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**C O S M O S**  
A S P A C E T I M E O D Y S S E Y

**Episode 1:  
“Standing Up in the Milky Way”**

Inspired by COSMOS: A PERSONAL VOYAGE  
Written by Carl Sagan and Ann Druyan & Steven Soter

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and  
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UNAPPROVED FINAL CUT

APRIL 21, 2014

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**COSMOS: A SPACETIME ODYSSEY**

Episode 1: "Standing Up in the Milky Way"

**ACT ONE**

1 OVER BLACK (STOCK) 1

CARL SAGAN (V.O.)  
*The cosmos is all that is, or ever  
was, or ever will be.*

Suddenly we are --

2 OMITTED 2

A3 CLOSE ON A DANDELION SEED (LIVE ACTION) A3

being raised into the breeze by a man's hand. REVEAL we are -  
-

3 EXT. MONTEREY CLIFFS - MAGIC HOUR (LIVE ACTION/VFX) 3

-- a perfect match to the opening moments of the original  
COSMOS.

CARL SAGAN (V.O.)  
*Come with me.*

-- the hand releases the dandelion into the air --

ANGLE - THE DANDELION (LIVE ACTION/VFX/RE-USE)

As it drifts toward the sky, we find a figure walking along  
the cliffs in the distance -- astrophysicist NEIL TYSON.

NEIL  
A generation ago, the astronomer  
Carl Sagan stood here and launched  
hundreds of millions of us on a  
great adventure -- the exploration  
of the universe revealed by  
science.

Neil walks along the cliffs to a rocky outcropping.

NEIL  
*It's time to get going again.*  
We're about to begin a journey that  
will take us from the infinitesimal  
to the infinite. From the dawn of  
time to the distant future.

FLASH CUT: The series' greatest galaxies, suns and worlds  
(RE-USE).

NEIL (V.O.)  
We'll explore galaxies and suns and  
worlds.

FLASH CUT: EVENT HORIZON - BINARY STAR SYSTEM (EP. 5 RE-  
USE).

NEIL (V.O.)  
Surf the gravity waves of space-  
time.

FLASH CUT: TARDIGRADES (RE-USE)

NEIL (V.O.)  
Encounter beings that live in fire  
and ice...

FLASH CUT: OUTERMOST PLANET of the IMMORTALS' SOLAR SYSTEM  
(EP. 11 RE-USE).

NEIL (V.O.)  
Explore the worlds of stars that  
never die...

FLASH CUT: PULSAR (EP. 8 RE-USE)

NEIL (V.O.)  
Discover atoms as massive as  
suns...

FLASH CUT: IRON ATOM (EP. 4 RE-USE), KINESIN STRUTTING  
ACROSS A MICROTUBULE GIRDER.

NEIL (V.O.)  
...and universes smaller than  
atoms.

FLASH CUT: EARLY HUMAN FAMILY IN A CAVE (EP. 4 RE-USE).

NEIL (V.O.)  
COSMOS is also a story about us.  
It's the saga of how wandering  
bands of hunters and gatherers --

FLASH CUT: A BABY LOOKS UP TO THE COSMOS, THE STARS MOVE  
ACROSS HIS EYES (EP. 3 RE-USE).

NEIL (V.O.)  
-- found their way to the stars.  
One adventure --

MONTAGE (RE-USE): AL-HAZEN, HALLEY, NEWTON, PAYNE,  
PATTERSON, FARADAY -- a smattering of our series' heroes in  
their most impactful moments.

NEIL (V.O.)  
-- with many heroes.

BACK ON NEIL, who walks as the sun sets, and we see the Milky  
Way arcing over the Pacific Ocean.

NEIL  
To make this journey, we will need  
imagination, but imagination alone  
is not enough, because the reality  
of nature is far more wondrous than  
anything we can imagine.

(MORE)

NEIL (CONT'D)

This adventure was made possible by generations of searchers strictly adhering to a simple set of rules -- test ideas by experiment and observation, build on those ideas that pass the test, reject the ones that fail. Follow the evidence wherever it leads. And question everything.

(MORE)

NEIL (CONT'D)  
Accept these terms, and the Cosmos  
is yours.

The original COSMOS theme music gives way to the new COSMOS theme.

NEIL (V.O.)  
Come with me...

REVEAL Neil is inside THE SHIP OF THE IMAGINATION, which hurtles up into the night sky, and we --

CUT TO:

**MAIN TITLE SEQUENCE**

OPEN ON:

4 A SLEEK, METALLIC SPACE SHIP (VFX) 4  
in Earth's orbit. Seed-shaped, impossibly futuristic, its polished surface reflecting stars.

NEIL (V.O.)  
In this Ship of the Imagination,  
free from the shackles of space and  
time, we can go anywhere.

5 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) 5  
The huge interior of this vessel is sleek and minimalist, part spacecraft, part temple -- both ancient and modern, like the Pyramids. As we'll see, it does some very cool stuff. At this point, we notice Earth through a panoramic FORWARD WINDOW.

Neil turns to the Forward Window, takes in the vision of the of Earth, ablaze with the lights of cities and the shimmering green aurora.

NEIL

If you want to see where we are in  
space, just look out the front  
window...

Neil looks downward toward the gleaming floor of the Ship. An EFFECT transforms the FLOOR into the WINDOW ON THE PAST.

NEIL

In the dimension of *time*, the past  
lies beneath us. Here's what Earth  
looked like 250 million years ago.

Through the glass-bottom boat view of the Earth's surface, the continents appear as they did 250 million years ago. The vanished supercontinent of PANGAEA.

NEIL

If you want to see the future...  
(looks to the ceiling)  
Look up. And this is how it could  
appear 250 million years from now.

