Plasticity, Plastics, Architecture. An Interview*

Niccolò Casas

Founder of Niccolò Casas Architecture / The Bartlett, UCL London)

niccolocasas@gmail.com

* Interview by Alice Iacobone, September-December 2024

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AI ALICE IACOBONE: Niccolò Casas, you are an Italian multidisciplinary architect, working at the intersection between several fields – from couture and fashion-tech to art and engineering, from design to data visualization, just to mention a few. Your work has been exhibited worldwide and has been realized in collaboration with a variety of remarkable companies and personalities, such as the fashion designer Iris Van Herpen, the fashion-tech designer Anouk Wipprecht, the multinational software and electronic corporations Intel and Autodesk, the 3D-printing companies Materialise and 3D Systems, the MIT research team. Could you tell us more about your practice and about the path that led you where you are today?

NC NICCOLÒ CASAS: I am an Italian architect and professor, principal and founder of Niccolò Casas Architecture, [1] and a PhD candidate at The Bartlett, UCL London. I lead a multidisciplinary practice dedicated to research and architecture, combining expertise across diverse fields to offer a unique vision of the discipline and profession. My career has been shaped by the interplay of design, ecology, and innovation, continually expanding the boundaries of architectural practice.

[1] https://www.niccolocasas.com/.

The early 2010s marked a significant turning point in my career, transitioning from local to global and from disciplinary to multidisciplinary. This transformative period was driven by three key developments: the rise

of social networks, the proliferation of high-speed internet, and the increasing accessibility of additive manufacturing technologies. These innovations opened unprecedented pathways for collaboration, enabling ideas and data to transcend geographic and disciplinary boundaries.

Global connectivity allowed me to engage with a diverse spectrum of thinkers and creators, regardless of their physical location. Simultaneously, the rapid integration of 3D printing technologies into various industries became a crucial medium for exploring interdisciplinary innovation.

Architects of my generation were uniquely positioned to embrace the additive manufacturing revolution. Having experimented with 3D printing as students and educators, we were already attuned to its potential. This foundation made us ideal collaborators in applying 3D printing to fields ranging from fashion and product design to art and medicine.

Not only did these interdisciplinary collaborations broaden the scope of my projects but they also reshaped my conceptual frameworks. They encouraged me to approach research and design through an integrative lens that bridges diverse scales, disciplines, and perspectives.

This evolution ultimately led to the development of my theoretical discourse, which examines the dynamics of context integration. This exploration forms the foundation of my PhD research at The Bartlett, [2] UCL, titled *Hypersection*. "Hypersection" is both a concept and a methodology that investigates how patterns, knowledge, and materialities can coexist and integrate without requiring adaptation or compromise, preserving their distinctiveness while creating new forms of synthesis.

[2] https://www.ucl.ac.uk/bartlett/.

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AI Beside your architectural and professional practice, you are also an academic scholar. Do theory and practice interact, in your work, or do they proceed in parallel without really influencing each other? To say it otherwise, is the relation between theoretical and artistic research happening in the form of a transformative dialogue or rather as a juxtaposition? Could you tell us more about your doctoral research and the ways in which it interacts (or not) with your activities as an architect?

NC My PhD focuses on a specific type of transition that I define as *hypersection*. Broadly speaking, a transition refers to the process through which a context—in space, time, or meaning—shifts into a new one. In architectural terms, this can be understood as the movement from one space—with a defined program, aesthetic, and materiality—to another, with the threshold or medium acting as the interface between the two contexts.

I propose three primary modes through which such transitions occur:

1. Continuous transitions: In these, two spaces or contexts are interconnected and dependent, with the transition occurring through a gradual transformation. Zaha Hadid's architectures exemplify this, showcasing fluidity and continuity.
2. Discontinuous transitions: These involve unrelated spaces or contexts, resulting in a radical and abrupt shift. Anish Kapoor's works, which often juxtapose stark contrasts between interior and exterior, provide a pertinent example.

3. Combinative transitions, which I define as *hypersections*: Here, spaces or contexts are interconnected yet retain their independence. A compelling illustration is the window, a unique space of coexistence, where "inside" and "outside" exist simultaneously while remaining distinct, independent, and different.

To address your question, the concept of hypersection transcends the discipline of architecture and finds particular relevance in communication, where it can be envisioned as a form of dialogue rooted in juxtaposition rather than compromise.

