

QUINTESSENCE



ENRICO MAGNANI

Art & Science at Gran Sasso National Laboratory (LNGS)
National Institute for Nuclear Physics (INFN)

A PERMANENT INSTALLATION

WHEN ART MEETS SCIENCE

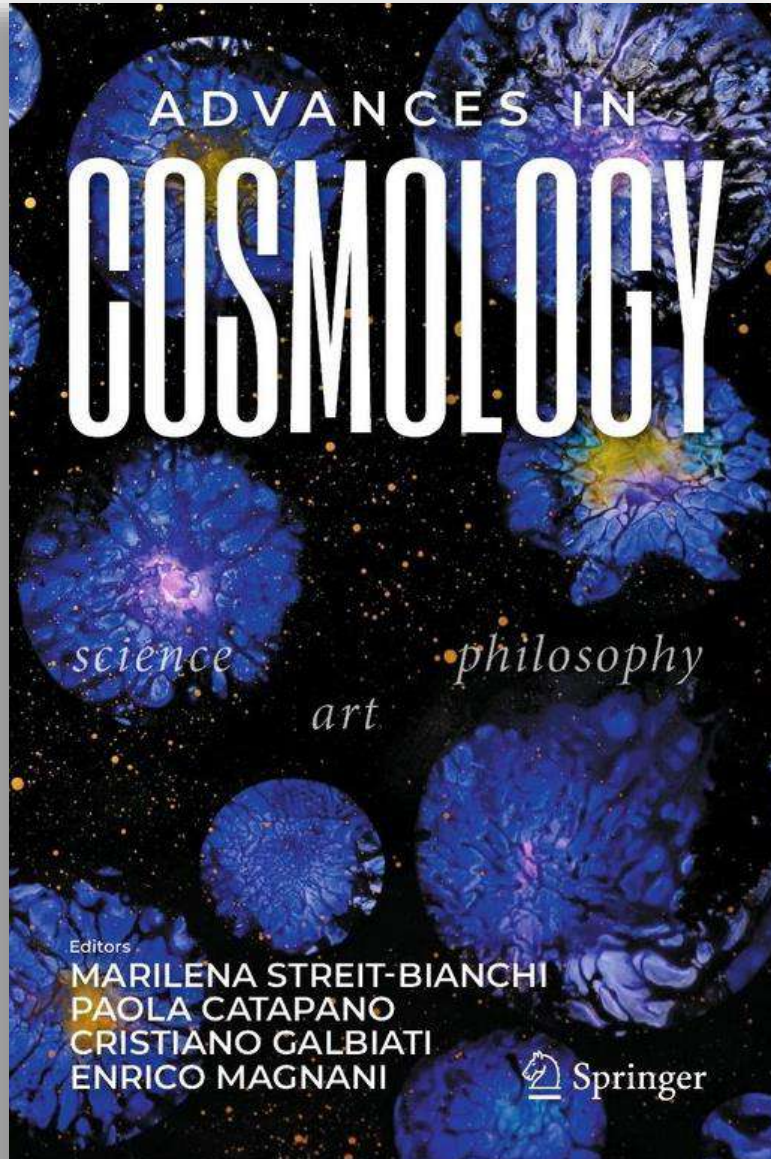
To develop and promote the interaction between the world of art and the world of science for a new vision and understanding of our universe.

Since 1st October 2020

*“De la discussion jaillit la lumiere”
(From the discussion springs light)*

Let's talk!

*To develop and promote the **interaction** between
the world of **art** and the world of **science** for a
new vision and understanding of our universe.*



Enrico Magnani

*The shore between
Art and Science*

Advances in Cosmology
Science - Art - Philosophy
Springer, 2022.



INTERACTION

Science to inspire the
world of Art



Art to represent and
sweeten the gradient of
Science

COMMON POINTS

Research

Divulgation

Beauty

Intuition

Research

The most beautiful experience we can have is the mysterious. It is the fundamental emotion that stands at the cradle of true art and true science.

Albert Einstein

More than ten years ago...

Divulgation

We depend on our words...

Our task is to communicate experience and ideas to others.

Niels Bohr

The research worker, in his effort to express the fundamental laws of Nature in mathematical form, should strive mainly for mathematical beauty. He should take simplicity into consideration in a subordinate way to beauty.
(P. Dirac)

Beauty

Compass No. 1

What makes the theory of relativity so acceptable to physicists in spite of its going against the principle of simplicity is its great mathematical beauty. (P. Dirac)

*With pure logic we would have ended up with tautologies; it could not create anything new. Nor could any science be derived from it. In a certain sense, these philosophers are right: to do mathematics, as to do geometry, or any other science, something more than pure logic is needed. To designate this something we have no other word but **intuition**.”*
(H. Poincaré)

Intuition

Compass No. 2

*All great scientific achievements arise from intuitive knowledge, that is, from axioms from which deductions are made... **Intuition** is the necessary condition for the discovery of these axioms.”*

(A. Einstein)

«Quintessence» Art & Science at LNGS

An artistic representation of astroparticle physics

Quintessence at LNGS

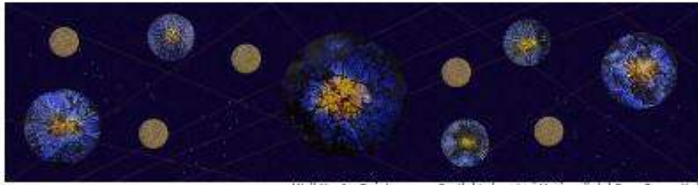
Installation located in
Research Division area

An overview

4 walls - 4 forces - 4 elements

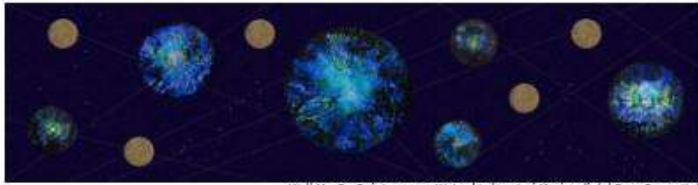
5° wall - unification + dark matter
(the challenges)

