# PRESS FILE EXHIBITION:

### TO THE EDGE OF TIME

- > from 22 October 2021 till 16 January 2022
- > Leuven university library

An initiative from:

> KU[N]ST Leuven, stad Leuven & KU Leuven

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Stephen Hawking

# TO THE EDGE OF TIME

### LEUVEN UNIVERSITY LIBRARY

> 22 OCTOBER 2021 - 16 JANUARY 2022

"What's really unbelievable is how the laws of physics were determined within mere seconds of the Big Bang. Where we are now, who we are today ... all of it in just those milliseconds."

Siemen Burssens

### **INTRO**

Did the Universe have a beginning? Will it come to an end? Where do humans fit into the big picture? Scientists and artists have considered these fundamental questions and have come up with some truly amazing ideas.

To the Edge of Time brings together world-class scientific objects and works by modern masters and award-winning contemporary artists from across the world to explore the discovery story of one of the biggest scientific revolutions of the 20<sup>th</sup> century, the Big Bang.

The Big Bang theory bridges the work of three of the 20th century's greatest European scientists: German-born physicist Albert Einstein produced a theory of gravity that could be applied to the entire Universe; Belgian astronomer Georges Lemaître was the first to propose that the Universe is expanding from a Big Bang; and British cosmologist Stephen Hawking showed that the Big Bang follows from Einstein's theory.

Objects from the scientists' lives and archives reveal their unique processes and ideas alongside artworks which playfully and critically investigate light, time, space, matter, and the very nature of perception and reality. Together they tell a powerful story that binds us all, generations of humans wondering, searching and working towards an ever-deeper understanding of the cosmos.

To the Edge of Time demonstrates how passion and a sense of awe yield new and radical, mind-boggling insights. Themes move between observation, hypothesis and evidence, from speculation to existential questions, artworks immerse us in the fearsome, awe-inspiring pleasures of the unknown, the imperceptible and the uncharted and encompass individual, social and political relationships with the cosmos, the Earth and each other.

To the Edge of Time tells a story on the far frontiers of the cosmos as well as close by. After all, there's a bit of the Big Bang in all of us.

A Leuven University Library exhibition and part of BANG! the Leuven Big Bang City Festival

### **CURATORS**



### THOMAS HERTOG

Thomas Hertog is a renowned Belgian cosmologist and physicist. He studied physics at KU Leuven and obtained his PhD under Stephen Hawking at the University of Cambridge in England with whom he developed a lasting collaboration. He worked as a researcher at the University of California, Santa Barbara, in the United States, at CERN near Geneva, and at the Paris Diderot University in France. Hertog was appointed professor at KU Leuven's Institute for Theoretical Physics in 2011, where he investigates the physical nature of black holes and the big bang on the basis of string theory. Hertog also leads Belgium's participation in the European Space Agency's first mission devoted to

gravitational waves - ripples of spacetime as predicted by Einstein in 1916.



### HANNAH REDLER HAWES

Hannah is a contemporary art curator and researcher who trained at Norwich School of Art and the Royal College of Art in London. She specialises in projects which raise social, cultural and ethical questions within the fields of art, data, science, and technology. She works with museums, galleries, and universities across the world. Alongside her independent practice she is the director of the Data as Culture art programme at the Open Data Institute. She

developed her love of interdisciplinary narratives as Head of the Arts Programme at the Science Museum Group, where she worked between 1999 and 2014. Hannah lectures, speaks and publishes on multidisciplinary art and curating practices.

# GEORGES LEMAÎTRE, FATHER OF THE BIG BANG



Albert Einstein & Georges Lemaître, 1933. Collection University Archives KU Leuven © The New York Times

Albert Einstein developed his new theory of gravity in 1915. With one equation he turned our worldview upside down. Einstein's theory of general relativity fundamentally altered how we look at the Universe. It remains essential to how gravity, space, time, and the Universe's course of evolution are understood.

