Scaling the Cosmos in the Modern Era (Florenz, 19–21 Nov 25)

Museo Galileo, Florence, Nov 19–21, 2025
Deadline: May 29, 2025

Florian Métral

Conference Scaling the Cosmos in the Modern Era: Images, Tools, and Instruments.
Organizers: Florian Métral (CNRS/Centre André-Chastel) and Maddalena Napolitani (Museo Galileo)

Conference Context
The Scaling the Cosmos conference aims to examine the evolution of human understanding and representation of the cosmos through images, tools, and instruments during the Early Modern era (15-18th centuries), and also opening the perspectives up to the present days. This interdisciplinary event will bring together perspectives from Art History, the History of Science, and Astrophysical Sciences, encouraging a dynamic dialogue between these disciplines. Hosted at the Museo Galileo in Florence, November 19–21, 2025, it is part of the project Celestial Spectacles / Cosmospectio, led by Florian Métral at the CNRS/Centre André-Chastel (Paris), and draws on the Museo Galileo's recent exhibitions, Ore Italiane (2023) and Splendori Celesti (2023–2024). The event also marks the 400th anniversary of Giovanni Domenico Cassini's birth (1625–1712) and contributes to the centennial celebrations of the Istituto e Museo di Storia della Scienza - Museo Galileo in Florence.

The Concept of Scaling
Though the concept of scaling is hardly new, its significance has evolved across academic disciplines, with profound implications for both the natural and human sciences. W. Rozeboom's landmark essay, "Scaling Theory and the Nature of Measurement" (1966), laid a crucial foundation by distinguishing between scaling and measurement. Scaling is not simply about size reduction but encompasses a complex interplay of spatial, temporal, and cognitive dimensions.

This distinction has informed multiple fields, from geography (D.J. Marceau's The Scale Issue in the Social and Natural Sciences, 2014) to political science (J. Meadowcroft's Politics and Scale: Some Implications for Environmental Governance, 2002) and anthropology (E. Summerson Carr and M. Lempert's Scale: Discourse and Dimensions of Social Life, 2016). In the biological sciences, works such as J.H. Brown and G.B. West's Scaling in Biology have explored the vital role of scaling in understanding life systems. Similarly, the history of science has illuminated how scaling functions as both a conceptual and methodological tool, as demonstrated by K. Tybjerg's analysis of scale in medical history and J. DiCaglio's Scale Theory (2021).

In art history, scaling has emerged as a key concept in understanding how size shapes our interac-

tion with objects and images. E. Lugli's work—starting with the Size Matters colloquium (Florence, 2012) and culminating in To Scale (2015)—explores how scale organizes spatial and relational dynamics in artworks. As Lugli contends, "scale requires us to consider how size enables a material entity to function convincingly as an artwork."

Scaling the Cosmos: An Interdisciplinary Approach

In astrophysical sciences, scaling has been foundational for modeling the vast structures of the universe. In his seminal article "Scaling in the Universe" (1995), S. Borgani discusses how scaling principles help interpret observational data and describe the large-scale structure of the cosmos, focusing on concepts such as fractals. The relationship between scaling and dark energy and dark matter has been explored by L. Amendola et al. in "Challenges for Scaling Cosmologies" (2006), which delves into the dynamic forces shaping the universe's elusive components.

Modern astrophysical instruments, like the Hubble and James Webb Space Telescopes, have broken new frontiers in cosmographic exploration, producing vast data sets and images that challenge both our understanding of the universe's microstructure and its grand, interconnected scales.

However, these modern endeavors echo the late medieval conceptualization of the cosmos, where the relationship between the microcosm and macrocosm formed a pivotal framework for understanding the cosmos. As K. Anderson's 2019 article "Scaling Nature: Microcosm and Macrocosm in Later Medieval Thought" suggests, scaling was integral to medieval conceptions of the universe as a hierarchical system, connecting the human scale to the divine and the cosmic.

Scaling the cosmos is far from a new phenomenon. Its contemporary form, however, crystallized in the early modern period, particularly during the Renaissance. From maps attempting to represent the Earth's vastness to modern astrophysical models, scaling has enabled the translation of celestial phenomena into intellectual and visual representations. The work of early modern astronomers such as Kepler and Galileo marked a turning point for a more tangible understanding of planetary motion and the nature of the universe.

Themes of the Conference

The central theme of the Scaling the Cosmos conference revolves around the concept of scaling as a critical framework that spans the Human and Natural Sciences, touching Art History, the History of Science, and Astrophysical Sciences. Here, scaling goes beyond the common idea of physical resizing; it represents a dynamic and multi-layered process designed to make the unfathomable cosmos accessible to human cognition. This includes exploring how the actual size of the world is represented through maps, models, diagrams, instruments, objects, and images—whether for scientific, artistic, political, or technical purposes.

Scaling operates across multiple registers—spatial, temporal, and cognitive—transforming not only how we understand the universe but also how we measure, represent, and perceive it.

The conference will explore the ways in which images, tools, and instruments have been devised to scale the universe. From early astronomical clocks and celestial globes to modern digital simulations of cosmic phenomena, each scaling operation presents both opportunities and limitations for understanding the cosmos.

By interweaving perspectives from history, science, and art, the conference will reframe how we think about scale—how the mapping of the cosmos, its visual representations, and the instru-

ments used to explore it function as both tools of scientific inquiry and cultural artifacts. This interdisciplinary approach aims to show how scaling the cosmos continues to evolve, enabling us to understand the universe not merely as a physical entity but as a cultural, epistemic, and historical construct.

Conference Sessions and Workshop

The conference will be structured around several thematic sessions, with three identified so far:
• “Measuring the Cosmos: Instruments, Clocks, and Timekeeping”
• “The Cosmos as a Spectacle: Images, Observations, and Simulations”
• “Historical and Visual Narratives of the Cosmos”

Additionally, a workshop for early-career scholars will provide an opportunity for emerging voices to contribute to these interdisciplinary dialogues.

By rethinking scaling as both a scientific tool and a cultural phenomenon, Scaling the Cosmos will offer new insights into the intellectual, visual, and material representations of the universe across history. This conference is an invitation to reconsider not only the methods and instruments we use to explore the cosmos but also the very ways in which we perceive and interpret our place within it.

Workshop Application Process
PhD candidates and early-career researchers who obtained their PhD within the past five years are invited to apply.
Each presentation will last approximately 15 minutes, followed by an open discussion with a panel of respondents. This exchange aims to foster collective reflection on methodological approaches and situate such research within the broader contexts of both the history of science and the visual arts. The workshop is conceived as a key moment for collaborative discussion and critical engagement.
We welcome papers that engage with the thematic sessions outlined above, but proposals are not limited to these topics. Submissions that focus on objects or archival materials from the Museo Galileo, or that require an in situ study of its collections, are particularly encouraged.
Participants will be required to submit a draft paper prior to the conference. It will be read by the workshop discussants to foster an open discussion. After the event, in the contest of the proceedings’ publication, participants might be asked to provide a final version of their presentation for inclusion. Finally, participants will be asked to provide a brief report reflecting on their experience in the workshop.
Selected participants will receive a grant covering travel and accommodation expenses in Florence for the duration of the conference.

Submission Guidelines
To apply, please submit a 300-word abstract of your presentation along with a short CV (maximum two pages) listing relevant publications and/or conference presentations. These materials should be combined into a single PDF file and sent to both Florian Métral (florian.metral@cnrs.fr) and Maddalena Napolitani (m.napolitani@museogalileo.it) by May 29, 2025.

Reference: