



**Farnesina**  
 Ministero degli Affari Esteri  
 e della Cooperazione Internazionale

#VIVERE **ALL'** ITALIANA

led by

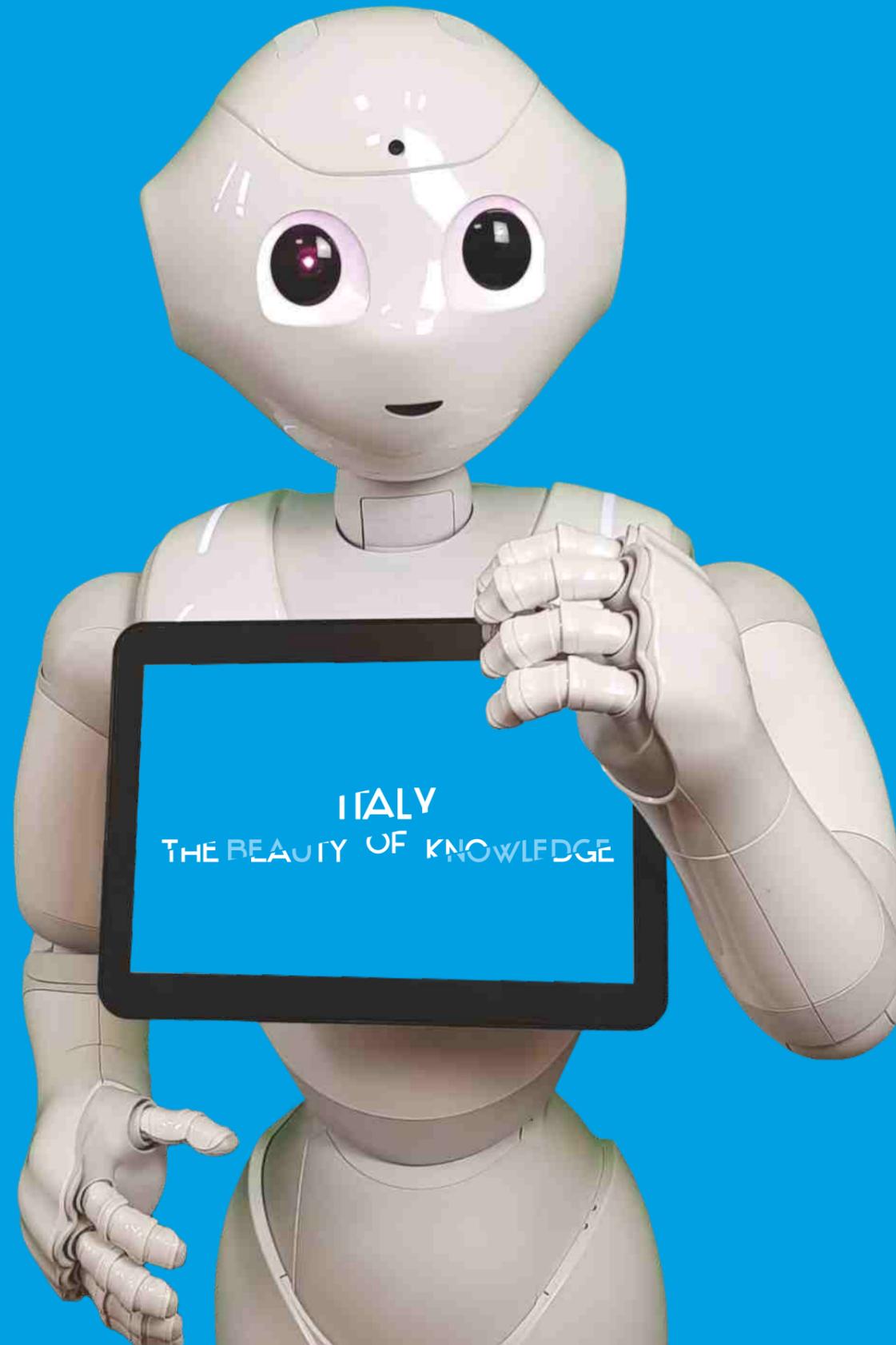


Consiglio Nazionale delle Ricerche

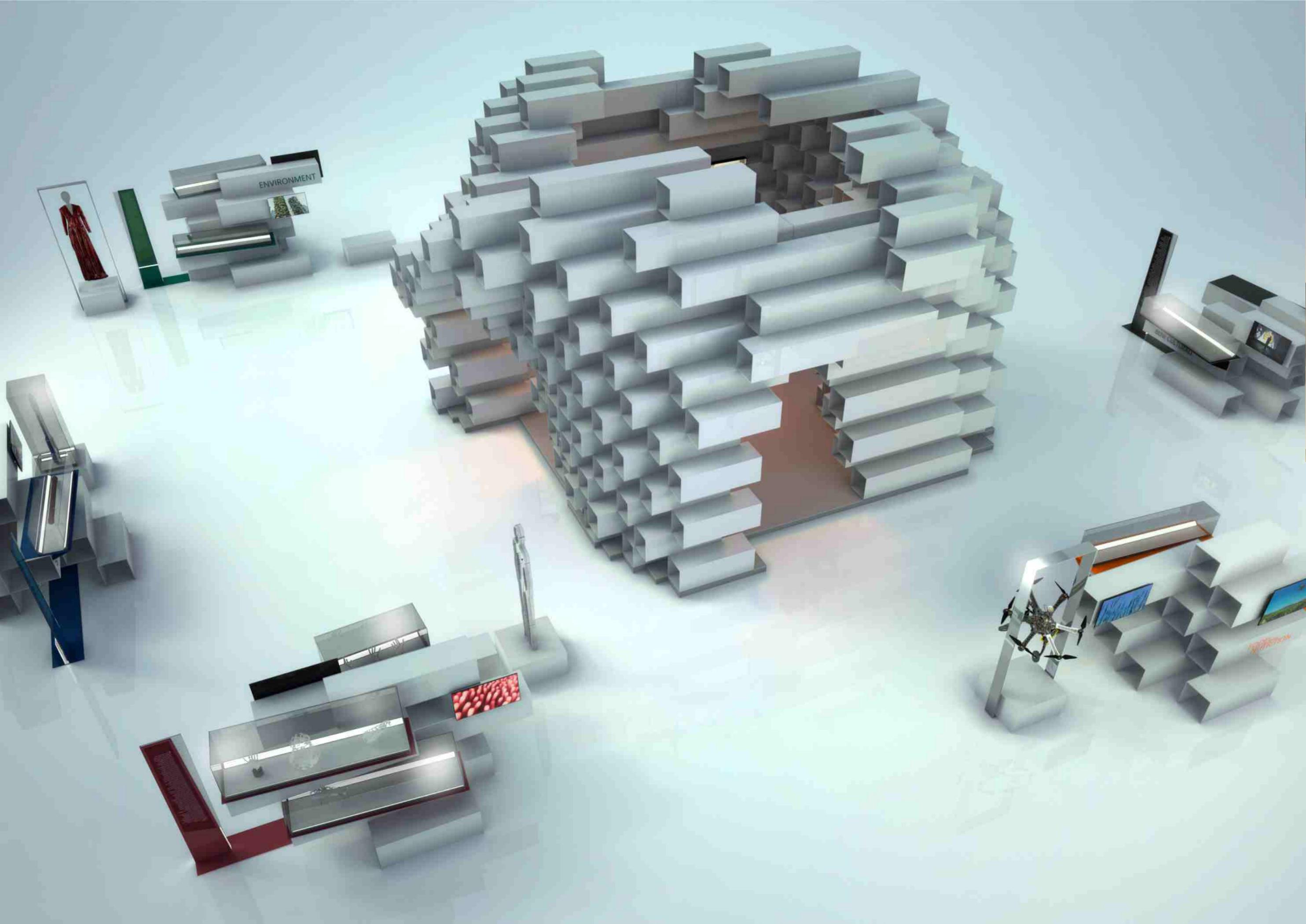
with



MUSEO NAZIONALE  
 SCIENZA  
 E TECNOLOGIA  
 LEONARDO  
 DA VINCI



ITALY  
 THE BEAUTY OF KNOWLEDGE





# ITALY

## THE BEAUTY OF KNOWLEDGE

**Italy: the Beauty of Knowledge** is an installation promoted and financed by the Italian Ministry of Foreign Affairs and International Cooperation and is led by the National Research Council along with the contribution of the four main Italian science museums:

- Fondazione Idis-Città della Scienza · Naples
- Museo Galileo · Florence
- Museo delle Scienze - Muse · Trento
- Museo Nazionale Scienza e Tecnologia Leonardo da Vinci · Milan

The installation was created as a travelling exhibition aimed at the promotion of the Italian research and innovation system at various international locations.