The ceiling activates -- this is THE WINDOW ON THE FUTURE -- to show the Earth surface changing as it might appear in the next 250 million years. The Atlantic Ocean has widened, the Pacific contracted, and the continents have reunited.

NEIL

If we're going to be venturing out  
into the farthest reaches of the  
cosmos --

Now we're looking at today's Earth in the Forward Window again.

NEIL

-- we need to know our *cosmic*  
*address*. This is the first line of  
that address.

Our Cosmic Address briefly GHOSTS onto the screen:

***Earth***

A6 EXT. IMAGES OF EARTH (STOCK/VFX) A6

Unique, sub-orbital views of our beautiful planet: Oceans, mountain ranges, canopies of green, city lights on the nightside, the aurora borealis. Music swells to evoke feelings of home.

6 EXT. SHIP OF THE IMAGINATION (VFX) 6

It pulls away from Earth, dodging a SWARM of ten thousand artificial objects in orbit. All sorts of satellites whiz past.

NEIL (V.O.)  
*We're leaving the Earth, the only  
home we've ever known, for the  
farthest reaches of the cosmos.*

A7 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) A7

Neil watching as the MOON fills the Forward Window.

CUT TO:

7 EXT. SOLAR SYSTEM / SHIP OF THE IMAGINATION (VFX) 7

We see the Ship as the MOON hugely enters the periphery of the frame so that we can resolve the details of its cratered surface.

NEIL (V.O.)  
*Our nearest neighbor, the Moon, has  
no sky, no ocean, no life -- just  
the scars of cosmic impacts.*

The Ship pulls away -- heading for the Sun.

8 OMITTED 8

9 EXT. SOLAR SYSTEM / SHIP OF THE IMAGINATION (VFX) 9

The skin of the Ship turns gold as the SUN looms into frame.

NEIL (V.O.)  
*Our star powers the wind and the  
waves and all the life on the  
surface of our world.*

10 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) 10

The Ship's interior floods with LIGHT, Neil squints to adjust to the brightness.



11 EXT. SUN'S ATMOSPHERE / SOLAR SYSTEM (VFX) 11

Roiling atmosphere and leaping solar prominences convey something of the Sun's power.

NEIL (V.O.)  
The Sun holds all the worlds of the solar system in its gravitational embrace. Starting with Mercury.

And now a tiny black circle moving across the Sun's surface. The planet MERCURY.

A12 EXT. SOLAR SYSTEM - VENUS (VFX) A12

comes into view. We sail through its smoggy atmosphere --

NEIL (V.O.)  
...to cloud-covered Venus, where a runaway greenhouse has turned it into a kind of hell...

and then we're flying over --

MARS

NEIL (V.O.)  
...Mars, a world with as much land as the Earth itself...

The Ship skims past several spacecraft from Earth, before rocketing off towards --

B12 OMITTED B12

12	OMITTED	12
13	OMITTED	13
14	OMITTED	14
15	EXT. SOLAR SYSTEM (VFX)	15

Our Ship now whizzes past a tumbling, lumpy-shaped object -- then another, and another. A belt of rocky asteroids circles the Sun between the orbits of Mars and Jupiter.

NEIL (V.O.)  
A belt of rocky asteroids circles  
the Sun between the orbits of Mars  
and Jupiter.

The planet JUPITER, accompanied by its FOUR GIANT MOONS,  
comes into view.

NEIL (V.O.)  
With its four giant moons and  
dozens of smaller ones, Jupiter is  
like its own little solar system.  
It has more mass than all the other  
planets combined. Jupiter's Great  
Red Spot -- a hurricane three times  
the size of our whole planet that's  
been raging for centuries.

16 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) 16

Neil looks out in wonder as the swirling GREAT RED SPOT on JUPITER nearly swallows us whole.

17 EXT. SURFACE OF JUPITER (VFX) 17

Our gleaming Ship is seen high above the vastness of the churning vortex.

CUT TO:

18 OMITTED 18

19 EXT. SATURN / SOLAR SYSTEM (VFX) 19

The jewel of our solar system. Our Ship comes in low over the ring plane and glides above hundreds of circular lanes. The Ship plunges through the ring plane, jostling the worldlets of ice that surround it.

NEIL (V.O.)

The crown jewel of our solar system  
-- Saturn, ringed by freeways of  
countless orbiting and slowly  
tumbling snowballs. Every  
snowball, a little moon.

20 OMITTED 20

21 EXT. SHIP OF THE IMAGINATION (VFX) 21

Our Ship banks away from Saturn and we see URANUS, followed by NEPTUNE.

NEIL (V.O.)

Uranus and Neptune -- the outermost  
planets, unknown to the ancients  
and only discovered after the  
invention of the telescope.

22 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) 22

Another larger belt of orbiting objects, this one made of COMET nuclei, begins to fly past the Forward Window. Music darkens, conveying a sense of newfound jeopardy. Reveal we're actually inside --

A23 EXT. SOLAR SYSTEM - KUIPER BELT (VFX) A23

A swarm of tens of thousands of frozen worlds, a vast disc of distant comet nuclei that make up the KUIPER BELT.

NEIL (V.O.)  
Beyond the outermost planet there's  
a swarm of tens of thousands of  
frozen worlds...

B23 CLOSER ANGLE (VFX) B23

As our Ship turns and banks and pivots, nearly avoiding the onslaught of asteroids.

CUT TO:

C23 EXT. SOLAR SYSTEM (VFX) C23

PLUTO comes into view, accompanied by its moons.

NEIL (V.O.)  
...And Pluto is one of them.

D23 INT./EXT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) D23

A distant object gets closer. Reveal its reflection on the Ship's skin --

IT'S THE SPACECRAFT VOYAGER!

Neil reacts as the spacecraft darts past the Forward Window.