In 1927, the Belgian priest, physicist, and mathematician Georges Lemaître, while meticulously investigating Einstein's equations, made an extraordinary discovery – the Universe is evolving and expanding. He pursued this idea and was the first to conclude – in 1931 – that if the Universe was expanding, it must also have had a beginning. Lemaître described the origin of the Universe as a *primeval atom* whose disintegration would have been the basis for all space, time, and matter as we understand them today. Lemaître's envisioned the origin of the universe as the "day without yesterday".

Initially, Lemaître's idea was dismissed, the moniker by which we all know it now – the Big Bang – was coined as a derisive comment! But Lemaître refused to be

dissuaded and made it his object of lifelong study. The fact that he was a priest didn't hold him back from conducting scientific research on our ultimate origins. In fact, he told *The New York Times* in the 1930s: "Once you realise that the Bible does not claim to be a science textbook and that Einstein's theory has no bearing on salvation, the long-standing conflict between science and religion dissolves."

However, it wasn't until 1965 that strong evidence of the Big Bang theory was established. Georges Lemaître received the news on his deathbed. After his death, the brilliant scientist and priest sadly vanished from collective memory. Even Stephen Hawking, whose doctoral dissertation proves that Einstein's theory is correct – that time must have had a beginning – only became acquainted with the 'father of the Big Bang' much, much later through his colleague Prof. Thomas Hertog, the co-curator of the *To The Edge of Time* exhibition.

Fortunately, Georges Lemaître now gets the international recognition he deserves. And fittingly, the *To the Edge of Time* exhibition is a tribute to his work.

"It's the unknown; it's the endless possibilities that make looking at the universe so exciting."

Clare Strand, To the Edge of Time artist

# **ARTISTS**

To the Edge of Time features works of art by Haseeb Ahmed, Phoebe Boswell, Constantin Brâncuşi, Rohini Devasher, Maurits Cornelis Escher, Andy Holden, Gavin Jantjes, Jackie Karuti, Melanie King, John Latham, Liliane Lijn, London Fieldworks, René Magritte, Kazimir Malevich, Cornelia Parker, Katie Paterson, Dawit L. Petros, Sarah Pickering, Leo Robinson, Semiconductor, Conrad Shawcross, Clare Strand, Thomson & Craighead, Stephan Tillmans, Suzanne Treister, Troika, Georges Vantongerloo, Jeronimo Voss, Mark Wallinger, Charmaine Watkiss, Grace Weir and Ni Youyu.

# **HIGHLIGHTS**

The Big Bang theory is one of the most profound scientific revolutions of the 20th century, or any century for that matter. *To the Edge of Time* exhibits unique scientific objects such as a piece of the Hubble telescope and KU Leuven's very first mainframe computer. These are presented alongside works by leading modern masters and award-winning contemporary artists from across the globe.

### Highlights include

- A 1919 glass-plate photograph of a total solar eclipse by British Astronomer Arthur Eddington, which rocketed Einstein to global fame by providing evidence for his Theory of Relativity. The image sits alongside a response to Einstein's theory by world-renowned contemporary artist Cornelia Parker. Furthermore, a rare pencil drawing by the Russian artist Kazimir Malevich is on display. It embodies the limitless gravityless space Malevich's Suprematism movement imagined in the very same period Einstein's theory was transforming space and time.
- Sketches by Georges Lemaître show how he expressed his ground-breaking discovery of the expanding Universe through exquisite hand-drawn graphs.
- In their work, Escher and Brancusi ponder on the finite time of our origins and our existence.
- Stephen Hawking's preserved blackboard covered in partial equations, cartoons and physics
  jokes believed to be by Hawking, his students and collaborators, is presented to the public for
  the very first time thanks to the Science Museum Group which acquired the piece in May 2021
  from the Estate of Stephen Hawking.

Artworks selected to relate or allude to the Big Bang engage with light, space, time, matter, perception, and reality. Sometimes the link is clear as day, but more often than not, it brings dazzling new questions and angles. Observation, hypothesis and evidence, speculation, existential questions are explored through immersive light installations, experimental photography, films, philosophy, and cartoon humour.