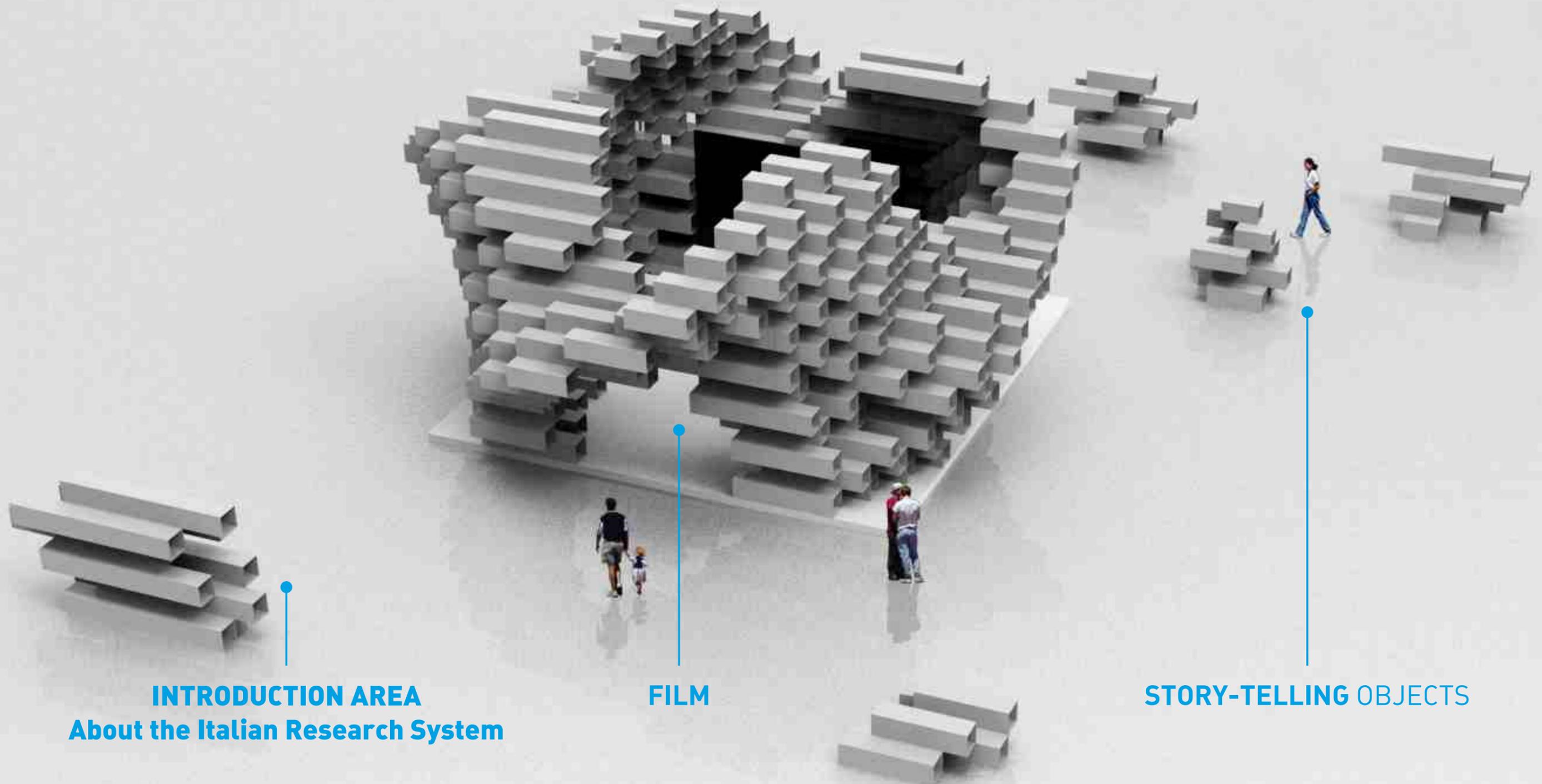
**Italy: the Beauty of Knowledge** highlights the contributions of Italian research and innovation to the creation of new possibilities for an enhanced social well being and awareness, locally and globally.

# ITALIA THE BEAUTY OF KNOWLEDGE

**INTRIGUING**

**UNDERSTANDING**

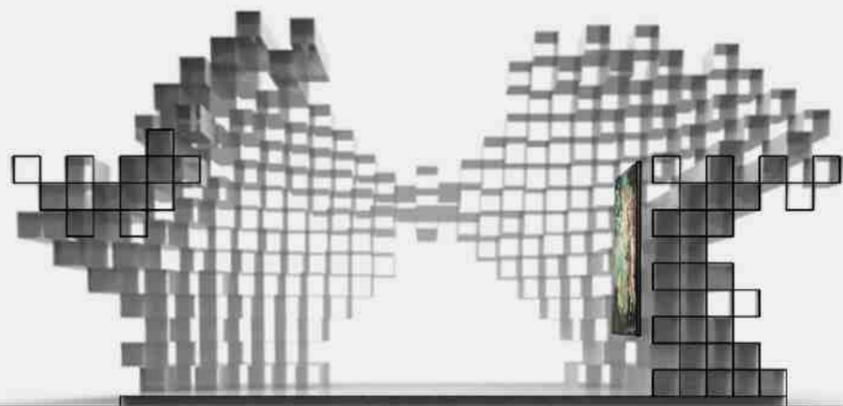
**BUILDING KNOWLEDGE**



**INTRODUCTION AREA**  
About the Italian Research System

**FILM**

**STORY-TELLING OBJECTS**



# ITALY

## THE BEAUTY OF KNOWLEDGE

**Italy** is renowned for its history and tradition, but it is also an active laboratory of innovation, where fascinating challenges are faced and where it is possible to imagine and plan for a better future.

**Italy: The Beauty of Knowledge** presents an emotionally-engaging experience and an intriguing opportunity to learn about the excellence of research in science and technology produced in Italy.

**The installation** is an immersive and engaging experience that aims to communicate the dynamic and beautiful nature of the quest for knowledge and research in Italy.

It is an interactive space combining virtual and physical components to convey this message.

The exhibition consists of a parametric structure, made with the same base building blocks that are designed in variable depths.