E23 OMITTED E23

23 OMITTED 23

24 EXT. SOLAR SYSTEM (VFX)

24

We are tracking a fast-moving OBJECT -- NASA's VOYAGER 1.

NEIL (V.O.)

Of all of our spacecraft, this is  
the one that's traveled farthest  
from home -- *Voyager 1*.

Something glints off the side -- a golden disk engraved with  
mysterious HIEROGLYPHICS.

NEIL (V.O.)

She bears a message to a billion  
years from now -- something of who  
we were -- how we felt -- and the  
music we made...

We hear a foretaste of Voyager's record content: Blind Willie  
Johnson's "Dark Was the Night" reverberates with longing  
among the stars.

25 OMITTED

25

26 OMITTED

26

A27 EXT. EDGE OF THE SOLAR SYSTEM (VFX)

A27

As our Ship flies past Voyager -- into the darkness.

NEIL (V.O.)

*The deeper waters of the vast  
cosmic ocean and their numberless  
worlds lie ahead...*

CUT TO BLACK.

**END OF ACT ONE**

ACT TWO

FADE IN:

AB27 EXT. SHIP OF THE IMAGINATION (VFX) AB27

As we float among the stars.

NEIL (V.O.)  
From out here the Sun may look like  
just another star...

B27 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) B27

Neil at the Forward Window.

NEIL  
...but it still exerts its  
gravitational hold on a *trillion*  
frozen comets...

C27 EXT. SPACE - OORT CLOUD (VFX/LIVE ACTION) C27

A vast and diffuse sphere, resembling a dandelion puffball  
centered on the dim and distant Sun.

NEIL (V.O.)  
...leftovers from the formation of  
the solar system, nearly five  
billion years ago. It's called the  
*Oort Cloud*. No one has ever seen  
it before, nor could they, because  
each one of these little worlds is  
as far from its nearest neighbor as  
Earth is from Saturn.

FLASH CUT: NEIL INSIDE THE SHIP.

NEIL  
This enormous cloud of comets  
encloses the solar system, which is  
the second line of our cosmic  
address.

Our address GHOSTS into view:

*Earth*  
**Solar System**

CUT TO:

27 EXT. SHIP OF THE IMAGINATION (VFX) 27

Our Ship approaching a star-choked field in Sagittarius.



NEIL (V.O.)

We've only been able to detect the planets of *other* stars for a few decades, but we already know that planets are plentiful -- they outnumber the stars.

NEIL (V.O.)

Almost all of them will be very different from Earth, and hostile to life as we know it. But what do we know about life? We've met only one kind so far -- *Earthlife*.

A28 EXT. ANOTHER PART OF SPACE (VFX) A28

It's pitch black.

28 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) 28

Through the window there's nothing but the empty void of darkness -- pitch black.

NEIL

See anything? Just empty space, right? Human eyes see only a sliver of the light that shines in the cosmos. But science gives us the power to see what our senses cannot. *Infrared* is the kind of light made visible by "night vision" goggles. Throw an infrared sensor across the darkness...

An INFRARED SENSOR reveals a DIMLY GLOWING WORLD looming large in the Forward Window.

NEIL

Rogue planet! A world without a sun! Our Galaxy has billions of them, adrift in perpetual night. They are orphans, cast away from their mother stars during the chaotic birth of their native star systems.

A29 EXT. SHIP OF THE IMAGINATION (VFX) A29

As it moves closer to the ROGUE PLANET, spotlights sweeping the dark surface.

NEIL (V.O.)

Rogue planets may be molten at the core but frozen at the surface. There may be oceans of liquid water in the zone between those extremes.

(MORE)

NEIL (V.O.) (CONT'D)  
Who knows what might be swimming  
there...

CUT TO:

29 INT./EXT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX) 29

Through the Forward Window -- the Milky Way as we first glimpsed it on Earth, but now in near infrared light.

NEIL  
This is what the Milky Way looks  
like in the infrared. Every single  
dot -- not just bright ones -- is a  
star. How many stars? How many  
worlds? How many ways of being  
alive?

Big musical moment as we CUT OUTSIDE to the Galaxy in SPARKLING visible light. Now we pull out farther still to see the entire Milky Way from above as a great pinwheel of stars.

NEIL  
Where are we in this picture? See  
that trailing outer arm?

We PUSH IN on Earth's location.

NEIL  
That's where we live, about thirty  
thousand light years from the  
center. The Milky Way galaxy is  
the next line of our cosmic  
address.

*Earth*  
*Solar System*  
***Milky Way Galaxy***

30 OMITTED 30

31 EXT. SPACE (VFX) 31

Pull out from the MILKY WAY to see it near its neighbor galaxy -- ANDROMEDA.

NEIL (V.O.)

We are now a hundred thousand light years from home. It would take light, the fastest thing there is, a hundred thousand years to reach us from Earth.

A32 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX)

A32

Out the Forward Window, the Milky Way is joined by its sister galaxy, the GREAT SPIRAL in ANDROMEDA and a few dozen smaller galaxies.

NEIL

This is the Great Spiral in Andromeda, the galaxy next door. We call our two giant galaxies and a smattering of smaller ones the "local group".

A graphic appears on the window as we move closer...

*Earth*  
*Solar System*  
*Milky Way Galaxy*  
***Local Group***

...and now we've now been swallowed whole by the window. The local galaxies recede and are joined by THOUSANDS of others.

NEIL (V.O.)

Can't even find our home Galaxy from out here. It's just one of thousands in the Virgo Supercluster.

*Earth*  
*Solar System*  
*Milky Way Galaxy*  
*Local Group*  
***Virgo Supercluster***

We see an image modelled on the HUBBLE ULTRA DEEP FIELD.

NEIL (V.O.)

