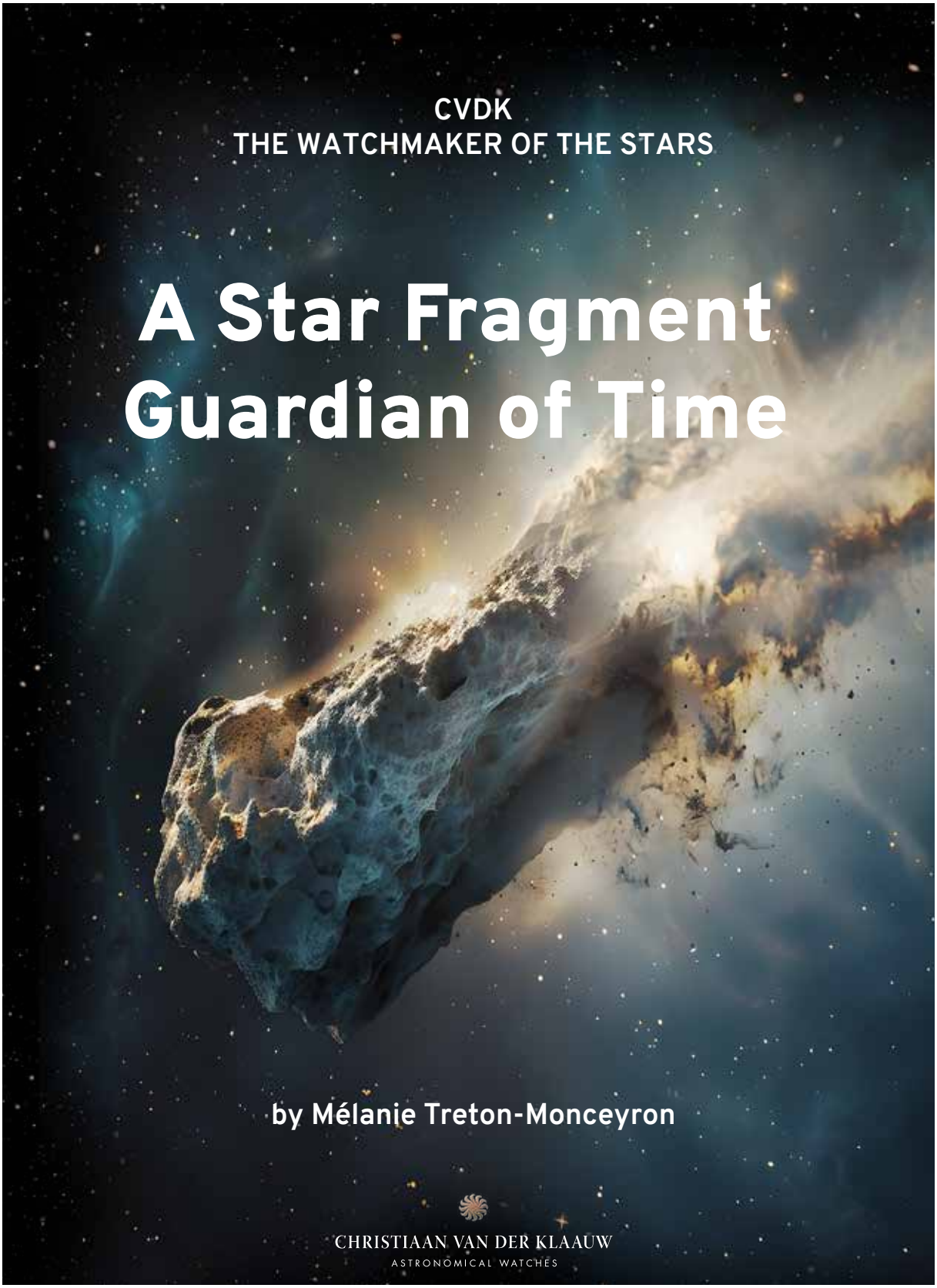
CVDK
THE WATCHMAKER OF THE STARS

A Star Fragment Guardian of Time



by Mélanie Treton-Monceyron

CHRISTIAAN VAN DER KLAAUW
ASTRONOMICAL WATCHES

A Star Fragment
Guardian of Time

CHRISTIAAN VAN DER KLAAUW

ASTRONOMICAL WATCHES

Préface

The Universe is a fascinating place to be. Matter, forces and fields, created in the wake of the Big Bang, interact energetically ever since. Simple elements, mainly hydrogen and helium, were partly transformed into a host of other atoms. It happened deep inside stars and during their sometimes super end-of-life explosions. Among the numerous products of fusion we find nickel and iron. But also, for instance, oxygen, carbon and calcium, main constituents of our bodies. Yes, we are all truly stardust!

About ten billion years elapsed when a huge cloud of gas and dust, enriched with our precious metals, started to collapse. While our sun took shape, its shroud of debris became the cradle of aggregations of dust, called planetesimals. Some managed to grow to sizes of tens to hundreds of kilometres. Deep in their cores, the radioactive heat became trapped. As their inner regions partly melted, heavier elements migrated to their cores, leaving a rocky crust emerging at the surface.

The early solar system apparently was a violent place as collisions occurred frequently. Sometimes, the parent bodies or asteroids, completely shattered into smaller pieces. They became iron and stony meteoroids, orbiting their own trajectory around the sun. By chance, some of them happened to cross the orbit of our home planet. Dispersing their kinetic energy in the atmosphere as a huge fireball, their remnants finally came to rest.

One iron meteorite, in itself a marvellous product of nature, experienced yet another transformation. The artists imagination and craftsmanship turned it into the case of the ultimate timekeeper. How appropriate for this material that started its career out of this world, with roots to the beginning of space and time!