Conventional methods of communication often require adaptation or mediation between differing viewpoints, but this approach is not always conducive to innovation. In my collaborative work, I endeavor to apply a method where diverse perspectives coexist without compromise, fostering outcomes that surpass the limitations of individual viewpoints.

This iterative process—where my multidisciplinary experiences inform my PhD research, which in turn shapes my approach to collaboration—continues to influence both my theoretical framework and professional practice.

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AI Let us focus on *Plasticity*, the installation that you presented at the 2021 Biennale of Architecture in Venice [FIG. 1, FIG. 2]. Realized in collaboration with 3D-printing company Nagami and with environmental organization Parley for the Oceans, the installation is realized with recycled marine plastic litter. Can you tell us more on the initial ideas behind this work and on its cross-sectoral implementation?

NC When Alessandro Melis [3] invited me to present an installation for the 17th Biennale of Architecture, I found myself deeply immersed in two profoundly interrelated texts: Greta Thunberg's *Our House Is on Fire* [4] and Timothy Morton's *Dark Ecology*. [5] These works continue to exert a significant influence on my thinking, shaping both my practical and theoretical endeavors.

In her 2018 TED Talk [6] Greta Thunberg, in response to critics questioning her decision to leave school, says: «Why should I be studying for a future that soon will be no more, when no one is doing anything to save that future?». Her words forced me to confront the urgency of the ecological crisis and its implications for creative practice. For the first time in history, humanity cannot take the future for granted—not due to divine will but as a direct consequence of our collective actions. Since the advent of modern science, no generation has faced the potential

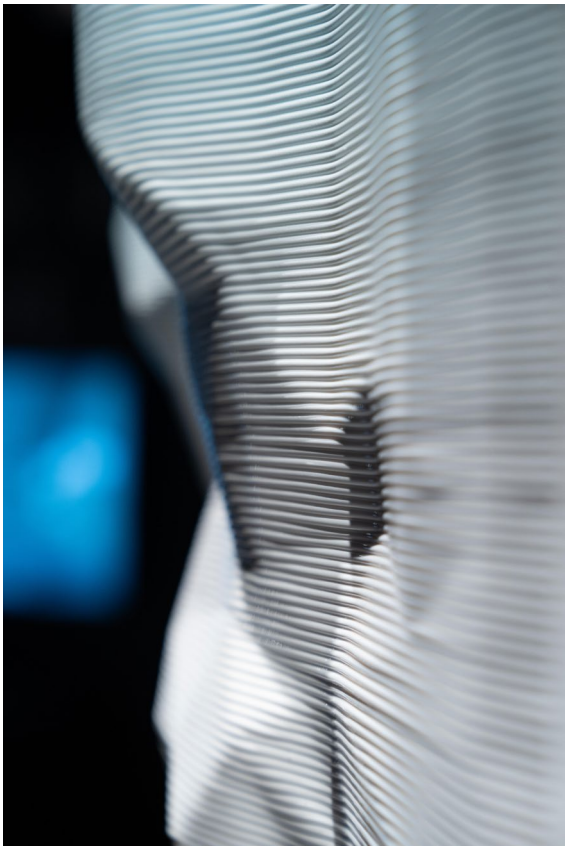
[3] Italian architect Alessandro Melis founded Heliopolis 21, a multi-awarded architecture practice based in Italy, Germany, and the UK. He was the curator of the Italian National Pavilion at the 17th Venice Biennale. He is also currently a professor of architecture and the inaugural endowed chair of the New York Institute of Technology.

[4] Ernman, M. & Thunberg, G. & Ernman B. & Thunberg S. (2020). *Our House Is on Fire: Scenes of a Family and a Planet in Crisis*. Penguin Books.

[5] Morton, T.B. (2016). *Dark Ecology: For a Logic of Future Coexistence*. New York: Columbia University Press.

[6] Thunberg, G. (2018). The disarming case to act right now on climate change. *TED: Ideas Worth Spreading*. https://www.ted.com/talks/greta_thunberg_the_disarming_case_to_act_right_now_on_climate_change?subtitle=en&geo=it.

[FIG. 1] Plasticity (detail) Niccolò Casas, Parley for the Oceans, and Nagami, 17th Biennale of Architecture, Venice, 2021
Photo: Tommaso Biondo



[FIG. 2] Plasticity (detail) Niccolò Casas, Parley for the Oceans, and Nagami, 17th Biennale of Architecture, Venice, 2021
Photo: Tommaso Biondo

extinction of civilization in the way ours does today. This realization led me to conclude that no work or research can hold genuine meaning unless it begins with sustainability as a fundamental premise.

