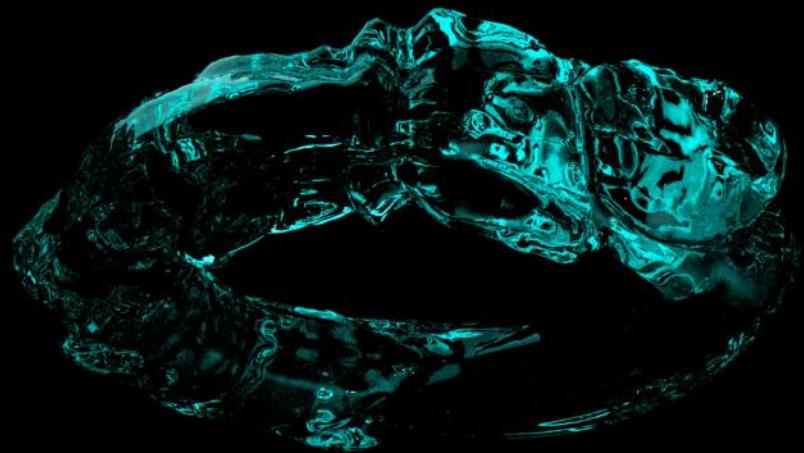
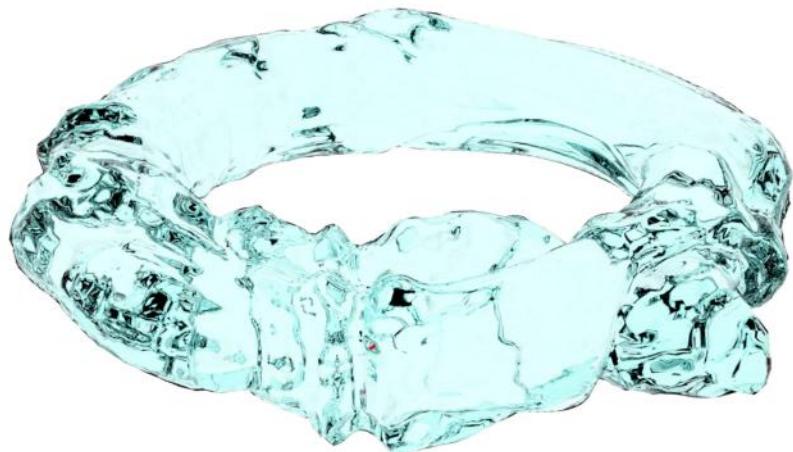




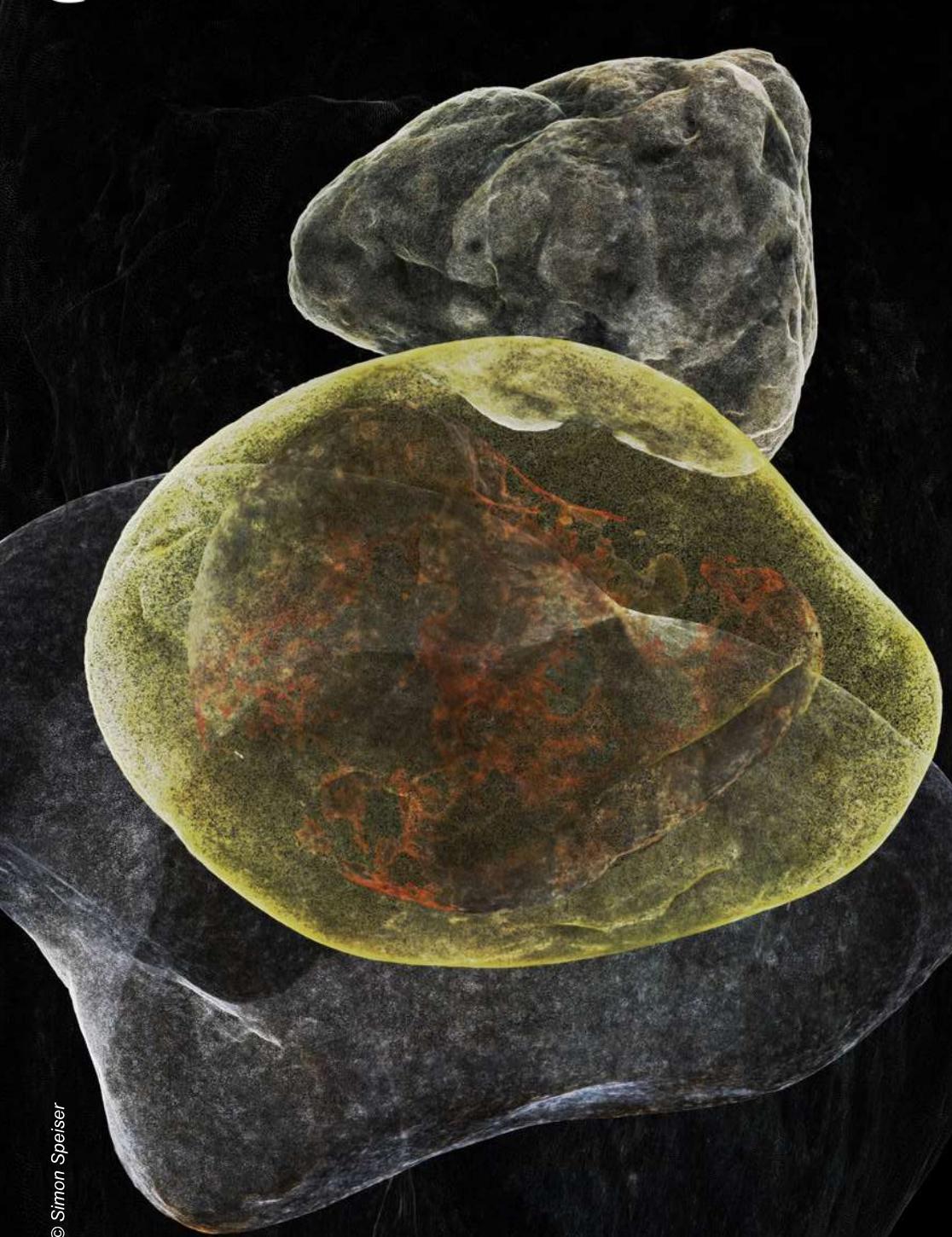
Staatliche Museen zu Berlin  
Preußischer Kulturbesitz