Some artists collaborate with scientists or try their hand at putting scientific instruments and data to use themselves. Thought experiments and poetic reflection take a deep dive into the mystery of the universe, sweeping us up and leading us into new and uncharted territories.

Throughout the exhibition, our role as observers is called into question. Do we create the Universe as much as it creates us?

"The universe is a giant playground where there are always new things to be discovered."

Jacques Kluska

# **SELECT WORKS**



© Andy Holden, Eyes in Space, courtesy of the artist, 2012.

Eyes in Space Andy Holden Collage, 2012

Andy Holden tore pictures of space out of his science textbooks and added plastic googly eyes to them. This simple, almost ridiculous act turns the tables on our usual perspective as observers. We usually look out at the Universe, but with Holden's intervention, the Universe appears to be looking down on us.



© UCLouvain Archives Department, Georges Lemaître Archive.

Diagram of the chronological evolution of the universe's radius

Georges Lemaître Hand-drawn graph on graph paper,1927

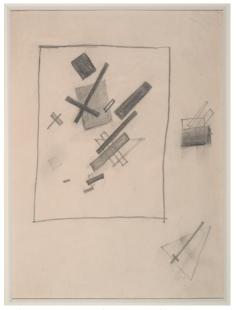
This extraordinary graph, one of several on display, is essentially the Big Bang theory's birth certificate. Time is depicted horizontally, while the size of the Universe is measured along the vertical axis. Some curved lines illustrate universes that are perpetually expanding, while others are in the process of collapse. Lemaître records the beginning of time – now known as the Big Bang – simply as 't=0' in the bottom left-hand corner. Despite their foundation in Einstein's Theory of General Relativity, Lemaître's epic graphs proposed such a radical change to how the cosmos is perceived that no one, not even Einstein himself, was willing to accept such a revolutionary concept.



Georges Lemaître and Andrée
Bartholomé consulting the Burroughs
E101 in the digital research
laboratory, May 1959
© UCLouvain, Georges Lemaître
Archive, Louvain-la-Neuve.

### Burroughs E101 electronic computer

Lemaître was a pioneer of computer science. He purchased one of the first electronic calculators, the Burroughs E101, at the Brussels World's Fair in 1958. The Burroughs is on display in the gallery alongside this photograph. Before electronic and digital computers made their début, 'human computers' performed complex calculations. Mrs Bartholomé, pictured here with Lemaître, was one of these computers.



Private collection, Belgium; © photo Bruno Vandermeulen.

# Suprematist Composition (Mixed Feelings) Kazimir Malevich Pencil on paper,1916

While Einstein was publishing his theory of relativity in 1915, Kazimir Malevich shocked the art world with his début of Suprematism, abstract art intent on elevating pure feeling over the traditional depiction of objects. Suprematism shifted the perspective away from the single point perspective common to art at the time in favour of floating shapes in an open, unbounded, and infinite space. The Suprematist Composition's monochromatic geometric shapes appear weightless, situated in an entirely new space. They are united by a powerful sense of dynamism, action, and freedom from prevailing ideas and structures.



© photo Ben Blackall, 2016, courtesy of the Lowry.

### Totality Katie Paterson Installation,2016

Long before humans invented clocks, the Sun, Moon, and stars were used to measure the passing of time. Totality ushers you into a staggering encounter with a singular moment from our collective experience of time. Nearly every documented solar eclipse – from partial to total – has been assembled across the faceted surface of a mirror ball. Drawings from antiquity, revolutionary photographs, and images captured with cutting-edge telescopic technologies revolve around the room in a progressive eclipse.



© Courtesy of the artist.

### Atmospheres

Rohini Devasher Single channel video,2015

The brilliant blue sky above the Indian Gauribidanur Observatory is presented as a spherical, almost solid form. Edged by architectural elements from a radio telescope, Devasher imagines the sky as a blank canvas onto which we might project our individual desires and thoughts. Visually it echoes the iconic 1972 *Blue Marble* photograph of the Earth, which astronauts on the Apollo 17 spacecraft captured from 29,000 kilometres up in space. Devasher, however, shows Earth in space from our perspective on the ground.



© Mu.ZEE.