March 2025

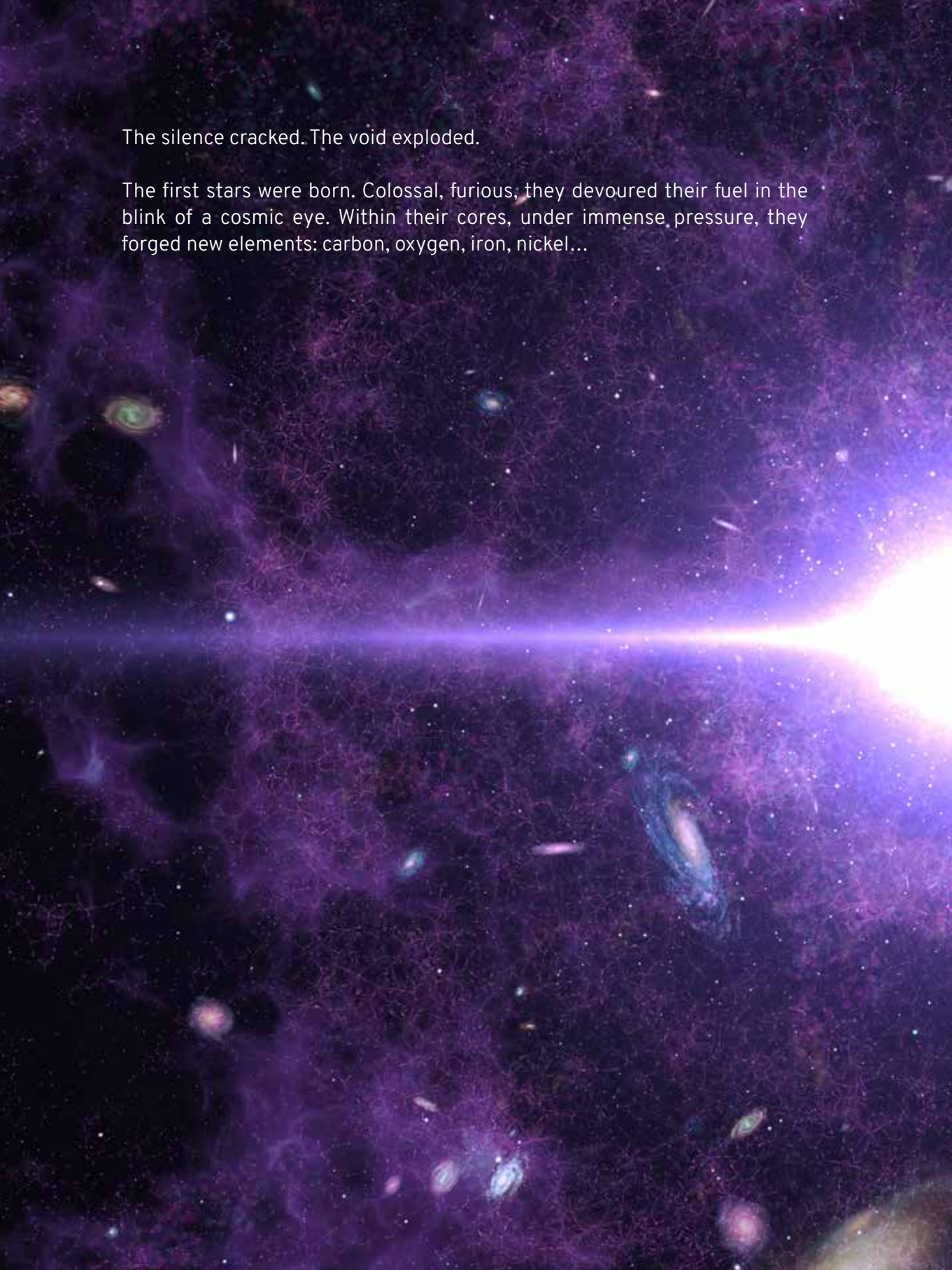
Niek de Kort / astrophysicist

-13.8 Billion Years Ago
The Dust of Origins

Nothing…
At the beginning, there was nothing.
No light disturbed the darkness, no sound broke the silence

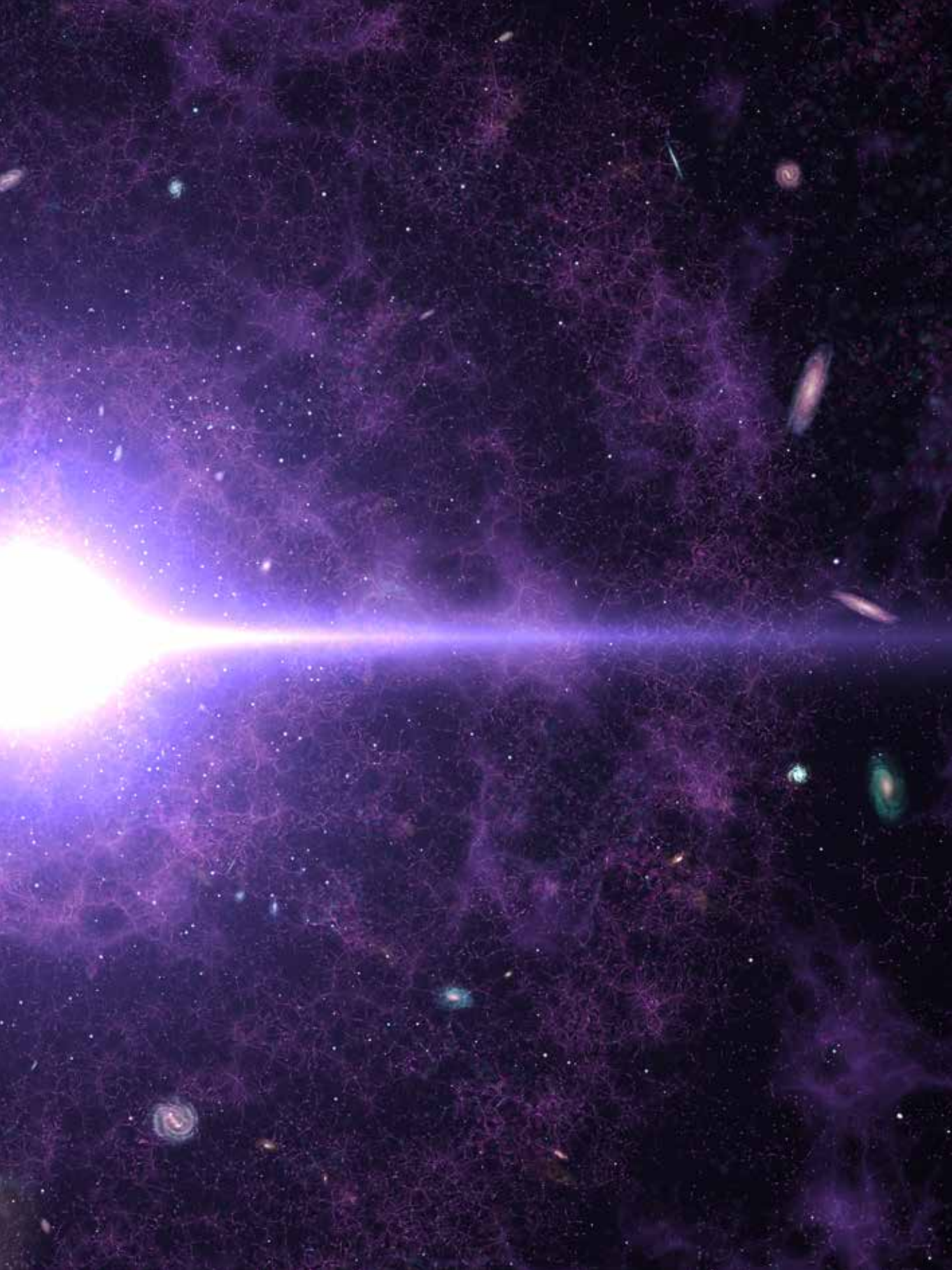
The universe was an infant—starless, planetless, devoid of metal or rock. A vast, dark ocean of hydrogen and helium drifted through the void, without shape, without purpose.

Then, one day—if time could even be said to exist then—at year 0, month 0, day 0, hour 0, minute 0, second 0, something changed.



