

Stretching Practices

Clemens Winkler

I. MEANDERING BETWEEN IMPLICIT AND COMPLICIT WAYS OF EXHIBITING

How can exhibition-making respond to an increasingly volatile present in which environmental exposure and collective vulnerability become unavoidable conditions of experience? In the *Stretching Materialities* exhibition at Tieranatomisches Theater (TA T), our research group Object Space Agency approached this question through a set of experimental practices that reframed the exhibition space as a porous medium—open to atmospheric conditions, to shifting proximities, and to the collaborative negotiation of density, materiality, and presence.

By treating the historical site not as a neutral container but as common ground entangled with environmental, technological, and social processes, we proposed new modes of spatial and epistemic cohabitation. Informed by current debates in feminist environmental humanities and posthumanist theory, we adopted the concept of weathering not merely as a metaphor but as a guiding curatorial ethos: to think with the layered exposures, durational stresses, and situated responses that constitute our ecological and institutional realities. As Christoph Holzhey and Arnd Wedemeyer have noted, »to insist that environmental damage is not looming past a future horizon but is already being weathered—and unevenly, unjustly so—means to forgo patent illusions of sustainability or resilience« (Holzhey & Wedemeyer 2020, 16). Within this framework, weathering becomes a mode of attending to what is already ongoing, sedimented, and yet materially transformative. → [Stretching Virtuality, 92](#) → [Stretching Spaces, 157](#) → [Stretching Time, 215](#)

Our approach thus oscillated between what we might call implicit and complicit modes of exhibiting. Implicit, in the sense that spatial arrangements, environmental forces, and material agencies were not always rendered explicitly visible, instead we activated them sensorially and affectively. Complicit, because our curatorial gestures acknowledged the entanglement of human and non-human forces, accepting our implication in the very ecologies we were seeking to observe, stage, or unsettle.

In this context, the twin themes of new proximities and new densities emerged as methodological anchors: proximity not only as spatial vicinity but as a practice of attunement and co-presence under the distancing constraints of the pandemic;

and density not as crowding but as the co-layering of temporalities, textures, and agencies in shared environments. The spatial and affective textures of TA T were thus not simply staged but stretched—through material translations, ambient interactions, and speculative mappings that foregrounded the manifold ways in which a space can weather.

*Exhibition Space as Common Ground*¹—Over the course of ten months, TA T became more than a site; it became a shared medium of research, negotiation, and transformation. Entrusted with this neoclassical structure, we, the seven members of the research group Object Space Agency, asked ourselves: what would it mean to stretch our practices together, in and with this historically layered space? Amid the constraints of the COVID-19 pandemic, we explored modes of proximity that resisted isolation, finding ways to be present with and for one another through situated practices. Site-specific readings, collective listening, and sensorial mappings provided entry points into the architectural and atmospheric dynamics of the building. → [Stretching Virtuality, 93](#) Our discussions spiraled from the rotunda—the former anatomical theater turned climatic and conceptual center—towards questions of temporality, material feedback, and virtual extension. → [Stretching Senses, 317](#)



¹ As we immersed ourselves in the evolving dynamics of the exhibition space, we began to rethink our own roles within it—not simply as curators or researchers but as part of an experimental setup in which agency was shared, distributed, and continually shifting. Our official research group name, Object Space Agency, soon began to morph through conversation. Drawing on the philosophical tone of our work, we started to refer to ourselves, half seriously, as a Space Agency for uncommon grounds—a nod to our interest in unsettled terrain, both literal and conceptual.



Fig. 1: First experimental setup in the renovated TA T and inspection of its surroundings 16.02.2021

Through a series of experiments—ranging from tactile VR installations to large-scale airflow interventions with local materials—we began to trace how spatial experience, bodily perception, and ecological awareness could converge in an exhibition context. These embodied investigations not only shaped our understanding of *new proximities* and *new densities* but also informed the curatorial strategies that unfolded throughout the exhibition.

² Neimanis and Loewen Walker extend the New Materialist lens through the concept of »insurgent vulnerabilities,« proposing the notion of »thick time«—a nonchronological, durational temporality that foregrounds entanglement beyond the nature-culture divide. Their use of »weathering« signals a radical reorientation to global climate change, emphasizing shared immersion and implication in climate conditions: »We recognize our own implications in the climate conditions around us, thick with co-labored temporalities that we are also making possible.« (Neimanis & Loewen Walker 2014, 569)

Material Translation—At TA T, our curatorial approach turned toward the spatial textures and invisible dynamics of the building itself. Rather than treating architecture as static, we engaged in a form of real-time translation—reading walls like porous texts and tracing their mineral or microbial inscriptions. These translations made latent qualities perceptible: the building as a living archive, weathered and reactive, a habitat rather than a container (fig. 1).

This shift prompted us to ask: what will become visible through such translations—and how do they alter the space's role as an exhibition medium? Our investigations probed the boundaries between control and responsiveness, activation and passivity. In place of traditional displays, we experimented with environmental triggers—temperature, humidity, airflow—that could evoke new forms of intimacy, even in the distancing reality of the pandemic. What if social distancing could be retranslated into a sensory closeness—through remote touch, breath, or ambient participation?

Intra-Weathering—Central to this process was Karen Barad's notion of intra-action (Barad 2007), which challenges the view of discrete entities interacting from a distance. Instead, things—including bodies, atmospheres, and ideas—emerge through their entanglement. In our exhibition practice, this entanglement took on a specifically atmospheric and weathered form. Building on Astrida Neimanis and Rachel Loewen Walkers concept of weathering, we began to perceive space not as a passive container but as a dynamic, co-constituted climate: shaped by breath, temperature, humidity, and affect (Neimanis & Loewen Walker 2014, 558). Curating became a practice of weathering-with—not just reacting to environmental conditions but sensing their inscriptions in material and temporal terms.²

This approach aligned with a broader shift in ecological thinking, one that resists both dystopian future projections and naive narratives of planetary healing. Recent thinkers such as Anna L. Tsing, Timothy Morton, and Donna Haraway have instead embraced the fractured temporalities of environmental ruination, focusing on the diminished but still generative conditions of life in the ruins. Morton's hyperobjects stretch and disorient time, evoking an uncanny attunement rather than speculative salvation (Morton 2013, 160). → [Stretching Senses, 309](#) Tsing's mushroom ethnographies, by contrast, cultivate curiosity

without futurist violence—attending to the aleatory entanglements of spores, soil, and gathering (Tsing 2015, 2–3). Haraway’s compost heap furthers this ethos, offering a model of sym-poietic cohabitation rooted in the thick, messy present (Haraway 2016, 31). Against the urge to narrate ecological futures, she urges us to »widen the present,« to stay with its tangles, traces, co-laborings, and trouble.

In this context, *Stretching Materialities* was not just an exhibition—it was an intra-active site of atmospheric speculation. Here, porous walls, breathing surfaces, and slow material degradation registered the entangled presence of bodies and climates. We did not exhibit weather as subject matter but allowed weathering itself to become a curatorial method: embracing the everyday ruinations, temporal loops, and shared vulnerabilities through which we co-constitute space and time. We weathered the exhibition as much as it weathered us. → [Stretching Time, 209](#)

Porosity—Despite its neoclassical grandeur, the building initially revealed itself to be a sealed-off structure—a restored, climate-controlled shell with a sanitized and carefully preserved interior. As we spent more time inside, sensing its temperature gradients, dusty corners, and material residues, a hidden porosity began to emerge. This quality of permeability—both literal and conceptual—proved to be a key to rethinking the space, not only as a site of containment but as one of exchange.

Porosity, in this sense, unfolded along multiple dimensions. On a physical level, it referred to how air, moisture, and microbial life subtly moved through boundaries—walls, vaults, and display cases—despite efforts to stabilize the building’s climate. These material insights resonated with emerging perspectives on the microecologies of the built environment, which advocate for architectural designs that cultivate, rather than sterilize, microbial diversity (Krüger 2017). From this point of view, architectural porosity becomes a condition for ecological health. → [Stretching Spaces, 160](#)

At the same time, we began to understand porosity as a metaphor: for institutional boundaries, disciplinary divisions, and social structures. The site-specific encounters—between human and non-human actors, between bodies and airflows—encouraged us to think relationally. We drew inspiration from ecological health research, which understands human well-being as entangled with environmental conditions. The concept of the exposome emphasizes how our bodies are shaped by lifelong exposure to air, particles, and chemicals (Wild 2005); the holo-biont frames humans as multispecies collectives, in constant

3 TA Tour App:
http://tieranatomisches-theater.de/ta_tour

symbiosis with microbial symbiotes (Margulis & Fester 1991); and architectural initiatives like the MIGI explore how built environments can support microbial richness and diversity (Robinson et al. 2021). These relational perspectives shifted how we designed the space. Rather than treating it as a static container for exhibition objects, we approached it as a living environment—open to atmospheric conditions, multispecies entanglements, and forms of public engagement that move across thresholds.

Porosity, as both material condition and metaphor, thus became a guide for spatial practices that embraced permeability over control, participation over prescription, and ecological interdependence over isolation.

The Laboratory—This shift toward permeability laid the groundwork for a more experimental spatial logic: the exhibition space gradually became a laboratory. Here, material interactions were explored through observational methods, performative elements, and situated experimentation. We opted for a physical exhibition format grounded in an open, porous, participatory research approach—one that echoed the building’s history as a site of scientific demonstration and theatrical staging.