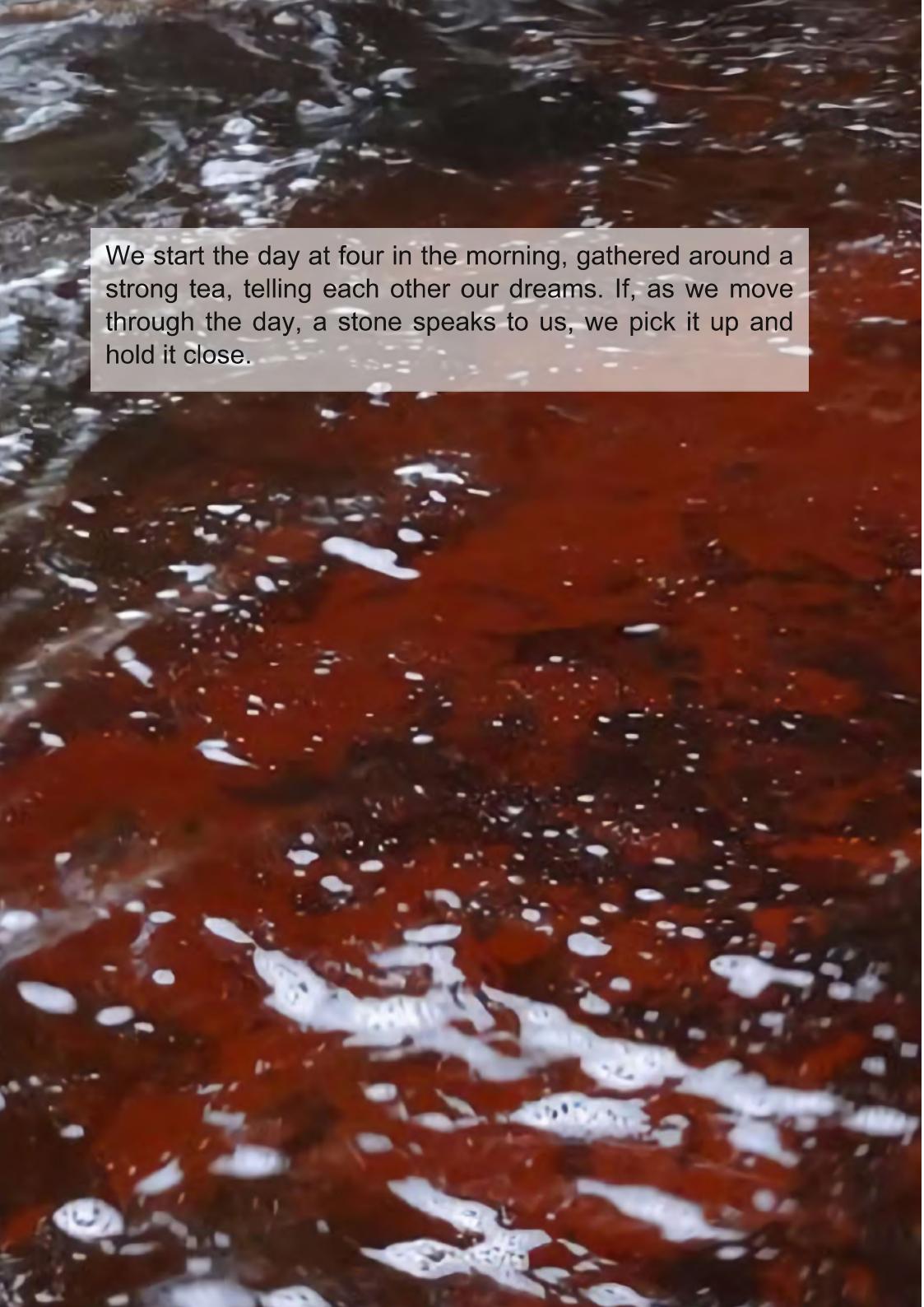


IASA CLAIMS SPACE FOR LIFE



© Norbert Pape





We start the day at four in the morning, gathered around a strong tea, telling each other our dreams. If, as we move through the day, a stone speaks to us, we pick it up and hold it close.

With my mind I move. I slip into your dreams and feel the way you walk.

When I dream with you, our concepts of time align. We go to the river and swim together in the heat of our dreamed up sun. As the wind plays, the lush green leaves around us agree with the numbing song of the forest bugs, mirroring the dancing reflections of the sun in this dark amber coloured water into which we are submerging our bodies.

I like the way you look at me, the way your gaze slows you down, makes your hasty soul calm and rest your mind on the variegating patterns of my mineral structures coming to you in the body of a young boy.

You've found me on your walk through the forest. I've felt you approaching from far away, knowing that we could align for some time, bringing our thoughts together, sharing our observations along the river of time that we ride on such different waves.

When we dream together our perceptions overlay, micro and macro becoming one, mapping your breath to what you call the cycle of the year, a rotation of the earth around the sun.

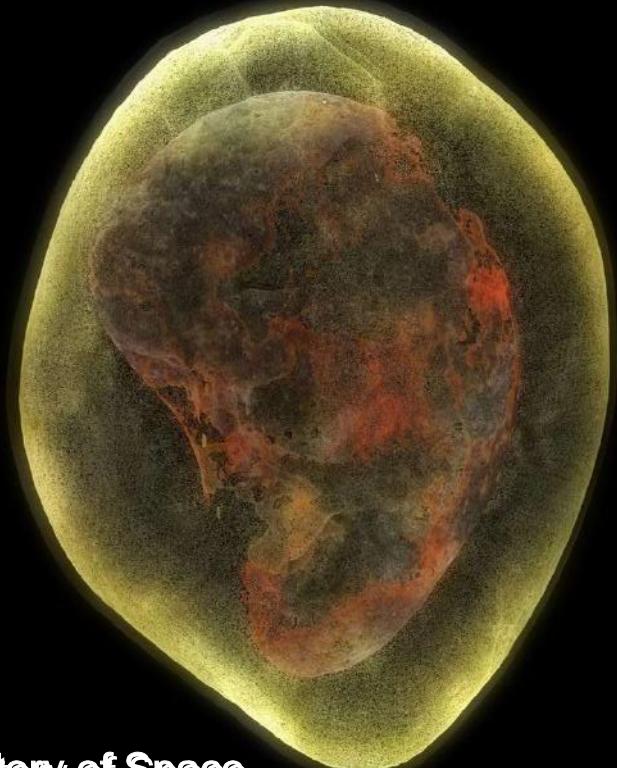
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'O' is a speculative Sci-Fi re-take of Steve Paxton's 'Satisfying Lover', the iconic piece from 1967 in which 40 people did 'nothing more' than walk across stage. His intention was one of democratization of dance, but also of analyzing habitual movement, and often in relation to the laws of physics. We want to take the act of walking a step further: each step is not only a falling, a dance with gravity, but also a pushing back of the planet Earth with one's feet. Consequently, if enough of us walk in the same direction in a circular manner long enough, we can alter the rotation of the planet, deviating its course ever so slightly, but hopefully significantly.



claims space for life. It recruits experts to support the development and dissemination of knowledge, cultural practices and technologies that will enable further exploration and benefit life on Earth. To ensure future success for the agency and the world, IASA also supports education efforts with an emphasis on increasing diversity in modes of inhabiting the planet.