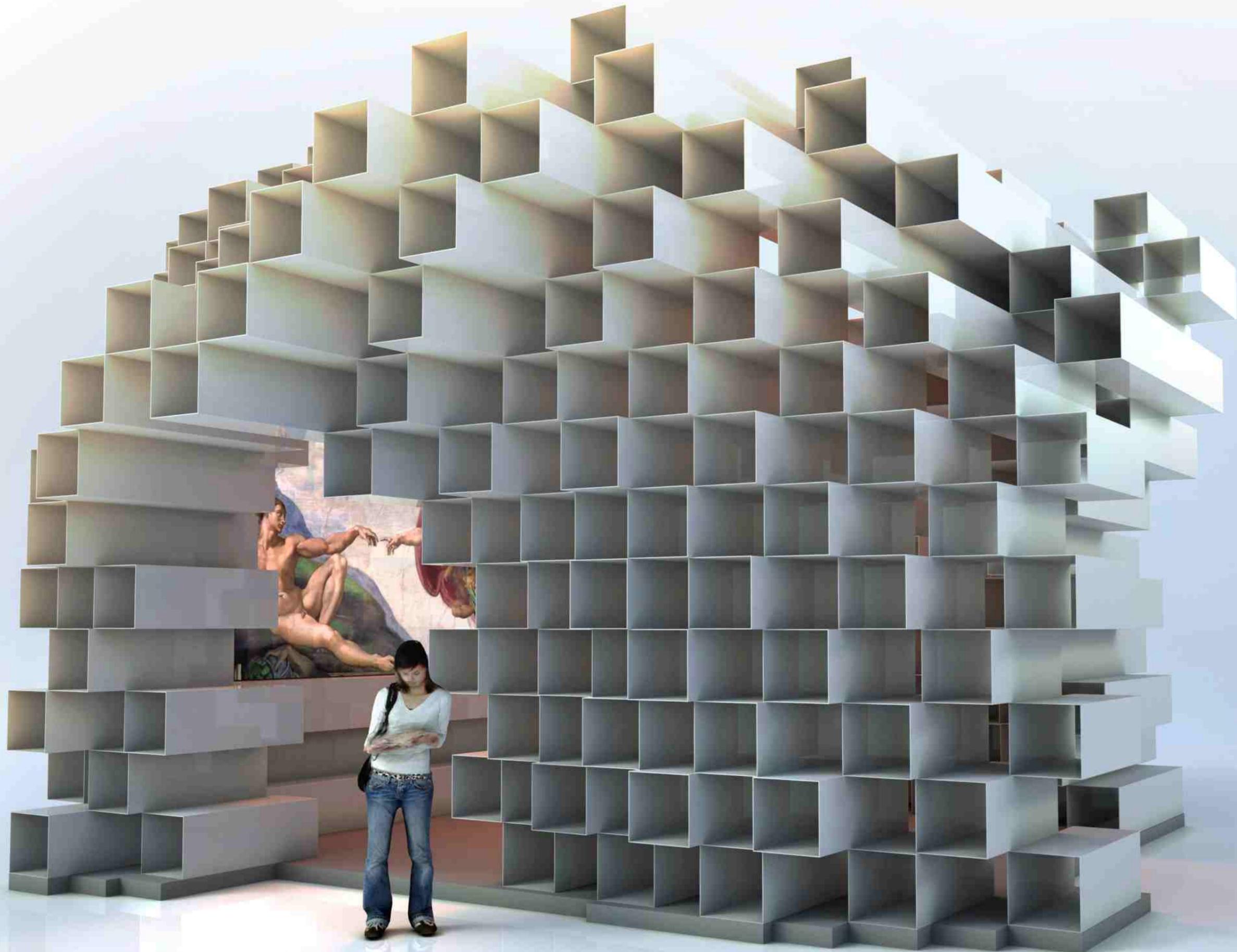
Throughout the different exhibition sections, the “Renaissance Spirit” is highlighted as a vital and significant component of the past, but also as a driving engine for current research and innovation, and a cultural model to be disseminated all over the world.





## A MULTISENSORY EXPERIENCE

The installation will engage the visitors in a multisensory experience throughout the space, featuring the screening of a film on the beauty of knowledge directed by prominent Italian director, Stefano Incerti.





## ITALY

### THE BEAUTY OF KNOWLEDGE

The AGORA represents the physical and spatial heart of the entire exhibition. It is built of equal building blocks with varying depths that reflect a dynamic space and a welcoming unfinished physical appearance.

It resembles a central court, open to its visitors and intriguing in its structure and is where the film *The Beauty of Knowledge* is screened.

## THE FILM:

### CHARACTERISTICS

The main story revolves around the experiences of a dozen protagonists including researchers, scientists, teachers, etc. present in laboratories and research centres.

The stories reflect the status of research and technology in Italy and the connections between the culture, arts and environment of the Italian research.

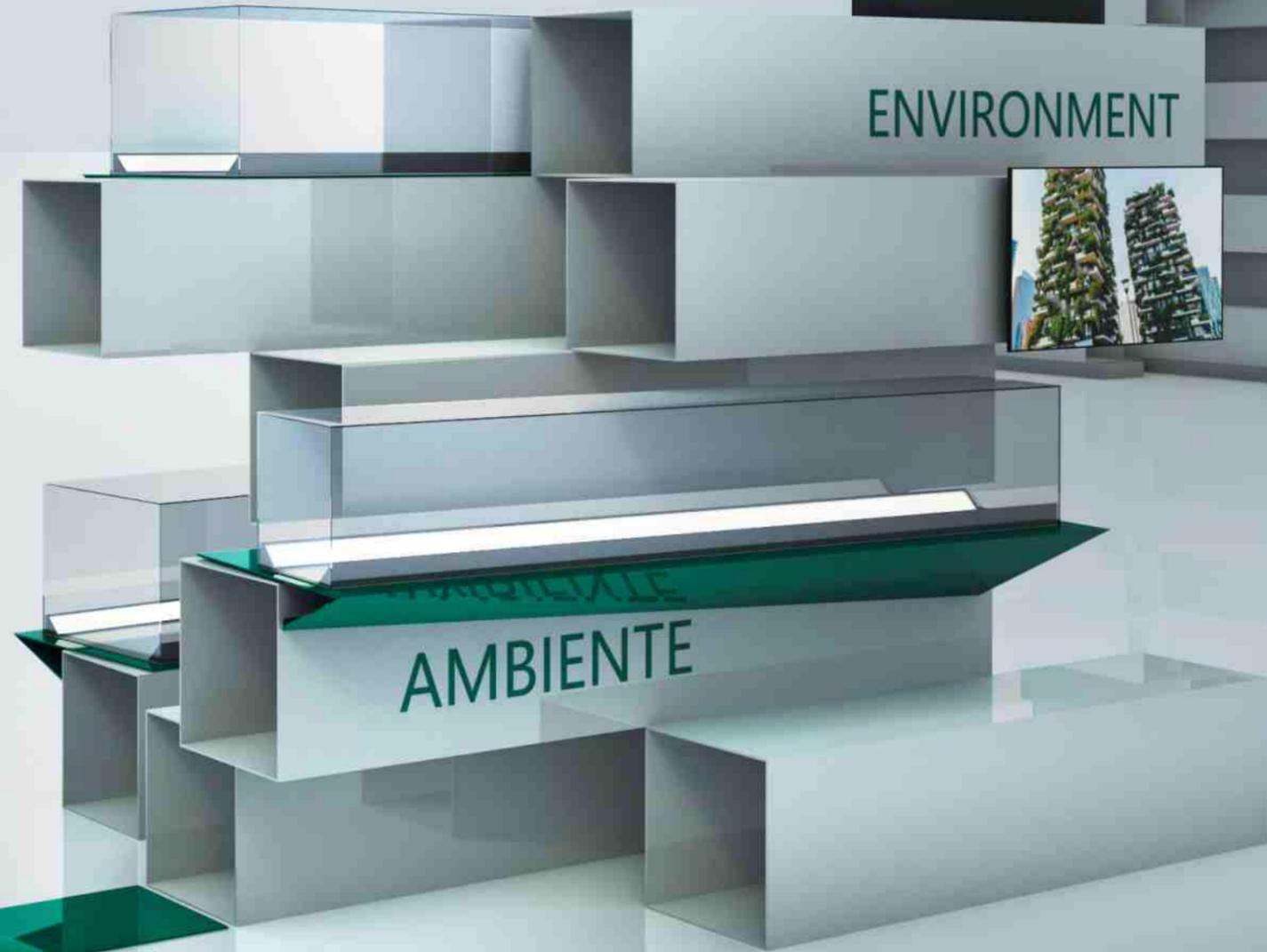


**AMBIENTE**

La sostenibilità è un concetto che si riferisce alla capacità di soddisfare i bisogni del presente senza compromettere la possibilità delle generazioni future di soddisfare i propri. In altre parole, si tratta di un modo di vivere e di lavorare che tiene conto dell'impatto ambientale, sociale ed economico delle nostre azioni. Questo significa adottare comportamenti e processi che rispettano l'ambiente, promuovono il benessere delle persone e favoriscono lo sviluppo economico a lungo termine.

Il nostro impegno per la sostenibilità è un valore fondamentale della nostra cultura aziendale. Crediamo che un'azienda possa prosperare solo se opera in armonia con l'ambiente e la società. Per questo abbiamo adottato una serie di iniziative che mirano a ridurre il nostro impatto ambientale, migliorare le condizioni di lavoro e promuovere lo sviluppo sociale.