The architecture of TA T, with its historically layered spaces—the laboratory on the ground floor and the lecture hall above—provided a generative setting. Central to this was the lifting table, originally used to transport anatomical specimens between floors, a functional element borrowed from theatrical set design. For *Stretching Materialities*, it became a platform for extending sensory, temporal, spatial, and symbolic perspectives.

Our curatorial strategies also extended into digital and atmospheric domains. The TA Tour app, developed during the pandemic as a freely accessible virtual experience, used 360° walk-in scenarios to translate the exhibition into a remote, yet immersive environment.³ Through this virtual interface, we located and made experientially accessible the building’s heating and electrical infrastructures—typically hidden systems that regulate indoor climates.

These interventions connected virtual environments with the inert materiality of indoor air, making the seemingly intangible perceptible. We further explored how external cloud formations—both real and simulated—could be linked conceptually and architecturally to indoor conditions. This did not aim to harmonize artistic and scientific modes of inquiry but rather, as

Elke Bippus suggests, to activate the aesthetic and sensory potentials for knowledge and research-based design (Bippus 2014). In this sense, *Stretching Materialities* became a stage where visitors became actors and actants, engaging with human and non-human materialities through hands-on experiments, immersive technologies, and situated reflection.

Other-than-human—Within this evolving laboratory of atmospheres, microbes and other-than-human actors emerged as central agents. The exhibition highlighted the microbial shaping of material surfaces, unsettling conventional notions of interiority, control, and cleanliness. Karen Barad’s concept of »queer performativity« (Barad 2011) inspired us to investigate and experiment with dust, biofilms, and microbial samples—challenging dominant narratives around hygiene and object integrity.

We deliberately included infrastructural zones such as the heating and electricity control rooms in our spatial mappings, examining how machinic systems co-evolved with biological processes like dust accumulation or spore dispersal. In this way, new technological approaches—such as the VR environments in TA Tour—stood alongside close, embodied observations of ordinary phenomena: spider webs in windows, moss growth, dead insects. These became entry points for a reassessment of human agency. → [Stretching Spaces, 173](#)

Nietzsche’s notion of truth from the perspective of a mosquito (Nietzsche 1873), Uexküll’s studies on the tick (Uexküll 1934), Guattari’s ecological thinking (Guattari 1989), and DeLanda’s assemblage theory (DeLanda 2006) shaped our reflections on distributed agency and situated perception. What was particularly striking was that we posed these questions in the »empty space« of TA T itself—a place of resonance, echo, and spectral presence that implicitly shaped our inquiry.

We extended our exploration beyond the interior. TA T’s biodegradable façade materials, nearby green spaces, and the Kleine Panke river formed part of our research terrain. We studied lichens as climate-sensitive indicators of air quality, and observed how exterior states of decomposition, adaptation, and liveliness seeped into the exhibition—transforming it into a porous, inhabited field (fig. 2).

This methodological openness also reframed curatorial roles. Rather than fixed positions of authority, curators, artists, scientists, and visitors became entangled participants in an



Fig. 2: Lichen collection with symbiotic basic types—fruticose, foliose, crustose—alongside weathered stones and bark from around TA T

unfolding inquiry—situated among weathering surfaces, microbial traces, and atmospheric agencies.

Boundaries Between Inside and Outside—The walls functioned not just as physical boundaries but as active surfaces for experimentation—hosting microbial life, material weathering, and air quality data. Rather than enclosing, their porosity turned them into thresholds that facilitated exchange. By integrating porous design, we embraced inclusivity, fluidity, and transformation. Porosity here is intimately linked to *leakage*, which challenges the fantasy of closure. → [Intermezzo 5, 344](#)

Unlike abrupt ruptures, leaks are gradual, subversive events that expose hidden spatial, material, and conceptual interconnections. They dissolve the divides between artworks, audience, and environment—allowing sound, light, movement, or meaning to seep through. As both failure and force, leakage transformed the exhibition into a liminal zone where disciplines and perspectives mingled. It resisted fixed narratives, foregrounding vulnerability and interdependence as curatorial strategies. Porosity thus emerged not only as a spatial property but as a mode of resistance and care.

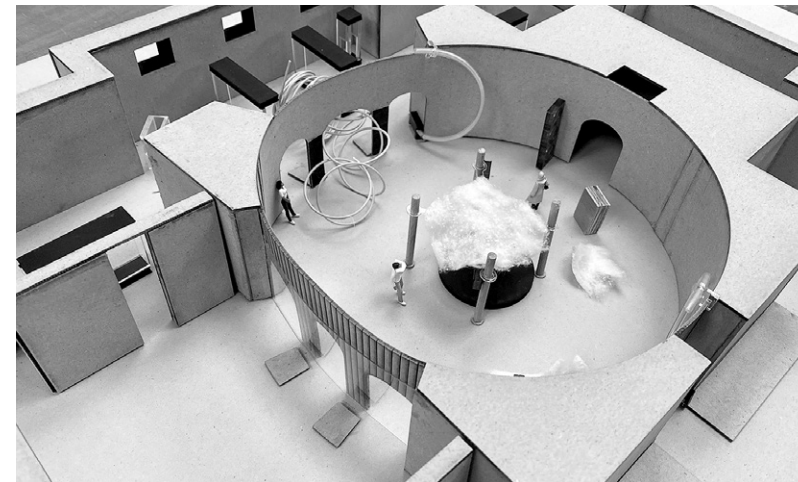


Fig. 3: Material model with early rattan designs, dust accumulations, cloud formation, and VR station at the rotunda’s former lifting table—high-lighting permeability of indoor exhibition space

At the exhibition’s core, the rotunda—site of the former lifting table—became a space for performative and participatory engagement (fig. 3). This architectural center revealed a micro-climatic phenomenon: thermal stratification and dust accumulation formed the »eye« of a subtle circular wind, five meters in diameter. Through participation and mediation, we sought to render this interplay of material, climate, and sensory experience perceptible.

In line with the concepts of intra-activity, contingency, porosity, and leakage, we explored techniques such as »bringing the outside in« and »allowing the inside to flow out« as methods which challenge traditional spatial dichotomies. Tracking the material activities of both the interior and exterior spaces—such as water, air, and energy consumption—redefined the boundaries of our exhibiting practice.



Fig. 4: Observations of TA T's water environment along the Kleine Panke river as basis for interior cloud formation, adjacent to the anatomical theater

Water—The visible water infrastructure at TA T inspired a reconsideration of the building's interior. Historical accounts place the Veterinary Anatomical Theater in a curated garden, once elevated above the Kleine Panke river. Erosion and sediment shifts have since made it the lowest point on campus—yet the building's interior remains affected by riverine moisture. How could we render this ongoing entanglement of water and architecture visible? → [Intermezzo 1, 62](#) → [Stretching Time, 221](#)

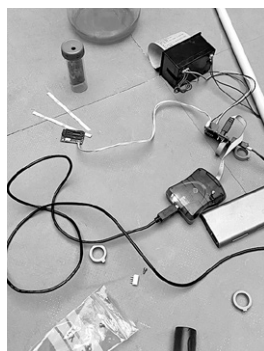
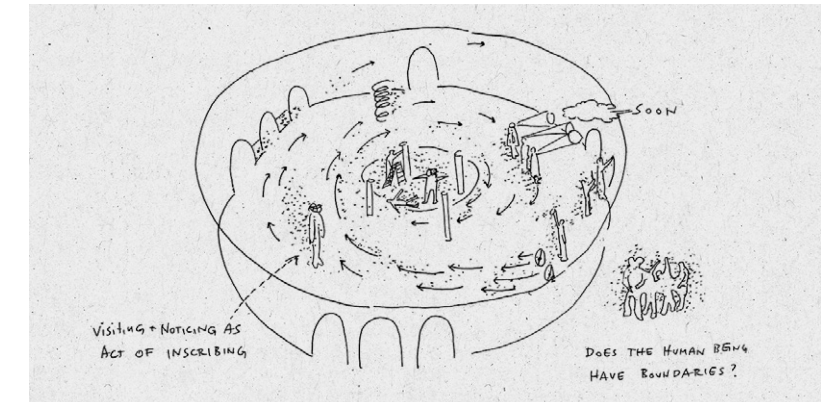


Fig. 5: Water filtration and measurements throughout the exhibition with Cluster member Dimitra Almpanti-Lekka

Drawing on ecological and probiotic approaches (Krüger 2017; Neimanis & Hamilton 2020; Hengge 2024), we studied precipitation patterns and sampled the Kleine Panke river. With Cluster member Dimitra Almpanti-Lekka, we measured humidity and temperature inside and around the exhibition. Water samples were tested for pH and minerals, then filtered for use in the space (fig. 4–5). From August 2021 to March 2022, this work made seasonal and climatic links increasingly perceptible. Diverting small amounts of river and rainwater indoors, we reintegrated the »outside« into the »watertight« architecture. Filtered water vapor formed an interior cloud, revealing human and non-human activity through droplet scaling, microbial movement, and air chemistry. As vapor spread, it became a carrier for microbial entities. Sulfur and carbon oxide reactions lowered the pH, prompting the appearance of soil bacteria and plant pathogens—direct consequences of indoor environmental conditions and human presence.

These processes were shared through walking tours and participatory formats. Protocol cards, field notes, and samples supported educational engagement around the cloud, the VR elevator, and other installations.