Wall 1



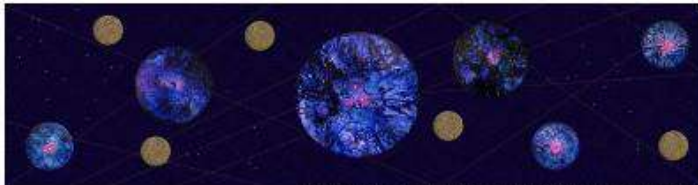
Wall No. 1 - Quintessence-Earth | Laboratori Nazionali del Gran Sasso, Italy

Wall 2



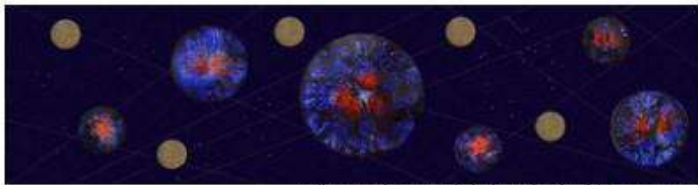
Wall No. 2 - Quintessence-Water | Laboratori Nazionali del Gran Sasso, Italy

Wall 3



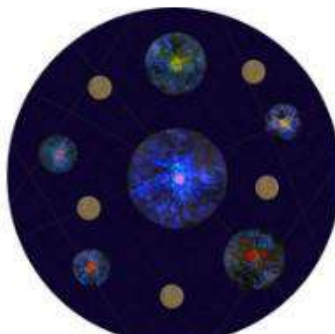
Wall No. 3 - Quintessence-Air | Laboratori Nazionali del Gran Sasso, Italy

Wall 4



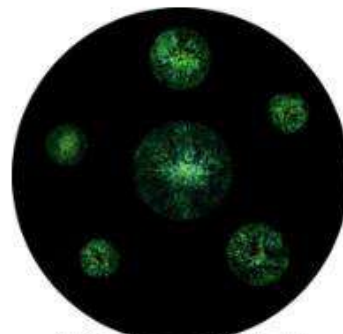
Wall No. 4 - Quintessence-Fire | Laboratori Nazionali del Gran Sasso, Italy

Wall 5



day

Wall No. 1 - Quintessence
Laboratori Nazionali del Gran Sasso, Italy



night

Wall No. 5 - Quintessence - Vision in the dark
Laboratori Nazionali del Gran Sasso, Italy

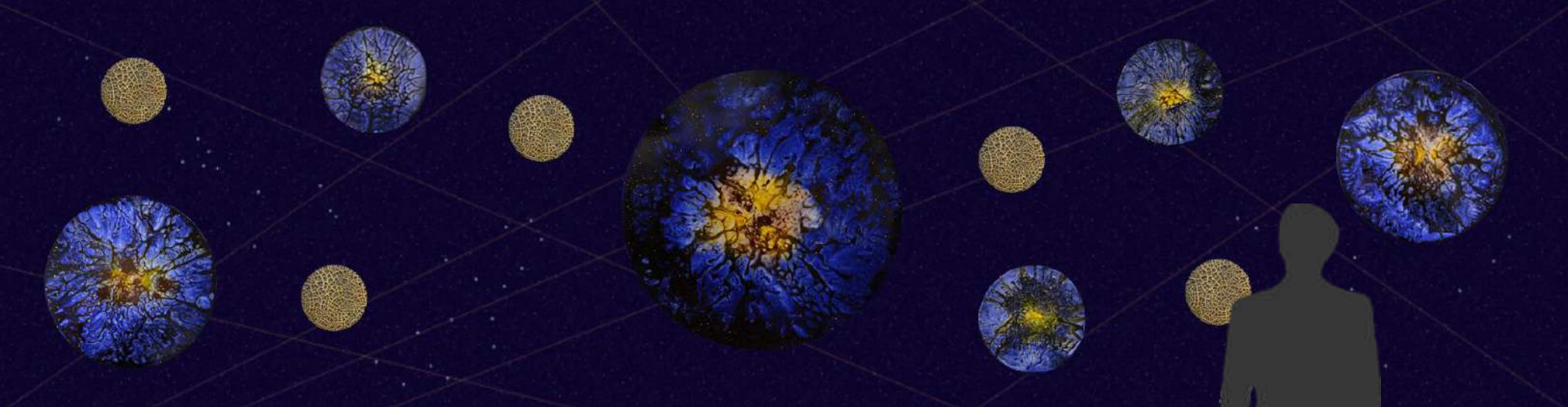


The structure in our DNA, the
code in our cells, the
molecules that make up our
bodies, all ultimately come
from the stars.
Carl Sagan



Wall 1 Earth

*Force: gravitational
Colors: yellow, brown
Constellations: Taurus, Virgo, Capricorn*



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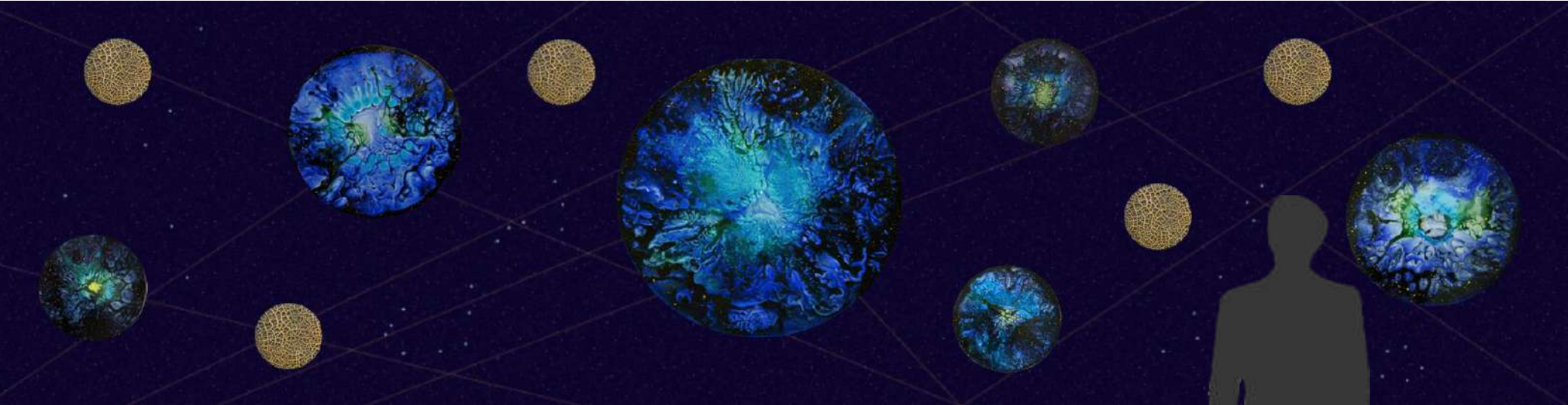
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Wall 2 Water

