting the paper onto a piece of linen that has been tightly stretched over a wooden frame, just like a painter’s canvas. We often use linen because it offers the best results in terms of performance and durability, although other cellulose-based fabrics can also be employed with success. The paper is adhered to the fabric using a combination of strong and weak adhesive joints. The outer perimeter of the artwork is firmly bonded to the linen. At the same time, the rest of the surface — the central area, which in practice includes nearly the entire surface except the borders — is attached with a weaker, reversible adhesive. The exact extent of this soft joint varies

— Nahir Fuente

according to the characteristics of the specific artwork. This setup enables the paper to expand and contract naturally in response to changes in humidity, without warping or buckling. The method draws on East Asian conservation traditions. Still, we have reimagined it with a creative twist and the use of modern materials, particularly a synthetic adhesive that retains its grip at room temperature, offering both stability and reversibility.

What were some of the real-world tests or applications of this method?

There have been three major unexpected tests. The first one involved 19th-century maps stored in a penthouse that flooded during a heavy storm. Surprisingly, they remained in excellent condition. The second test involved early 20th-century cinema posters that had been stored for five years in poor conditions, more particularly in a furniture warehouse without climate control. When I went to inspect them, I was surprised to find they were still in excellent condition. The third and most dramatic test came during the 2024 Dana floods in Valencia. The very same posters were stored in a building that flooded with up to 80 centimetres of water and they remained submerged in that environment for ten days. Three weeks later, when we were finally able to examine them, the lower sections, which had been submerged, were damaged and covered in mud. However, the upper portions, which had been exposed to extremely high humidity, were completely intact and perfectly flat. In all three cases, the technique not only worked, but it exceeded expectations of real-world, high-risk scenarios.

How did your involvement with GREENART begin?

When GREENART was announced, I applied on behalf of my university, proposing a system that could significantly reduce the need for strict climate control in exhibition spaces. The project provided us with the resources to study the technique rigorously — running tests, developing mock-ups and confirming that it worked across various settings. It has validated the technique to such an extent that we can now disseminate it through workshops and publications. GREENART has funded most of the research work, including staff time, materials and logistical support. All this help has allowed us to refine and document the technique. We are now starting the dissemination, as with the lecture in Paris where we presented the method for the first time and an upcoming hands-on workshop in Athens. The support we received in Paris was particularly meaningful, not least because the Centre Pompidou expressed interest in the technique. Beyond presenting the technique to the world, it is essential to ensure a genuine understanding and practical competence. GREENART has been instrumental in supporting this educational mission, helping us to emphasise teaching through small-group workshops where practitioners can engage with the method. Hands-on experience is essential; the technique must be "felt", tested and practised.

What advantages does your technique have over more traditional methods?

It increases the relative humidity range within which paper remains flat by 10 to 20%. That is quite significant. Paper treated this way recovers its shape more quickly after humidity fluctuations. Traditional methods often leave the paper somewhat deformed after exposure to high moisture, but ours allows it to bounce back to its original shape. Additionally, it is far more affordable and environmentally friendly than building sealed microclimate display cases. It is also a low-cost, low-tech, high-efficiency technique. Unlike traditional solutions that rely on climate-controlled vitrines or air conditioning systems, both of which require ongoing maintenance and significant energy consumption, this approach avoids high expenses. Beyond that, moving a large framed paper piece mounted in a vitrine can involve specialised equipment and logistics. But works treated with this technique remain light, manageable and easy to transport. Lastly, the method uses basic and natural materials: linen, wood and starch, paired with a small amount of synthetic adhesive. Its elegance lies in its simplicity: no machinery, no sensors, no need for advanced infrastructure. This makes it especially well-suited to institutions with limited resources and regions where consistent climate control is neither feasible nor sustainable.

How does it affect the artistic integrity of the piece?

Artistically, the paper looks smoother and flatter. That might be a concern if the artist intended a more textured surface; however, the technique does not need to be applied in this case. We are also altering the original nature of paper by supplementing it with other materials. But from a conservation standpoint, most systems alter the original nature of the paper in some way. Conservation is not about freezing an artwork in time but about ensuring it remains accessible and meaningful for future generations. In that sense, change is not a failure of conservation; it is in its nature when done with care and intention. The technique alters the piece in a minimal and respectful way and this is fully reversible. The adhesive used in the central area is designed to leave no visible trace, even under magnification. It is like a Post-it note — strong enough to hold, yet easily removed without damaging the underlying material. And if, in 100 years, conservators develop a more efficient technique, then this method allows them to start again. That is the ethical cornerstone of modern conservation: do what works best today, but leaving the door open for the future.

Salvador Muñoz Viñas

Courtesy Salvador Muñoz Viñas. Polytechnic University of Valencia


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Testing the technique on mock ups

Courtesy Polytechnic University of Valencia

You previously mentioned Japanese inspiration…

Japanese paper conservation is incredibly sophisticated. They use handmade paper with unique fibre structures that can be manipulated while wet, which Western papers cannot handle. They mount and dry papers on special lattices called *karibari*. My approach replaces the costly and complex system with a tensioned linen canvas, achieving a similar effect using a more straightforward and more accessible setup. The key is the interaction between the paper and the canvas — their differing reactions to humidity help balance each other out.

Could this method be scaled up?

Technically, yes. But it is not a product you can just buy — it is a technique that requires training and experience. Once someone learns it, they can adapt it to local materials and needs. Intuition and tactile understanding come with practice. That is why workshops are vital. It is not for *virtuosos*; it is designed to be simple and accessible, even in countries with limited resources. In fact, I hope to take it to Asia or Latin America in the near future. Many regions in these areas face challenging climates, characterised by dramatic and frequent fluctuations in humidity levels. This method could provide an affordable and effective solution for institutions that may not have access to high-tech conservation infrastructure or those seeking to reduce spending on room climate control.

Is anyone currently using it in an institutional setting?

So far, just the institutions I have worked with: the University of Valencia-Estudi General, the Polytechnic University of Valencia and the Valencian Institute of Cinematography. Plus, I have also used it on works from several private collections. As we offer more training and publish our findings, I expect the technique to spread. It is an easy and eco-friendly solution that could benefit museums, collectors and conservators worldwide.

Courtesy Polytechnic University of Valencia

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