Morton's *Dark Ecology* offers a complementary and equally provocative perspective. His concept of "dark coexistence" invites us to embrace the strange, entangled relationships between the human and the non-human. Morton writes: «Sense must coexist with nonsense, its shadow. A thing is shadowed by another thing because it's shadowed by itself. Recursion points to coexistence in a nonholistic, not-all (which is to say *ecological*) possibility space» (2016, 91).

This poetic articulation illuminates a profound ecological truth: the recognition that humans are irrevocably enmeshed with non-human entities, ranging from the bacteria within our bodies to the toxic materials we create. Morton suggests that creativity lies not in rejecting or erasing these "dark" realities but in reimagining coexistence. He challenges us to perceive beauty within the shadowy, paradoxical interplay of oppositional forces and to transform toxicity into sustainability.

This intellectual convergence became the foundation for *Plasticity*, my installation for the Biennale. *Plasticity* emerged from two intertwined realizations: first, that we must coexist with the plastics we have produced and continue to produce; and second, that it is vital to create symbols of hope for future generations.

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AI The description of *Plasticity* on your website tells us that the installation is made from «Parley Ocean Plastic®, a catalyst material created from upcycled marine plastic waste» [FIG. 3]. In this sense, the plasticity of your *Plasticity* refers first and foremost to plastics. Plastics are at once an incredible opportunity and a threat to the health of the planet. You also mention that *Plasticity* could be seen as «the syncretism of plastic and sustainability». What are your thoughts on this Janus-faced material? How do you see plastics and architecture interact, given the complexity of this material that is "good" and "bad" at once? Do recycling and upcycling stabilize once and for all this constant shift in meaning, immobilizing such an oscillation on the good side and therefore redeeming plastics for good, or is the oscillation here to stay?

NC Cyrill Gutsch [7] founded Parley for the Oceans [8] in 2012 – a global environmental organization and network that unites creators, thinkers, and leaders to take action for the oceans. His mission was to highlight the beauty and fragility of marine ecosystems while collaborating on projects to halt their destruction. Gutsch envisioned transforming plastics into products that could serve as powerful symbols of hope. In a famous Adidas campaign, *Impossible is Nothing*, Gutsch declared: «I want plastics to be gone». [9]

However, as Timothy Morton reminds us, we cannot simply make plastics "be gone",

[7] Cyrill Gutsch is a German-born designer and brand developer based in New York. After working as a designer for companies including Lufthansa, BMW, and Adidas, a 2012 meeting with Paul Watson prompted Gutsch to found Parley for the Oceans.

[8] https://parley.tv.

[9] https://www.ispot.tv/ad/OqPe/adidas-impossible-is-nothing-cyrill-gutsch-song-by-emily-wells.

[FIG. 3] Plasticity (detail) Niccolò Casas, Parley for the Oceans, and Nagami, 17th Biennale of Architecture, Venice, 2021
Photo: Niccolò Casas

we are entangled with them. Plastics persist – they reappear in strange and insidious ways, such as microplastics in the water we drink and the food we consume. Morton warns: «We entail one another and are not one another. Plants, specters, and hallucinations return more vividly when you try to prune them» (2016, 91). In other words, the toxic cannot be erased; it is entangled with us, continually shaping and reshaping our ecological reality.

This unavoidable entanglement underscores the paradox of plastics: there is no such thing as "away" on our planet. Plastics endure, taking between 20 and 500 years to decompose depending on their composition. The oceans, which produce more than half of the world's oxygen and absorb fifty times more carbon dioxide than our atmosphere, are choked by these Janus-faced materials.

Morton offers a provocative perspective: «Let's put these structures in the middle of every town square in the land. One day there will be pilgrimages to them and circumambulations. A whole spirituality of care will arise around them» (2016, 161). Similarly, Cyrill Gutsch's ethos aligns with this idea – bringing plastic waste into plain sight as a way to transform its narrative and cultural significance.

Plasticity is an architectural embodiment of this philosophy. It transforms a toxic substance into an ecological and symbolic initiative that transcends its physicality. *Plasticity* begins by supporting efforts to intercept plastics from rivers, mangroves, and coastal areas – 200 kilograms of plastic waste, primarily from bottles and fishing nets. It educates audiences about the environmental damage caused by toxic substances, fosters communities that care for our oceans and planet, and demonstrates the potential of novel fabrication technologies.