Il nostro obiettivo è diventare un'azienda leader nel settore della sostenibilità. Per questo abbiamo adottato una serie di iniziative che mirano a ridurre il nostro impatto ambientale, migliorare le condizioni di lavoro e promuovere lo sviluppo sociale.

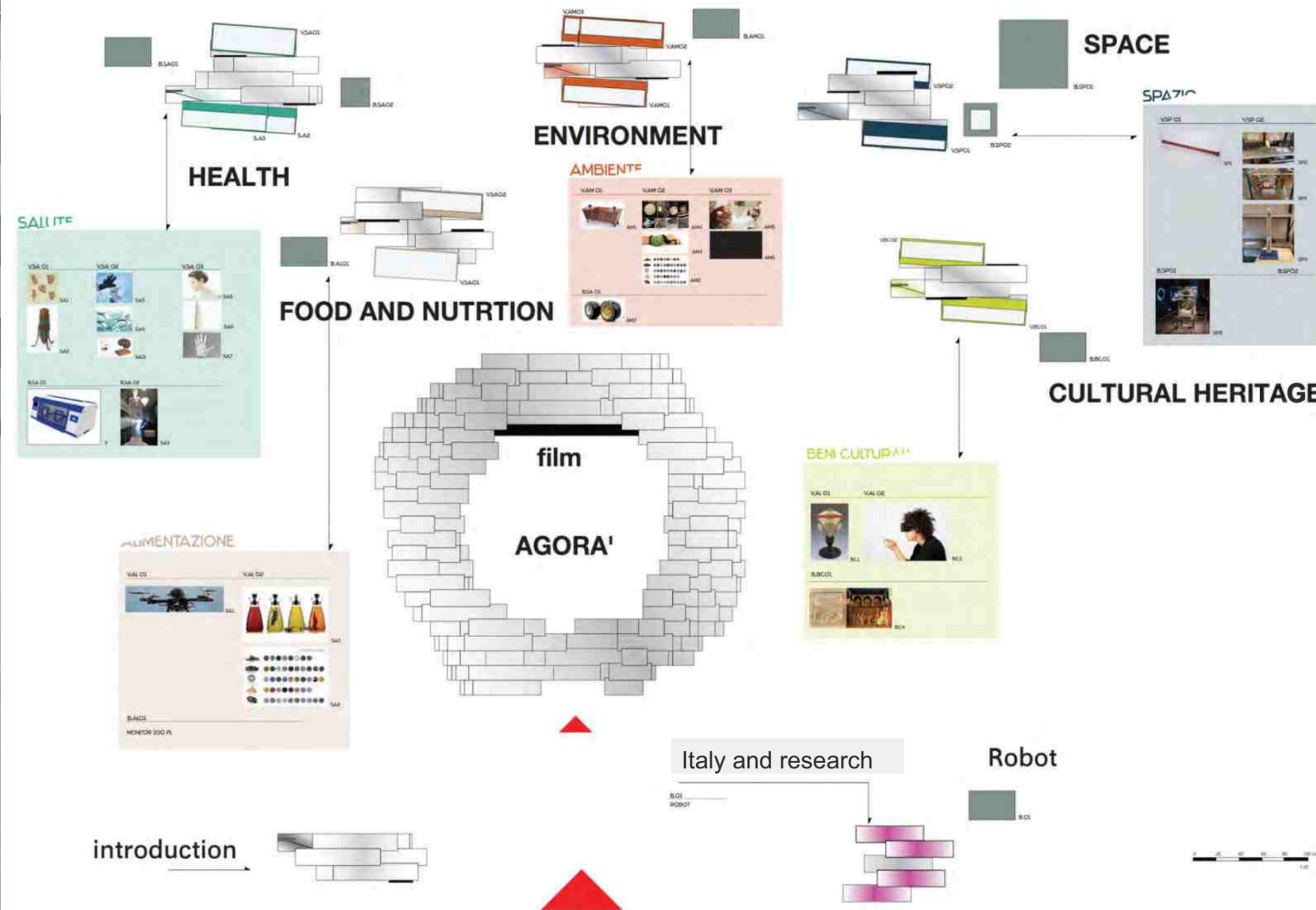


AMBIENTE

# THEMATIC SECTIONS AND STORY-TELLING OBJECTS

The exhibition will explore “The Beauty of Knowledge” through the following main themes:

- Health
- Environment
- Space
- Food and Nutrition
- Cultural Heritage





CULTURAL HERITAGE

SPACE

SPAZIO

Lo spazio è una superficie  
a tridimensionalità variabile,  
però sempre collegata a una  
base quadrata e regolare, come  
una griglia di cubi. È  
una griglia di cubi che  
si apre e si chiude come  
"cassonetti di legno", dando  
all'ospite la possibilità di  
vedere, toccare e  
interagire con gli  
elementi tecnologici e  
scientifici che sono  
presenti in questo spazio.  
Il risultato è un ambiente  
che è un laboratorio  
interattivo e un luogo  
di incontro e di scambio  
tra le diverse discipline  
scientifiche e tecnologiche.  
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SALUTE

Il risultato è un ambiente  
che è un laboratorio  
interattivo e un luogo  
di incontro e di scambio  
tra le diverse discipline  
scientifiche e tecnologiche.



# THE WELCOMING ROBOT

**Social robots** can assist and entertain people in several, even creative, manners.

From assistive to creative robotics we are working together to imagine and create the next future.



## MAIN PRINCIPLE OF THE PROJECT

If we are to look at the history of modern science, we can trace the development of the scientific method to the Middle Ages, when the heights of its development were reached as part of the ventures in the Islamic World. Later on, with beginnings in the 14th and mostly in the 15th and 16th Centuries, science returned to Europe and its entry was actually through Italy, the birthplace of the Renaissance movement, which marked a significant milestone in the history of science.

It is also in Italy, where the pioneer of the “new science”, Galileo Galilei had lived and worked. Galileo was a writer, poet, musician and musicologist, designer, art critic besides being a great scientist. A character that granted him the title “The Tuscan Artist” given by English poet John Milton.

The Italian scientific tradition signifies a culture that continued to grow with time, and also nowadays with the idea of the “Bel Paese”, the beautiful country, which can be traced back to Dante and Petrarch, but was better elaborated in the nineteenth century by Italian geologist and palaeontologist, Antonio Stoppani. Today, Italy is among the top countries in the world in terms of production of knowledge in mathematics and natural sciences.

Italian scientists may be few when compared to those from other countries, however, they are certainly leaders in their research especially that they continue to have a close link with beauty and aesthetics, hence with the arts, literature and philosophy. In reality there is almost no scientific field - from mathematics to physics, chemistry to biology, neuroscience and medicine - in which Italian scientists do not have a position of excellence.

In the beginning of the twentieth century, Italian mathematics was among the top three in the world, together with the French and German. Between 1934 and 1938, Rome was, thanks to physicist Enrico Fermi and the “Via Panisperna boys”, the “World capital of nuclear physics”. It was also in Rome, despite being in war, where three young scientists, Marcello Conversi, Ettore Pancini and Oreste Piccioni, inaugurated the field of “particle physics”.



## MAIN PRINCIPLE OF THE PROJECT

Following the Second World War, our country was quickly able to recover from the catastrophic outcomes of the Fascist regime. In the 1950s for example, Italy was where both the first transistor computer and the first "personal computer" were developed (at the Olivetti). Italy was also the third country, after the Soviet Union and the United States, to send its own satellite into space. This country is also home to Chemist and Nobel Laureate, Giulio who is renowned for his work on high polymers and neurobiologist and Nobel Laureate, Rita Levi-Montalcini who was co-discovered the nerve growth factor (NGF).

On a different note, Italy was among the first countries to adopt nuclear energy for civil uses. At the National Institute of Health in Rome, high-level research in pharmacology and biochemistry attracted important international Nobel Prize Laureates, such as British biochemist Ernst Boris Chain and Swiss biochemist Daniel Bovet and who were both awarded Nobel Prizes for the work they did in Italy. Similarly, development of particle accelerators was also an example that inspired researchers in atomic energy all over the world.