Force: strong nuclear
Colors: turquoise, green, blue
Constellations: Cancer, Scorpio, Pisces



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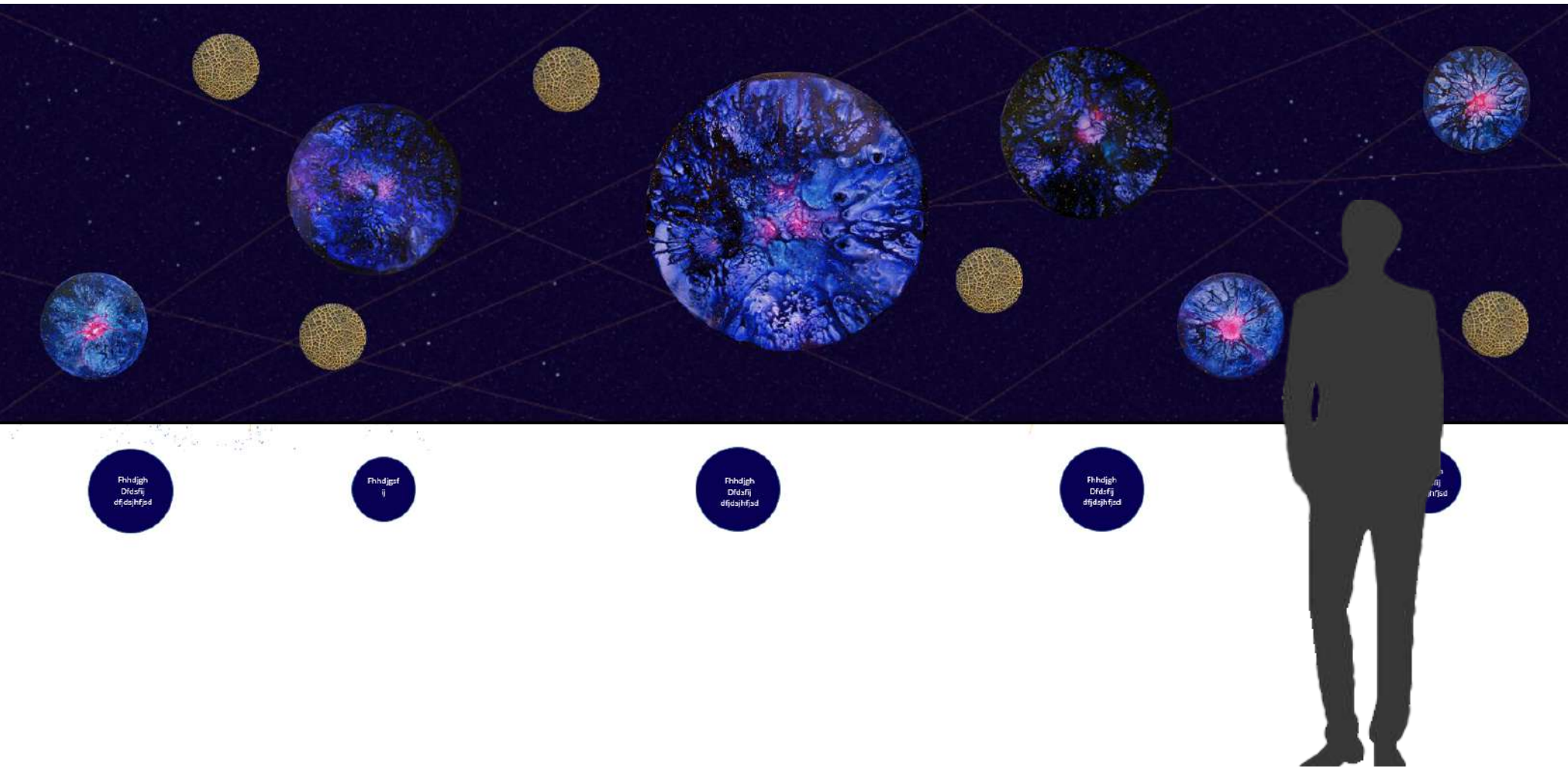
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Dimensions: 500 x 130 cm

Wall 3

Air

Force: weak nuclear
Colors: blue, indigo, purple
Constellations: Gemini, Libra, Aquarius

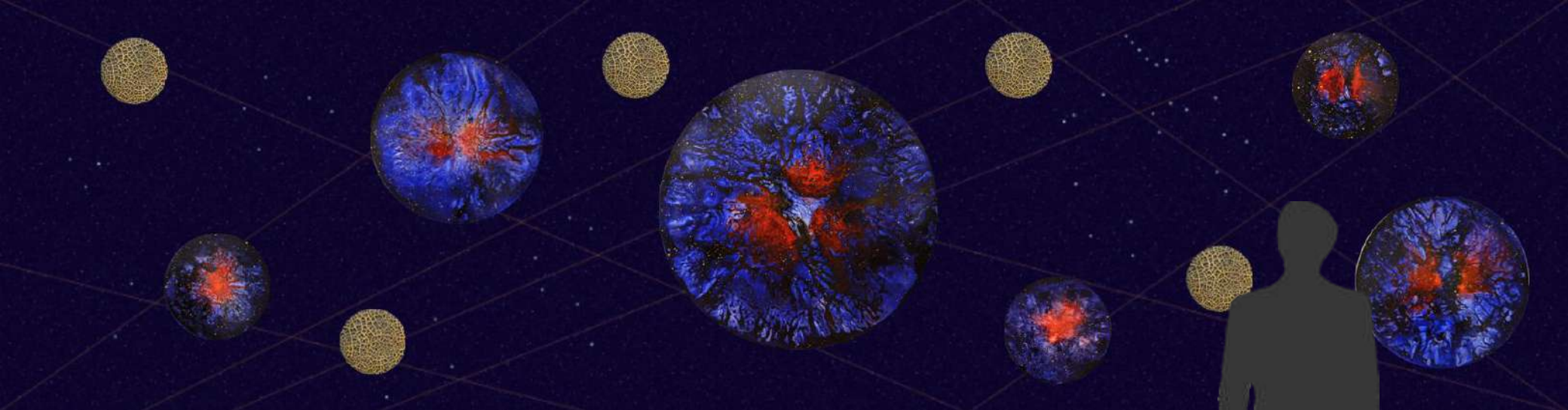


Dimensions: 500 x 130 cm

Wall 4

Fire

Force: electromagnetic
Colors: yellow, orange, red
Constellations: Aries, Leo, Sagittarius