On this scale, all the objects we see, including the tiniest dots, are galaxies. Each galaxy contains billions of suns -- and countless worlds. Yet, the entire Virgo Supercluster itself forms but a tiny part of our universe.

Countless GALAXIES converge to dwarf the Virgo Supercluster until we see it as a mere filament in the large-scale structure of the ENTIRE UNIVERSE. It is a structure unlike any we have seen before -- a network of vibrant purple super-highways. We fly through it.

NEIL (V.O.)

This is the cosmos on the grandest scale we know -- a network of a hundred billion galaxies. It's the last line of our cosmic address. For now.

*Earth*  
*Solar System*  
*Milky Way Galaxy*  
*Local Group*  
*Virgo Supercluster*  
***Observable Universe***

Cosmic address fades out. We GO WIDE again to see Neil on the Ship.

NEIL

*Observable universe?! What does that mean? Even for us, in our Ship of the Imagination, there's a limit to how far we can see in spacetime. It's called our cosmic horizon. Beyond that horizon lie the parts of the universe that are too far away -- there hasn't been enough time in the 13.8 billion year history of the universe for their light to have reached us.*

B32 EXT. SPACE (VFX/STOCK)

B32

In all its vastness.

NEIL (V.O.)

Many of us suspect that all of this -- all the worlds, stars, galaxies, and clusters in our observable universe --

The OCEAN OF SPACE COLLAPSES into a single BUBBLE...

NEIL (V.O.)  
-- is but one tiny bubble in an  
infinite ocean of other universes:  
a *multiverse*.

We PULL BACK to see that our tiny "bubble" is one of millions of pearl-like bubbles --

NEIL (V.O.)  
Universe upon universe... Worlds  
without end...

-- on the froth of a thunderous WATERFALL.

32 INT. SHIP OF THE IMAGINATION (LIVE ACTION/VFX/STOCK)

32

NEIL  
Feeling a little small? In the  
context of the cosmos, we are  
small.

We find Earth in space, the Pale Blue Dot, suspended in a beam of light. Neil is small, also, against the Forward Window.

NEIL (V.O.)  
We may just be little guys, living  
on a speck of dust afloat in a  
staggering immensity, but we don't  
*think* small. This cosmic  
perspective is relatively new. A  
mere four centuries ago our tiny  
world was oblivious to the rest of  
the cosmos. There were no  
telescopes. The universe was only  
what you could see with the naked  
eye.

Neil turns to the Window on the Past to look at the Earth. There are no lights on the night side, it's illuminated only by moonlight.

NEIL  
Back in 1599, *everyone knew* that  
the Sun, planets, and stars were  
just lights in the sky that  
revolved around the Earth -- that  
we were the center of a little  
universe, a universe made for us.

We PUSH IN on the dark side of Earth...

NEIL (V.O.)

There was only one man on the whole planet who envisioned an infinitely grander cosmos. And how was he spending New Year's Eve of the year 1600?

BLACKNESS swallows the frame and we come out of it to find...

33 OMITTED 33

34 INT. BRUNO'S PRISON CELL - NIGHT (ANIMATION) 34

GIORDANO BRUNO, 52, gaunt and haggard, with graying black hair, trembling on a makeshift bed of straw.

NEIL (V.O.)

Why, in prison, of course.

Off the mystery...

CUT TO BLACK.

**END OF ACT TWO**



**ACT THREE**

FADE IN:

35 EXT. ROME - CITY STREET - NIGHT (LIVE ACTION/GRAPHICS) 35

Neil is alone, walking along the timeless, winding cobblestones.

NEIL

There comes a time in our lives when we first realize that we're not the center of the universe -- that we belong to something much greater than ourselves. It's part of growing up. As it happens to each of us, so it began to happen to our civilization in the 16th century.

FLASH CUT: A graphic of the GEOCENTRIC UNIVERSE spins before us.

NEIL (V.O.)

Imagine a world before telescopes, when the universe was only what you could see with the naked eye. It was obvious that Earth was motionless and that everything in the heavens -- the Sun, Moon, the stars, the planets -- revolved around us. And, then, a Polish astronomer and priest named Copernicus made a radical proposal: the Earth was *not* the center... It was just one of the planets and, like them, it revolved around the Sun. Many, like the Protestant reformer Martin Luther, took this idea as a scandalous affront to scripture.

NEIL (V.O.)  
They were horrified. But for one  
man, Copernicus didn't go far  
enough.

CUT TO:

36 INT. SAN DOMENICO MAGGIORE MONASTERY - NIGHT (ANIMATION) 36

A slender, dark-haired GIORDANO BRUNO, 28 years old and wearing the garb of a Dominican monk, moves cautiously down a hallway and enters a room. The year is 1576.

NEIL (V.O.)

His name was Giordano Bruno and he was a natural born rebel. He longed to bust out of that cramped little universe.

37 INT. BRUNO'S ROOM - NIGHT (ANIMATION) 37

He walks cautiously across the room, and --

NEIL (V.O.)

Even as a young Dominican monk in Naples, he was a misfit.

carefully removes a floorboard, trying his best not to make a sound. He pulls a book from beneath and opens it.

The text on the book's vellum spine glows with the title *T. Lucreti Cari - De rerum natura* -- and when it does, it morphs into the English: *Lucretius - On the Nature of Things*.

NEIL (V.O.)

This was a time when there was no freedom of speech in Italy. But Bruno hungered to know everything about God's creation. He dared to read the books banned by the Catholic Church. And that was his undoing.

Bruno opens the book to the title page. As he reads...

NEIL (V.O.)

In one of those forbidden books, an ancient Roman, a man dead more than fifteen hundred years, whispered to him of a universe far greater. One as boundless as his idea of God.

38 CLOSE ON THE BOOK (ANIMATION) 38

One of the CUPIDS depicted in the margin comes to life. He pulls an arrow from his quiver and ventures to the edge of the page.