### Formation de la matière

Georges Vantongerloo Oil on canvas,1951

The concentric circles of Vantongerloo's Formation de la matière [Creation of Matter] are reminiscent of the internal structure of atoms. Vantongerloo's experiments with complex structures reflect a desire for his art to be subsumed into the infinite, unfathomable universe – as one



© Science Museum Group, London.

DON'T FORGET TO DOUBLE-CZECH YOUR RESULTS
Blackboard from Stephen Hawking's office at
Cambridge University inscribed with
coloured chalk

This chalkboard hung in Stephen Hawking's Cambridge office. Its scribbles and mathematical equations date back to the early eighties, a time when Hawking and his colleagues were avidly engaged in trying to combine the gargantuan and infinitesimal – Einstein's theory of relativity and quantum mechanics (atoms and subatomic particles) – into a single theoretical framework. These may very well be Hawking's last handwritten notes.



Collection de la Fédération Wallonie-Bruxelles © Vincent Everaerts.

### La belle captive

René Magritte Pencil and gouache on paper,1965

A picture within the picture's edge disrupts an apparently seamless cloud- and seascape that travels from the external 'real' world to the inner world of the canvas. Theatrical curtains emphasise the artifice of a painting that captures a poetic reality, not what we deem to be an elusive 'objectivity'. We are part of the Universe that we are trying to understand; we cannot step outside the cosmos. How does this shape the mysteries we seek to unravel?



© Victoria & Albert Museum, London.

### Gavin Jantjes

Untitled

after a painting from the series 'Zulu, (the sky above your head)' 1988

Screenprint on handmade Khadi paper

Untitled recalls the Southern African Khoi San peoples' cosmic creation myth. A young girl throws burning embers from the fire into the sky. The coals form the stars and the white ashes become the galaxy we live in, the Milky Way. Gavin Jantjes' work addresses shared humanity, identity and lost histories. He says, 'No nations lay claim to the heavens. They are undefined ... and are accessible to every human being.'



© Image courtesy of NASA, ESA, S. Beckwith (STSCI) and the Hubble Deep Field team.

### A deep field for the time deaf

Grace Weir Animation, 2007s Courtesy of the artist

Deep field brings us face to face with ancient light a stone's throw from the Big Bang. A section of the night sky appears completely black until a few, then many twinkling galaxies emerge, many billion light years away. Eventually a vivid coloured palette of galactic activity fills the screen. Powerfully contemplative, the animation acts as a reminder that the only time we can directly experience the past is when we look into the night sky. feelings.



© Courtesy of the artist and Tiwani Contemporary, London.

### The Lake (Newton)

Leo Robinson
Graphite, collage on paper ,2017

The Lake seems to capture the profound moment when Einstein transformed Newton's mystical conception of the Universe into a physical fabric, heralding the birth of modern cosmology. While Einstein's space warps and bends, a portrait of Newton travels towards a fire. Robinson is interested in how we change with our beliefs. Other ideas from science, nature, theology and art merge in his imaginary micro-civilization, where truth is provisional and capable of transformation.



 $\ensuremath{\texttt{©}}$  Courtesy of the artist and Hauser & Wirth, Zürich.

### Ego

Mark Wallinger Digital prints,2016

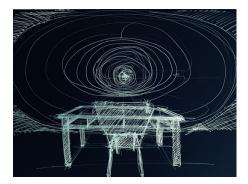
Turner-prize winning artist Mark Wallinger's *Ego* is a mischievous recreation of Michelangelo's infamous painting, *The Creation of Adam*. While the original shows God's hand giving life to Adam, the artist presents cell phone snapshots of his own hands performing both roles. Is he demonstrating the most extraordinary hubris, fulfilling a huge ego as the title implies, or is he just having a laugh? Perhaps he is pointing to something deeper – that we all play a role in creating ourselves? Also on display is Wallinger's multichannel video installation *Orerry* which positions us, the viewers as the central object around which the world revolves.

"The Universe isn't too big for humanity, for it neither transcends the potential of science nor the capacities of the human mind."