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Dimensions: 500 x 130 cm

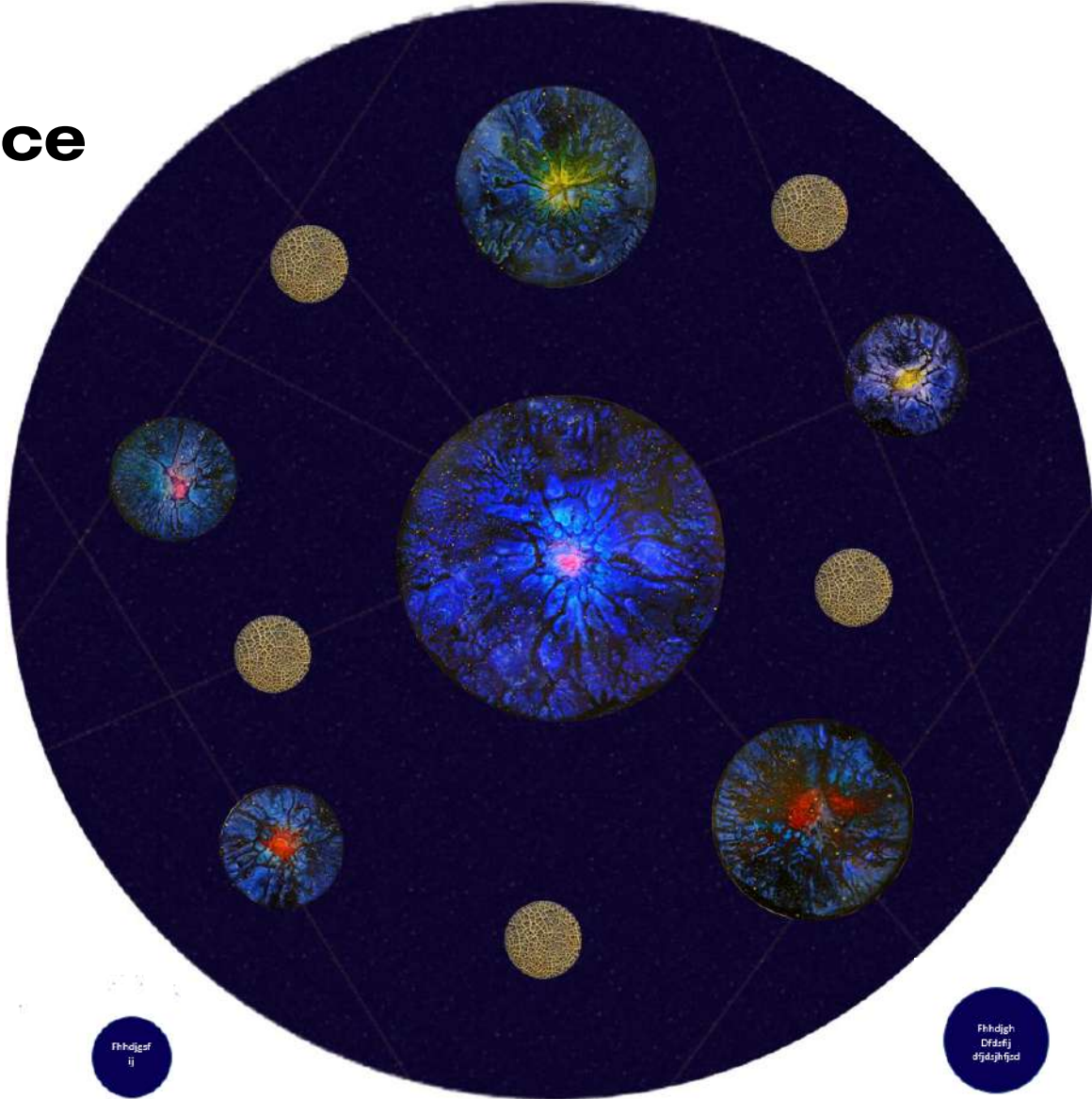
Wall 5

Quintessence

Force: Unified

Colors: all

Phosphorencence



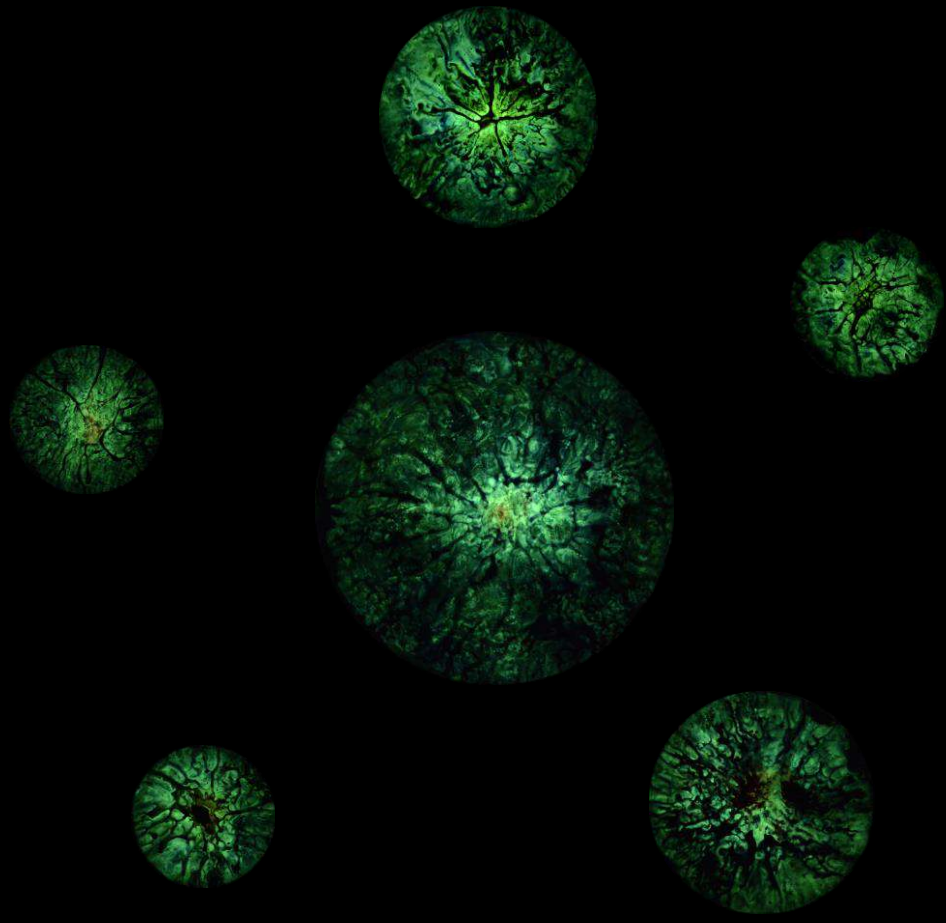
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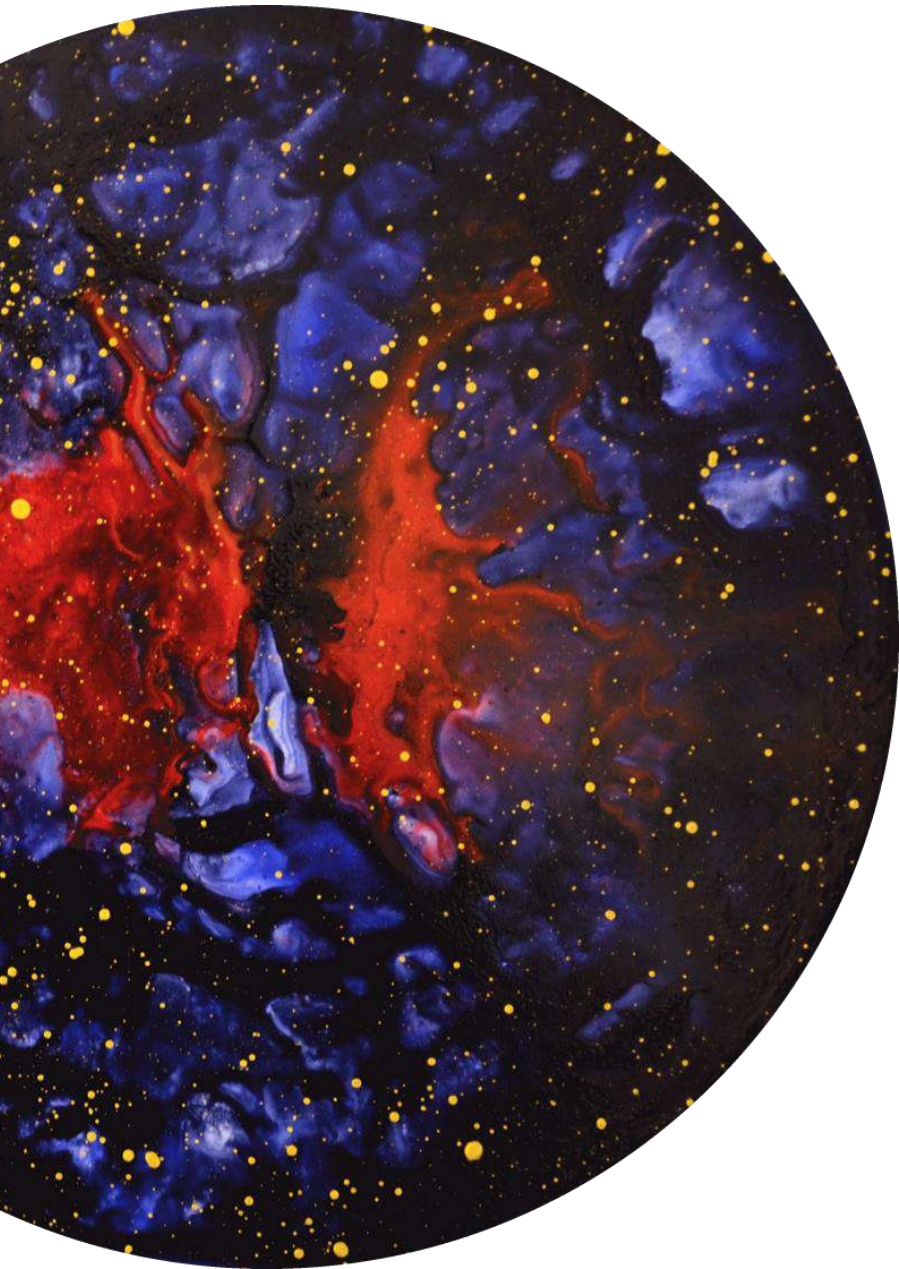
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Dimensioni: diametro 300 cm





Supernovae

Life, death and rebirth

The *Supernova* pictorial cycle, to which the works I created for the LNGS belong, draws attention to the **spectacular** phenomenon that can characterize the **end of a star's life**.

The material released by the explosion may be at the origin of the formation of new celestial bodies. The supernova thus becomes a symbol of **death**, **rebirth** and **cyclicity** of the universe.

All the materials we are made of were produced within the collapsed stars: we are truly "**stardust**".

Reminding us that **everything is in everything**, the supernova links the macrocosm to the microcosm, the universe to man; all in a hymn to life, to its complexity and its magic.