The silence cracked. The void exploded.

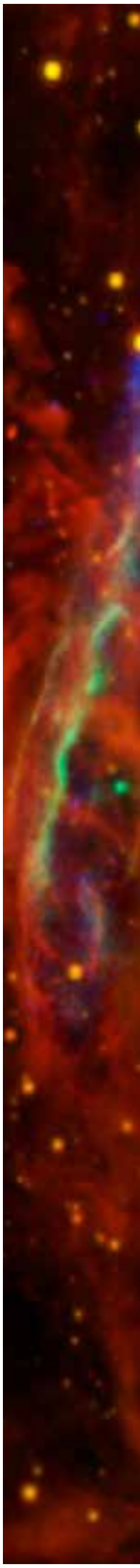
The first stars were born. Colossal, furious, they devoured their fuel in the blink of a cosmic eye. Within their cores, under immense pressure, they forged new elements: carbon, oxygen, iron, nickel...



These materials had never existed before. They were the first tangible fragments of planets, of mountains, of the blood that would one day flow through living veins.

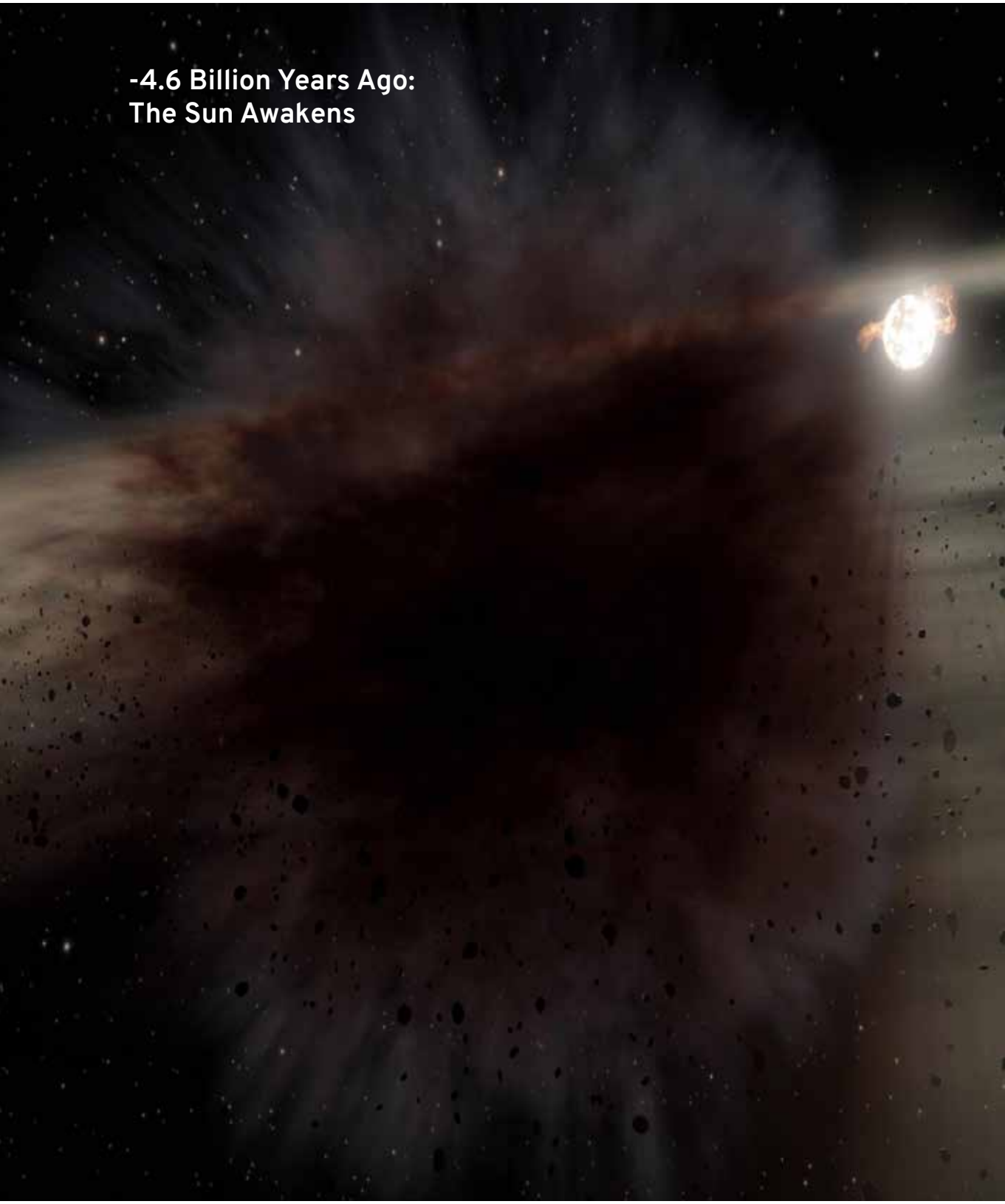
But these stars, like all things, met their end. They perished in titanic supernovae, scattering their atoms into space, sowing iron and nickel like seeds in a celestial garden.

Among these stellar ashes, a tiny speck of metal was cast into the void, beginning an endless journey.



NASA's Goddard Space Flight Center/CI Lab (P. 9,10)

NASA/ESA/JPL-Caltech/UCLA/CXC/SAO


-4.6 Billion Years Ago:
The Sun Awakens

After billions of years drifting through space, this grain of metal was drawn into a growing vortex—a massive collapsing nebula. Something was being born.

At its center, a fiery heart ignited: the Sun. Around it, matter whirled in a chaotic dance, dust and rock colliding, fusing, shaping the first bricks of the Solar System.

The grain of metal did not remain alone for long. It bound itself to others, growing—
a dust speck became a pebble,
a pebble became a rock,
a rock became a block,
a block became an asteroid.

Some of these asteroids grew large enough that gravity awakened within them, triggering a crucial transformation: differentiation.

Collisions followed, one after another, until the asteroid reached the size needed to ignite its own inferno.

NASA/JPL-Caltech

-4.5 Billion Years Ago: The Molten Heart

As the asteroid grew, its interior began to heat. The relentless bombardment of space debris, combined with the radioactive decay of certain isotopes, ignited an infernal heat. The metal melted and reorganized itself—iron and nickel flowing toward the center, while lighter elements remained near the surface.