Georges Lemaître

# **NEW COMMISSIONS**

To the Edge of Time displays new works by Haseeb Ahmed, Phoebe Boswell, Conrad Shawcross and Suzanne Treister.



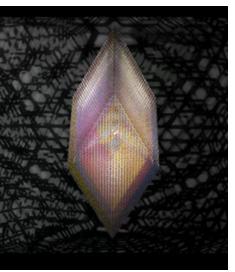
Study for The Cosmologists' Desk Haseeb Ahmed Digital drawing, 2021

The Cosmologist's Desk manifests these ripples in space-time by having everyday objects from a cosmologist's office perform unusual tasks. To remain upright, a chair tilted backwards negotiates its centre of gravity with that of the Earth's; a grandfather clock ticks, telling what was once the time – a gravity-induced imperfection – while a teapot pours an infinite cup of tea. Ahmed, originally from the United States, is a young artist residing and working in Brussels. He is currently co-creating a new gravitational wave-inspired installation with KU Leuven engineering students.



Mum's Feet (Grounded) Phoebe Boswell, 2021 Courtesy the artist

Phoebe Boswell's deeply personal portrait *Mum's Feet, Grounded* presents an East African mother as a powerful symbol of our collective beginnings. The use of markmaking using lines and pigments takes us back to our earliest attempts to communicate our thoughts and ideas. The work speaks to a sense of eternity, timelessness and a universal sublime. Born of stars and of flesh, we are here. We exist within the Universe, and it exists within the stories we create.



© Conrad Shawcross.

### Slow Arc inside a Cube XI 2021 Conrad Shawcross Mechanical installation Created with the support of KU Leuven funding.

Moving lights in a cluster of mesh cages create a liquid interplay of layered shadows whose crisscrossing paths are hard to follow. Different focal points appear and disappear, frustrating any attempt to identify the exact source of each shadow. Shawcross compares the effect to the layering of stars stretching out billions of kilometres into space, which, he suggests, inevitably creates interference patterns and the illusion of something that 'probably isn't there'.



© Courtesy of the artist, Annely Juda Fine Art, London, and P.P.O.W. Gallery, New York.

# The Holographic Universe Theory of Art History (THUTOAH)

Suzanne Treister
Single-channel video with sound and
watercolour drawings by scientists
THUTOAH was developed as part of the
Collide International Award, a
collaboration between CERN and FACT,
coproduction by Scanner.
New version commissioned by KU Leuven
for To the Edge of Time.

Leading theoretical physicists now think of the Universe as a hologram, in the sense that one of the dimensions we experience is an illusion. Treister suggests artists got there first. A colossal library of 25,000 international artworks is projected chronologically at 25 images per second, creating its own illusion of time and history. In an accompanying soundtrack, Hawking and Hertog ask if now might be the moment for us to do without time?

### PRACTICAL DETAILS & CONTACT

To the Edge of Time runs from 22 October 2021 through 16 January 2022. The exhibition is open every day from 10 a.m. to 5 p.m. The exhibition closes early on 24 and 31 December 2021, at 2 p.m. And the exhibition is closed for the holidays on 25 December 2021 and 1 January 2022.

Tickets are available online at https://bib.kuleuven.be/english/about/index/admission

A special promotion with a tailored guided tour is available for schools and groups. Group tours are by reservation only. Book yours with an email to oerknal@kuleuven.be

To find out about school and group tours, check out <a href="https://bib.kuleuven.be/english/about/exhibitions/Time">https://bib.kuleuven.be/english/about/exhibitions/Time</a>

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# **CURATORS**

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### AND THAT'S NOT ALL ...

### MUSEUM NIGHT BANG!

Visit *To the Edge of Time* on 17 November 2021 between 7 p.m. and 11 p.m. and find yourself swept up in the mesmerising concerts, performances, and workshops scattered throughout the city. Find out more on <a href="https://www.bangfestivalleuven.be/program/museum-night-bang">https://www.bangfestivalleuven.be/program/museum-night-bang</a>

#### SCIENCE DAY

Check out To the Edge of Time on 28 November - Science Day - between 10 a.m. and 5 p.m.