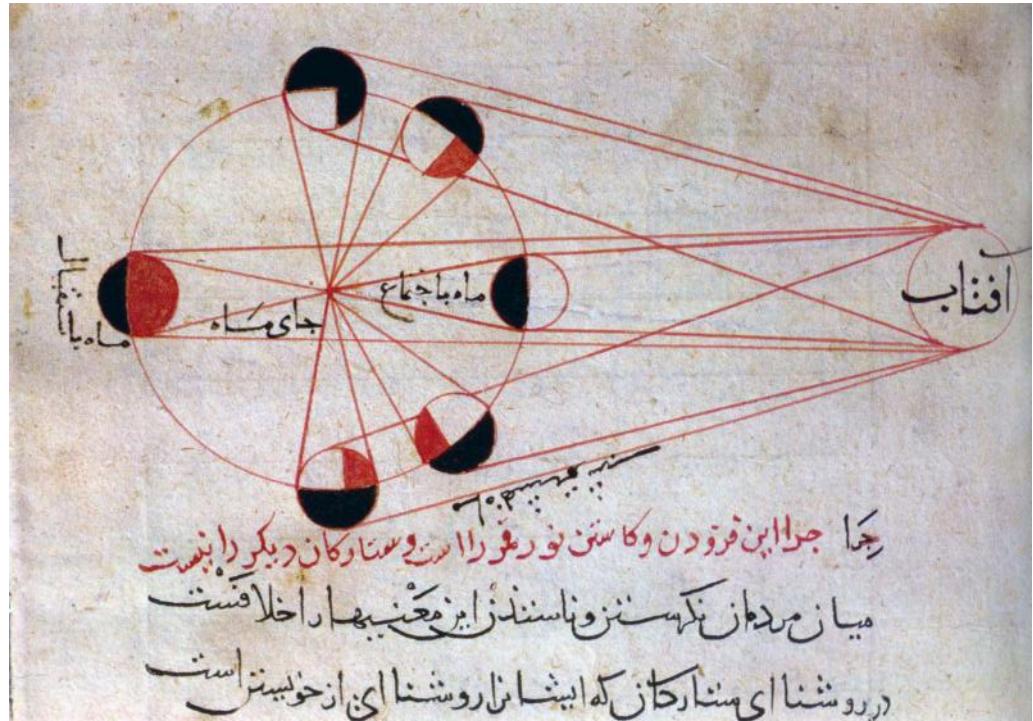
© Simon Speiser



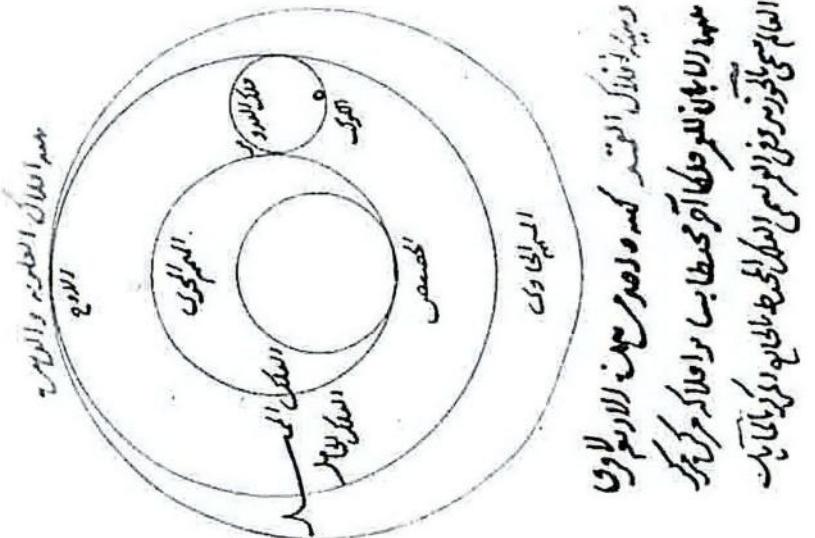
## A Brief History of Space

Space is a central notion in mathematics and physics and has always been at the heart of their interactions. From Greek geometry to Galileo experiences, mathematics and physics have been rooted in constructions performed in the same ambient physical space. But both mathematics and physics have eventually left the safe experience of this common ground for more abstract notions of space. [...] The capacity to manipulate spaces without relying on a spatial intuition has laid the foundations for one of the most important revolutions in geometry: the conception of spaces of arbitrary dimension. [...] The intuition of space has been pushed far away from the original intuition of the ambient physical space, but in a clear continuity. The evolution of the notion of space in mathematics and physics has continued until now. However, the results of these developments are less universally known in the mathematical and physical communities where the common background stays, even nowadays, the classical paradigm.