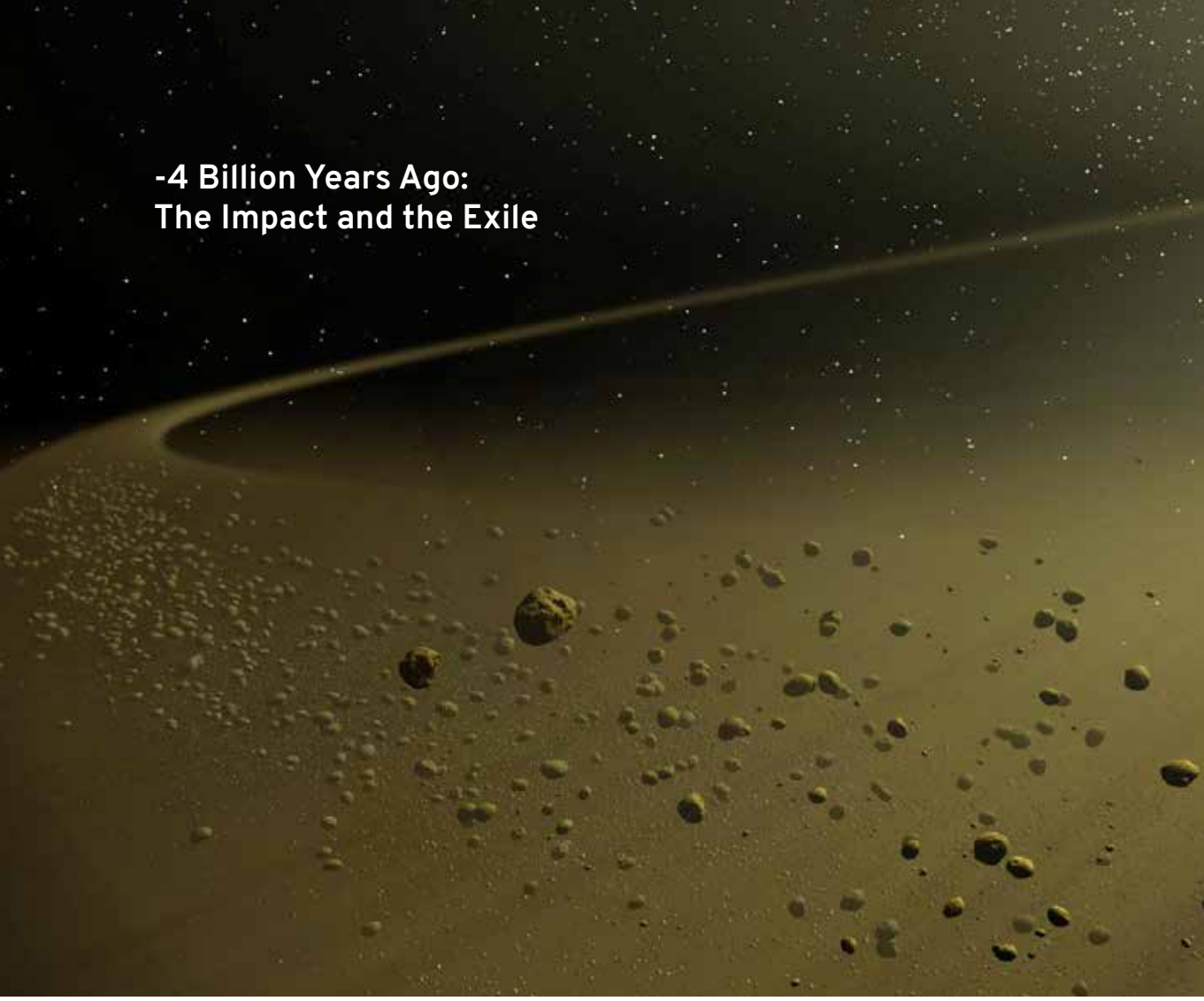
At the asteroid's core, a perfect metallic nucleus was born, a molten heart akin to that of young planets.

But something even more mysterious was happening.

As time stretched over millions of years, the core began to cool—slowly, ever so slowly. The radioactive heat that had kept it molten faded, and its structure crystallized.

During this nearly eternal cooling, a unique pattern emerged—the Widmanstätten structures, an intricate crystalline network, a metallic fingerprint of time itself, a pattern that could only form through millions of years of patient solidification.

This heart became a clock, engraving time within itself.

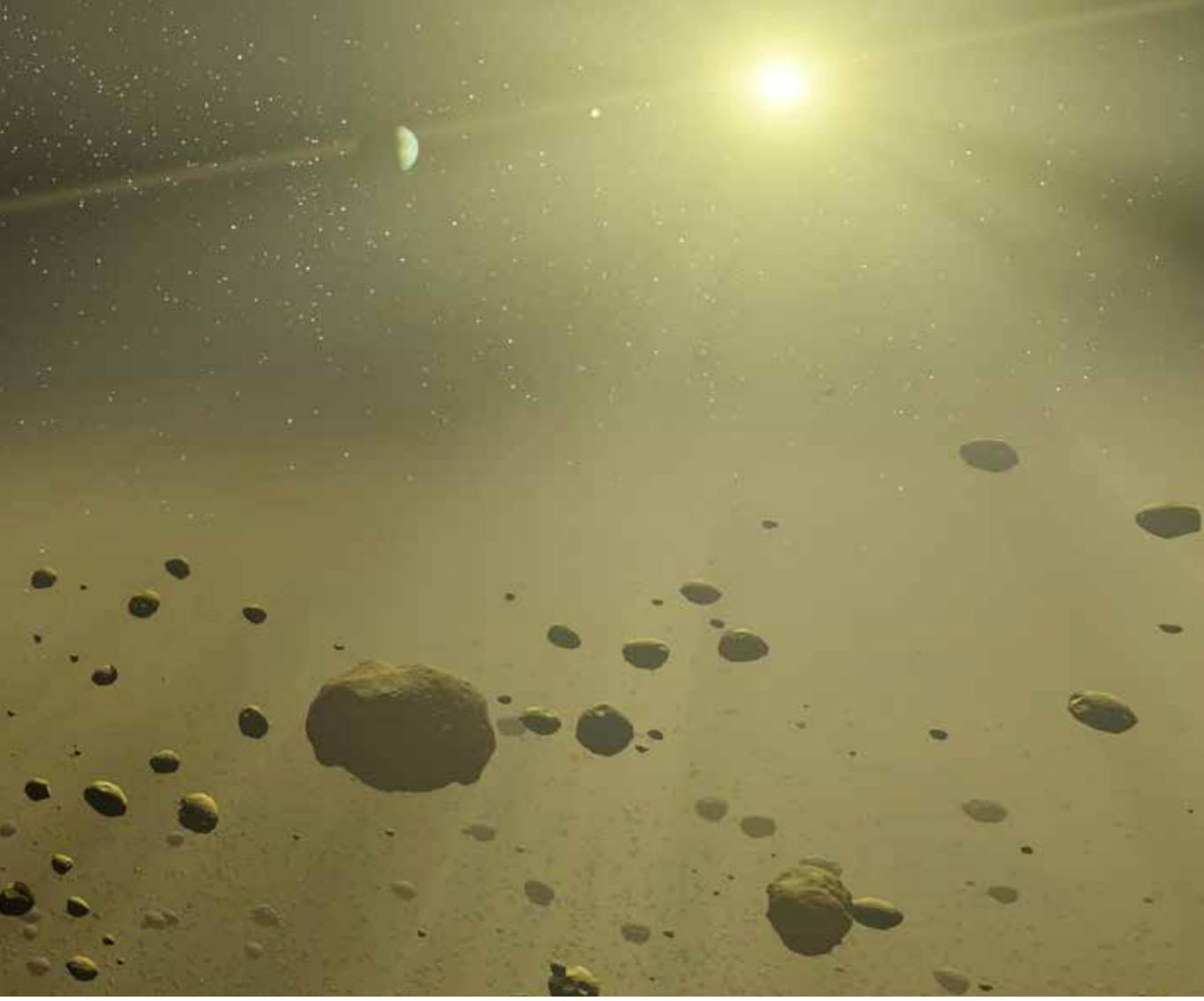


-4 Billion Years Ago: The Impact and the Exile

But this celestial clock was not left in peace.