#### COSMOS - COSMIC DESIGN AND POETRY

During the same period, from 24 October to 27 February, Thomas Hertog is co-curating an exhibition on the COSMOS at the CID, the Grand-Hornu's centre of innovation and design.

Black holes, dark matter, nebulae, exoplanets, gravitational waves, the Big Bang, the multiverse... The countless bodies and cosmic phenomena that make up our universe are sources of inspiration for literature, music, the visual arts, and the performing arts. Our fascination with them also finds expression in the design world.

Many designers have posed questions on the architecture of the universe and the hidden laws of physics that govern it. From Einstein's theory of general relativity to quantum theory, the modern image of the cosmos is embodied in design and architectural projects that lead us far beyond its scientific roots and reflect its mysteries.

The exhibition *Cosmos: Cosmic Design and Poetry* is made up of four sections. From *Micro to Macro* and *Our Distant Galaxies* (very distant) to *Our Solar System*, these mysterious and scientifically observed phenomena have inspired the work of many designers who, in often drawing on theoretical representations and scientific observations, appropriate them and give them their own personal twist, all with a sense of fascination and an appreciation of beauty.

### **USEFUL INFORMATION:**

The CID at the Grand-Hornu Rue Sainte-Louise 82 7301 Hornu www.cid-grand-hornu.be

Open Tuesdays to Sundays from 10:00 am to 6:00 pm.

Exhibition dates: 24 October 2021 to 27

February 2022

Bookings: 065/613902 or reservations@grand-

hornu.be

### PRESS INFO:

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### TO THE EDGE OF TIME COLOPHON

### GENERAL COORDINATOR

Annelies Vogels

#### **CURATORS**

Thomas Hertog & Hannah Redler Hawes

### STEERING COMMITTEE

Wouter Daenen, Lien De Keukelaere, Thomas Hertog, Hannah Redler Hawes, Hilde Van Kiel, Annelies Vogels

### SCIENTIFIC AND CONTENT-RELATED ADVICE

Conny Aerts (KU Leuven), Katy Barrett (Science Museum Group), Monica Bello (CERN), Gareth Bell-Jones (Flat Time House), Sir Ian Blatchford (Science Museum Group), Tilly Blyth (Science Museum Group), Geoff Belknap (Science Museum Group), Geert Bouckaert (KU Leuven), Alison Boyle (Science Museum Group), Frans Cerulus (KU Leuven), Graham Farmelo, Luc Geurts (KU Leuven), Jan Govaerts (UCLouvain), Claire Grafik (The Photographer's Gallery), James Hartle (UCSB), Lucy Hawking, Catherine Heymans (University of Edinburgh), Gustaaf Janssens (KU Leuven), Katrien Kolenberg (KU Leuven), Christine Kreamer (National Museum of African Art), (Dominique Lambert (University of Namur), Clare Manchester, Gerda Neyens (KU Leuven), Andrew Spira, Christina Seyfried (KU Leuven), Karen Verschooren (STUK), Marc Vervenne (KU Leuven), Siska Waelkens (KU Leuven), Véronique Fillieux (UCLouvain)

Courtesy of the KU Leuven Libraries, the UCLouvain Georges Lemaître archives, the Committee of Contemporary Art – KU Leuven, the Department of Physics and Astronomy – KU Leuven, Brout - Englert - Lemaître Center for Theoretical Physics, e-Media Research Lab, The European Organization for Nuclear Research (CERN), and the Hawking Estate.

### PRODUCTION

Wouter Daenen the KU Leuven Libraries team

### COMMUNICATION & EVENTS

Diewer van der Meijden, Shana Ludikhuyze & Wouter Daenen

### PUBLIC RELATIONS

An Lombaerts, Vincent Langouche (Fonk vzw), Hilde Van Hemelrijck, Diewer van der Meijden

### **SCENOGRAPHY**

Exponanza

Ward Denys, Britt Kennis, Filip Roose

EXHIBITION CONSTRUCTION & ART HANDLING

Atento