Italy is the country where chemist Primo Levi was born, who's 1975 book *The Periodic Table*, was named the "best science book ever written" by The Royal Institution of Great Britain in 2006. Primo Levi had renewed an ancient tradition, which according to journalist and writer Italo Calvino constitutes the "profound vocation of Italian literature", that is, the interweaving of science, philosophy and literature. A tradition which Levi and Calvino join in with Dante, the poet of science, Galileo Galilei, the greatest writer in the history of Italian literature, and Giacomo Leopardi, critic of social, cultural and psychological transformations induced by the development of science.

Italy, with its beautiful landscapes and the largest number of UNESCO Cultural Heritage sites, is one of the places in the world where artistic research and scientific research meet one another and cross-fertilise in an intimate way. Today this wealth of scientific creativity is extended to many other sectors. The aim of *Italy: The Beauty of Knowledge* is to highlight these Italian contributions with brief glances at each of the relevant sectors. Throughout the exhibition's different elements, *The Renaissance* will be a recurring and overarching theme where the relationship between logic and beauty and between science and art is always at the heart.



## MAIN PRINCIPLE OF THE PROJECT

The purpose of this story of Italian science is to revive the Renaissance spirit and reflect on how it continues to be at the heart of our country's cultural model and lifestyle, something that inspires people all over the world. The title of the exhibition Italy: beauty of knowledge attempts to embody all of the aforementioned elements and tries to intrigue the visitors by immersing them in the space where narration goes through the past, present and future of Italian science.

Visitors are presented with a multi-layered story and a film that showcases emotionally engaging objects reflecting themes, places and research all of which reminisce the "mother story"; the central knot of the exhibition. The use of media, signs, and languages creates a unique dialogue and engages multiple senses at the same time.



# EXHIBITION PROJECT

## TECHNICAL CHARACTERISTICS

**The exhibition** is built around a central part, The Agora, which is a circular space with a central court built with building blocks of an 8.00 m diameter and a height of 4.50 m.

The project's components are flexible and adaptable, hence can be changed in accordance with the hosting institution's needs. It is also possible to use a "compact" version of the exhibition. The exhibition elements were developed by means of a parametric computational and matrix structure symbolising the identity of the Italian research system. The parametric structure, made with the same base building blocks that are designed in variable depths (37cm and of variable length included in a range that goes from 74 cm to 400cm).

**AGORA** · The AGORA reflects a dynamic space and a welcoming un-finished physical appearance. It resembles a central court, open to its visitors and intriguing in its structure, where the film *The Beauty of Knowledge* is screened.

**THE FILM "The Beauty of Knowledge"**  
by Stefano Incerti

**Duration:** 10/12 minutes

**Resolution:** 4K

**Format:** 1: 2.35 (wide-screen),

**Language:** Italian

**Subtitled:** English and Arabic.

# HEALTH SECTION

Italy is known for its “art of living” as it is a country with tremendous beauty and cultural heritage. For that it has been called the “Bel Paese”; the beautiful country, where the beauty of knowledge is embedded in its people’s living, production and research.

This lifestyle has allowed Italy to be among the top ten nations in terms of life expectancy and this is where health comes in as a topic in this exhibition.

The Health Corner focuses on the elements and the “recipe” of well-being in Italy while bringing together different perspectives from science, culture, history, traditions and beauty, through which the following main themes are highlighted:

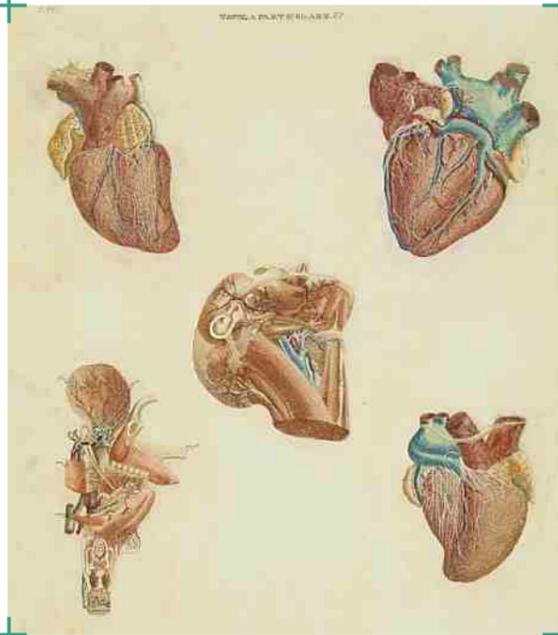
- **Active and Healthy Aging;**
- **The Mediterranean Diet;**
- **Biorobotics, Biomaterials and Manufacturing 4.0.**

# CREATING FUTURE FOR HEALTH AND QUALITY OF LIFE FROM THE PAST

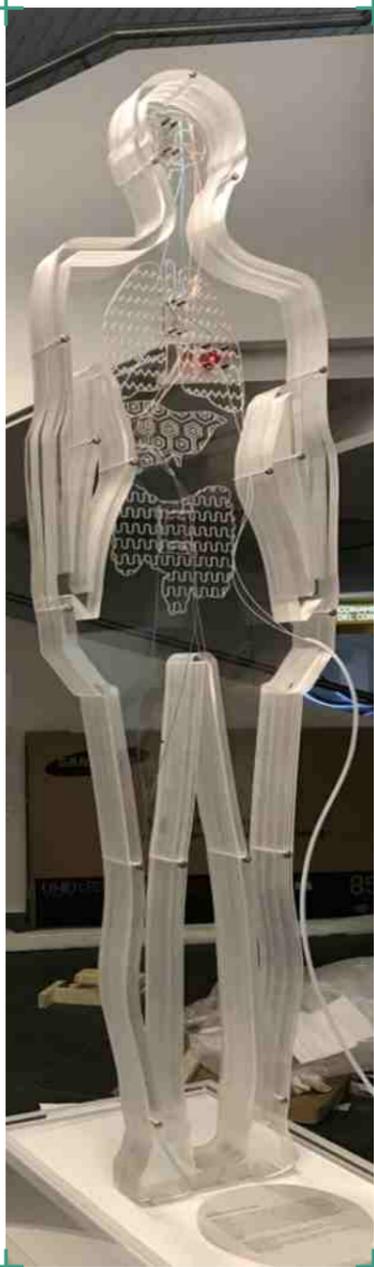
## ◀ UNIVERSAL ANATOMY

by Paolo Mascagni

The first scientist to trace the structure of the lymphatic system, Paolo Mascagni (1755 – 1815) spent 15 years developing “Universal Anatomy”.



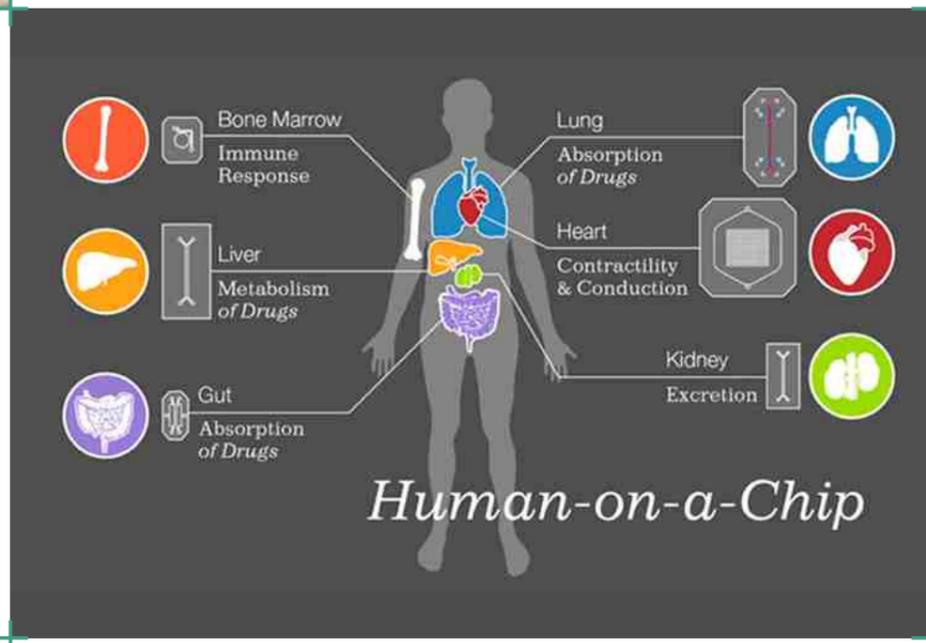
◀ CREATING FUTURE



## ◀ HUMAN BODY ON CHIP

Using 3D printing technologies and microfluidic circuits it is possible to print human tissue on fluidic chips for the realisation of Tissue-on-Chip (TOC) devices.