The young Solar System was still a battlefield. A colossal impact shattered the differentiated asteroid.

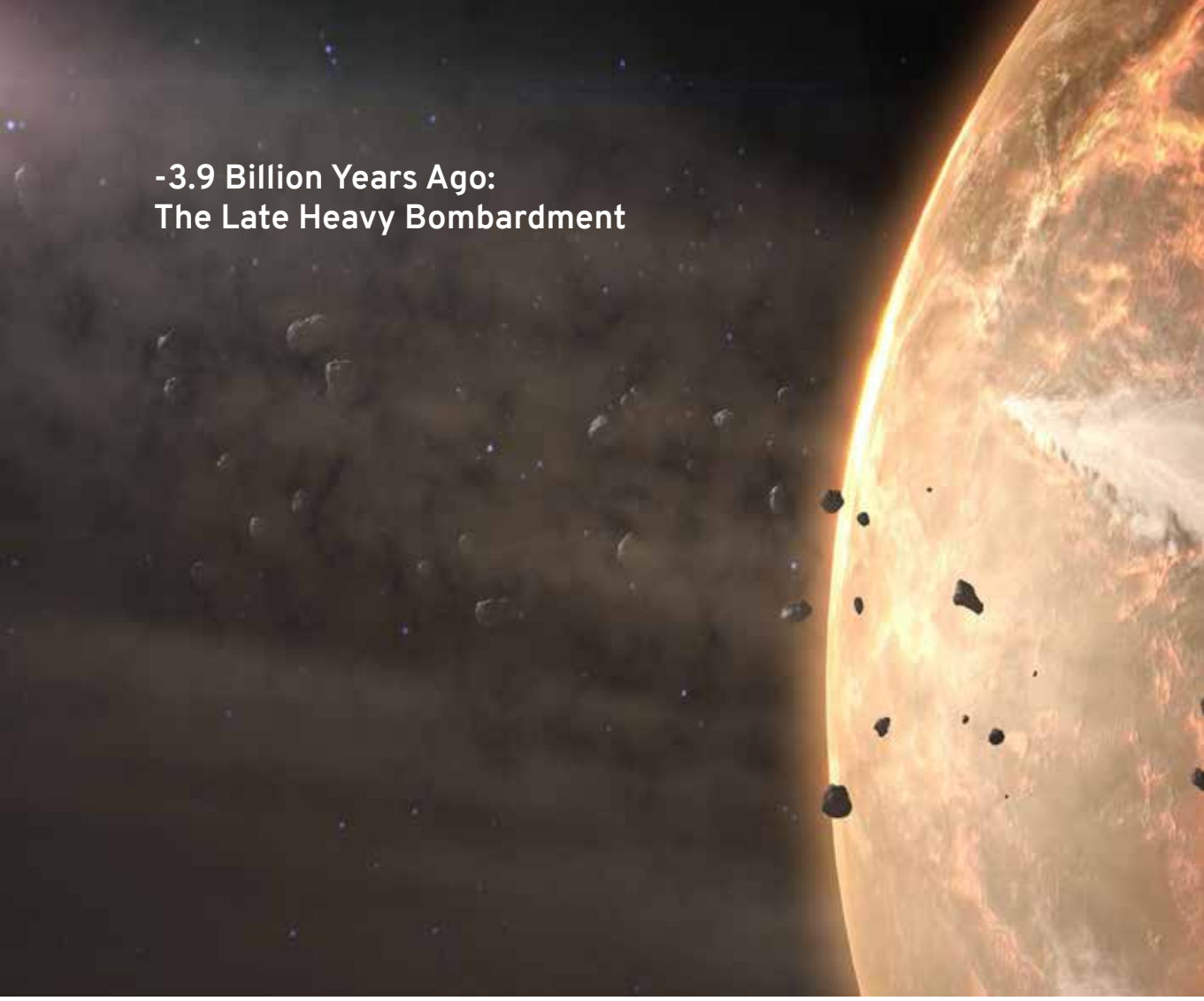
The force of the collision was unimaginable. Its rocky crust was torn apart, exposing its core to the merciless void. Fragments were hurled into space, flung in all directions. Some were captured by forming planets, others consumed by the Sun, reduced to cosmic dust.



But one fragment, an iron-nickel shard etched with time, survived the impact. It was cast into space and remained free.

And it was not alone.

NASA/JPL-Caltech



-3.9 Billion Years Ago: The Late Heavy Bombardment

Something disturbed the balance of the young Solar System.

Did a planet drift too close?
Did the gas giants stir the heavens with their gravity?
Did a distant star brush past?

No one knows.

But one thing is certain: chaos followed.