At its core, *Plasticity* embodies the coexistence central to my concept of *hypersection* and Morton's *dark ecology*. Plastics, as you describe, are a Janus-faced material: simultaneously a problem and an opportunity. *Plasticity* encapsulates this duality, existing as both a symbol of unsustainability and sustainability – a syncretism. It challenges us to rethink the boundaries between these opposites, showing that their coexistence can generate new possibilities rather than erasure.

5

AI *Plasticity* was displayed in the context of the 2021 Biennale of Architecture in Venice, a unique place where *urbanscape* and *waterscape* cannot be disentangled from one another. Does this architectural work of yours interact with this complex city? If so, in which ways? Would it be possible to consider it *site-specific*? And, are there any possible ties between the architecture in Venice and your architecture *Plasticity*?

AI Plasticity can be seen as a metaphor for Venice, a city whose beauty emerges from the coexistence and tension between nature and human intervention. These forces exist together yet remain somehow independent, encapsulating the paradoxical relationship that defines the city's identity.

Formally, *Plasticity* draws from two oppositional lexicons: an organic one, evocative of natural, free-form structures, and a linear, geometric one. This duality serves as a metaphor for the interplay between humanity and nature. Importantly, there is no compromise between these elements; instead, they coexist in their pure forms, neither altering nor subsuming the other.

In designing *Plasticity*, I sought to create a work that embodies the aesthetic principles of my concept of *hypersection*. Using boolean operations, I achieved a seamless continuity between the two distinct patterns. The boundary between them becomes a point of continuous transition, enabling aesthetic and conceptual information to flow between the two lexicons while maintaining their independence and distinction.

Materially, *Plasticity* critiques the unbalanced relationship between humankind and its environment. At least 5.25 trillion pieces of plastic currently float in the oceans, wreaking havoc on marine ecosystems, contributing to climate change, and ultimately affecting human health. This interconnectedness underscores the necessity of control over plastics, envisioning them as active, integrated parts of our cities rather than pollutants in our waters.

The idea of integrated distinction – where neither the linear nor the organic submits or adapts to the other – serves as a metaphor for ecological coexistence. This makes *Plasticity* an ideal representation of Venice itself: a city that exists only in the delicate balance between water and construction, where coexistence is both uncompromising and essential.

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AI Being printed out with 3D-printing techniques, *Plasticity* is both a material object and a digital file. From a theoretical point of view,

there are good reasons to associate plasticity and casting; 3D-printing, in turn, seems to function pretty much as casting in the post-digital era: it allows for artworks' reproduction, scalability, changes in material, and more. You often resort to 3D-printing in your work; what are your thoughts on this technique, from both a practical and a theoretical perspective? Do you see a connection with the plasticity of casting, translated in the post-digital scenario?

NC 3D printing processes are fundamentally continuous, operating through an additive method where material is deposited layer by layer. The versatility of additive manufacturing varies significantly depending on scale: at smaller scales, it offers higher definition and the possibility of removable support structures, while at larger scales, resolution decreases and the distinct layering becomes more visible. At these larger scales, support material is often impractical, meaning objects must be self-supporting – a constraint that aligns the process with traditional clay modeling, where structural integrity is essential during fabrication.

As you point out, I am particularly drawn to 3D printing for several reasons. First, it enables production on demand, making additive manufacturing a sustainable fabrication process aligned with environmentally conscious design principles. This adaptability makes it an ideal tool for both design research and artistic experimentation. Second, it facilitates the exploration of new sustainable materials, ranging from upcycled plastics to highly biodegradable substances like oyster shells, cork, olives, algae, and coffee-based materials. Finally, 3D printing embodies what I refer to as the *phygital* [10] quality of contemporary fabrication – a seamless hybrid of physical and digital realities.

A pivotal example of this emerged in March 2022 during the first Decentraland Metaverse Fashion Week, [11] when Brytehall Gallery invited me to create a *phygital* NFT collection titled *Crystalline*. This collection included a dress and bracelet designed to exist both as digital code and as physical objects, producible via 3D printing. The pieces were honed from bio-recycled resin, and collectors could purchase the NFT, a video animation of the dress created in collaboration with artist Franknitty3000, [12] and physical artifacts at varying scales: the bracelet, the 10-inch miniature of the dress, or the full 1/1 dress.