# CREATING FUTURE FOR HEALTH AND QUALITY OF LIFE





## < MIKI

MYKI is a hand prosthesis with tactile sensors that is controlled and perceived naturally by amputated patients.

# CONNECTING MINDS FOR HEALTH AND WELL-BEING



## < HUMAN IN VITRO SKIN

Human in vitro Skin is the first model of human skin developed in vitro, that is a replicate of the structure and functions of the real native skin.



### ◀ TINS OF OIL AND TOMATOES

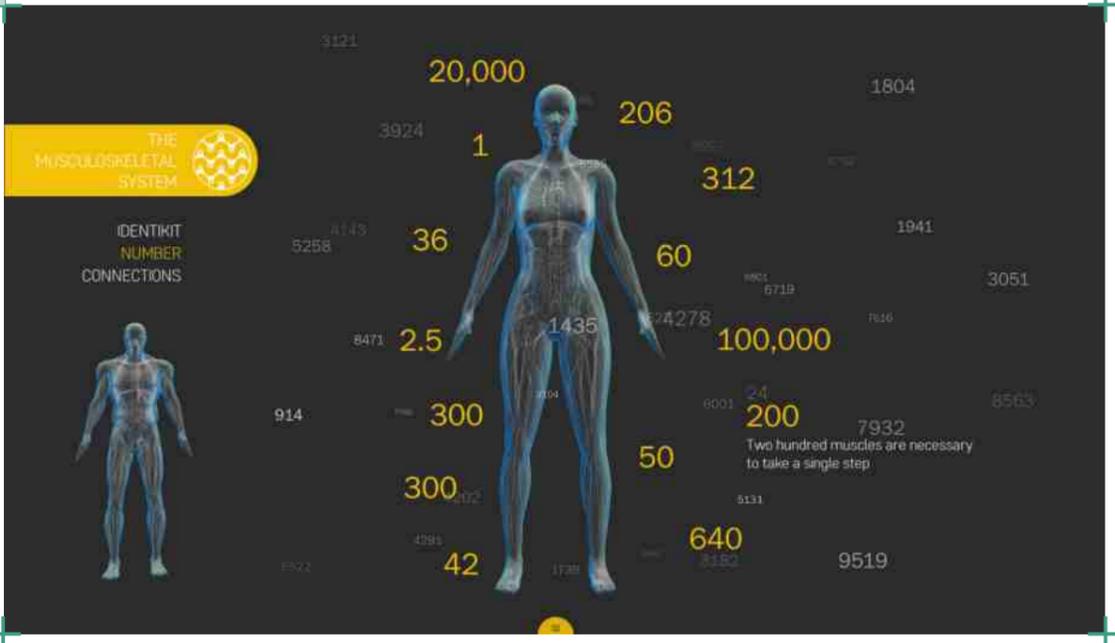
Foods that have always been part of the Italian tradition, such as tomatoes and oil, are today the starting point for creating new foods, enriched with bioactive substances.

# CONNECTING MINDS FOR HEALTH AND WELL-BEING



### ◀ COLOURED 3D PASTA

"Functional" durum wheat semolina pasta, enriched with bioactive and antioxidant substances



# CREATING FUTURE X HEALTH AND QUALITY OF LIFE

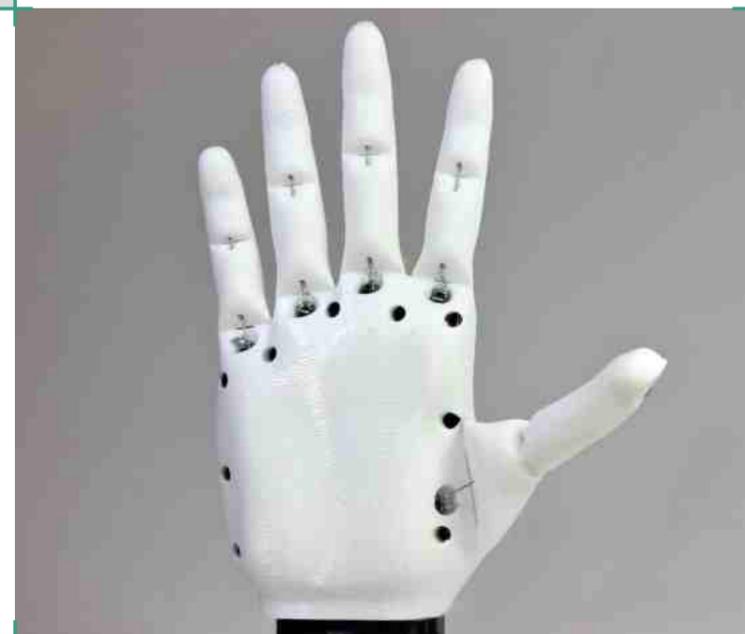


◀ **BIOCAST**



◀ **AUXETIC NECKBRACE**

Auxetic neckbrace, a cervical collar with a auxetica structure maintains the wellbeing of the neuromuscular system of the cervical spine.



◀ **FREEHAND**

Freehand is an electromechanical hand controlled by electromyographic signals (EMG).

# ENVIRONMENT SECTION

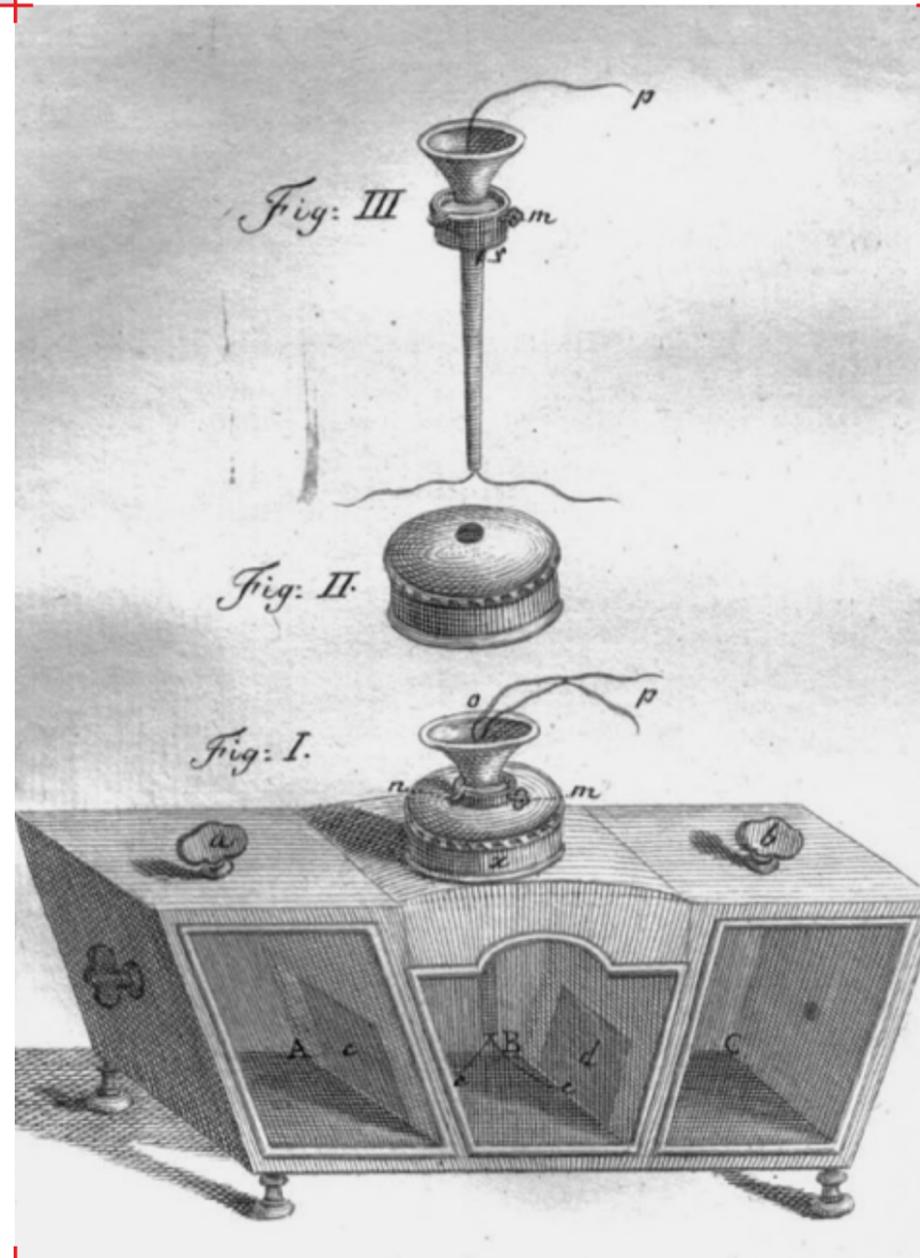
"Bel Paese" is brought again in this corner but with a different lens this time. The story starts from the Mare Nostrum, the Mediterranean Sea, that embodies different testimonies from the ancient civilisations as well as contemporary stories on Blue Economy, Circular Economy.