Air and Particulates—Introduced through breath, wind, and bodily presence—air became a central medium in shaping the exhibition (fig. 6). Drawing on Eva Horn's concept of air as an »enviroming medium« (Horn 2018), we explored its sensory, biological, and political dimensions. Air is not just a gas mixture—it is a dynamic, immersive force that connects bodies and environments. In *A Sense of Air*, Horn calls for an aesthesis of climate, emphasizing everyday perceptibility over dystopian abstraction.



Atmosphere, from *atmós* (vapor) and *sphaira* (sphere), holds a dual meaning: meteorological and emotional. This duality allows air to be both omnipresent and overlooked. The phrase »in the air« reflects this ambiguity—a carrier of moods, materials, and change. Lucretius's ancient observation of dust in a sunbeam led him to infer the activity of invisible atoms. Today, we continue to understand air as dense with life—dust composed of past bodies and environments (Lacey & West 2006). The exhibition extended this tradition, moving from historical dissection to a microbiological focus on clouds, air, and hygiene. Drawing from *meteorological medicine* (Horn 2022), we linked air to health, recalling miasma theories where disease traveled through contaminated air. Stagnant water, smells, dust, oils, exhalations—all were once seen as hazardous vectors. The exhibition revived this lens to explore air's entanglement with hygiene, ventilation, and exposure.

The pandemic reactivated this knowledge, casting air as both biological and social medium. Through airflow visualizations and breath tracking, we addressed contamination and

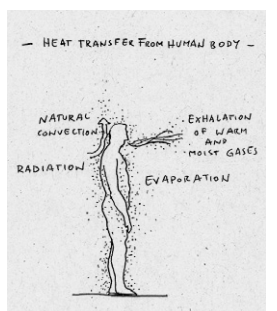


Fig. 6: Top: Diagrammatic drawing of the 13-meter wide central exhibition space with an experiential core, flanked by co-practices of imagination and mapping
Bottom: Diagram of human heat/sweat output and thermal movement; measuring interior climate as part of the weather

care. Following Tim Ingold, air isn't a container but a dynamic medium for locomotion, respiration, and perception (Ingold 2010). It shaped our being-in-the-world—and our exhibition.

This perspective becomes particularly relevant when considering practices within a novel proximity—situations in which the dynamics of vicinity and distance must be reconsidered in response to changing spatial, social, and ecological conditions. Bringing this further into epistemologies of designing practices in the exhibition, we examined how we experience air to become knowledgeable about our environment through it, and integrate sociality into our actions relating to it. We »perform« air through ventilation practices, and raised awareness of this constant exhausting of the atmosphere and breathing of air by building upon visualization techniques for air flow through Schlieren photography (Perraudin, Rešetar & Winkler 2021). With Tim Ingold, air—neither a static entity nor a part of a fixed network but a dynamic living hybrid, a medium that enables locomotion, respiration, and perception—became a vital element of our exhibition, a vital element of being-in-the-world, shaping both social and bodily experiences (Ingold 2010).

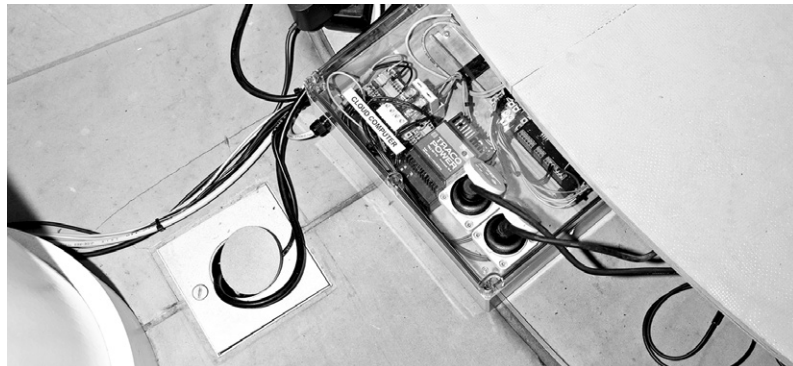


Fig. 7: *Cloud Computer* installed for daily climate control in the exhibition space—named after its aim to create ideal conditions for a physical indoor cloud

Energy Consumption—It should be noted that under today's technological conditions, it's nearly impossible to gain a full overview of the many material and energy cycles of an indoor space. However, it has been shown that new technological, »smart« solutions in society do not become more efficient by starting anew, but rather by building upon existing structures (referred to as »grey energy,« fig. 7). The integration of ecological and biological ways of thinking in other disciplines, which also recognize existing material resources and energy infrastructures as crucial, is increasingly evident in artistic practices.⁴

Through these intra-active practices with water, air, and energy, our research-led exhibition began with an awareness of using one's own resources and working conditions in the realization of set goals. → *Stretching Spaces*, 153 □ *Exhibition*, fig. 15, 137

⁴ Museums for Climate Action, <https://www.museumsforclimateaction.org/reimagine/exhibits/weathering-with-us>.

⁵ Together with Léa Perraudin, I have explored the relationality of care, control, and proximity and reflected between the discourses of the humanities and research through practice-led design in terms of their shared and contradictory modes of investigative world-making (Perraudin & Winkler 2023).

II. PRACTICES OF NEW PROXIMITY

Through our investigative curatorial process, we engaged with spatial boundaries not as fixed demarcations but as zones of permeability and entanglement—between the hidden, the inaccessible, and the reachable. This shift allowed us to activate, rather than control, the space through exhibition elements. In navigating proximity and distance, our own positioning within the space became central.

Stretching Practices explored environmental techniques at the intersection of microscopic and planetary processes—changes we influence both consciously and unconsciously. Using air, weather, and climate as entry points, we developed new perspectives on material phenomena through collecting, embodiment, and engaging with the environment at TA T.

On a methodological level, our aim was to understand exhibiting as a form of research—particularly in relation to active matter and the bridging of disciplinary boundaries. Amid urgent ecological and social crises, site-specific, relational, and practice-oriented approaches gain relevance. These approaches integrate situated knowledge and new technologies while attending to practices of care, repair, and healing—always in relation to material flows and eco-social responsibilities.⁵ Critical exhibition-making becomes a testing ground for the *what, how, where, and when* of these practices.

Rather than isolating disciplines, these new practices foster structural permeability. They do not seek singular, objectified outcomes but open-ended results. Central to this is the articulation of implicit knowledge, the organization of practice-based research, and the development of new modes of attitude, assertion, participation, and care.

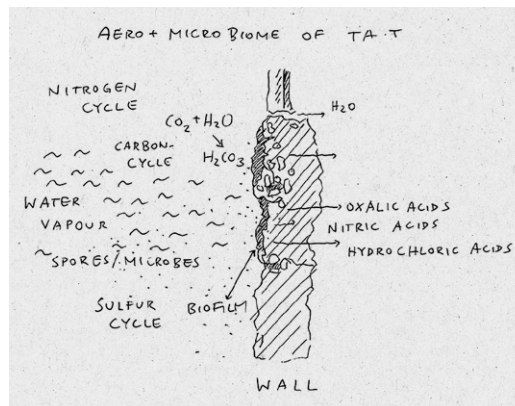
Control, Care, Climatic Intimacy—In our curatorial work, we consistently returned to the question of how to reframe our relationship with nature—not only through control over fragile or fleeting substances but through a practiced proximity. Climate, increasingly rendered abstract through data and graphs, becomes something external—reduced to measurements: PM2.5 and 10, ozone, nitrogen oxides. Pollution becomes a value; weather a statistic. Yet concepts like tipping points, miasmas, emissions, and metabolism are also bodily, site-specific, and felt. They can be experienced—especially when localized, embodied events



(such as changing weather or breathing discomfort) are staged. Our work thus moved between effective interventions and the sensory incomprehensibility of ecological change.

At TA T, we proposed a situated and embodied airy practice—a design of new proximities. Positioned between critical and practical approaches (Mareis, Renner & Greiner-Petter 2022), we embraced the atmospheric ambiguity of »something's in the air.« Air, which flows through and beyond bodies, invites speculation, anticipation, and attunement. It mediates both risk and care.

Fig. 8: Section sketch of the TA T façade—showing how renovation, conservation, and design coexist with ongoing biological, chemical, and mechanical weathering



Reconfiguring Cultural Techniques of Proximity—Air operates at the threshold of measurement and lived knowledge. In meteorological medicine, air was already considered both sensory and scientific (Horn 2022). In the Hippocratic tradition, health was understood as a balance (Eucrasia) of bodily fluids (humors) related to the four elements: air, water, earth, and fire. If one of these elements or its qualities, such as dryness, moisture, cold, or heat, was excessive in the body's environment, it would disrupt the internal balance. In his famous treatise on local climates, air, and water, Hippocrates emphasized the importance of understanding »the warm and cold winds, both those common in every land and those specific to a particular region«—at a time when climatology, meteorology, and astronomy were still intertwined (Horn 2022).

These historical insights resonate with modern climatology. While the IPCC (Intergovernmental Panel on Climate Change) defines climate as weather averaged over thirty years and across locations, weathering unfolds in specific places and times. As Astrida Neimanis writes, weather is an embodied, agentic force: it moves, scars, imprints (Neimanis 2020). In *Stretching Practices*, we engaged with these insights through embodied techniques—like breathing, meditation, and writing exercises—while

referencing the human body as a »barometer,« long attuned to atmospheric change before instruments existed.

