

MULTISCALE ECOLOGIES OF MEMORY

Mathematics, Living Systems, Artistic Research

SYMPOSIUM

24–25
SEPTEMBER 2026

PALAZZO DELLA PROVINCIA DI BARI
BARI, ITALY

A symposium bringing into dialogue

mSPACE — Multiscale Stochastics,
Patterns and Analysis of
Combinatorial Environments

and

MIMOSA PUDICA — Performative
Research on Plant Memory and
Digital Ecologies

MATHEMATICS • STATISTICS • PLANT SCIENCES • ECOLOGY
PHILOSOPHY • ANTHROPOLOGY • ARCHITECTURE • ART



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portale/mimosa-pudica/



ABOUT THE SYMPOSIUM

Multiscale Ecologies of Memory stems from the convergence of two ongoing research initiatives: *mSPACE* – Multiscale Stochastics, Patterns and Analysis of Combinatorial Environments, a COST Action dedicated to the mathematical study of multiscale systems, and *Mimosa Pudica*, a long-term performative artistic research project studying plant memory and its implications for imagining digital ecologies. What happens when fields of research that rarely encounter one another come together around shared questions and a shared table? Can artistic research produce knowledge through its own methods and also create spaces in which different forms of knowledge can meet and cross-pollinate? The symposium creates a space for dialogue between mathematics, plant biology, ecology, philosophy, anthropology, architecture, statistics and artistic research. It brings together researchers from different universities in Italy and Europe around methods, vocabularies and forms of knowledge. Through presentations, roundtables and a shared observation session, different approaches to memory and observation enter into conversation. The contributions move across the temporalities of landscape, ecological data and statistical uncertainty, the geometry of networks, plant memory and the relationships between biological and technological forms of remembering. The shared observation session along the Bari coastline extends this exchange beyond the conference setting, introducing a situated experience of attention and encounter. *Multiscale Ecologies of Memory* marks the first public collaboration between the COST Action *mSPACE* and the *Mimosa Pudica* artistic research project, opening possibilities for further transdisciplinary collaboration.

Multiscale Ecologies of Memory is curated by Valentina Vetturi.

Contributors — Maria Concetta De Pinto, Delio Mugnolo, Giulia Annalinda Neglia, Teresa Numerico, Alessio Pollice, Sanja Puljar D'Alessio

Reading by — Anna D'Elia Belli

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Thursday 24 September, 13:30–13:40

MICAELA PAPARELLA

Pinacoteca Metropolitana di Bari Corrado Giaquinto

Welcome

Opening remarks on behalf of the hosting institution.

Thursday 24 September, 13:40–13:55

DELIO MUGNOLO & VALENTINA VETTURI

FernUniversität in Hagen · Accademia di Belle Arti di Bari

Introduction: mSPACE and Mimosa Pudica

An introduction to the two research initiatives the symposium stems from, and to the questions that brought them into dialogue.

Thursday 24 September, 14:00–14:30

SANJA PULJAR D'ALESSIO

University of Rijeka

Making an Open Landscape: Multiscale Rhythms and More-than-Human Change on the Island of Cres

The presentation offers an anthropological contribution to the question of how a landscape is produced and transformed through interactions among different species and through processes unfolding across different temporal scales. Drawing on multispecies ethnographic research on the island of Cres, Croatia, I focus on its open landscapes and on the relations among wild plants, sheep, bees, people, weather, and changing forms of land use.

The openness of these landscapes is not a stable natural condition but a more-than-human achievement. It emerges from the temporary synchronization of heterogeneous rhythms and durations: short rhythms of flowering, grazing, harvesting, rain, dew, and wind; seasonal and annual cycles of plant reproduction, pastoral practices, beekeeping, and gathering; longer processes of pasture maintenance, vegetation succession, generational labour, and abandonment; and broader transformations associated with depopulation, tourism, markets, and climate change. When some of these rhythms shift or cease to coincide, for example through declining grazing, changing ecological conditions, or changing regimes of work and land use, the relations that sustain the open landscape are reconfigured, transforming the landscape in the process.

Approaching the landscape through these intersecting temporalities also raises questions about memory. Past relations become materially sedimented in vegetation patterns, grazing grounds, paths, dry-stone walls, and practices of care. In this sense, the “memory” of a more-than-human system need not be located in a single organism: it can be distributed across plants, animals, human practices, and the configuration of the landscape itself. Cres thus provides a case for thinking about emergence, continuity, and change as effects of multiscale and multispecies relations rather than of any single temporal process.

Following Nature's Footprints: Observational Data and Ecological Variation Across Space and Time

Ecological systems leave measurable traces of their dynamics through data collected across heterogeneous landscapes and over multiple temporal scales. Observational data—from field surveys and ecological monitoring to historical records and contemporary sensing technologies—provide invaluable evidence of how living systems respond to changing environmental conditions. Yet such data are inevitably incomplete, noisy, and unevenly distributed. Statistical modeling is then an essential tool for transforming observations into ecological understanding.