Research and Beauty. This corner brings together a set of objects that delve into the following themes:

- **Environmental Sustainability;**
- **Circular Economy and the Reuse of Waste;**
- **Science and Green Fabrics;**
- **Eco-friendly Beauty and Italian High Fashion.**

# BUILDING FOR THE FUTURE

## INSPIRED BY THE PAST



### < EVAEROMETRO

The eudiometer of Felice Fontana, Evaerometro, was designed to measure the purity of air. It was long believed that Fontana's instruments had been lost, or even that they had been only designed and never built, however, this instrument demonstrates the opposite.

# A BETTER WORLD TOGETHER

## OUR PLANET AND THE ENVIRONMENT



### < THUMBIO

Thumbio is a bioplastic immobilization bandage specially made for the wrist using starch and waste of Mozzarella.



### < SCOBYSKIN

Faux leather made using a bacterial matrix.



### < CONNECTED TIRE

Advanced tires that can be connected to an application, the Connected tires are specially designed with an enhanced durability and lower CO2 emissions, noise and fuel consumption.

# A BETTER WORLD TOGETHER

## OUR PLANET AND THE ENVIRONMENT

### ◀ THE GREEN LAMP

This bio-lamp is constructed using mushroom bioplastic.



### ◀ SHOE

Men's shoe made according to a bio process, enhancing its environmental requirements in its complete life cycle.

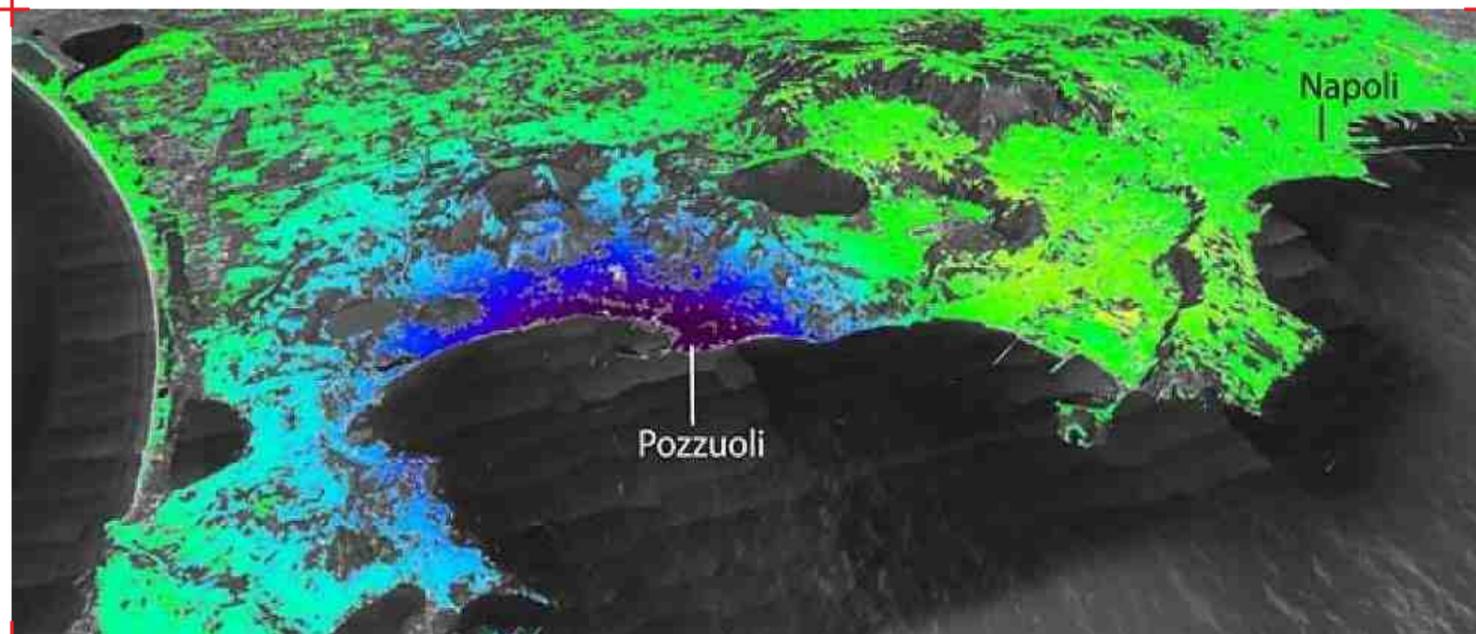
### ▶ ECOLOGICDRESS ▶

The ecologicdress of Vegeatextile is an example of the circular economy model which is the solution to the challenges connected to the take-make-waste model.