From Indicators to Interventions—Our design approach opposed air-conditioning in favor of air *attuning*. This required reconsidering how air is sensed, materialized, and related to—reviving meteorological medicine and challenging the distancing logics of hygienic separation. Instead of abstract data, we used ecological indicators—moss, lichens, weathered stones, insect traces—as multisensory clues. These materials offered portals into the spatial critique of sustainability, resource cycles, and ecological cohabitation (fig. 8).

In architectural discourse, such shifts are mirrored by moves toward permeable structures and air-sensitive technologies (Gissen 2009). Air is no longer a passive backdrop but a dynamic, relational medium—one that mediates agency, risk, and connection (Horn 2022).

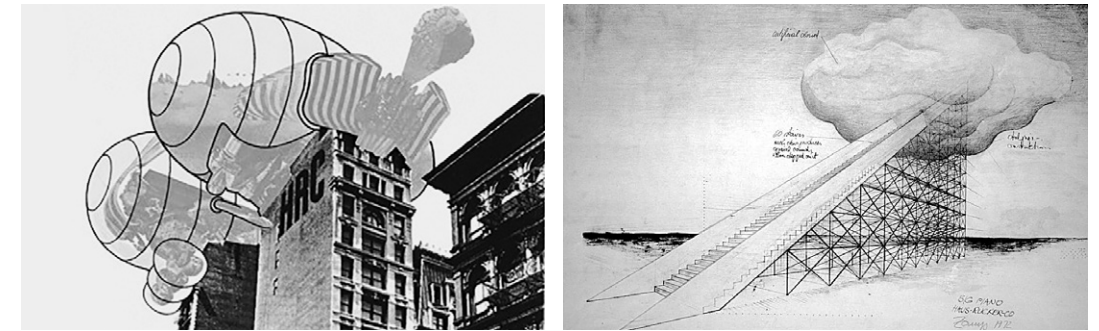


Fig. 9: Rooftop Garden and Big Piano, Haus Rucker & Co. 1972

Participatory practices at OSA included breathing exercises and scattering hygroscopic olivine basalt pebbles. These pebbles, while physically uncomfortable to walk on, reference planetary-scale geoengineering: enhanced weathering to bind CO₂. Such interventions tested the entanglement of bodily sensation, spatial design, and ecological speculation (Temple 2020).

Historical Echos—Human influence on atmospheric systems is entangled with long-standing political, scientific, and economic interests. Hans Haacke's Condensation Cube (1963–65) offered one of the earliest critiques of institutionalized control over air as a dynamic, self-regulating system (Jarzombek 2019). Around the same time, Haus-Rucker-Co's speculative collages, such as their *Oasis in the Urban Grid* project series (1972)—imagined inflatable, breathable environments suspended above urban rooftops (fig. 9)—called for spatial practices more attuned to the human body and environmental care.

These works resonate with our inquiry into New Proximities: how to live with, attune to, and co-sense ecological systems, not just represent or manage them.

III. MAPPING PRACTICES

Mapping—Observation and Technology

In our experimental exhibition, we used mapping and sampling techniques to capture airborne residues, examining their particulate and microbial presence in Petri dishes in relation to surrounding materialities, weather, and climate. We placed greater emphasis on biotic components, as microbial communities—linked to plants, animals, and humans—function like an extended genotype or *holobiont* (Margulis & Fester 1991) and play a critical role in ecological health.

From a multidimensional perspective, our research traced how airborne particles—biotic and abiotic dust, aerosols, and trace gases—mediate between atmospheric, ecological, and perceptual layers. Water vapor and trace gases shape dust formation, which in turn influences cloud droplets and atmospheric currents. These processes were made tangible in guided tours and participatory formats at TA T, where visitors encountered the air's materiality and its subtle yet persistent influence on spatial perception. Engaging with dust, spores, and volatile compounds brought us into dialogue with emerging aerobiological research, calling for a rethinking of air as a metabolic, interspecies medium of exchange and care (Winkler 2024).

We termed these practices *algorithmic weathering*, emphasizing how instruments, bodies, and their residues continuously introduce new particles and energies into the space, thereby co-producing the environmental conditions they measure. Collecting indoor and outdoor samples allowed us to trace »invisible« climatic processes and translate them into tangible artifacts. Here, mapping is not a passive act of observation but an active intervention—every sample, fingerprint, or microbial trace reconfigures the spatial atmosphere.

These practices of tracing and noticing, far from being passive observation, became techniques of inscription—modes of writing into and with the ongoing atmospheric changes—thereby transforming algorithmic weathering into a lived, co-generated process of *algorithmic weather*.

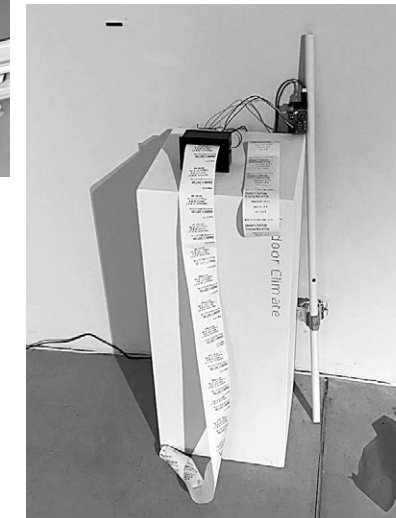
Computer-assisted methods and custom microcontrollers with environmental sensors made metabolic activity in the air



Fig. 10: Circuit board for monitoring indoor climate and gas compositions

Fig. 11: First measurement results and derivations for the showroom at TA T, June 2021

measurable (fig. 10). Alongside physical artifacts, we gathered data on what was volatile or persistent, decaying or preserved. Distributed sensors visualized shifts in humidity, temperature, and CO₂ triggered by visitors, making atmospheric change a co-produced phenomenon within the exhibition process (fig. 11).



Collecting in a Metabolic Archive—The integration of measurement technologies with dust, spatial climates, and natural residues is well-established in urban infrastructures. Our aim, however, was to explore this fusion as a site of sentiment and speculation—through a growing cloud installation, linked to measurement devices which floated as a living archive. These formations created a material-semiotic language of air and dust, evoking Sharon Macdonald's call for recognizing the epistemic potential of dust languages to constitute architectural spaces (Macdonald 2022).

We relied on recent technological infrastructures to understand the intertwined ecologies and climate dynamics embedded in spatial design. □ [Process, fig. 14, 276](#) Our space was intentionally shaped to reflect the intra-machinic genesis of environmental maintenance. Across scales—from microscopic imaging to satellite-based spectroscopies—we constructed a *metabolic archive*: a dynamic accumulation of residues—biotic, abiotic, anthropogenic—collected over time in settling dishes, environmental logs, visitor counts, humidity records, and sequencing data. This archive was not fixed; it evolved *in actu*, with each act of sensing, collecting, or documenting becoming part of the intra-active process of atmospheric transformation.

□ [Process, fig. 8, 272](#)



Building on our earlier understanding of intra-weathering, we treated airborne debris and residues not as mere contaminants but as generative traces of biological, meteorological, and anthropogenic processes (fig. 12). A pivotal exchange with Regine Hengge and Anna Gorbushina revealed the vibrant metabolic life of indoor air at TA T. Drawing on microgeology and aerobiology (Gorbushina 2008), they showed how even in a seemingly inert exhibition space, airborne particles—ruptured willow pollen, soot, skin particles, plant pathogens—spoke of distant geographies and entangled ecologies.

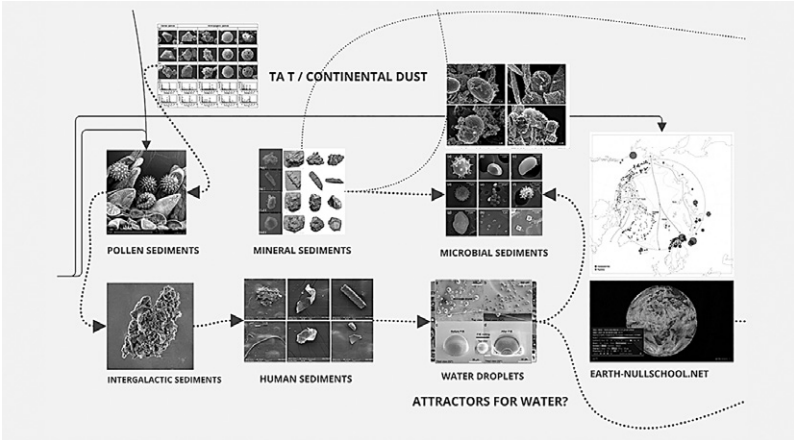


Fig. 12: Dust types/classifications, screenshot from Miro Board

Some of these life forms actively shape atmospheric conditions: the plant pathogen *Pseudomonas syringae*, for instance, induces rain in clouds by altering water’s freezing point; phosphorus-rich aerosols fertilize far-off forests but also deposit contaminants, altering soil and water quality. These particles travel across vast distances, contributing to both ecological processes and environmental degradation. Even wildfire smoke boosts plant growth by diffusing sunlight but also adds pollutants to the air. These entanglements reframed the exhibition space as a porous, co-constituted medium, materially shaped by invisible yet potent flows.