Creation exploiting the **fluid-dynamics effects** of the star explosion - with all the limits of the case



Dark matter

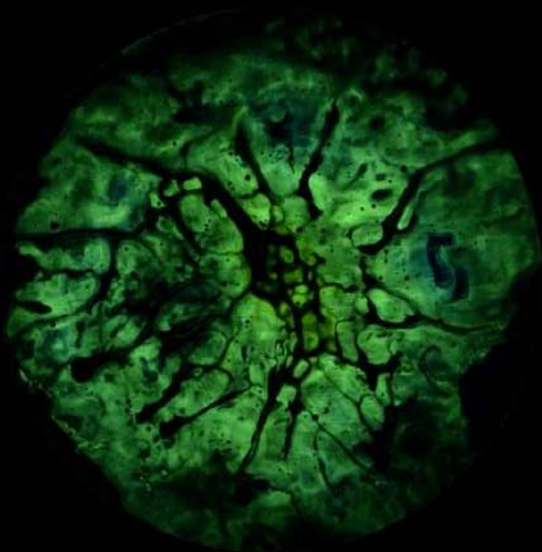
Phosphorescence as a change in paradigm

The works on the fifth and last wall belong to the *Supernova Dark Matter* pictorial cycle and were created with the same technique as the *Supernova* series, but on a **background of phosphorescent pigment**.

In this way the artist wants to introduce an aspect that becomes a **metaphor** for dark matter: Phosphorescent atoms are present, but cannot be seen

We use light to see things; phosphorescence, on the contrary, is seen by **removing the light**.
The paradigm is reversed.

Pictorial emblem of the complexity and relativity of the universe, an invitation to humility, to refine the tools of investigation and to always push knowledge beyond by overcoming the investigative barriers and prejudices that bind the thought.



The earth and the planets

Challenging geo-neutrinos

Cosmos is not only populated with stars, but also with **planets**, like our Earth.

The Earth is also a source of neutrinos, the **geo-neutrinos**, created in the **nuclear decays** of some of the elements present in it.

The experiments studying neutrinos are located in the earth under the **Gran Sasso** mountain.

Two good reasons for including these celestial bodies in the composition.

The works representing the planets are made with **clays** which, when drying, spontaneously create a crack.



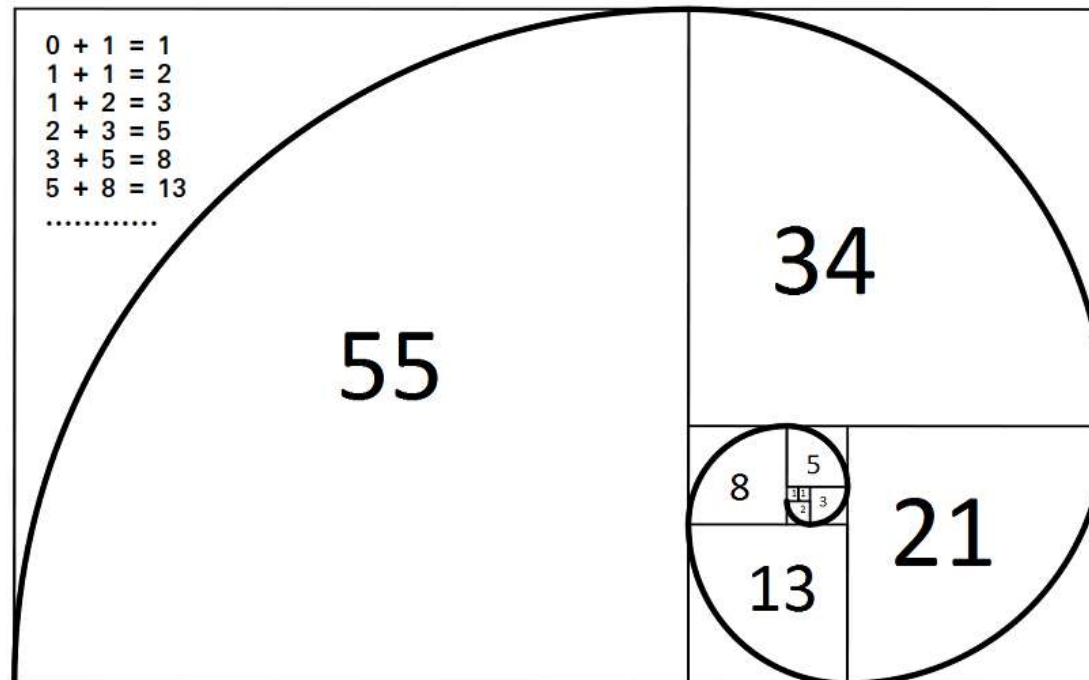
The Fibonacci sequence

The numbers of the beauty of nature

The Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89... is probably the most famous number sequence. Why?

If we "**measure**" nature, we realize that this numerical sequence or something that originates from is often **hidden** in a very elegant way.

Mathematics, biology, art and beauty find a perfect synthesis in the Fibonacci numbers. It also contains the equally famous **Golden Ratio** ($\phi=1,618...$)

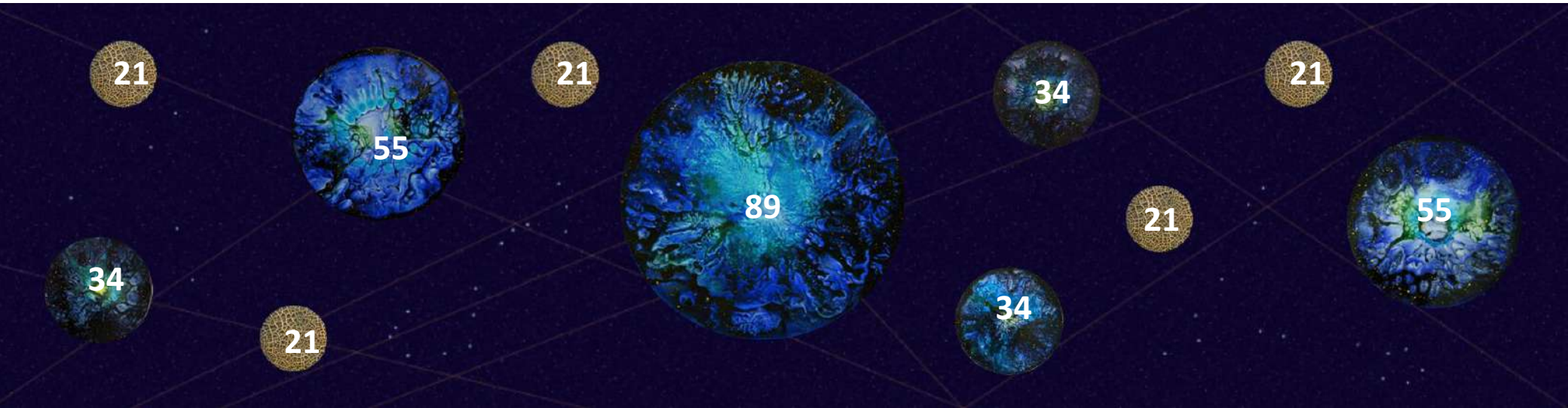


The Fibonacci sequence

The numbers of the beauty of nature

In the creation of *Quintessence*, the Fibonacci sequence is the basis of the size and the number of works that **each of the 5 walls** contains.