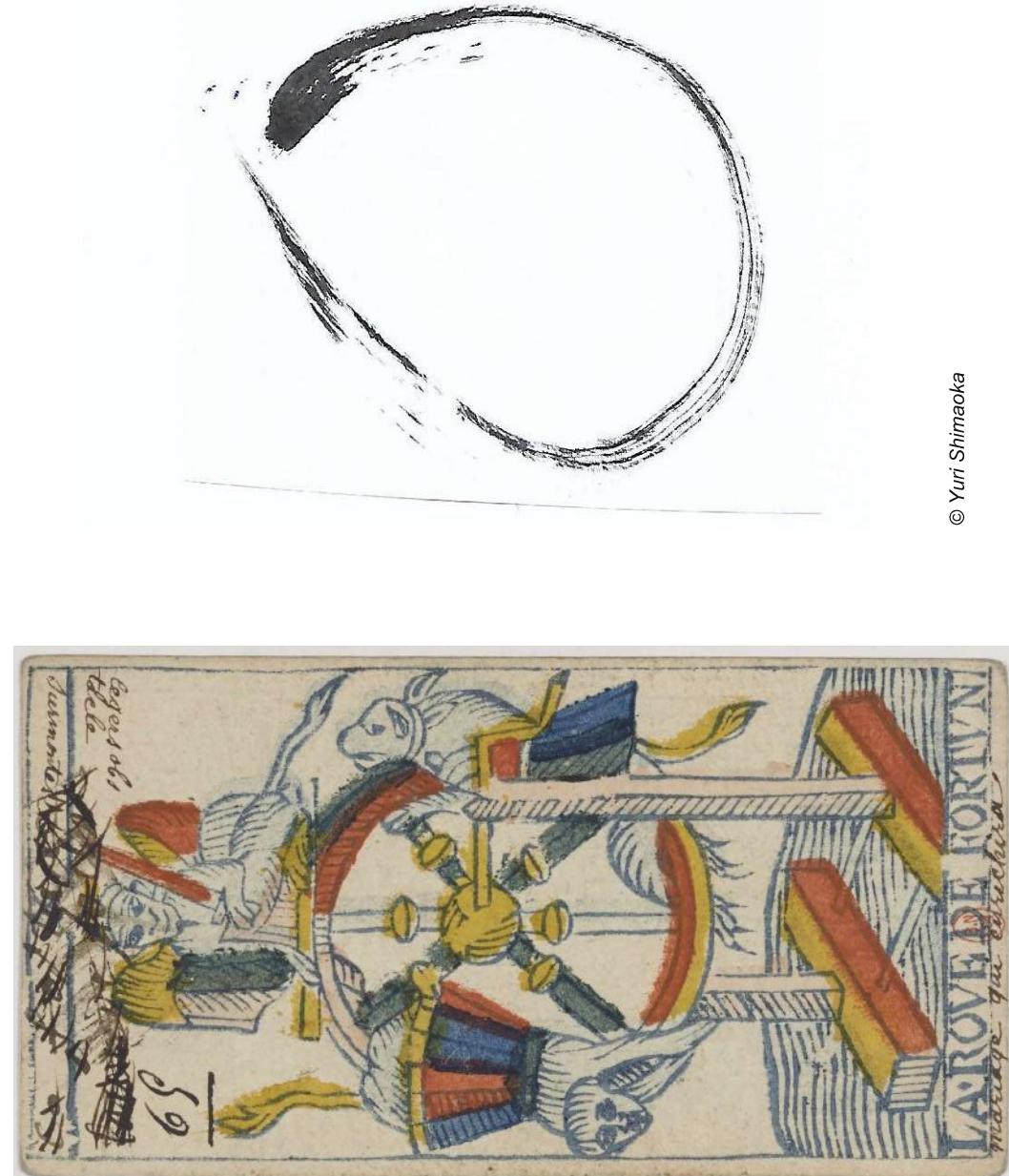
*New Spaces in Mathematics*, edited by Mathieu Anel and Gabriel Catren, Cambridge University Press 2021, p. 1-2



Abu Rayhan al-Biruni, Lunar Eclipse, early 11th century



Ali Qushji, Excerpt of scientific work providing evidence for the Earth's rotation, 16th century



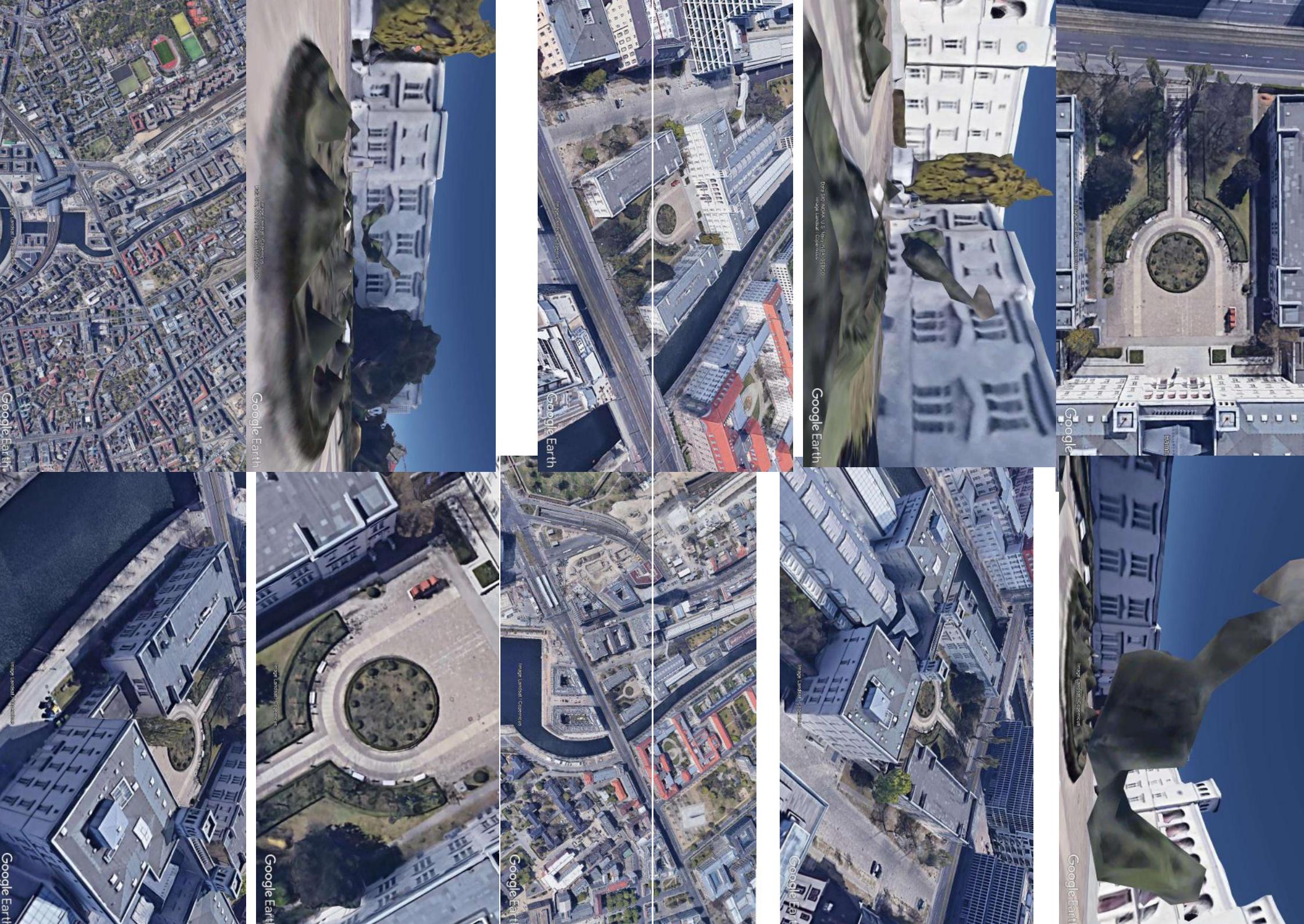
Tarot de Marseille, early 19th century, gallica.bnf.fr / Bibliothèque nationale de France



© Norbert Pape



Motif by Ashna, embroidery by Elena Polzer



Walking springs to mind. In human walking, each move begins with a touch down upon the surface of the earth. The surface is an accumulation of all the inert bits huddling down toward the core. On this surface we stride. We also meander, stumble, hobble. On earth, florr, path, slope, marsh, negotiating the next move.