The ecological and atmospheric dynamics we encountered aligned with Collins’s (2020, 181) framing of intra-weathering as a co-constitutive process. Here, environmental phenomena and their reciprocal bodily constitution are inseparable, and the exhibition space becomes an active participant in the weathering process. Our early samples of lichens, mosses, biofilms, and rock residues acted as both indicators and collaborators—especially yellow lichens, whose colorations tracked sulfur levels from traffic emissions. Dust particles were archived using double-sided adhesive tape to capture ongoing exchanges between growth, decay, and presence. These traces became not just evidence but

agents within a larger process of intra-weathering—transforming acts of noticing and collecting into modes of curatorial inscription within an ever-changing atmospheric milieu (fig. 13, 14).



Fig. 13: Left: Electron scanning microscopy of residues in the interior entrance area of TA T. Dust samples (textile fibre, soot particles, pollen, rock samples, microbial traces), March 2021. Right: settling dishes of dust samples from TA T at the Max Planck Institute of Colloids and Interfaces



Fig. 14: Three microscopic images of airborne deposits narrating their liveliness as miniature blasted landscapes hinting at skin particles, ruptured willow pollen by air pollution, and soot deposition by car traffic. Site-specific findings during our exhibition, 2022

An illustrative example of how atmospheric events can extend into cultural imagination is the 1815 eruption of Mount Tambora. The resulting ash cloud, which caused global temperature drops and crop failures, also triggered the »year without a summer.« This climatic anomaly famously inspired Mary Shelley’s *Frankenstein*, a novel deeply embedded in the speculative interplay of weather, societal disruption, and human creativity. This historical moment, marked by intra-weathering in both the material and metaphorical sense, evokes a compelling lens for our embodied fabulation techniques, as we explore how climate events, like the eruption, spark new forms of cultural production and co-speculation. The layering of environmental factors with imaginative responses is central to how we understand the ongoing entanglements of nature, culture, and narrative in contemporary ecological crises (fig. 15). □ Exhibition, fig. 12, 134 □ Exhibition, fig. 13, 135



In-between Scales/Forms of Collecting and Archiving in the Context of Ecological Practices—Airborne particles, such as dust, microbes, and pollutants, allow us to recognize the connections between different scales. Air carries traces of human and natural activities across various temporal and spatial scales, rendering

6 This was measured in studies on the microbiology of the higher troposphere and stratosphere with devices such as the Aircraft Bioaerosol Collector (ABC) system on the NASA C-20 A aircraft (Smith et al. 2018).



Fig. 15: Collection wall during exhibition period with images on the floor

visible hidden dynamics within the exhibition space. By focusing on the activities of particles in the air, we can track and understand their origins and interrelations across various scales. This perspective raises new questions about linking phenomena at different scales: how can the atmospheric scale, extending up to 12 km above us, be connected to those of soil moisture and vegetation? What happens on a smaller scale with molecules of trace gases or water vapor, and how do they influence the formation of dust particles and water droplets in clouds? How are these particles linked to air columns and turbulence, which transport them into the atmosphere and back to the ground? And how do these movements correlate with global wind and circulation patterns? With this understanding of multiple scales, we sought to make the liveliness of dust, which connects these different scales, tangible and accessible for participatory formats and tours at TA T.

Due to new scientific and technological insights, we now have a better understanding of material flows in the atmosphere, including their transcontinental dynamics (fig. 16). Interestingly, in 1854, Christian Gottfried Ehrenberg, in his *Microgeology*, announced the vitality of atmospheres and analyzed dust particles (fig. 17). He introduced the first categories of dust: biotic (pollen), mineral, and anthropogenic. Today, extraterrestrial dust is also measured. Ehrenberg established three principles for microbial development: they grow under suitable conditions, they can survive in the stratosphere up to 10 km, and they decay under unfavorable conditions⁶—a concept of liveliness that is also relevant for design practices, as materials also follow these same dynamics.

In a conversation with microbiologist Anna Gorbushina in March 2021, we talked about the vitality of the dust in our exhibition. She explained that human influence on Earth is as significant as the natural material of the Earth's crust. Biotic and abiotic substances now settle on human-made surfaces, often with a transcontinental history, as demonstrated by fungal spores. Gorbushina told me, »Airborne bacteria and fungi are taking over human-made surfaces, making them biotic. In the desert, where temperatures fluctuate from +70°C to -4°C, organisms settle under extreme conditions on the surface and can grow. These organisms are often called extremophiles from a human perspective, surviving temperature shifts from black smokers in the ocean to radioactive levels from nuclear sites.«

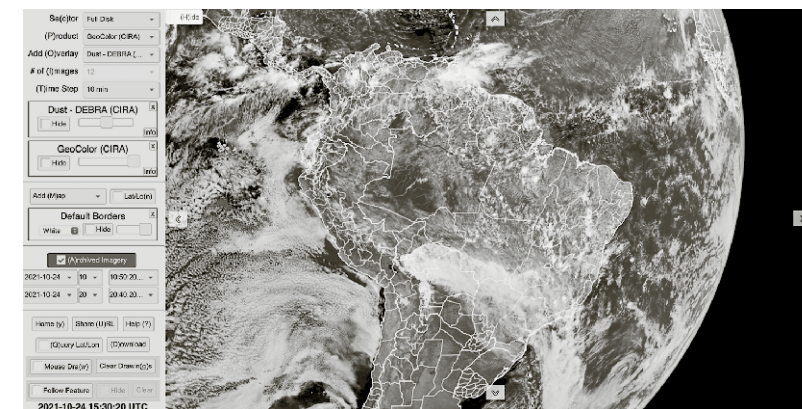


Fig. 16: Mesoscale Meteorology Branch at the Cooperative Institute for Research in the Atmosphere (CIARA) at Colorado State University, screenshot: <https://rammb-slider.cira.colostate.edu>



Fig. 17: Ehrenberg's illustration of airborne dust collected by Charles Darwin on the Beagle near the Cap Verde Islands, January 1833 (Gregory 1973)

She further explained, »A dust particle from the desert can travel long distances and land in an exhibition space. Our labs analyze pigments necessary for bacteria to survive in the stratosphere.« Gorbushina continued:

Now the adventure begins—together with my colleagues, we have researched the color of airborne microbes and their travel routes, for example on mineral dust particles from the desert or anthropogenic particles. Due to specific color indicators referring to melanin or carotene, we can trace their travels. Imagine you are an air particle surviving in the crack of a dust particle, traveling from the desert in Africa to the rainforest in Brazil, and then from Florida to Europe. This happens under extreme UV radiation conditions that we humans would not survive without protection. Therefore, microbes have developed color layers to withstand and absorb these high radiation levels.

As described, at 8 km height, during a journey of about 11 days, a specific protective layer forms around the microbes, inhibiting their activities depending on weather and climatic conditions. These color pigments can even be analyzed to infer certain climatic events.
(Excerpt from our conversation)

Following the data of microbes and particles that traveled to us and will continue their journey onward, we began to envision forms of collecting aeolian dust that extend far beyond the institutional boundaries of our exhibition project (fig. 18). This process highlights the importance of understanding the curious liveliness of the air, imagining the formation of indoor clouds as metabolic processes—which accumulate at the center of our exhibition space, inside the rotunda (fig. 19). [Process, fig. 13, 275](#)

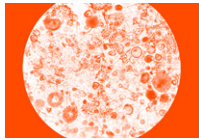
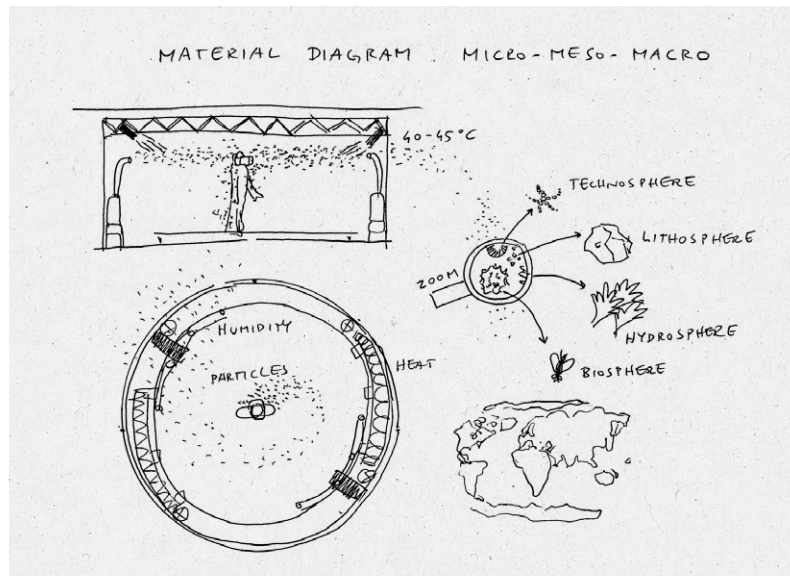


Fig. 18: Visit to the dust archive of the Leibniz Institute for Biodiversity Research, Natural History Museum Berlin

Fig. 19: This diagram shows the interrelation of scales between climate in the exhibition space and continental drift of particles.



IV. PRACTICES IN COLLECTIVE DENSITY

Practice of Experience Creation—»Watch out when walking in the water fields!«—this bit of mischievous advice was particularly relevant for the center of our exhibition space, the rotunda. Here, once home to the wooden lifting table that transported animal cadavers from the dissection room to the auditorium, a new climatic and immersive density was to take shape. On the one hand, this happened through the convergence of climatic,

ephemeral, and material intensities; on the other, through the VR elevator, which invited speculative worlding beyond the material realm.