NEIL (V.O.)

Lucretius asked the reader to imagine standing at the edge of the universe and shooting an arrow outward.

The cupid draws back his bowstring and lets an arrow fly into the void. We track the arrow as it passes a stylized background of CLOUDS and STARS, until it flies entirely out of frame.

NEIL (V.O.)

If the arrow keeps going, then clearly, the universe extends beyond what you thought was the edge.

The cupid shoots another arrow. We track this arrow farther until it strikes an IVY-COVERED WALL and lodges in it.

The cupid flies out to the wall, finds the arrow, and returns it to his quiver.

NEIL (V.O.)

But if the arrow doesn't keep going -- say it hits a wall -- then that wall must lie beyond what you thought was the edge of the universe.

The cupid climbs atop the wall and shoots the arrow outward for a third time.

NEIL (V.O.)

Now if you stand on *that* wall and shoot another arrow, there are only the same two possible outcomes: It either flies forever out into space. Or it hits some boundary, where you can stand and shoot yet another arrow. Either way, the universe is unbounded. The cosmos must be infinite.

The cupid scratches his curly head and, puzzled, flies back to his place in the marginalia of the book.

39 BACK ON BRUNO (ANIMATION)

39

his awe-struck expression at the thought of infinity gradually becomes a smile.

NEIL (V.O.)

This made perfect sense to Bruno. The God he worshipped was infinite. So how, he reasoned, could Creation be anything less?

Bruno looks up in shock to see the disapproving ABBOT and OTHER MONKS gathered at the open doorway to his room.

40 EXT. SAN DOMENICO MAGGIORE - THE NEXT MORNING (ANIMATION) 40

Bruno in plain shabby clothes stumbles out of the doorway. A bundle is tossed onto the pavement behind him and the great doors slam shut. Bruno dusts himself off, picks up the bundle, and takes to the open road.

NEIL (V.O.)

It was the last steady job he ever had.

41 EXT. FOREST - NIGHT (ANIMATION) 41

Northern Italy. Two years later. Bruno, blue with cold, tries to warm himself by a small campfire. Shivering, he wraps himself as best he can in his cloak and lies down by the fire. He closes his eyes.

NEIL (V.O.)

And then, when he was thirty, he had the vision that sealed his fate.

CUT TO:

42 A HAND-COLORED WOODCUT (ANIMATION) 42

The Sun, Moon, and stars are arrayed on a dome over an idyllic Tuscan landscape in spring. We move CLOSER to the woodcut to see BRUNO is part of the scene, sleeping peacefully under the lone tree. MOVE IN on the WOODCUT, which COMES ALIVE as ANIMATION.

43 CLOSER ON BRUNO (ANIMATION) 43

who opens his eyes, rises and looks up to the dome of the sky, which depicts an Earth-centered universe.

NEIL (V.O.)

In this dream, he awakened to a world enclosed inside a confining bowl of stars. This was the cosmos of Bruno's time.

As if in a trance, Bruno walks over to the place where the sky dome meets the horizon. He gets down on his knees.

He hesitates for a moment before poking the dome of stars with his finger. To his astonishment it's not rigid. It WAVERS like a curtain.

NEIL (V.O.)

He experienced a sickening moment  
of fear, as if the bottom of  
everything was falling away beneath  
his feet. But he summoned up his  
courage.

Bruno lifts up the curtain of the sky and crawls out to the  
other side of it. The MUSIC conveys ascending grandeur as  
Bruno looks --

44

SKYWARD (ANIMATION)

44

The universe on the other side of the curtain is also  
rendered in Renaissance style, but it is BOUNDLESS, full of  
diverse SUNS and WORLDS extending into the distance in all  
directions. Bruno smiles and spreads his arms as if they  
were wings and FLIES up and through the now infinite star  
field. Motion parallax conveys the three dimensionality of  
space.

And we hear Bruno speak for the first time:

BRUNO (V.O.)

I spread confident wings to space  
and soared toward the infinite,  
leaving far behind me what others  
strained to see from a distance.

Bruno SOARING among the suns and worlds and nebulas of our  
infinite universe.

BRUNO (V.O.)

Here, there was no up. No down.  
No edge. No center. I saw that  
the Sun was just another star. And  
the stars were other Suns, each  
escorted by other Earths like our  
own.

Bruno approaches an Earth-like WORLD.

BRUNO (V.O.)

The revelation of this immensity  
was *like falling in love*.

The reverie ends abruptly, and we find a bearded Bruno making  
his way along a path in the forest.

NEIL (V.O.)

Bruno became an evangelist,  
spreading the gospel of infinity  
throughout Europe.

(MORE)

NEIL (V.O.) (CONT'D)  
 He assumed that other lovers of God  
 would naturally embrace this  
 grander and more glorious view of  
 Creation.

BRUNO (V.O.)  
*What a fool I was.*

45 EXT./INT. CARDINAL'S OFFICE - THE VATICAN - DAY (ANIMATION) 45

Establishing. Inside we find --

A Latin document sits on a desk with the name *Giordano Bruno*  
 and the word *excommunicationis* standing out.

NEIL (V.O.)  
 He was excommunicated by the Roman  
 Catholic Church in his homeland...

A BEJEWELED HAND pours hot RED SEALING WAX on the official  
 document, picks up a heavy bronze seal and brings it down on  
 the wax with a BANG.

CUT TO:

46 ANOTHER OFFICIAL RELIGIOUS DOCUMENT (ANIMATION) 46

this one in French, but, again, with Bruno's name and the  
 words *damnatio memoriae* standing out. An arm clothed in a  
 plain brown woolen sleeve reaches into frame. The unadorned  
 hand brings another seal down -- BANG.