1 work of Ø 89 cm, 2 works of Ø 55 cm, 3 works of Ø 34 cm and 5 works of Ø 21 cm.
All the **golden lines** that cross the space, an artistic representation of neutrinos, originate from points that are all proportional to **1.618...**

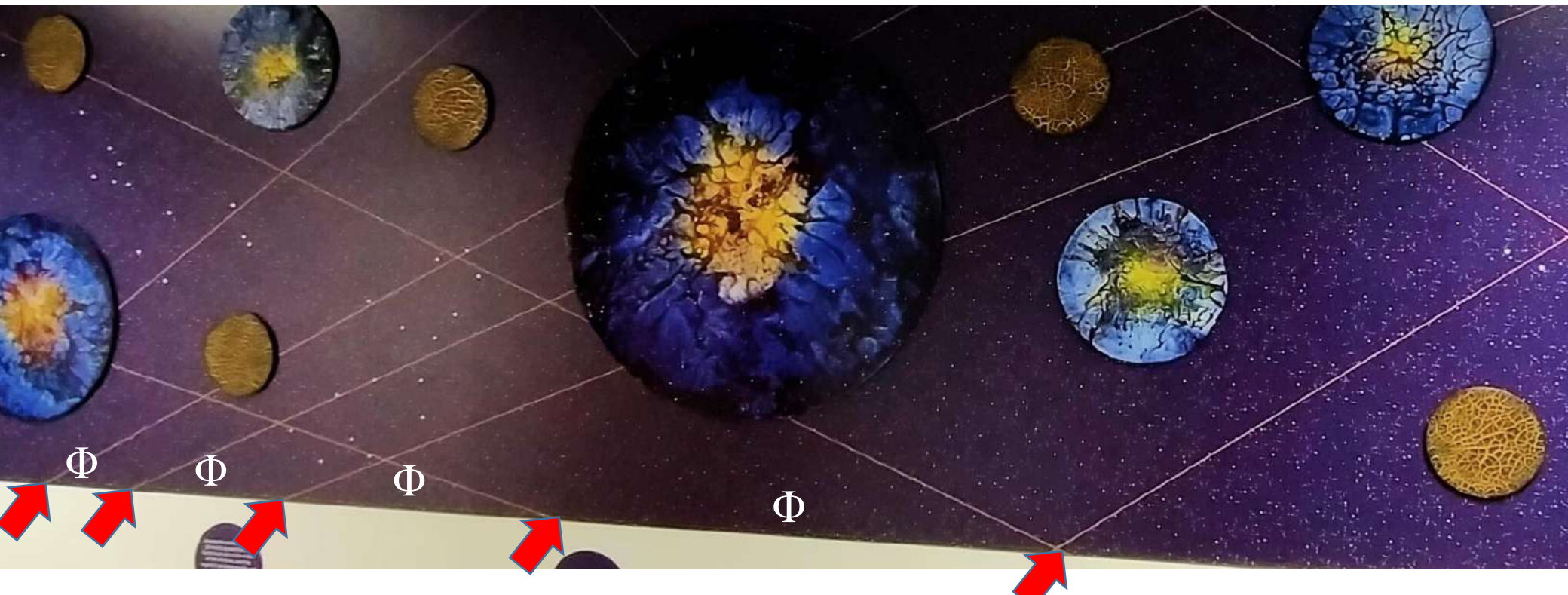


Neutrinos

Elusive travellers of the universe

These particles that **pass through everything** they encounter: space, stars and planets, are so light, **elusive** and ethereal that they led **Pauli** to say: "**I did a terrible thing**, I postulated the existence of a particle that cannot be detected".

Thin **golden straight lines** that originate from celestial bodies and let themselves be captured only in exceptional cases are the artistic representation that I have given to such a precious particle.



The constellations

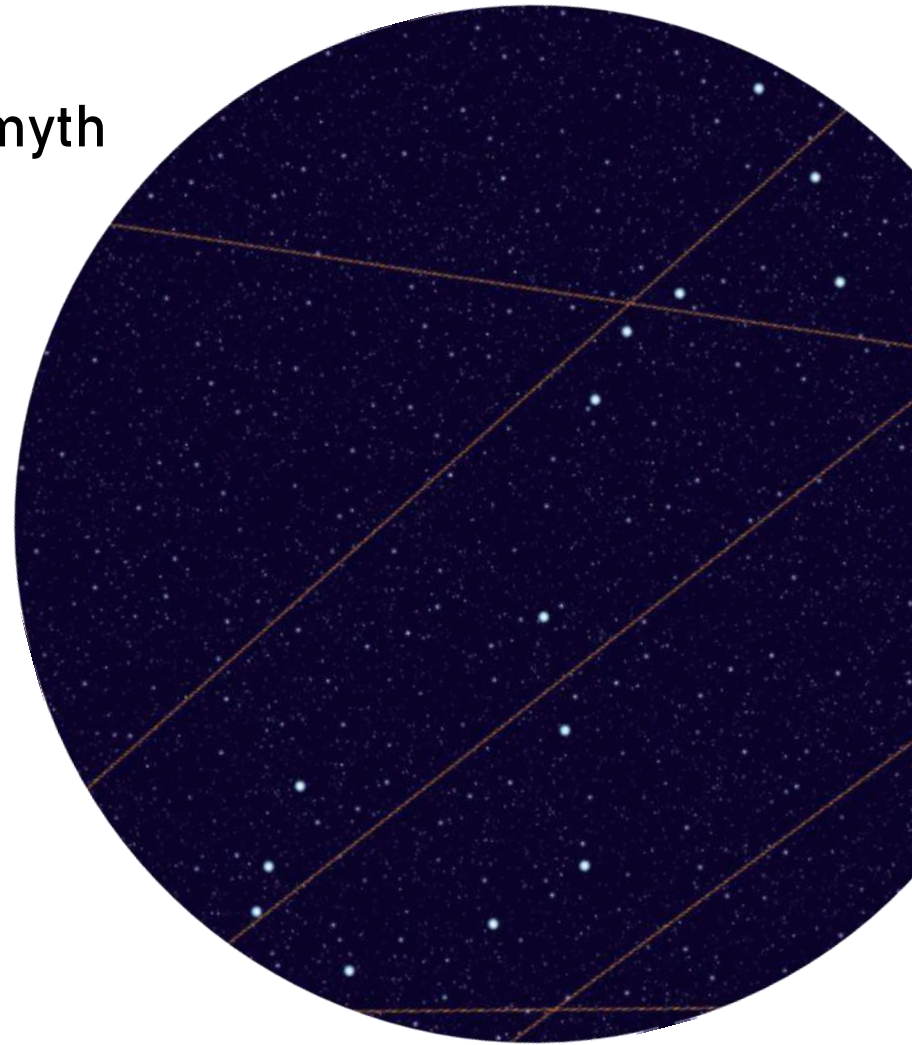
Astronomy and astrology – science and myth