Through breathing, body heat, and physical residue, we engaged in a direct and ludic exchange with the climatic densities of the rotunda on an environmental scale (Choy 2021). Intimate, sensitive practices involving fleeting materialities—often seen as marginal effects in the present—will likely demand attention in the future as forms of »slow violence.« These practices call for a renewed awareness of warm vapors and formless smoke as elements in production processes within culture, business, and research, which are often overlooked, or worse, trivialized.

Collective Density—The concept of collective density framed the exhibition space as an emergent structure shaped by the interactions between objects, participants, and environmental factors. But what defines density? Is it the concentration of particles, people, ideas, atmosphere, or weather? What makes it collective? Is it the shared experience of the VR elevator, the collective act of breathing, or something else entirely? Where are the boundaries—who is inside, who is outside? How does one enter? How is it formed?

At the center of the space, a floating cloud created by thermal layers in the exhibition responded to these questions. A circular wind generated a vertical air curtain, maintaining a stable microclimate at the center of the rotunda. Building on previously collected air quality samples, the metabolic archive was linked to the embodied experience of this indoor cloud—an assemblage of particulates and energy states. This connection introduced participatory, speculative, and critical perspectives into the exhibition, aligning with the concept of Practice in New Proximity—an approach that neither maintains complete detachment from the cloud nor relies on direct interaction but engages through a *hands-through* design methodology.

Combining the capture of metabolic airborne activities with investigative, performative, and participatory-speculative methods (mapping, experiencing, speculating), we engaged with the space's historical context. The TA T exhibition space was originally designed to preserve animal specimens, with small windows and thick walls maintaining a stable climate. Over the course of four months under quarantine and six months open to the public, we studied the space's thermal conditions, tracking

how heat regulated the exchange between objects, materials, and visitors (fig. 20). A subtle circular wind formed an air curtain, protecting a stable microclimate in the center of the rotunda. Our next step was to create a stratified air environment: a warm, dry layer at around 40°C, a damp layer in the middle at 30°C, and a cooler, drier bottom layer at 15°C. Visitors were invited to engage with the *pneuma* of the space—feeling, playing, breathing, and reflecting within an artificially produced, tangible atmosphere.

Hands-on and *hands-through* workshops incorporated both natural and synthetic materials, allowing them to erode, crack, and weather. These practices critically examined traditional conservation methods, especially in veterinary medicine, where microecologies—such as the control of water absorption, temperature, and humidity—are crucial to preventing degradation. The micro-weather and cloud formations at the center of the space were not mere spectacles. Instead of dissipating after their peak, they were extended into a discursive space through participatory formats, eventually becoming part of the archive on the exhibition walls. »Since the cloud at the center could not be reproduced, the physical experiences could only be deeply personal. A continuously forming atmospheric event connected specific energetic, material, and residual effects with something invisible and dreamy, like the empathy of an expanded ›we‹.« (Winkler 2024)

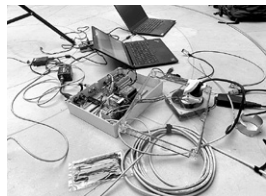


Fig. 20: Cable structure for cloud installation connecting infra-structures of the exhibition space

Through my previous work with cloud apparatuses (Winkler 2020), I am familiar with the conditions required to work with air, weather, and clouds as artistic and creative media within controlled systems. However, the rotunda—with its open hallways—posed a new challenge. How could the internal climate be made perceptible, even in a seemingly calm space where people and open doors continuously generated turbulence?

Confronting spatial densities reactivated a sense of what it means to let go—climate eludes control, urging a decentering of the human. Yet immersion reveals our constant entanglement: we never fully let go, as we ceaselessly leak into our surrounding environment. □ [Exhibition, fig. 14, 136](#) □ [Exhibition, fig. 16, 137](#)

Aerial Metabolic Archiving—Within the framework of *New Proximity* and *Collective Density*, entering the cloud—literally immersing one's head or body—became a dense material experience. The cloud obscured some elements while revealing new flows and particulate densities. But how might these direct, affective encounters with microclimates contribute to a *metabolic archive*—an archive that reflects planetary cycles?

Particles, having traveled intercontinental distances, arrived in the exhibition space and continued their journey: settling on surfaces, entering bodies, or circulating in the air. Initially located on the wall, this archive was reimagined at the center of the space through a walkable cloud installation (fig. 21, 22). Activated by curators, researchers, and later visitors, it engaged air, water, microbes, temperature, and building materials as shared media. → [Intermezzo 5, 344](#) The cloud became a co-enactment of the wall collection—an ephemeral, immersive archive of metabolic exchange.



This emerging microclimate functioned both as display and as process. By attending to and temporarily stabilizing intra-weathering, we revealed not only a designed microclimate but a shared process of atmospheric co-construction—between visitors, microbes, particulates, and space itself. The cloud's dispersal marked a turning point: a shifting spatial climate that invited research and play. Samples of lichens, weathered stones, and dust—collected throughout the exhibition—testified to what persists after weather's passage. □ [Process, fig. 16, 277](#)

Over time, the cloud installation evolved into a self-monitoring entity, revealing the resonance between the museum's controlled climate and global atmospheric dynamics. A faint, circular wind directed toward the center formed a moist stratification—5 meters wide, 2 meters high, weighing about 850 grams—constantly reshaped by visitors' presence. This indoor weather, hovering above the Virtual Elevator, became the dramaturgical protagonist. It responded to bodies and objects alike, establishing a fleeting, humid, metabolic archive.

Fig. 21: 5-meter wide scaffolding circulating the quiet center of the rotunda for cloud layering and building the Virtual Elevator platform

Fig. 22: Cloud condensation in the interior with Benjamin Maus (electronic artist) and Astvaldur Torrisson (exhibition design)



Through walking, breathing, sensing, and gesturing, visitors contributed to the cloud's form—prompting a kind of *autonubeo-poiesis*.⁷ Transpiration, respiration, and perspiration enacted gaseous exchanges of nitrogen, oxygen, CO₂, and water vapor. Human body heat—around 80 watts per adult per hour—formed small convection openings, momentarily disrupting the mist like micro-ozone holes. Even spoken words and door movements sent ripples through the cloud. These metabolic imprints rendered atmospheric exchange visible and tactile.

On the floor, olivine basalt pebbles introduced planetary processes of carbon sequestration through enhanced weathering. In contrast to energy-intensive climate control systems, these hygroscopic stones slowly absorbed CO₂ and decayed into dust—integrating into the exhibition's microecology.

We do not merely exhale gas but emit particles that form ecological relations within the environments they enter. Using adhesive strips and electron microscopy, we examined airborne residues: textile fibers from previous installations, wind-blown pollen despite lockdowns, soot, mineral fragments, and red sandstone—likely carried in on shoe soles. Breathing and sensing became methods of material inquiry, revealing air as an archive of human and non-human activity.

Every breath, gesture, and representation contributed to shaping this metabolic archive. Through heat and humidity, microclimates and microbiomes emerged, settled, and co-populated the space. Air became not just medium but co-agent—active, spatial, and critical. Through spatial design, we cultivated something formless yet continuously evolving.



Fig. 23: Aerobiological measurements with Skander Hatroubhi and Regine Hengge twice per week from December 2021 to March 2022

Moreover, the cloud demonstrated that our work was not simply a neutral act of scientific measurement and analysis. Cloudiness, as something indeterminate, exists—much like the symbolic—within the material itself, in the density of water droplets, heat, and dust particles acting as nuclei. It manifests as active matter only through the collaboration of design disciplines, scientific analysis, and the discursive inquiries of the humanities. Every interaction continued to shape it, ultimately acting as a curatorial force. The process itself became a form of curatorial intervention—whether through setting up tripods to measure air quality, deploying air samplers, or scattering data sheets throughout the space (fig. 23). The wall archive, with its protocols, dust residues, and bioindicators, remained difficult to grasp. In contrast, the floating cloud—through its direct interaction with the air—enabled a continuous recalibration of embodied knowledge.

⁷ The cloud constantly stabilized itself anew through its high degree of constant self-organization, which can also be read as volatility. It had something autopoietic about it in the sense of Karl Popper (1990) and is understood here through the nubeological investigation according to Gerhard Lang's *Cloud Walks* (*Cloud Walk 10*, New York City, 2013) as a certain kind of autopoiesis, as is characteristic of clouds. This holds especially for initiating the project »Farming the Uncanny Valley,« speculating with air track 2018–2021 (Schwabe, Hülsen & Trübvetter 2022, 122–123).

Participation blurred the lines between observer, maker, and environment. Within the cloud, meteorological experiments on personal climate sensitivity became possible—experiments otherwise abstract in climatology. Artistic inquiry demanded we trace the untraceable: what has accumulated, what happens in situ, and what might yet occur. The steam system's base inputs—water and energy—were quantified and recorded via a *Cloud Computer* (fig. 7), folding technological processes into the metabolic archive as a new weather image.