NEIL (V.O.)  
 ...expelled by the Calvinists in  
 Switzerland...

CUT TO:

47 YET ANOTHER OFFICIAL RELIGIOUS DOCUMENT (ANIMATION) 47

this one in German, also with Bruno's name and the word  
*damnatio memoriae* standing out. An arm in a black sleeve  
 reaches out and grabs a seal.

The seal slams down with a BANG.

NEIL (V.O.)  
 And by the Lutherans in Germany.

FLASH CUT: A ship sailing across the English Channel at  
 night.

NEIL (V.O.)  
 Having worn out his welcome on the  
 continent, Bruno jumped at an  
 invitation to lecture at Oxford in  
 England.

48 EXT. OXFORD UNIVERSITY - DAY (ANIMATION)

48

Bruno, dressed in an academic gown that is a bit too large for him, walks across the snow-covered square to one of the medieval buildings.



NEIL (V.O.)

At last, he thought, a chance to  
share his vision with an audience  
of his peers!

49 INT. LECTURE ROOM - OXFORD - DAY (ANIMATION)

49

An audience of SCHOLARS, wearing the distinctive garb and  
headgear of their profession, sit expectantly.

Bruno strides up to the podium, which is too high for his  
small stature. He rolls up his overlong sleeves like a  
circus juggler and stands on tiptoes to be seen.

The SCHOLARS titter audibly at the sight of him.

BRUNO

I have come to present a new vision  
of the cosmos. Copernicus was  
right to argue that our world is  
not the center of the universe.  
The Earth goes around the Sun.  
It's a planet like the others. But  
Copernicus was only the dawn. I  
bring you the sunrise.

More audible snickers. Some of the scholars shake their  
heads. But Bruno is undeterred.

BRUNO

The stars are other fiery suns,  
made of the same substance as the  
Earth. And they have their own  
watery earths... with plants and  
animals no less noble than our own.

Catcalls. ANGRY SCHOLAR #1 rises to his feet.

ANGRY SCHOLAR #1

Are you mad or merely ignorant?  
Everyone knows there is only one  
world.

BRUNO

What everyone knows is wrong. Our  
infinite God has created a  
boundless universe with an infinite  
number of worlds...

ANGRY SCHOLAR #2 jumps to his feet and sneers.

ANGRY SCHOLAR #2

Do they not read Aristotle where  
you come from? *Or even the Bible?*

Scornful laughter spreads through the audience. Only a few scholars appear thoughtful.

BRUNO  
I beg you, reject antiquity,  
tradition, faith, and authority.

A scholar lobbs an APPLE at Bruno's head -- it barely misses.

BRUNO  
Let us begin anew, by doubting  
everything we assume has been  
proven!

Now things turn ugly. A near riot ensues.

VARIOUS  
Heretic! Infidel!

BRUNO  
Your God is too small!

CUT TO:

50 EXT. OXFORD UNIVERSITY (ANIMATION)

50

Bruno, his academic robes in tatters, barely escapes the pursuing mob as he stumbles across the snow-covered square.

NEIL (V.O.)  
A wiser man would have learned his  
lesson.

BACK TO:

51 EXT. ROME - CITY STREET - DAY (LIVE ACTION)

51

Neil walking. The mood is darker now, more ominous.

NEIL  
But Bruno was not such a man. He  
couldn't keep his soaring vision of  
the cosmos to himself... Despite  
the fact that the penalty for doing  
so in his world was the most  
vicious form of cruel and unusual  
punishment.

Off the dangers to come...

**END OF ACT THREE**

**ACT FOUR**

FADE IN:

52 EXT. ROME - CITY STREET - DAY (LIVE ACTION)

52

As before.

NEIL

Giordano Bruno lived at a time when there was no such thing as the separation of church and state, or the notion that freedom of speech was a sacred right of every individual. Expressing an idea that didn't conform to traditional belief could land you in deep trouble. Recklessly, Bruno returned to Italy. Maybe he was homesick. Still, he must have known that his homeland was one of the most dangerous places in Europe he could possibly go. The Roman Catholic Church maintained a system of courts known as the Inquisition. Its sole purpose was to investigate and torment anyone who dared voice views that differed from theirs.

Neil notices a low window, goes to look inside.

NEIL

It wasn't long before Bruno fell into the clutches of the thought police...

PUSH INTO the window to find --

53 OMITTED

53

54 A PRISON CELL (ANIMATION/STOCK)

54

Where Bruno sits. OVER SEVERAL TIME CUTS, we find him again and again, more aged and frail as the years pass.

NEIL (V.O.)

This wanderer, who worshipped an infinite universe, languished in confinement for eight years.

(MORE)

NEIL (V.O.) (CONT'D)  
Through relentless interrogations  
he stubbornly refused to renounce  
his views.

FLASH TO: PERIOD INSTRUMENTS OF TORTURE (STOCK)

NEIL (V.O.)  
Why was the Church willing to go to  
such lengths to torment Bruno?  
What were they afraid of? If Bruno  
was right, then the sacred books --  
and the authority of the Church --  
would be open to question.

55 EXT. PALACE OF CARDINAL MADRUZZI - ROME - DAY (ANIMATION) 55

NEIL (V.O.)  
Finally, the cardinals of the  
Inquisition rendered their verdict.

56 INT. TRIBUNAL OF THE INQUISITION - SAME (ANIMATION) 56

TEN CARDINALS, in full regalia, look on dispassionately as  
the indictment is read. The Jesuit Cardinal, ROBERT  
BELLARMINE, bearded and long-faced, dominates the  
proceedings.

Bruno, haggard and in tatters, does his best to stand with  
dignity before his judges.

BELLARMINE  
You are found guilty of  
questioning the Holy Trinity and  
the divinity of Jesus Christ. Of  
believing that God's wrath is not  
eternal and that everyone will be  
saved. Of asserting the existence  
of other worlds...