Then we claim the step. "I took that step." Do we forget the support? Yes, I think so. We take it for granted, unless we have been out strolling in a major earthquake, or felt the scree slip beneath our foot in a mountain climb.

Each of us learns to walk by ourselves. We are encouraged by many, true enough, but what can they do?

Steve Paxton, *Gravity, Contredanse* 2018, p. 15



You're walking. And you don't always realize it  
But you're always falling  
With each step, you fall forward slightly  
And then catch yourself from falling  
Over and over, you're falling  
And then catching yourself from falling  
And this is how you can be walking and falling  
At the same time

Laurie Anderson, *Walking and Falling*, 1982

that which is above is that which is below is

To explore the vastness  
The Destiny of Earthseed  
Is to take root among the stars.  
It is to live and to thrive  
On new earths.  
It is to become new beings  
And to consider new questions.  
It is to leap into the heavens  
Again and again.  
It is to explore the vastness  
Of heaven.  
It is to explore the vastness  
Of ourselves.

*Octavia Butler, The Book of the Living,  
verse 59*

*Les Grandes Heures du duc de Berry, 1407*



*Yuri Shimaoka, 4D torus, 2021*

# that which is above is that which is below is

To create a Möbius strip, which is a surface of which you cannot distinguish the top from the bottom, cut along the dotted line and join the edges so that the directions of the blue arrows match.



If I use a Möbius strip for this experiment, it's because it breaks with our spatial habits: right/left; front/back, etc. It forces us to experience a limitless time and a continuous space.

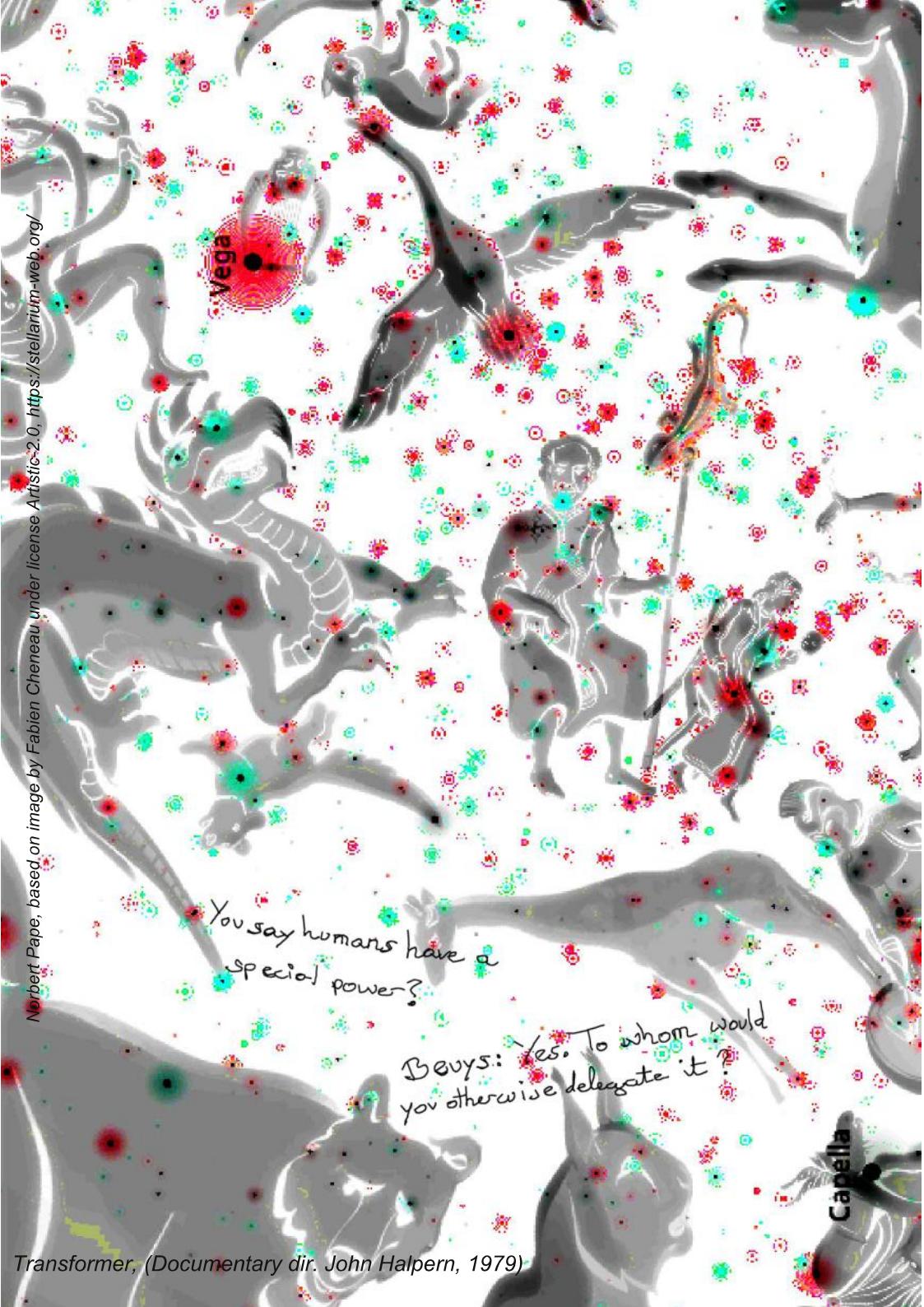
Lygia Clark and Yve-Alain Bois. "Nostalgia of the Body" October, Vol. 69 (Summer, 1994)



To create a Klein bottle, which is a closed surface of which you cannot distinguish inside from outside, find a quiet place in 4 dimensional space, cut out the red and blue rectangle and glue the edges so that the directions and colors of the edges match. If you have a hard time finding a 4D spot, do it in 3D, but you will then have places of self intersection. Here is how you knit one: <https://mycrafts.com/diy/how-to-make-a-klein-bottle-hat-mathematical-knitting/>