The Petri dish in figure 24 and the diagram in figure 26 show the relative abundance of airborne microbial genera sampled before, during, and after the appearance of an indoor cloud on 1 March 2022, the day of an internal seminar. Among the dominant taxa were Proteobacteria, ubiquitous in air, water, and soil; Micrococcus, typically skin-associated and airborne; and Paracoccus, an organism linked to both soil and atmospheric nitrogen cycling. Together, these microbial presences reflect how human activity, movement, and indoor weather conditions co-shape the ecology of air and could be mapped with environmental parameters such as temperature, humidity, and visitor numbers in figure 30. □ [Exhibition, fig. 23, 142](#)



One striking example of air transformation emerged during a seminar on theatrical storytelling based on on-site scientific measurements. As participants moved through the cloud, microbial activity surged: human pathogens, skin microbes, lactic acid bacteria, and soil organisms introduced via footwear. Air samples even revealed plant pathogens typically found in Southeast Asia—especially those linked to Aloe Vera, a plant more cosmetic than climatic. The MAS-100 Eco Sampler confirmed: our single workshop day had left behind its own microbiome.

Co-Speculating Car(ri)ers in Suspension—At TA T, the microbiome and the air's layered composition served as co-curators, subtly shaping our exhibition space. The cloud, as a space of collective densities between microbes, humans, climate, trace gases, and particulates, became a central curatorial element. Collaborating with international art academies through seminars, we fostered a dynamic environment for exploring alternative life realities and desirable microclimate fictions (fig. 25).

Our approach of »teaching as research,« deeply rooted in TA T's tradition, emphasized the participatory opening of our exhibition. We stressed the negotiation of form between

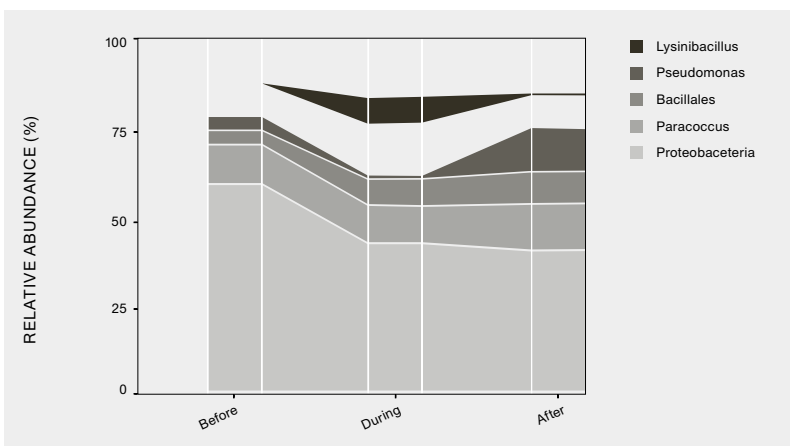


Fig. 24: Aerobiological samples in the exhibition room to better measure the liveliness of the room environment. Residues from people can be detected for up to half a day with a MAS-100 from microbiology/forensics

Fig. 25: Further air measurements and external observations inside TA T



Fig. 26: Diagram showing airborne microbial imprints of the indoor cloud before, during, and after its appearance, combining metagenomics, temperature/humidity, and visitor numbers



measurement, physical experience, and fabulation. Drawing from non-Western narrative practices (Nyong'o 2019), we asked, »Have you ever felt the energy of the air? Walked on a cloud?« These questions encouraged the intertwining of speculative storytelling and embodied experiences, probing issues of form, control, and irreversibility.

Our methodology embraced a situated-empirical and performatively speculative approach. We sought to build shared belonging as a research collective within the exhibition space, while also exploring materiality through speculative actions across disciplines. Experimental design methods, particularly those involving weather, fog, and clouds, offered new dimensions in material design, connecting biological experiments, analog media, and electronic techniques.

Through ecological interweaving, exhibition practices became active participants in knowledge creation, a notion captured by a student during the *Speculative Objects* seminar: »Imagine a microbe curates this exhibition—what should be exhibited, and for how long?«⁸

Triangular Dance of Experiencing, Mapping, and Fabulating—The co-designing process led to a transdisciplinary dance between mapping, bodily experience, and fabulation (fig. 27). There was no clear direction of movement—each practice influenced the others.⁹ Tracing and mapping air residues through scientific methods, coupled with creative-artistic methods like cloud installations, opened pathways for reflecting on futures and contexts. These practices merged the material-semiotic qualities of clouds with the dynamic interplay between disciplines, generating docking points for interaction.

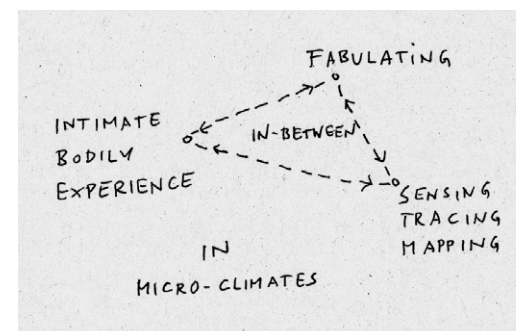


Fig. 27: Illustration of the three main figures of situated practice: mapping, experiencing, and fabulating, articulated in the exhibition space

An example of this dynamic emerged in a collaborative scene from January 2022. During a live exhibition, the cloud heated up in response to a tour group arriving. Behind-the-scenes processes, such as printing newly emerging exhibition texts on the VR elevator platform, brought to the surface the tensions between scientific documentation and audience participation, highlighting the unpredictable dramaturgies of exhibition-making.

Implicit and Complicit Forms of Knowing—The largest challenge in the project was to make implicit knowledge visible. We interrogated the fluidity of exhibition-making, navigating the intersection of artistic and scientific research. By embracing interdisciplinary engagement, we viewed the exhibition space as an intra-active entity that could negotiate new aesthetic experiences, complicity, and knowledge creation. Success was not defined by outcomes but by the experimental interactions within the space—how they provoked co-curation, empowered visitors, and facilitated exchanges across disciplinary boundaries.

10 One of the most significant ways in which speculative design has changed over the past decade is its opening up to more participatory modalities. »The days of designers dreaming on behalf of everyone have passed.« (Dunne & Raby 2013, 164)

This approach to exhibition-making positioned us not as specialists but as accomplices in a collective, generative practice. We aimed to stretch conventional exhibition roles, cultivating forms of engagement that transcended fixed categories. Through this fluid approach, the exhibition itself became a living document of co-speculated, embodied fabulation—inviting visitors to engage physically, emotionally, and cognitively with non-human agencies like air, microbes, and particles. As the exhibition unfolded, these intertwined methodologies fostered new forms of knowledge production and engagement.

Participatory Workshops and Speculative Design

The co-speculation seminars¹⁰ »Imagining Suspended Car(ri)ers« raised several pivotal questions for design education: how can interspecies design offer more integrative ways to protect the climate? What can we learn through the lens of airborne particles in the environment? And, perhaps most fundamentally, how can we relearn to be in the air? These questions led us to explore speculative design concepts in the context of exhibition-making, focusing on bodily experience, materiality, and interactivity.

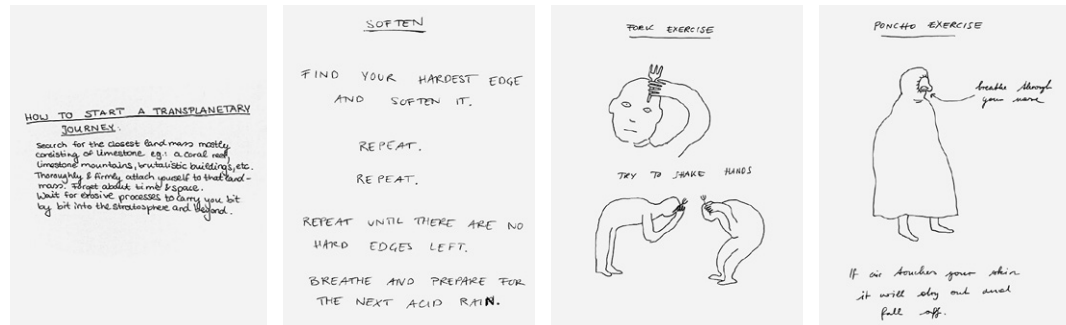


Fig. 28: Event Scores from the seminar »Speculative Objects« with University of Theater Arts Ernst Busch Berlin, 2021

We began with a central question from speculative design: what current phenomenon or social circumstance do we want to overcome in designing the space? This question prompted us to imagine aesthetic forms for future exhibitions and to reflect on the invisible barriers that might manifest within an exhibition space.

The first seminar took place at TA T, predominantly conducted remotely as part of the international Open Design Master's program hosted by Matters of Activity and the University of Buenos Aires, Faculty of Architecture. This seminar focused on producing short film essays that explored biological systems, algorithmic and poetic thinking, and bodily experiences. These »Micro Climate Fictions« allowed us to experiment with

various media tools and techniques to reflect on the everchanging atmospheres around us. → [Intermezzo 4, 257](#)

In the following seminar, we partnered with the University of the Arts Berlin (UdK) in a class dedicated to process and product design. Here, we focused on modeling fictitious air particles as exhibition objects as part of the »Symbiotic Air Mutants« project. This seminar delved into themes of multi-species coexistence, polluted air, and planetary metabolism. Students created hand-sized models of speculative aerosols, combining natural, synthetic, and found materials. These models were then presented in the exhibition space, offering a glimpse into anthropogenic, probable, and damaged atmospheres. The aim was not only to reflect on environmental issues but also to transform these concerns into lively, resilient, and speculative forms of air particles—blurring the lines between art, science, and speculative design. □ [Exhibition, fig. 26, 144](#)



Fig. 29: Participatory workshops with various international art and design universities

The third seminar, »Speculative Objects,« a collaboration with the University of Theater Arts Ernst Busch Berlin. This seminar generated performative exercises and event scores—minimal instructions for action that echoed the works of artists like Erwin Wurm or Yoko Ono.¹¹ These exercises encouraged visitors to engage experimentally with the atmosphere while standing in the cloud installation. Standing in the cloud, visitors speculated through their own bodies (fig. 29). Visitors were invited to write short narratives and re-narrate them through bodily exercises, transforming their speculations into embodied actions. This process emphasized human involvement in indoor atmospheres and the biosphere, viewing bodies as both weathering agents

11 Yoko Ono, *Grapefruit*, 1964; from the cloud piece: »Imagine the clouds dripping. Dig a hole in your garden to put them in« first published 1963.

and weathered entities, shaped by and shaping the open weather systems around them. »Hyperobjects and Other Unkissable Lovers« explored the inhabitants of a cloud as microscopic airborne assemblages, creating a »cloud theater« (fig. 29).