Bellarmino gestures to GUARDS, who force Bruno to his knees.  
Bellarmino begins to read from the document before him.

BELLARMINE  
All of the books you have written  
will be gathered up and burned in  
St. Peter's Square.

BRUNO  
Reverend Father, these eight years  
of confinement have given me much  
time to reflect...

BELLARMINE  
So you will recant?

BRUNO

My love and reverence for the  
Creator inspires in me the vision  
of an infinite creation.

Bellarmino's eyes narrow.

BELLARMINE

You shall be turned over to the  
Governor of Rome to administer the  
appropriate punishment for those  
who will not repent.

Bruno now understands he is doomed, and looks the cardinal  
straight in the eye:

BRUNO

*It may be that you are more afraid  
to deliver this judgment than I am  
to hear it.*

57 INT. BRUNO'S CELL - EVE OF EXECUTION (ANIMATION)

57

Bruno shivers on a dirty straw palette.

With some difficulty he slowly rises and walks over to the  
high narrow mullion. He stands on tiptoes, straining for one  
last look at the stars. Try as he might, he can't see them --  
his view is obstructed.

He steps back and imagines the night sky. In his mind's eye  
he is thirty once again.

His CELL WALLS magically begin to FALL AWAY. Bruno RISES  
with arms outstretched into the "woodcut" heavens of the  
earlier sequence. CLOSE ON BRUNO AS HE SOARS through the  
infinite field...

HIS EYES SHUT TIGHT -- When he opens them, we see that Bruno  
is NOT soaring in space at all. He is actually astride a  
MULE. *His momentary freedom was only in his mind's eye.*  
REVEAL we're:

58 EXT. CAMPO DI FIORE - MORNING (ANIMATION)

58

The MOB is abuzz with excitement. The crowd makes way for a  
procession of OFFICIALS in their finery, PRIESTS, bearing  
crosses, banners, and censors, and SOLDIERS with pikes and  
halberds.

Bruno is dressed in a white robe decorated with DEMONS and  
HELLFIRE and a tall white conical hat. He is manacled and  
gagged with a wooden vise. As the crowd roars, the Soldiers  
lead him to the stake at the center -- and begin to PILE  
KINDLING at his feet.

Bruno's eyes blaze with anger.

A TORCH lights the pyre. Glowing EMBERS rise to the heavens --

59 TO BECOME THE STARS (VFX) 59

Hold on the STAR FIELD for a somber moment, then:

60 INT. SHIP OF THE IMAGINATION (LIVE ACTION/ VFX) 60

We are with Neil.

NEIL

Giordano Bruno had planted the seed. Ten years after Bruno's martyrdom, *Galileo* first looked through a telescope, realizing that Bruno had been right all along -- the Milky Way was made of countless stars invisible to the naked eye, and some of those lights in the sky were actually other worlds. Bruno was no scientist. His vision of the cosmos was a lucky guess, because he had no evidence to support it. Like most guesses, it could well have turned out wrong. But once the idea was in the air, it gave others a target to aim at -- if only to disprove it.

FLASH CUT: Our Ship floating among the stars.

NEIL (V.O.)

Bruno glimpsed the vastness of space... But he had no inkling of the staggering immensity of *time*.

Stars through the Forward Window as we begin to PULL BACK --

NEIL

How can we humans who rarely live more than a century hope to grasp the vast expanse of time that is the history of the cosmos? The universe is 13.8 thousand million years old. In order to imagine all of cosmic time let's compress it into a single calendar year.

-- PULL WAY BACK to reveal Neil is standing on a sprawling HOLOGRAPHIC CALENDAR.

Off the promise of what's next...

60A OMITTED 60A

60B OMITTED 60B

**END OF ACT FOUR**

**ACT FIVE**

FADE IN:

61 OMITTED 61

62 THE COSMIC CALENDAR (LIVE ACTION/VFX) 62

Showing the giant scale of the COSMIC CALENDAR.

NEIL

The Cosmic Calendar begins on January 1st with the birth of our universe. It contains everything that's happened since then, up to now, which on this calendar is midnight, December 31st.

We find Neil on the far corner of the calendar -- on December 31st.

NEIL

On this scale, every month represents about a billion years. Every day represents nearly forty million years. Let's go back as far as we can, to the very first moment of the universe.

Neil begins to walk back across the calendar. As he reaches January --

63 A POINT OF VIOLET LIGHT (LIVE ACTION/VFX) 63

in the upper left hand corner of the calendar EXPLODES into a white-hot SPHERE OF EXPANDING ENERGY.

NEIL

January first -- the Big Bang.

Our new MUSIC underscores the moment in all its bad-ass glory.

NEIL

It's as far back as we can see in time. For now.

The heat and energy fill the frame with WHITE.



BACK ON NEIL.

NEIL

Our entire universe emerged from a point smaller than a single atom. Space itself exploded in cosmic fire, launching the expansion of the universe and giving birth to all the energy and matter that we know today. I know that sounds crazy, but there's strong observational evidence to support the Big Bang theory. It includes the amount of helium in the cosmos, and the glow of radio waves left over from the explosion.

As the sphere of energy continues to balloon, it becomes dimmer, turning yellow, then a dull red, finally dissipating into an eerie, dark fog.

NEIL

As it expanded, the universe cooled, and there was darkness for about two hundred million years.

Begin to FADE TO BLACK. The darkness around Neil is punctuated by SEVERAL POINTS OF LIGHT.

NEIL

Gravity was pulling together clumps of gas and heating them until the first stars burst into light, on January 10th.

FLASH CUT: Face-on view of the Calendar, highlighting January 10th.

NEIL

On January 13th, these stars coalesced into the first small galaxies.