The constellations can be seen in completely different ways by **astronomy and astrology**.

They are not only the celestial bodies studied by physics and cosmology, but also **mythological** entities and leave room for **imagination** and the **divination** of the destiny of man.

Each composition that appears on the first four walls of the installation is associated with an element: Earth, Water, Air and Fire.

The **twelve constellations** of the zodiac are also traditionally associated with the four elements.



First wall, dedicated to **Earth**, Taurus, Virgo and Capricorn

Second, dedicated to **Water**, Cancer, Scorpio and Pisces

Third wall, dedicated to **Air**, Gemini, Libra and Aquarius

Fourth wall, dedicated to **Fire**, Aries, Leo and Sagittarius

The most beautiful thing we
can experience is the
mysterious. It is the source
of all true art and science.

Albert Einstein

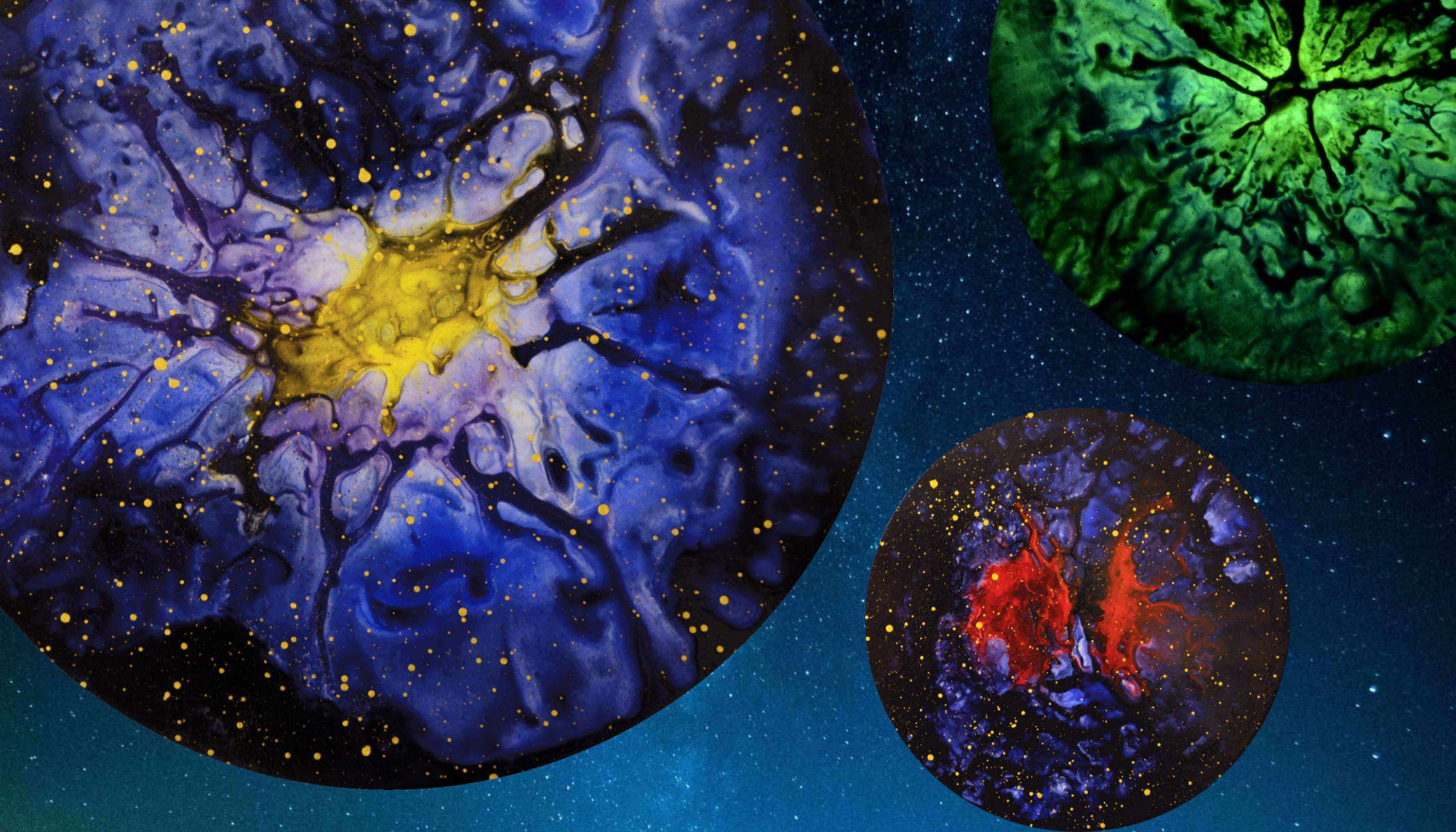
Be a free thinker and don't
accept everything you hear as
truth. Be critical and evaluate
what you believe in.

Aristotele

The quotes

Words are part of the work

I have selected these quotes not to forget how much **the giants of science** had a **360-degrees gaze on reality**, without excluding **mystery, intuition, art, beauty, freedom of thought**, the feeling of a higher unity and the **courage to break the old paradigms** when faced with the truth.



Thank you for your attention!