Building on these ideas of speculative perspectives, we created a virtual experience through a 3D floor for a VR elevator, designed collaboratively with Swiss 3D motion designer Helen Galliker. The VR elevator allowed visitors to view the environment from the perspective of a feared airborne pathogen, asking, »How does it feel to be the pathogen? Where to go? How far can you travel through the air?« [Process, fig. 25, 287](#) This immersive experience extended to the perspective of a cloud full of airborne microbes. How could these non-human perspectives be made accessible? This question echoed themes explored in multispecies ethnographies, offering an opportunity to follow airborne microorganisms across long distances (fig. 30, 31). We visualized this process through an artificial ecosystem in VR, where participants could trace the movements of airborne microorganisms over vast distances. Through this speculative lens, we explored how particles accumulate and interact with toxic materials and how our own bodily contributions, such as sweat, might influence these processes. [→ Intermezzo 4, 258](#)

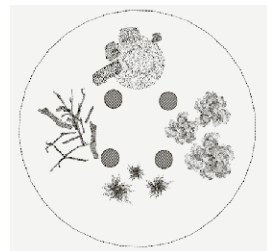


Fig. 30: Top: Floorplan of a VR tour through various ecologies connected to clouds

Fig. 31: Screenshot of the VR tour through microbial clouds in the exhibition space, emphasizing microbial perspectives on objects, spaces, and humans

Implicit and Complicit Forms of Knowing—Our publication explores the fluidity of exhibition-making at the intersection of artistic and scientific research, emphasizing spatial, virtual, temporal, new sensorial material design, and methodological aspects. It approaches the exhibition space as an intra-active

entity—one that negotiates new aesthetic experiences, complicity, collaboration, and interdisciplinary engagement for knowledge creation through design practice.

Throughout the exhibition, our inquiry integrated architectural, artistic, and scientific methods to examine the materiality of exhibition spaces and the dynamic interplay between objects, participants, and their environments. Central concepts like *practicing in new proximity* and *practicing in collective density* emerged as essential for understanding how research goals translate into lived, co-constructed experiences. Rather than focusing on predefined outcomes, we prioritized the situated experiments within the space. These experiments encouraged interaction, empowered visitors to co-curate and co-design spatial arrangements, and facilitated unexpected exchanges (fig 32).

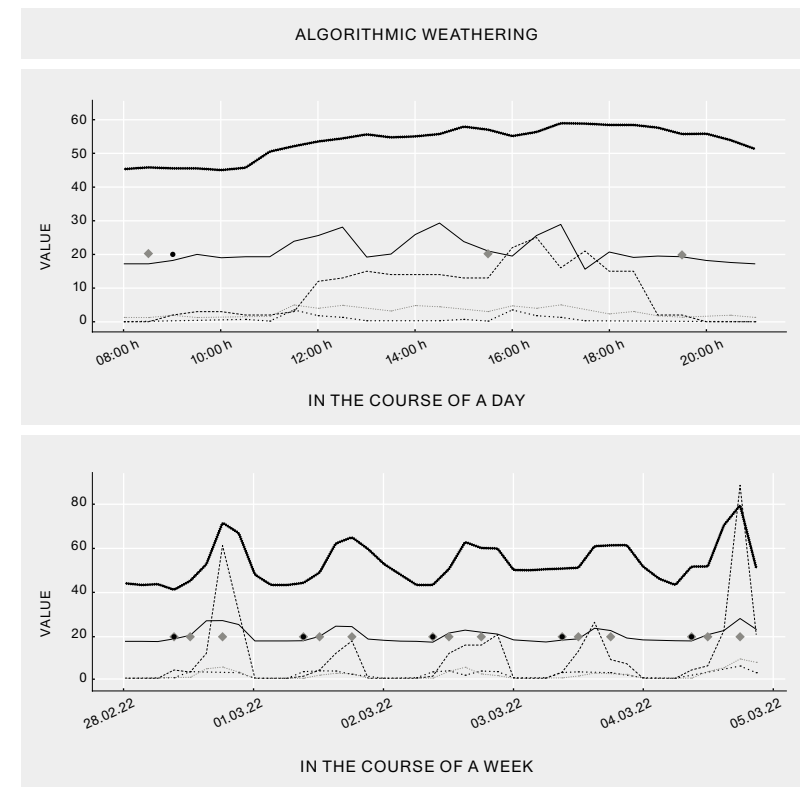


Fig. 32: Diagrams showing various tracked values throughout the exhibition space, correlating aspects of humidity, temperature, dust sampling, and visitor amounts, which all contribute to cloud formation in the space

The interdisciplinary working process within the exhibition space, which doubled as a laboratory, embraced an ethics of care. It interrogated scientific representations and methodologies, particularly concerning non-human entities—microbes, stones, algorithms, heat, moisture, and plants—positioning them not as passive subjects but as active participants in the research.

Beyond exhibition-making, we advocated for integrative approaches to education that foster critical thinking, multisensory engagement, and inclusive science communication. By challenging disciplinary boundaries, we explored how participation, sensorial experiences, and dialogue could be extended beyond the exhibition space itself. Creativity lay in the freedom to stretch conventional practices, whether implicit or explicit, cultivating forms of engagement that resisted easy categorization. Throughout the process, we positioned ourselves as accomplices—researchers, designers, scientists, curators, and exhibition-makers—understanding curation not as a specialized domain but as an open-ended practice of exchange. Rather than reinforcing fixed roles, we sought to create *docking points* between disciplines, inviting curators and non-curators alike into the evolving landscape of our exhibition-making.

Our aim was twofold: we wanted to exhibit something that engaged the various and diverse visitors, humans and non-humans included. We also wanted to keep track of and exhibit the visitors' engagement with the objects themselves in our exhibition. To this end we employed a dynamic, metabolic process of archiving, where the exhibition space itself acted as a living document of co-speculated, embodied fabulation. In this space, *new proximities* and *intimacies* were explored, allowing visitors to physically and emotionally engage with non-human agencies—air, microbes, and particles—while the *stretching of practices* transformed conventional exhibition roles. These intertwined methodologies created a fertile ground for unexpected exchanges and new forms of knowledge production, challenging the boundaries of scientific, artistic, and social frameworks.



□ Exhibition, fig. 2, 122

CONCLUSION

Complicity as a Concept of Collaboration and Cooperation

In the course of the exhibition project, the concept of complicity emerged not as a predetermined framework but rather as a dynamic reflection of the collective process itself. Our collaboration within Object Space Agency was never rigidly fixed. Despite coming from diverse backgrounds, we found ourselves drawn together, unified—at least temporarily—by a shared passion, interest, and complementary creative methods. Over time, we realized that our bond was rooted not in a formalized plan but in

12 Complicity is always characterized by energy, imagination, and subversive power—situated and contingent practices (Ziemer 2016). To achieve such a collective organizational form, we began by articulating our individual ideas and values—acknowledging where they aligned or diverged. This process of self-positioning helped us identify shared concerns and tensions. We remained open to experimenting with new technologies as tools of inquiry rather than control, while maintaining a critical ecological and social stance, as emphasized by Notroff (2007), rooted in awareness of material agency and the infrastructures shaping perception and practice.

a shared commitment to co-constructing an atmospheric ecology through experimentation, exchange, and mutual curiosity.

Complicity, as it unfolded, transcended traditional models of collaboration.¹² It allowed for flexible, heterogeneous encounters that adapted to the situated research interests of the moment. Our collective energy was not about a final, fixed outcome but about the ongoing, subversive power of creative engagement. This approach, driven by playful and constructive formats, cultivated new publics through our shared participation, fostering new forms of knowledge production and unexpected exchanges.

Clouds emerged as floating, illusory boundary-objects within the rotunda. »Being together apart« described the simultaneity of presence and distance, where particles, bodies, and clouds coexisted in a circulating condensation of fleeting perceptibility. The tension between proximity and separation, between the continuous and the discrete—between the analog and the digital—reflected how atmospheres and attendees mutually outlined, permeated, and dispersed one another. What remained when someone left the space? No footprint on the floor—but a suspended nutrient in the air.

In retrospect, complicity was not an abstract concept to be conceptualized at the outset but a lived experience, emerging from our shared actions and responses within the space. It embodied a temporary, yet powerful, alignment—allowing us to work together creatively, subverting hierarchies, and generating new possibilities for collaboration. In this process, we recognized that the strength of collective work lies not in static roles or expectations but in the fluid, responsive dynamics of collaboration that arise as the work unfolds.

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