While the project required me to prepare distinct files tailored to the scale and technical specifications of different 3D printing machines, it highlighted a critical limitation of current additive manufacturing: its dependence on scale-specific adaptations. However, I foresee a future where advances in artificial intelligence eliminate this need for manual adjustments, enabling 3D printing to fully realize its *phygital* potential.

[10] Phygital, a combination of physical and digital worlds, is an emerging concept and a current trend in several industries. The term was initially coined by Chris Weil in 2007 to describe this integration from a holistic point of view. In order to bridge the physical and digital worlds, several technologies play a key role, including robotics, the Internet of Things (IoT), artificial intelligence (AI), and extended reality (XR).See the blog entry "What is phygital? Uncover its real meaning", *Vection Technologies Blog*. https://vection-technologies.com/blog/What-Is-Phygital-Uncover-Its-Real-Meaning/.

[11] See the blog entry "Tradition and innovation collide: Decentraland metaverse fashion week 2023", *Decentraland Blog*. https://decentraland.org/blog/announcements/tradition-and-innovation-collide-decentraland-metaverse-fashion-week-2023.

[12] Frank Nitty 3000 is a multi-faceted artist with a career spanning over ten years and three continents which saw him work as an art director in fashion, creative director in the advertising industry and as a music video director. Since the 2010s Frank has been a pioneer exploring the boundaries between digital art and otherwise commercial purpose imagery under the moniker "FrankNitty3000". https://www.franknitty3000.com/about.

Recent advances in AI have already begun to diminish the need for design adaptation in 3D printing. AI now enables the rapid translation of 2D images into 3D geometric shapes, which can be directly printed. This capability further dissolves the boundaries between physical and digital realms, allowing objects to exist almost simultaneously as digital designs and tangible artifacts. In this sense, additive manufacturing transcends its role as a mere fabrication technique, becoming a metaphor for the interconnectedness of our post-digital society, where distinctions between the virtual and material are continuously renegotiated.

7

AI Your work unfolds at the crossroads between different disciplines and artistic genres. For instance, you alternatively refer to your work *Plasticity* as an *installation*, as an instance of eco-innovative *architecture*, as a *sculpture*. Your engagement, as an architect, with fashion and design is also revelatory of this. Do you think that your ability in smoothly transitioning from, say, architecture to sculpture is due to an underlying, inherent plasticity at work in your practice? Do you have a "plastic approach" to the arts?

NC Architecture is fundamentally about transitions – between spaces, times, and meanings: here and there, before and after, this and that. These transitions shape the program, aesthetics and materiality, of an architectural project. If we replace "space" with "discipline", the same types of transitions apply: continuous, discontinuous, and combinative.My work transitions between disciplines through deliberate, non-mediated coexistence. Rather than merging disciplines into a compromise, I aim to force their distinct perspectives to coexist and even conflict. This tension generates dialogues and insights that would not emerge otherwise. In my teaching and practice, I cultivate this approach by creating conditions where diverse knowledge and backgrounds interact without mediation.Such a method contrasts with how collaborations are often rooted in compromise, where differing perspectives adapt and bend toward one another to form a shared informational pattern. However, I believe in the potential of non-mediated transitions, where adaptation isn't required. This perspective can lead to innovation by allowing each discipline to retain its distinct identity while engaging with others.Take, for example, my collaboration with haute couture designer Iris Van Herpen on the Magnetic Motion dress [FIG. 4]. Is it a dress? Not entirely – it's rigid and doesn't adapt to bodily movements. Is it architecture? Not in a conventional sense. The dress eludes established definitions, carving out a new, undefined space that transcends traditional categories. It represents the creation of objects that generate new fields or artistic genres by existing in a state of indeterminacy.

Such objects resist precise definitions – they are intentionally ambiguous. This is why I describe my Biennale project *Plasticity* variously as an installation, an instance of eco-innovative architecture, or a sculpture. It doesn't conform to predefined functions or aesthetics; instead, it challenges expectations, creating something open and full of potential. In this sense, it's "plastic".