However deeply rooted this rejection of the empirical may be, in Western ways of thinking about mathematics it seems to have gone unnoticed that not all cultures subscribe to this elevation of metaphysics above physics. Not all cultures and philosophies subscribe to this belief that the empirical world is contingent, and that only the nonempirical can be necessary. For example, the Lokayata (popular/materialist) stream of thought in India adopts exactly the opposite point of view. It explicitly rejects any world except that of sense perception. It admits the pratyaksa or the empirically manifest as the only sure means of pramana or validation, while rejecting anumana or inference as error-prone and fallible. That is, in terms of the Platonic gradation of reality, Lokayata places intellectual ways of knowing on a lower footing than knowledge relating directly to sense perception. However odd this may seem from a Western perspective, and notwithstanding the orientalist characterization of Indian thought as "spiritual," all major Indian schools of thought concur in accepting the pratyaksa as a valid prambna, or means of validation. Moreover, pratyaksa is the sole pramina that is so accepted by all schools, since Lokayata rejects anumana, while Buddhists accept anumana but reject gabda or authoritative testimony, although Naiydyikas accept all three, and add the fourth category of analogy (upamana).

C.K. Raju, "Computers, Mathematics Education, and the Alternative Epistemology of the Calculus in the *Yuktibhāṣā*", *Philosophy East and West* 51, no. 3 (2001)  
325–362.



Transformer, (Documentary dir. John Halpern, 1979)

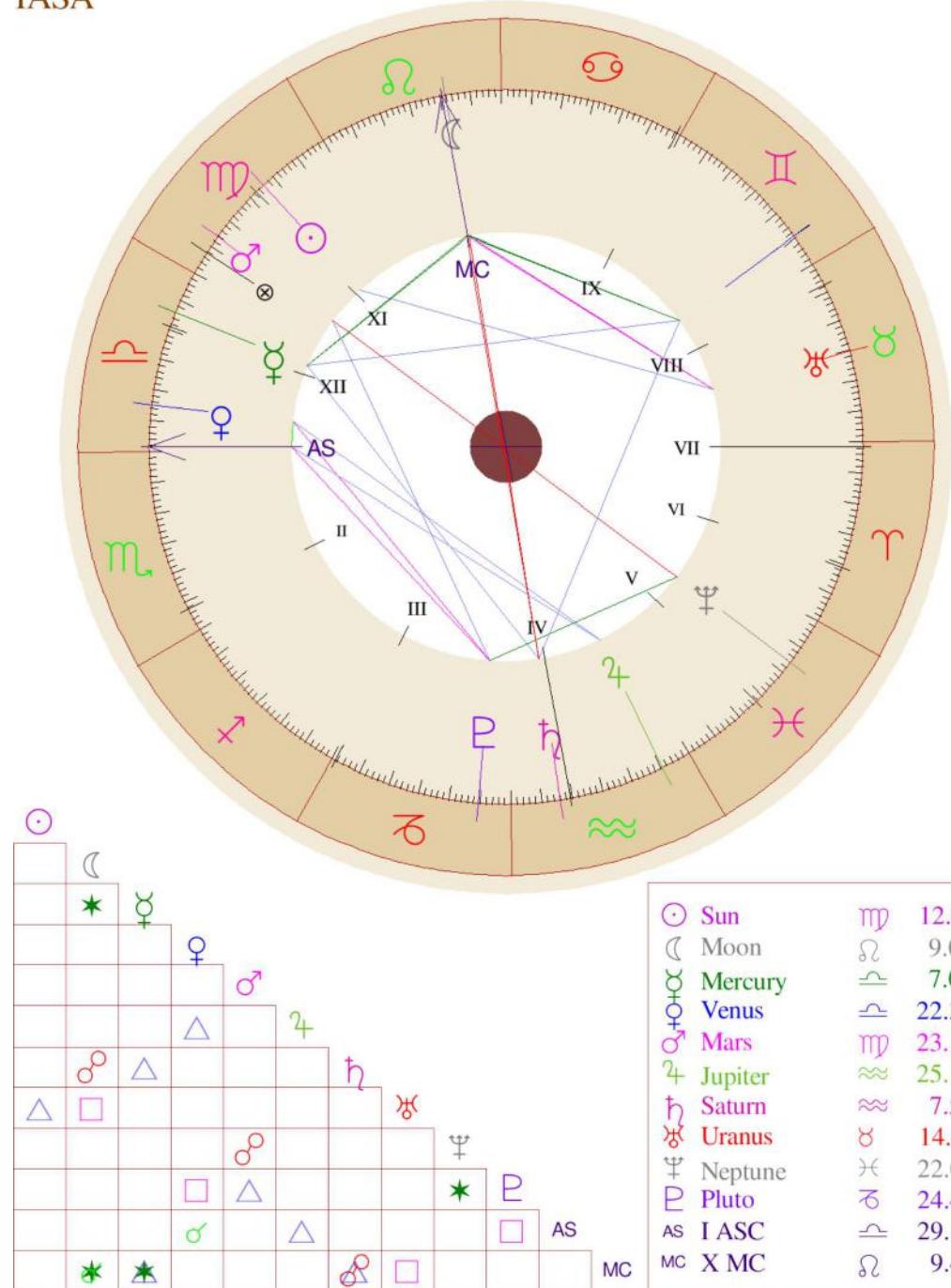
Disidentification negotiates  
 Strategies of resistance  
 within the flux of  
 discourse and power  
 Disidentifications, 1999

What we described as "the awful thing we  
 experienced of arriving late in the modern  
 Tanpinar described what Tanpinar  
 confronted what Tanpinar described what Tanpinar  
 Teigore confronted", that is, the experience foreclosed and already  
 the experience foreclosed and already literary,  
 the experience foreclosed and already spiritual.  
 call belatedness pupils, to find one's future. There is much  
 world, as naive people's past and present to the spiritual  
 defined by other people's evidence attesting to A. H. Tanpinar  
 historical and sociological Regulation Institute" by A. H. Tanpinar  
 Pankaj Mishra for the foreword of "The Time Regulation Institute"

What are the possibilities of politicizing disidentification, this  
 experience of misrecognition, this uneasy sense of standing under a  
 sign to which one does and does not belong? Butler answers: "it may  
 be that the affirmation of the slippage, that the failure of identification,  
 is itself the point of departure for a more democratizing affirmation of  
 internal difference."