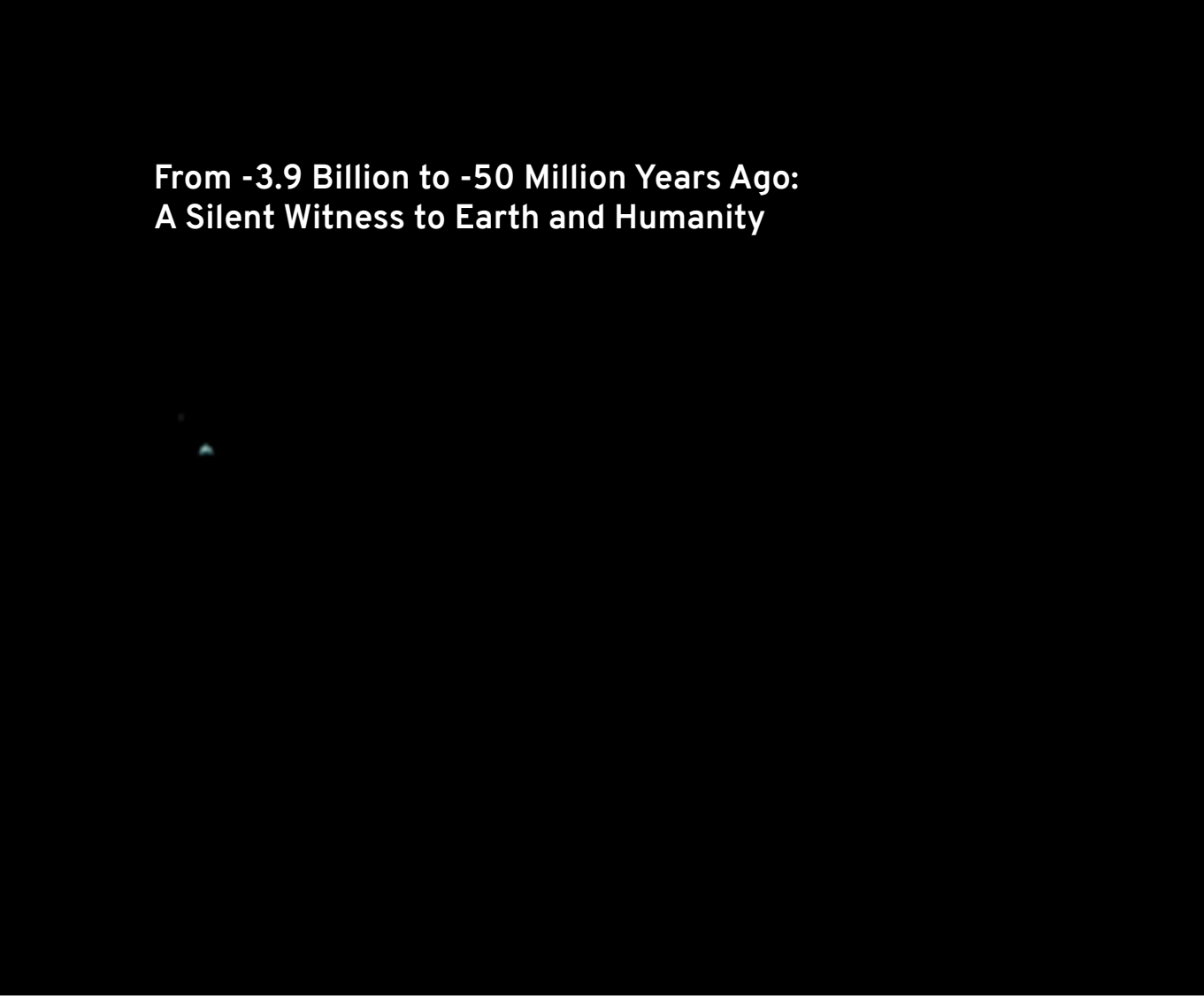
The gravitational upheaval triggered the Late Heavy Bombardment, a cosmic downpour of asteroids that rained down upon planets and moons

The Earth was scarred forever. Oceans of molten rock surged beneath the fury of impacts.
But it was the Moon that bore the most visible scars. Even today, most of its craters are the echoes of that age of fire and stone.

Yet our fragment did not descend to Earth—not yet.

Instead, it remained adrift in the asteroid belt, trapped in an eternal waltz between the Sun and the void.

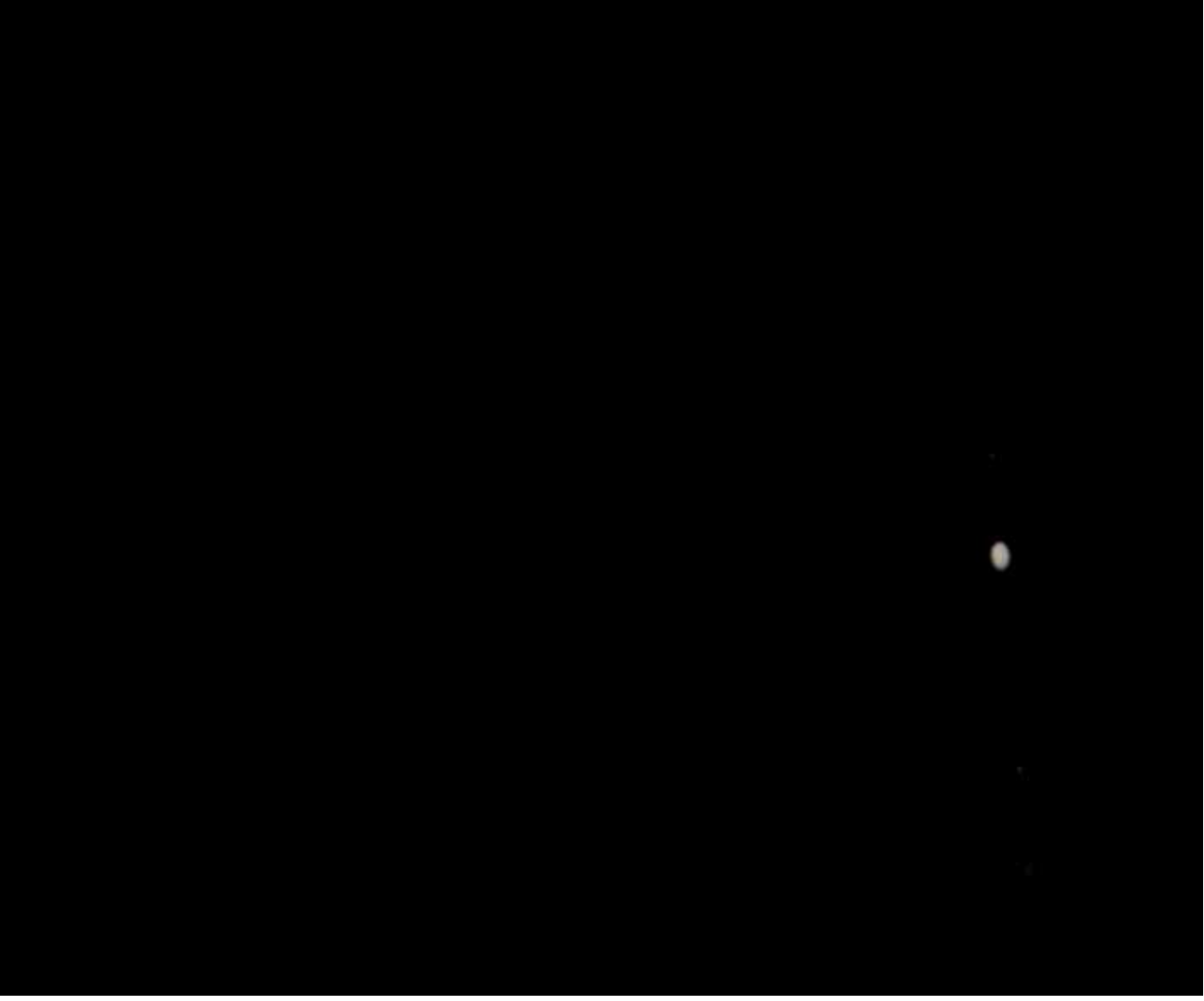
From -3.9 Billion to -50 Million Years Ago: A Silent Witness to Earth and Humanity



For billions of years, this meteorite was a silent observer of time.

From its distant orbit, it watched Earth take shape, cloak itself in oceans, weave a thin veil of atmosphere.

It witnessed the first bacteria emerge—tiny bubbles of life in the vastness of time.



It saw continents drift, dinosaurs rise to rule, only to be wiped out by another meteorite.

It watched as the first humans stood, gazed at the Moon, and began to measure time

And yet, it remained unseen, floating in the cosmic silence.