Among those I encountered, some real-world ecological and environmental applications include: investigating the relation between vegetation density and soil resistivity sensor data for a crop; exploring biological and environmental features in a river network; detecting trends of seagrass cover by aerial imagery historical data; analyzing genomic and environmental data in the context of landscape genetics. Drawing on these examples, I'll discuss how observational data capture spatial and temporal variation, how natural processes generate complex patterns across scales, and how statistical modeling provides a unified framework for disentangling environmental signals from stochastic variability and observational uncertainty.

Rather than viewing uncertainty as a limitation to be eliminated, I argue that it is an intrinsic characteristic of complex ecological systems and a fundamental component of scientific inference. Statistical models do not simply predict ecological patterns; they provide a principled framework for integrating incomplete information, quantifying uncertainty, and formulating hypotheses about the mechanisms underlying observed variation. In this sense, models become interpretative instruments that connect empirical observations with ecological processes, revealing both the possibilities and the limits of our understanding. Statistical thinking can contribute to broader reflections on memory, adaptation, resilience, learning, and emergence. Following nature's footprints thus becomes a metaphor for understanding how living systems record environmental change and how quantitative models allow us to reconstruct these traces while acknowledging the inherent uncertainty of complex natural worlds.

Thursday 24 September, 15:10–15:40

DELIO MUGNOLO

FernUniversität in Hagen

Networks, small-worlds, meanders: from spectral theory to geometry and back

This is a gentle introduction to the spectral theory of metric graphs, with a specific focus on spectral geometry: the study of links between the size and spacing of eigenvalues, on the one hand, and the geometric features of a physical structure or a real-world network, on the other.

Thursday 24 September, 16:00–16:45

ROUNDTABLE

Moderated by Teresa Numerico

The Nuances of Observation

What does it mean to enter into a relationship with the world through observation? A conversation on knowing, imagining and intervening as situated, participatory practices, and on the tension between local forms of knowledge and claims to universality.

Thursday 24 September, 17:00–18:30

VALENTINA VETTURI

Accademia di Belle Arti di Bari

Mimosa Pudica. To Be Somewhere in Particular

Shared Observation Session, Bari coastline

Can we learn alongside plants to imagine and practice digital ecologies shaped by living, decentralized, impermanent forms of memories?

The question has been orienting *Mimosa Pudica* (2024-ongoing) from the outset. This long-term performance-as-research project, inspired by the homonymous plant *Mimosa pudica*, has been developing through an ecosystem of practices: daily forms of observation of the plant, lecture-performances, roundtables and shared observations.

Mimosa pudica is a tropical herbaceous plant native to South America that has since spread to Asia, Africa and the Mediterranean basin. It is known for her ability to open and close her leaves in a way that is perceptible to the human eye.

Observing *Mimosa pudica* means taking time, slowing down, not expecting a response, and entering a dimension that is not governed by the need to achieve a result. The plant does not live in response to stimuli alone; the closing of its leaves is one possibility among others. The movement may be triggered, diminish, or not occur at all. The regulation of the plant's behaviour precedes the observer's gaze and continues in relation to environmental conditions.

Digital technologies often privilege accumulation and persistent storage, with material and environmental costs. Research on plant memory raises questions about other temporalities of retention, change and forgetting. *Mimosa Pudica* unfolds in the space between these different ways of remembering.

If the scientist's body is a feeling body and a site of learning, as Monica Gagliano suggests, and if art can be understood as an embodied form of knowledge, as Carolyn Christov-Bakargiev proposes, what might happen when different bodies observe together?

For *Multiscale Ecologies of Memory* in Bari, *Mimosa Pudica* invites the symposium's contributors to *Be Somewhere in Particular*: along the rocky coastline south of Palazzo della Provincia, practising attention to halonitrophilous vegetation between the sea and traces of human intervention.

Bibliographic sources

Gagliano, Monica. 2025. Keynote address at *Thinking with Plants and Fungi*, Harvard Divinity School, Cambridge, MA, 17 May 2025

Christov-Bakargiev, Carolyn. 2025. Keynote address at *Unframing Knowledge: Artistic Research Beyond Theory and Practice*, P+ARTS, Naples, Italy, 27–29 October 2025.

Friday 25 September, 10:00–10:30

MARIA CONCETTA DE PINTO

Department of Biosciences, Biotechnology and Environment · University of Bari Aldo Moro

Plant Memory: Remembering Without a Brain

Plants have no brain, no neurons, and no nervous system. Yet they can respond differently to an event depending on whether they have experienced it before. A plant exposed to a period of heat may become more tolerant to a later heat wave; repeated stimulation may alter subsequent responses; past environmental conditions can leave traces that persist long after the original stimulus has disappeared. These observations have given rise to the concept of plant memory. Rather than being stored in specialized structures, memory in plants emerges from a distributed network of signals, metabolites, proteins, and epigenetic modifications that allow information about previous experiences to be retained over time. Through processes such as priming and thermomemory, environmental events can shape future responses, linking past conditions to present behaviour.

The study of plant memory is changing the way plants are viewed. No longer seen as passive organisms that merely react to their surroundings, plants appear as dynamic systems capable of perceiving, integrating, and storing information from the environment. Understanding how this information is encoded and maintained not only provides new insights into plant adaptation, but also broadens the discussion of what memory can be beyond the context of brains and nervous systems.