J.E. Muñoz, *Disidentifications*, Univ Of Minnesota Press 1999, p.12

IASA





# O

a choreography by Pêdra Costa, Göksu Kunak, Norbert Pape, Elena Polzer, Yuri Shimaoka

Participating artists: Franziska Aigner, Ardot Aslan, Kelley Becker, Zinzi Buchanan, Marly Borges, Helen Burghardt, Yara Colón, Emese Csornai, Leman Sevda Daricioğlu, Emeka Ene, Christian Filips, Chris Gylee, Gil DuOdé, Alexander Hahne, Michael Kaddu, Dongkyu Leo Kim, Linards Kulles, Ariel Nil Levy, Camila Malenchini, Magdalena Meindl, Lyla Palmer, Sunny Pfalzer, Rain Rose, Lotte Ramínez Speiser, Simon Speiser, Vera Varlamova, Rude Vianna, Cristina Viegas.

Logistics: Simone Graf

Video documentation: Andrea Keiz

Thanks to Marina Naprushkina, Kolja Kohlhoff, Claudia Ehgartner, Barbara Campaner

Supported by Institutions Extended, a cooperation between the Neue Nachbarschaft/Moabit and Hamburger Bahnhof - Museum für Gegenwart - Berlin and by the NATIONAL PERFORMANCE NETWORK - STEPPING OUT, funded by the Federal Government Commissioner for Culture and Media within the framework of the initiative NEUSTART KULTUR. Assistance Program for Dance.

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Staatliche Museen zu Berlin  
Preußischer Kulturbesitz



nationales  
performance  
netz



institutions e x t e n d e d

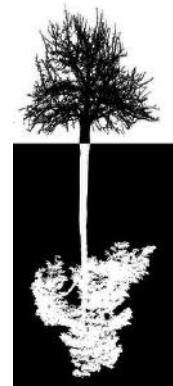
ehrliche ARBEIT  
freies kulturbüro



Die Beauftragte der Bundesregierung  
für Kultur und Medien

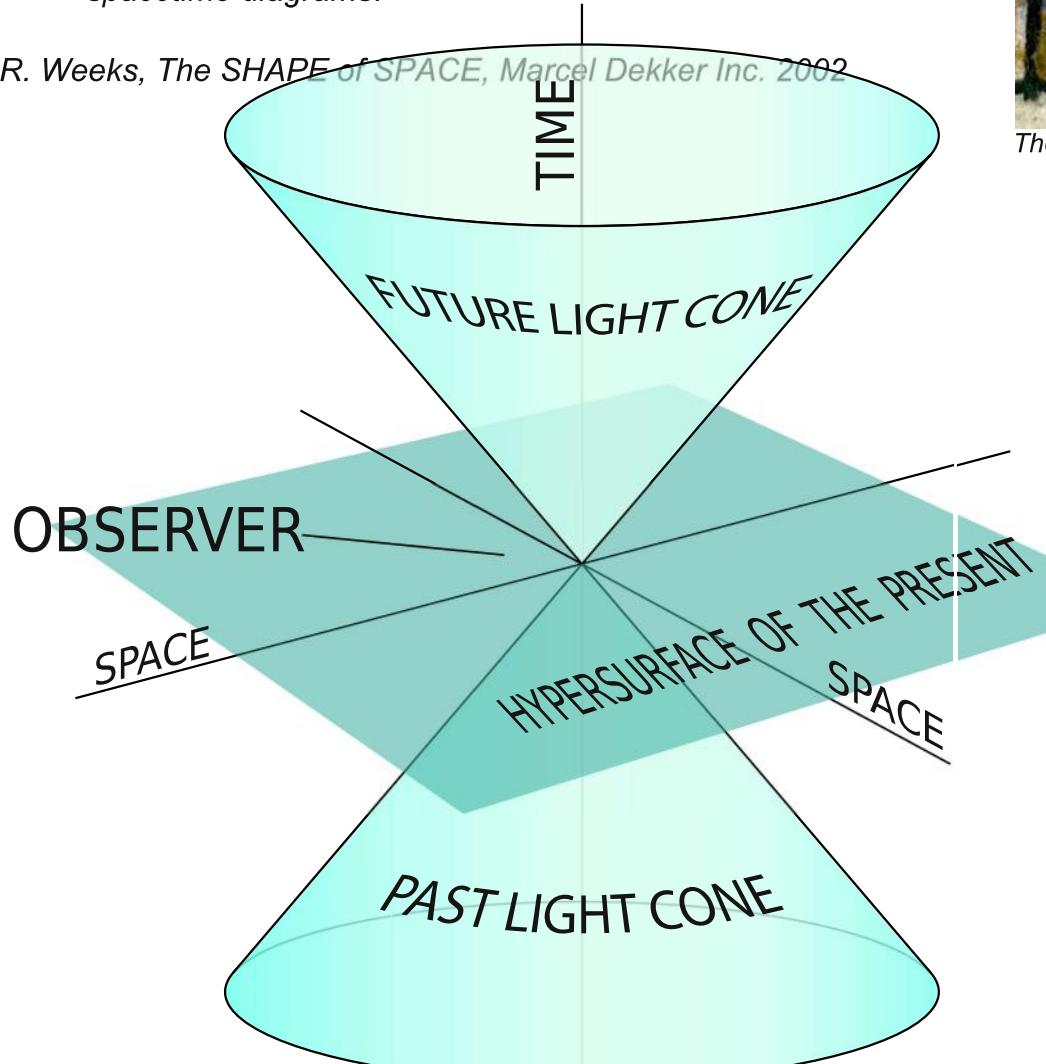


PinguinDruck.de



Sagredo: What came before the big bang?  
 Salviati: Nothing did.  
 Sagredo: You mean the space was entirely empty then?  
 Salviati: No, space didn't even exist!  
 Sagredo: Oh, I see: at times before the big bang there simply was no space. What a curious thought.  
 Salviati: It's worse than that: "before" the big bang there wasn't any time either!  
 Sagredo: What? No time?! Even if there was no matter and no space, surely there would have been time.  
 Salviati: Allow me to draw you some pictures. They'll be *spacetime diagrams*.

Jeffrey R. Weeks, *The SHAPE of SPACE*, Marcel Dekker Inc. 2002



Thomās Cantimpratensis, *De natura rerum*, 1244

This 'beginning', like all beginnings, is always already threaded through with anticipation of where it is going but will never simply reach and of a past that has yet to come. It is not merely that the future and the past are not 'there' and never sit still, but that the present is not simply here-now. Multiply heterogeneous iterations all: past, present, and future, not in relation of linear unfolding, but threaded through one another in a nonlinear enfolding of spacetime-mattering, a topology that defies any suggestion of a smooth continuous manifold.

Time is out of joint. Dispersed. Diffracted. Time is diffracted through itself.