# A BETTER WORLD TOGETHER

## OUR PLANET AND THE ENVIRONMENT



### < CNR-IREA

Istituto per il Rilevamento  
Elettromagnetico dell'Ambiente

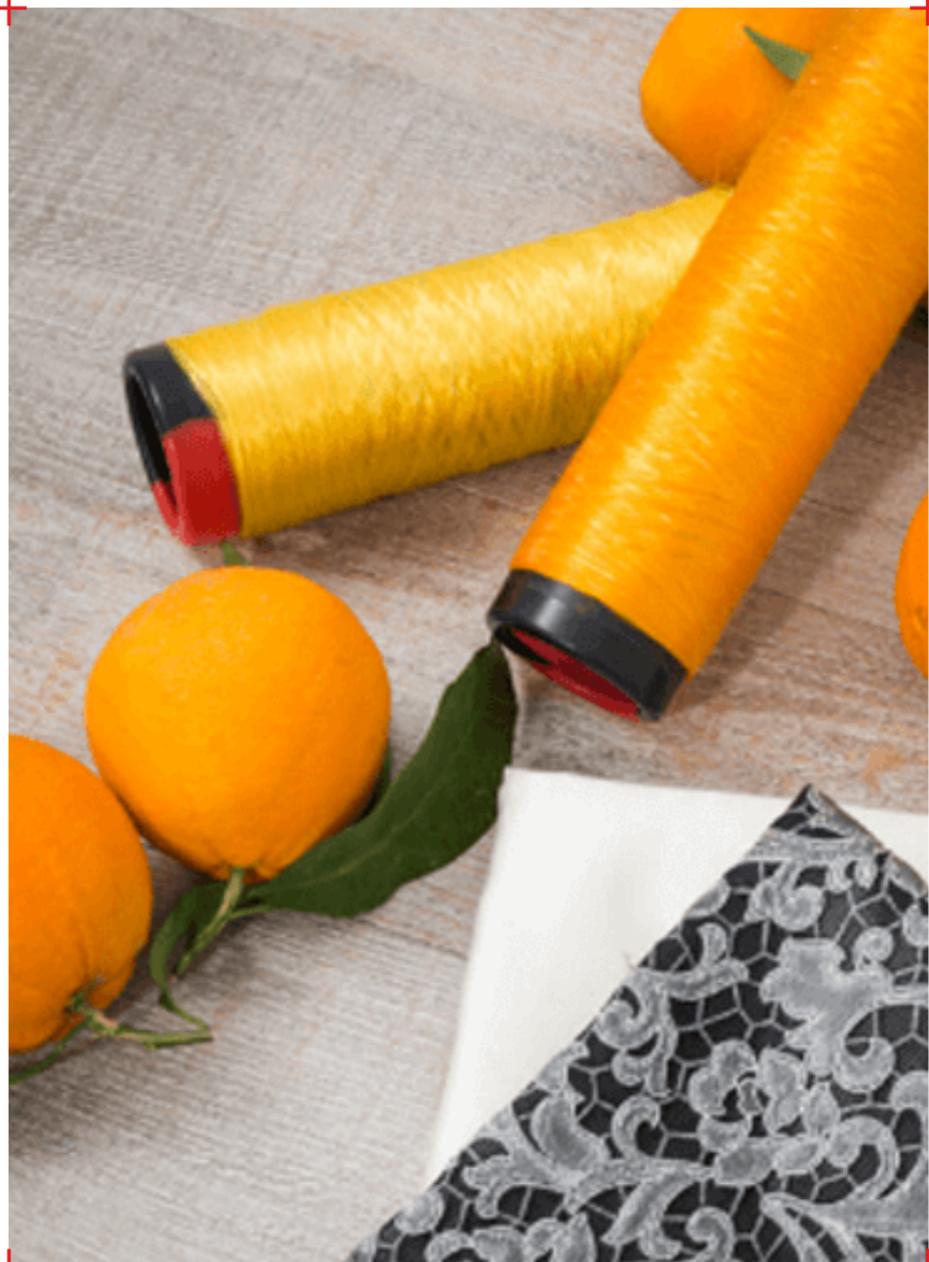
### NEW MATERIALS >

New materials with special  
design made from algae,  
diatoms and crustaceans.



# A BETTER WORLD TOGETHER

## OUR PLANET AND THE ENVIRONMENT



### ◀ TRIS CAMPIONI ORANGE FIBER

Orange fiber is the world's first and only brand to produce a patented material from citrus juice by-products. The fabrics are formed from a silk-like cellulose yarn that can blend with other materials.



### ◀ BIS CAMPIONI VEGEA

The Vegeatextile® are biobased technical textiles made from wine industry biomass: grape marc. Grape marc is a fully vegetal raw material (grape skins, stalks and seeds) derived from wine production. An innovative polymerisation technology makes it possible to turn wine industry biomass' oils and lignocellulosic component into a biopolymer for Vegeatextile® production.

# SPACE SECTION

Space, with its vastness and openness, presents a meeting point for the beauty of the Universe and the beauty of Knowledge. Here we narrate a dialogue between the current and past Italian research that has been a main player and contributor to the quest of understanding and exploring space.

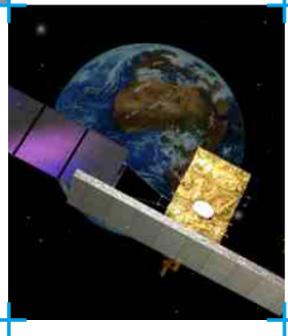
The story showcases the creativity which Italian research has always employed in its pursuit of answering the great questions posed to our humanity by the grand cosmos.

The themes on which the story is built are:

- **Italian Space Missions;**
- **Italian Astronauts in Space: Stories on Life and Experiences in the Sky;**
- **Studying the Cosmos: Research Conducted in Space;**
- **A Visual Journey in Space: The Universe through Images.**

# BUILDING FOR THE FUTURE

INSPIRED BY THE PAST



## ◀ COSMOSKY MED

The first Earth satellite observation system designed for dual purposes, civil and military.



## ◀ GALILEO GALILEI TELESCOPE

(Replica)

A monumental object in the history of science, Galileo's telescope revolutionised astronomical observations, from the measurement of astronomical positions to the study of real celestial bodies.



### < LISA PATHFINDER

LISA is paving the way for future missions by testing in flight the very concept of gravitational wave detection.

# BUILDING FOR THE FUTURE



### < VEGA

An expandable launch system, VEGA is designed to launch small payloads satellites for scientific and Earth observation missions to polar and low Earth orbits.



# BUILDING FOR THE FUTURE



## ◀ THE BEAUTY OF ITALY THROUGH SHOTS BY ITALIAN ASTRONAUTS

Sequence of images taken by Italian astronauts who during their missions recounted the beauty of Italy and Earth seen from space.



## ◀ VIRGO MIRROR

Original mirror of the Virgo interferometer model.

# FOOD AND NUTRITION SECTION

Italy is renowned for its rich and exquisite culinary tradition and so it is certainly a topic worth exploring under the theme of beauty of knowledge.

"Man is what he eats" (Feuerbach), not only because of the composition of the different foods that we eat, but also because food is a mixture of social, economic, cultural and scientific factors. This is true both for what we eat and for the way we produce it. Made in Italy agriculture is characterised by its originality, quality and safety of the products.

A main challenge for 21st-century agriculture is to meet the production needs with the sustainable management of natural resources while protecting the environment. Today Precision Farming is considered to be the most effective tool to achieve the aforementioned objectives. Various tools and technologies help us improve how, where and when to intervene, such as drones, sensors, cameras, remote sensing, simulation models and data processing computers.

Precision agriculture is "a system that provides the tools to do the right thing, in the right place, at the right time". Here we bring objects and stories that explore food from its sustainable production, consumption and its disposal and reuse.



## ◀ **DRONE FOR PRECISION AGRICULTURE**

Thanks to drones we can watch from above and "see" beyond the visible spectrum, monitor the health status of plants, map crops and control the presence of pests.



## ◀ **MATERIALS FROM FOOD WASTE**

Objects, lighting fixtures, and vases, are examples of the products made with materials from food waste.



## ◀ **FOOD CONSERVATION SYSTEM**

The revolutionary food storage system Takaje selected by ADI Design Index 2011



### < **MOSCARDINO**

Disposable utensils with a dual functioning (fork and spoon) made of biodegradable thermoplastic materials.



### < **CANNA DI FUCILE**

New format of pasta with helical scuffing inspired by the shape of the gun barrel made by the Real Fabbrica d' Armi of Torre Annunziata.



## ◀ GALILEAN MICROSCOPE

The Galilean Compound microscope was a key tool to transforming research in the field of nature and medicine.

# CULTURAL HERITAGE SECTION

This area is a reflection of the Italian art-science cross-fertilisation that truly signifies “the beauty of knowledge”. The story here passes through all fields of knowledge through a virtual immersion in the universe of research on Cultural Heritage.

Immersive virtual installations narrate the story of our country and its different civilisations, through short narrative episodes set in 3D spaces.

The other part showcases Italian research on BBCC through the overlapping, to the real vision, of metadata elements, like the restorations, the connections between different parts of a complex, the geometric cleavages of the monuments, the documents, putting the users in a position to see what would not be possible in real exploration.

The basic idea is that our Heritage is a testimony of the complexity of history in our territories and our lives.

The themes explored are:

- **The Research on Cultural Heritage;**
- **Technologies for the Conservation of Cultural Heritage;**
- **Technologies for the Use of Cultural Heritage.**

# CREATING SUSTAINABLE SOLUTIONS FOR CULTURE AND KNOWLEDGE

## ◀ FROM ETRUSCAN TO MIDDLE AGE

Stories of our country's history, people, places and different civilisations narrated with the aid of immersive virtual installations.



## ◀ MULTIFACETED SOLAR CLOCK

(Stefano Buonsignori)  
A fascinating instrument combining the arts and sciences, this 16th Century clock is a typical example of the Italian renaissance culture.





# TECHNOLOGY FOR CULTURAL HERITAGE

## ◀ FROM ETRUSCAN TO ROMAN CIVILISATION

Stories of our country's history, people, places and different civilisations narrated with the aid of immersive virtual installations.



## ◀ VIRTUAL COMPUTING LAB

Arts from a scientific lens – this combination of visualisation and representation techniques gives a different perspective on the Italian cultural heritage.