Earth and Jupiter as viewed from Mars
NASA/JPL/Malin Space Science Systems

-50 Million Years Ago:
The Call of Earth

Then, one day, a tiny gravitational disturbance altered its fate.

A passing asteroid nudged its trajectory, shifting it ever so slightly.
It began a slow descent into the inner Solar System.

Its time as an observer was ending.

NASA/JPL

-50,000 Years Ago:
The Final Descent

With each orbit around the Sun, it drew closer to Earth.

Until, one day, it could resist no longer.

It plunged into Earth's atmosphere at over 60,000 km/h.

The air before it compressed, ignited, transforming it into a blazing inferno. Its surface melted, forming a smooth black fusion crust, its final scar from the journey.

A streak of fire slashed across the sky.

Perhaps, at that moment, somewhere in the desert, a man looked up at the Moon and saw a star fall to Earth.

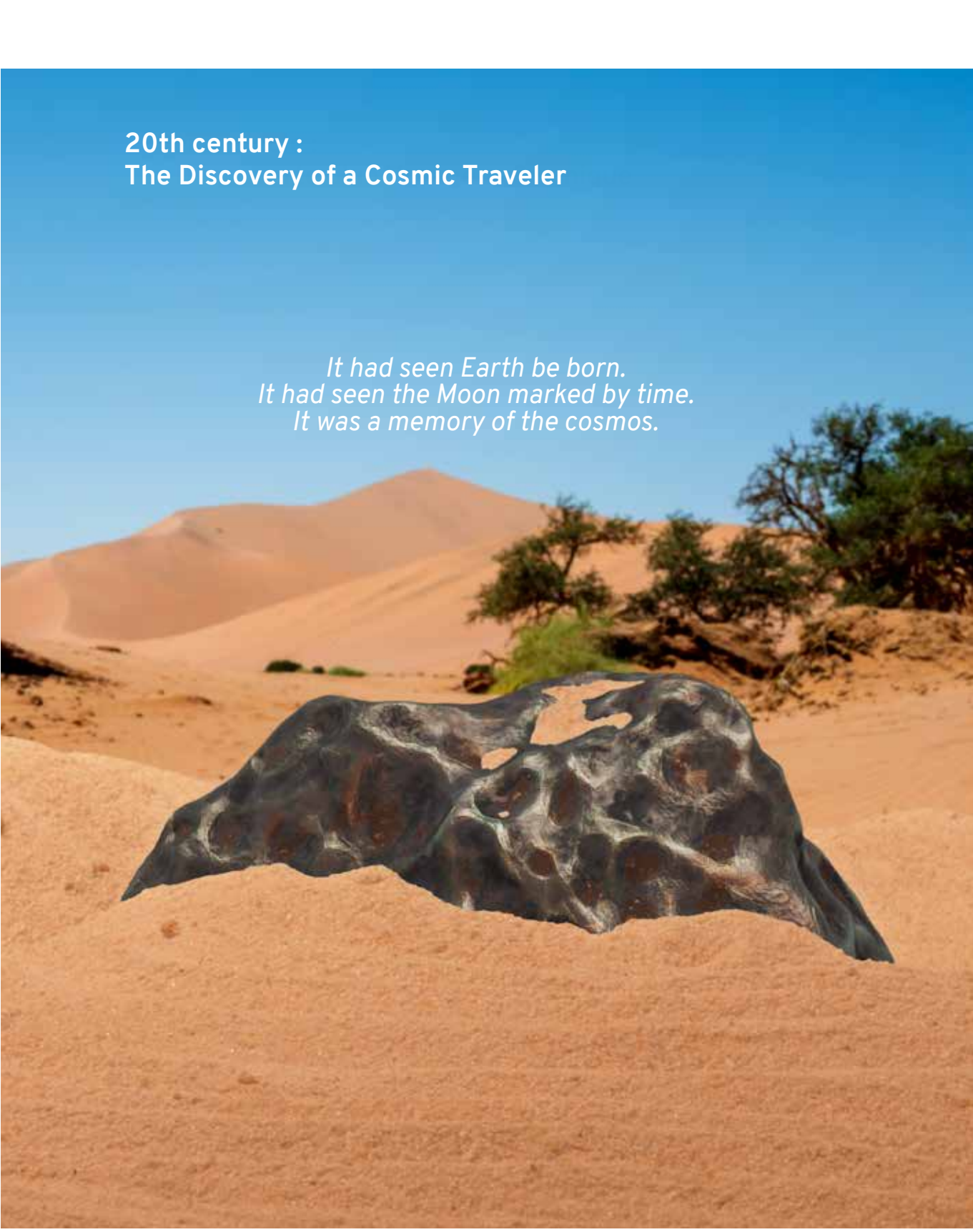
The meteorite had come home.

NASA/Art By Don Davis -1977-

The Impact: A Fireball in the Sky

20th century :
The Discovery of a Cosmic Traveler

It had seen Earth be born.
It had seen the Moon marked by time.
It was a memory of the cosmos.



Millennia later, in a remote corner of the Gobi Desert, an explorer saw a dark glimmer half-buried in the sand.

He picked it up, feeling its unexpected weight, its metallic coldness, the fine striations carved into its surface by the universe itself.

Analysis confirmed what the sky had already whispered—this was a fragment of an asteroid's core, broken apart 4 billion years ago, wandering through space before falling to Earth 50,000 years ago.

2023 :
The Clock of the Stars

Stars die. Meteorites fall. But time never stops.

In his workshop in Naarden, Netherlands, Pim Koeslag, gazed at the meteorite before him.

It was no longer just a relic.
It was destined to become a vessel for time, protecting one of the most extraordinary horological movements ever conceived: The Grand Planetarium Eccentric.

Before sculpting even the smallest piece, one must first understand the nature of the material.

Pim Koeslag had the fragment undergo an X-ray analysis, revealing its precise composition:

• 91.66% iron – forged in the fiery heart of supernovae, the same element that forms the cores of planets.

• 7.64% nickel – responsible for the mesmerizing Widmanstätten patterns, a crystalline network that can only emerge after millions of years of slow cooling.

• 0.7% cobalt – a rare signature, irrefutable proof of its extraterrestrial origins.

But the meteorite had not yet revealed all its secrets..

A Metal Forged by the Universe

The Obstacle of Frozen Time

Pim Koeslag placed the fragment under a CNC machine, a precision milling tool designed to sculpt the hardest metals. The tool bit into the material, carving the stellar iron with meticulous accuracy.
Millimeter by millimeter, the metal resisted.

Then—a sudden shock.

The machine halted abruptly.
The tungsten carbide drill, designed to cut through the toughest alloys, had just shattered.
The watchmaker stood still for a moment. He understood immediately.

A detail invisible to the naked eye, a whisper only the material could reveal.

After its formation, the metal had undergone a slow internal transformation. Under the immense pressure of the cosmos, under the intense heat that once reigned at its core, some of its components had crystallized into a structure of extreme hardness—one akin to that of a diamond.