Memory between Biology and Technology

According to Wendy Chun (2011), human and computer memory are very different from each other, because human memory is prone to forgetting and recreate every piece of information from scratch, during the recollection, while computer memory is stable for future recalling, unless the machine is malfunctioning.

Malfunction, instead, is the very point of biologic memory, we are always bad at remembering events or data, and very good at reinventing souvenirs, according to necessity, following emotions and present circumstances. Human memory, therefore, is creative and associative, capable of connecting distant things, while computer memory is able only to reproduce what was inserted, if the query is correctly formulated.

The point here is that digital technologies are also powerful ways to externalize human memories, creating an external support for supplementing recollection and projecting it on future requirements. As all externalization tools, digital memory reshapes the subjectivity, because our identity depends on how we represent our stories, both individually and collectively. This reshaping of recollection is particularly relevant in the case of artificial intelligence tools based on data-intensive machine-learning techniques. The success of artificial intelligence depends on the deep integration between human cognitive capabilities, and technical procedures, that works at different levels of complexity.

The first level is relative to the availability of content, used to train systems, but human intervention is relevant also to shape the machine, to interpret data, to choose the best data for training etc. this activity is sometimes called the “ghost work” inside the machines (Steyerl 2026). Plus, there is the obvious interaction via the prompting of the users.

As Joseph Weizenbaum (1976) suggested all technical tools are also education tools and need both expert educators, and sharp learners. They shape and reflect the way we look at the world, but because we are part of our world, they reflect the way we see ourselves (Vallor 2024).

We need to co-create our machines, and govern the companies that control them, to make sure that they don't reshape how we perceive intelligence, conscience, social and democratic values etc., considering that these traits are impossible to define universally, they are dynamically interpreted by a collective activity.

Bibliographic sources

Chun, W. H. K. (2011). *Programmed visions: Software and memory*. MIT Press.

Steyerl, H. (2026). *Medium hot: Images in the age of heat*. Verso Books.

Vallor, S. (2024). *The AI mirror: How to reclaim our humanity in an age of machine thinking*. Oxford University Press.

Weizenbaum, J (1976). *Computer power and human reason: From judgment to calculation*, W. H. Freeman and Company

Friday 25 September, 11:10–11:40

GIULIA ANNALINDA NEGLIA

Politecnico di Bari, Italy

Landscape as a Multiscalar Archive of Cultural Memory and Adaptive Ecologies

Landscape architecture engages with memory not only as a cultural or historical construct, but also as an ecological process continuously shaped through interactions between human communities, living environments, and the material traces embedded in places. Within this perspective, landscapes can be understood as the mirror of territorial living archives, where traces of past events, practices, and environmental adaptations are preserved, transformed, and reactivated across multiple spatial and temporal scales.

The paper proposes a multiscale interpretation of memory as a relational phenomenon that connects territorial, environmental, cultural, and social systems across different dimensions of space and time.

Rather than viewing memory as an exclusively human attribute, the presentation argues that landscapes themselves function as complex mediators of learning, adaptation, resilience, and emergence. From this perspective, landscape becomes a privileged field for investigating how memories circulate through living and territorial systems and how ecological and cultural futures are continuously co-produced.

Drawing on research conducted in Mediterranean landscapes and historic environments, the presentation explores how memory emerges, evolves, and operates across multiple spatial and temporal scales, shaping the relationships between territorial environments and ongoing ecological, cultural, and social transformations. Because territories retain the traces of adaptive processes within complex socio-ecological systems, landscapes can be interpreted as living repositories of multiscale knowledge, where natural dynamics, historical stratifications, and social practices continuously interact. They function as adaptive archives in which memory is not simply conserved but constantly reworked through ecological and cultural processes unfolding across scales. In this sense, cultural memory can be understood as a dynamic form of territorial intelligence, capable of connecting inherited experiences with future adaptive transformations.

Friday 25 September, 12:00–13:30

ROUNDTABLE

Moderated by Sanja Puljar D'Alessio

Threads and afterthoughts

A closing conversation that picks up threads from the presentations and the coastal walk, opening them up for discussion among contributors and participants.

Friday 25 September, 14:30–15:00

ANNA D'ELIA BELLI

Translator

Manuela Draegher, Comitato di sostegno alle erbe infestanti. Comunicato

The statement issued by the *Committee for the Support of Weeds* is taken from a book published in France in 2012, *Herbes et Golem*, by Manuela Draegher, one of the heteronyms of Antoine Volodine, spokesman of the literary movement known as Post-Exoticism.

The text, unpublished in Italy and translated here by Adriana Belli, herself also a heteronym, gives a voice to the thousands of nameless weeds that grow in our countryside. Trampled, mocked, grazed upon, the weeds want only to exist and to be respected. To do so, they need a name, one that can speak them into being and tell us something of their innermost nature – by turns joyful, vengeful, erotic, peaceful, or anarchic and insurrectionary.

The list of weeds we are about to read forms a kind of litany of the forgotten, of the defenceless, of those that escape the rules of classification, but are no less alive or any less essential to our existence.