Karen Barad, *Quantum Entanglements and Hauntological Relations of Inheritance*, *Derrida Today*, 3(2), 240–268. 2010

Probability distribution of two particles that repell each other in a restraining external field:

$$z = (y - x)^2 e^{-(x^2 + y^2)}$$

Can you remember a mathematical dream?

Nicole El Karoui: What I remember even better was how uneasy the zero made me feel when I was a little girl. It was the symbol that seemed to be a sign of some major transgression, especially for a girl: to articulate the void, give it substance, even God hadn't done that. At the same time, that circle, which was empty on the inside, that hoop seemed to me to be the entrance to mysterious, very alluring world, the promise of a swirling, unlimited way of thinking... Alice in Wonderland...

As a probability theorist of phenomena in movement, I have dealt with the question of how to mathematically represent the present, or what we observe, the past, or what we have supposedly observed, and the future, what we hope to be able to foresee. A major breakthrough was made by Kolmogorov (1933) with the use of measure theory tools such as tribes. But this formal postulate of



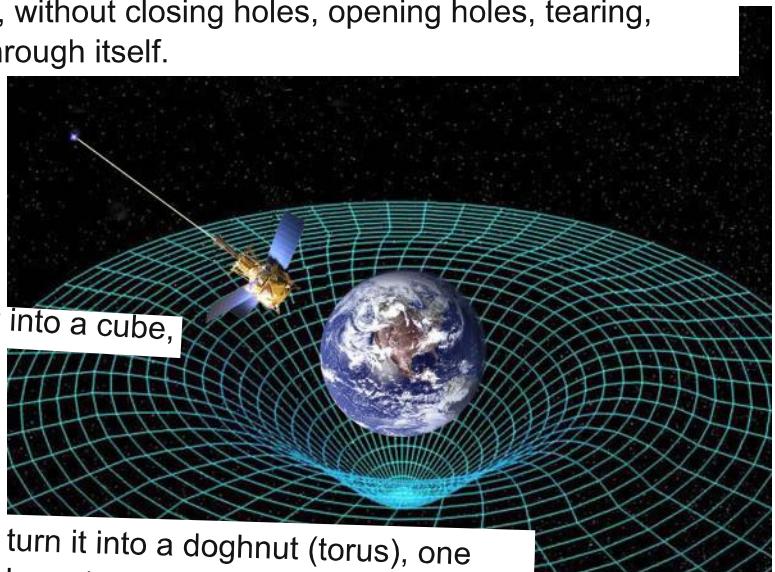
time as increasing, even if it is endowed with a fanciful touch of randomness, inevitably poses the question of the origin of time, of the zero from which time first began to move. Arab civilization, which is the advocate of that absolute zero (strange, isn't it?), does not situate itself in a linear time extending into infinity, but rather in a time that is elastic, that stretches and stretches, but always ends up coming back to its point of departure. Past, present, and future intertwine in an arabesque that Kolmogorov's model would have a hard time reproducing, and this poses the question of the cultural and social dependence of mathematics.

*Mathematics: A beautiful elsewhere. Jean-Pierre Bourgignon,  
Michel Cassé, Fondation Cartier 2011*

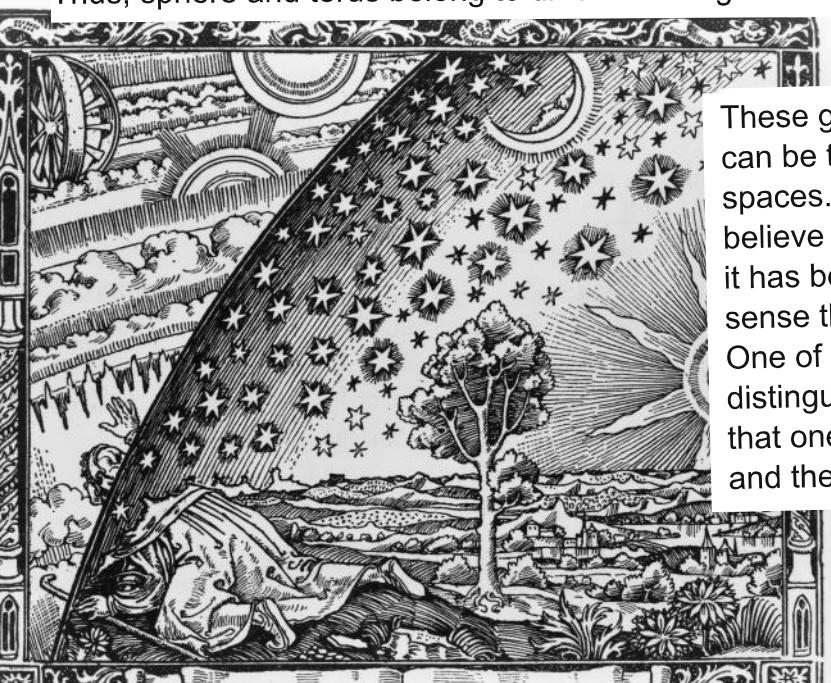
Much like origami or pottery, a branch of mathematics called topology is concerned with the properties of geometric objects that are preserved under continuous deformations, such as stretching, twisting, crumpling, and bending; that is, without closing holes, opening holes, tearing, gluing, or passing through itself.

Take a ball.

One can shape it into a cube,  
a pillow,  
an egg, a heart.



Thus, sphere and torus belong to different categories.



These geometric objects can be thought of as spaces. While some believe the Earth is a flat, it has become common sense that it is round. One of the features that distinguishes the two is that one has an edge, and the other not.

unknown artist,  
*The Flammarion*  
engraving, 1888

Cosmology poses the question of the shape of the universe. I think our basic intuition is that it is a big 3D container in which all the celestial objects (including us) fly around each other, or away from each other. Evidence shows this is unlikely to be the case.



Conversely, I want to believe that expanding our knowledge of possible spaces could enrich our way of intuiting the world.

Like the Möbius strip.

It is a surface for which we cannot decide which side is on top, and which one is on the bottom.

Or the Klein bottle with no distinction between inside and outside.

Or higher dimensional spaces.

Or that we can rigorously define spaces by making local maps and gluing them together, without needing to make a picture of the whole.

Or that space can have holes and is not necessarily smooth.

Text by Norbert Pape

CIRCUMAMBULATION is a ritual term meaning literally "to walk a circle around".

自らを冷暖かく見る事  
が出来ます、  
今迄続けてきた事、  
これらは “心身”、  
終わるところまで見て、

や日頃の責任

一円相成りまことに

ゆめ