This silent mutation had made the meteorite an exceptional material—a fragment of the universe so dense, so pure, that it defied even the tools of men.

This was no ordinary piece of metal.
It was a crystalline structure shaped by the cosmos itself, a matter that had evolved over billions of years, reaching a level of resistance that challenged the very laws of Earth.

Pim Koeslag smiled. Another obstacle. Time does not yield so easily.

After multiple adjustments, after countless hours of painstaking precision work, the form of the watch case finally emerged.

A celestial vessel, ready to house the most extraordinary planetarium ever created.


JUNE
GEMINI
JULY
CANCER
AUGUST
LEO
SEPTEMBER
VIRGO
OCTOBER
LIBRA
SCORPIO
NOVEMBER
SAGITTARIUS
DECEMBER
CAPRICORN
JANUARY
AQUARIUS
FEBRUARY
PISCES
MARCH
ARIES
APRIL
TAURUS
MAY
CHRISTIAAN VAN DER KLAAUW

2025 :
The Grand Planetarium Eccentric Meteorite
A Star Fragment, Guardian of Time

This is no ordinary watch.

It is a miniature Solar System, a mechanical masterpiece of precision, the only planetarium watch in the world that displays all eight planets, tracking their precise orbits around the Sun in real time.

The Sun reigns at the center of the dial, motionless and luminous, rotating with the seconds indicator.

Mercury, Venus, Earth (and its moon), Mars, Jupiter, Saturn, Uranus, and Neptune orbit around it, moving at their real celestial speeds.

Each planetary revolution is measured in real time, a reminder that human time is merely a fragment of cosmic time.

Inside the meteorite, this mechanism beats to the rhythm of the celestial bodies, protected by a metal that has endured through the ages.

The meteorite, once a silent observer of the celestial ballet, is now the guardian of this miniature system, preserving a mechanism that connects human time to that of the universe.

Every second that passes beneath the sapphire glass is an echo of the meteorite's journey through space.

Each revolution of the dial is a reminiscence of the billions of years that have elapsed.

Eternity on the Wrist

Born from a dying star 10 billion years ago,

Torn from an asteroid 4 billion years ago,

Falling to Earth 50,000 years ago,

It now measures the time of men.

It has drifted through space for longer than our planet has existed.

It has seen Earth take shape, watched the Moon scarred by impact, observed civilizations rise and fall.

For eons, it was a solitary traveler.

But today, it no longer floats in the cosmic void.
It no longer lies hidden beneath the sands of the desert.

It now protects a celestial movement, a timepiece where planets revolve around the Sun, an instrument that unites the time of stars with the time of humankind.

A fragment of a star, now the guardian of time, beating to the rhythm of the planets.


CHRISTIAAN VAN DER KLA
METEORITE
JOURE
PLANETARIUM ECCENTRIC


VIRGO
LIBRA
OCTOBER
21/0
SCORPIO
NOVEMBER
24/0
SAGITTARIUS
27/0
DECEMBER
CHRISTIAAN VAN


JULY
LEO
JUNE
GEMINI
TAURUS
APRIL
ARIES
MARCH
PISCES
FEBRUARY
AQUARIUS
JANUARY
CAPRICORN
DER KLAAUW

Astronomical

Asteroid

An asteroid is a small celestial body composed of either rock or metal that orbits the Sun. Most asteroids exhibit irregular shapes and are predominantly found between the orbits of Mars and Jupiter, as well as in regions beyond Neptune. Their orbital trajectories display only minimal eccentricity, much like those of the planets.

Big Bang

The Big Bang is a cosmological theory that explains the origin and evolution of the Universe. It marks the moment when the Universe, initially condensed into an extremely dense and hot point, embarked on a rapid expansion that led to the formation of everything existing today: galaxies, stars, planets, and even space-time itself.

Cosmos

The entirety of the universe, considered in its order and harmony.

Differentiated asteroid

An asteroid that has undergone internal material separation based on density, forming a core, mantle, and crust.

Differenciation

The process by which a celestial body separates its constituent elements according to density due to internal heat.

Gravitational perturbation

The alteration of a celestial body's motion due to the gravitational influence of another body.

Interstellar

Situated or occurring between the stars within a galaxy.

Isotope

An atom of the same chemical element with a different number of neutrons, resulting in a distinct atomic mass.

Late Heavy Bombardment

A period of intense asteroid and comet impacts on the planets of the Solar System, occurring approximately 4 billion years ago.

Moon

A natural satellite of a planet, typically formed from the same protoplanetary disk or captured by the planet's gravity.

Nebula

A vast cloud of gas and dust in space, which may serve as a stellar nursery or a remnant of a supernova explosion.

Planet

A celestial body in orbit around a star, sufficiently massive to maintain a nearly spherical shape and to have cleared its orbital neighborhood.

Planetesimal

A small rocky or icy body that served as a precursor to planets within the protoplanetary disk.

Radioactivity

The spontaneous decay of unstable atomic nuclei, releasing particles or radiation.

Supernova

The cataclysmic explosion of a massive star at the end of its life cycle, releasing vast amounts of energy and matter.

Vortex

A swirling motion of gas or matter in space, commonly observed around black holes or in star-forming regions.

Widmanstätten

A distinctive crystalline structure found in iron meteorites, resulting from the slow cooling of iron and nickel; named after Alois von Widmanstätten, who described it in 1808.

Horological

Alloy

A metallic mixture composed of multiple elements, designed to enhance the mechanical properties of horological components.

CNC machine

A computer-controlled machine tool that enables the precise machining of horological parts.

Dial

The surface displaying the hours and minutes, often adorned with markers and numerals.

Tungsten carbide milling cutter

An extremely hard cutting tool used for high-precision machining of watch components.

Thanks

This book is the result of an extraordinary journey at the crossroads of astronomy, horology, and dreams. It could not have come to life without the passion, knowledge, and generosity of those who contributed, whether closely or from afar.

A heartfelt thank you to Niek de Kort, whose expertise and insight helped ground this story in scientific reality while preserving its poetic essence.

To Helen and André Kuipers, for their enlightened perspective on the infinite and their love of the stars.

To Adrie Warmenhoven from the Eise Eisinga Planetarium, for his unwavering support and dedication to sharing the beauty of the cosmos.

And to all those who, through their talent, passion, and dedication, played a role in bringing this watch and this book to life.

Finally, a grateful thought to the universe itself—the one that forges stars, shapes meteorites, and reminds us, through time and space, that we are merely witnesses to a journey far greater than ourselves.

Grateful to the universe…

Born in the heart of a vanished star
10 billion years ago, this meteorite
has traveled through space and time,
witnessing the birth of planets and the rise
of civilizations.

After 50,000 years beneath the desert
sands, it becomes a vessel of time,
protecting the Grand Planetarium
Eccentric, a watch where planets orbit the
Sun in real time.

This book tells the odyssey of a fragment
of the universe, from the depths of
interstellar space to your wrist, where
human time meets the rhythm of the stars.