8

AI In presenting *Plasticity*, you provide a definition. You say: «*Plasticity* intends to highlight the notions of transformation and conversion. The term refers to the scientific property of a material to deform by undergoing permanent changes and acquiring new forms and properties. In architecture, as in art, it is the quality of a work to freely articulate in space. Therefore, *Plasticity* could be interpreted as the capability of a material to transform itself by acquiring new spacial characteristics and dimensions through a process of identity redefinition». In this sense, plasticity, as a concept, is equated to permanent transformation. Is this transformation, in your work and in your view, necessarily a transformation that goes for the best? Have you ever explored negative plasticity, the possibility of this «process of identity redefinition» to take on a disruptive connotation – to "go for the worst"?

NC This is truly one of the best questions I've ever received, and I'm delighted to answer it.

In my theoretical approach, adaptation and bending could indeed be considered forms of "going for the worst". My interest lies in hypersection and in hypersecting objects – objects that emerge from non-mediated collaborations. These objects, as I've explained above, are undefined and resist classification, existing instead in a state of openness.

When these objects are required to adapt to a specific field, they become less compelling to me; they fall into pre-existing definitions. This loss of ambiguity and adaptability diminishes their potential for generating new insights and dialogues.

For example, take my third collaboration with Van Herpen: the *Hacking Infinity* dress [FIG. 5]. To imbue a rigid 3D-printed material with dynamic properties, we invented a knitting system reminiscent of old medieval coats of mail. This ecosystem, made of 6556 intricately intertwined parts, gave the dress a unique kind of flexibility—remaining physically rigid while moving harmoniously with the body.

While this solution was successful and elegant, the dress begins to look more like a conventional dress compared to the *Magnetic Motion* dress I discussed earlier. It starts to fit within a field, a definition. From the perspective of hypersection, it becomes less interesting because it is the result of mediated transitions.

What you call "negative plasticity" could be understood as its adaptation to a specific purpose or a defined field. Such adaptation reduces the openness of the object, restricting its potential for permanent transformation.

9

AI To conclude, let us circle back to a more general topic. Among the arts, architecture is the one whose social role is most immediate to grasp. You say that «to have a true impact on the redefinition of future inhabitation, architecture must reinvent itself as a new discipline focusing on the construction of collaborative environments». Could you please elaborate on this? What do you think about the future of architecture in

[FIG. 4] Magnetic Motion Dress Niccolò Casas and Iris van Herpen, Magnetic Motion dress, Iris van Herpen Magnetic Motion collection, Spring/Summer 2015 Ready-to-Wear, Paris Fashion Week, Paris, September 2014Photo: Team Peter Stigter

[FIG. 5] Hacking Infinity Dress Niccolò Casas and Iris van Herpen, Hacking Infinity dress, Iris van Herpen Hacking Infinity collection, Fall/Winter 2015–16 Ready-to-Wear, Paris Fashion Week, Paris, March 2015Photo: Niccolò Casas

relation to the inhabitation of the future? What could be the social and political role of architecture in the face of the widespread housing crisis that we are witnessing at different rates and in different ways across the global North and South?

NC As a visiting professor at RISD (Rhode Island School of Design), I co-directed the BodyScapes program alongside Catherine Andreozzi and Ludovico Lombardi (Zaha Hadid Architects), bringing together students from the Digital + Media, Architecture, and Apparel departments. The program created a collaborative environment where diverse backgrounds and experiences converged, challenging preconceived notions and uncovering unexpected visions.I believe architecture should function in a similar way, fostering multidisciplinary dialogues that explore new forms of dwelling and inhabitation.Architecture must shift its focus from the building itself to the broader concept of how we inhabit spaces. As architects, we are uniquely positioned to mediate between diverse perspectives – balancing the often-divergent needs of stakeholders such as clients, contractors, engineers, local communities, and municipalities. This expertise in orchestrating complex dialogues should not only drive building innovation but also inspire a deeper exploration of how we live. By rethinking fundamental aspects of life – how we eat, move, dress, communicate, and work – architecture can redefine its role in shaping sustainable futures. Sometimes, the solution isn't warming the building but rather equipping the individual with adaptive technologies, such as wearable warming devices. Similarly, traditional laundries may become unnecessary if buildings offer ecological drying rooms that minimize energy consumption and environmental impact.

Architecture should adopt perspectives from other disciplines and, in turn, challenge those disciplines to evolve. It must become a discipline that constructs not just buildings, but the conditions for cohabitation and collaboration – particularly in an era of drastic climate change, where urgent adaptation is essential.

Action, coexistence, innovation, and openness lie at the heart of my vision for the future of architecture.