The stars around Neil spin into GALAXIES. Smaller galaxies join to become the spiral MILKY WAY.

NEIL

These galaxies merged to form still larger ones, including our own Milky Way, which formed about eleven billion years ago, on March 15th of the cosmic year.

FLASH CUT: Face-on, highlighting March 15th.

NEIL

Hundreds of billions of suns.  
Which one is ours? It's not yet  
born.

We MOVE INTO the --

64 MILKY WAY GALAXY (VFX/LIVE ACTION)

64

Where SUPERNOVAS FLASH...

NEIL (V.O.)

It will rise from the ashes of other stars... See those lights flashing like paparazzi? Each one is a supernova, the blazing death of a giant star. Stars die...

We are afloat in a luminous sanctum of interstellar clouds and jewel-like stars. Among them are nebulous "TEARDROPS" with their tails pointing away from the brightest nearby stars.

NEIL (V.O.)

...and are born in places like this one -- a stellar nursery. Here, they condense like raindrops from giant clouds of gas and dust. They get so hot that the nuclei of the atoms fuse together deep within them to make the oxygen we breathe, the carbon in our muscles, the calcium in our bones, the iron in our blood -- all of it was cooked in the fiery hearts of long vanished stars.

Neil walks out from the interstellar nursery -- we're back on the calendar.

NEIL

You, me, everyone, we are *made of star stuff*.

We FLASH TO a giant RED STAR. It shudders and EXPLODES, spewing fiery debris in all directions.

NEIL (V.O.)

This star stuff is recycled and enriched again and again through succeeding generations of stars.

BACK ON NEIL.

NEIL

How much longer until the birth of our Sun? A long time -- it won't begin to shine for another six billion years.

FLASH CUT: Face on, highlighting August 31st.

65 INT. COSMIC CALENDAR - NEW ANGLE - AUGUST 31 (LIVE ACTION/  
VFX) 65

where a semi-translucent HOLO-IMAGE emerges from the floor of the Calender and hovers nearby. It's of another INTERSTELLAR NURSERY, embryonic stars swaddled in debris and illuminated by their older siblings.

NEIL

Our Sun's birthday is August 31st on the Cosmic Calendar. Four and a half billion years ago.

The holo-image shows proto-planetary disks flickering from within, and an INFANT SUN blazes into light.

NEIL

As with the other worlds of our solar system, the Earth was formed from a disk of gas and dust orbiting the newborn Sun. Repeated collisions produced a growing ball of debris.

Around it the disk of gas and dust is forming the planets through a series of collisions.

We focus on the asteroid belt between Mars and Jupiter. We zero in on one particular ASTEROID out of the multitude

NEIL

See that asteroid? No, not that one. The one over there. We exist because the gravity of that one next to it just nudged it an inch to the left -- What difference could an inch make on the scale of the solar system? Just wait -- you'll see.

A MOLTEN EARTH is bombarded by asteroids and comets.

NEIL

The Earth took one hell of a beating in its first billion years.

A large world careens into the Earth. BOOM!

When the dust settles a bit we see the still molten Earth but now with RING of ORBITING DEBRIS.

NEIL

Fragments of orbiting debris  
collided and coalesced until they  
snowballed to form our Moon.

CUT TO:

A66

EXT. PRIMORDIAL EARTH - TWILIGHT (LIVE ACTION/VFX)

A66

From this angle, we see a vast and rugged landscape. No signs of life. In the red sky we see the young Moon looming ten times larger and a hundred times brighter than today.

NEIL (V.O.)

The Moon is a souvenir of that violent epoch. If you stood on the surface of that long ago Earth, the Moon would have looked a hundred times brighter. It was ten times closer back then, locked in a much more intimate gravitational embrace.

FLASH CUT: THE MOON revolving close around the Earth. As it spins farther away into normal orbit, we PULL OUT to reveal we're back on the Calendar.

NEIL (V.O.)

As the Earth cooled, seas began to form. The tides were a thousand times higher then. Over the eons, tidal friction within the Earth pushed the Moon away.

The Earth looms large over the tiny figure of Neil.

BACK TO PRIMORDIAL EARTH.

Neil kneels by a rippling TIDAL POOL.

NEIL

Life began somewhere around here, September 21st, three and a half billion years ago on our little world. We still don't know how life got started. For all we know, it may have come from another part of the Milky Way. The origin of life is one of the greatest unsolved mysteries of science.

CLOSE ON NEIL'S HANDS (VFX)

As he thrusts his hands into the pool, we --

NEIL (V.O.)  
That's life cookin'...

CHANGE SCALE to see what's happening at the MOLECULAR level:

B66 OMITTED B66

C66 OMITTED C66

66 THE NANO-MACHINERY OF LIFE (VFX) 66

DNA replication, protein synthesis, anaerobic glycolysis.

NEIL (V.O.)  
...evolving all the biochemical  
recipes for its incredibly complex  
activities. By November 9th, life  
was breathing, moving, eating,  
responding to its environment...

MICROBES divide, collide, separate, envelope one another.

NEIL (V.O.)  
We owe a lot to those pioneering  
microbes. Oh yeah, and one other  
thing. They also invented sex.

Commingle of microbes takes on new significance, and we --

FLASH CUT: Face-on the Calendar, highlighting December 17th.

67 EXT. PRIMORDIAL EARTH - DAY (LIVE ACTION/VFX) 67

The tidal pool is now an OCEAN SHORELINE on an Earth still  
barren but with blue skies and a few algae-covered rocks.

NEIL  
December 17th was quite a day.  
Life in the sea really took off,  
exploding with a diversity of  
larger plants and animals.

He kneels by the shore as a CREATURE with rudimentary legs  
drags itself out of the water.

NEIL  
*Tiktaalik* was one of the first  
animals to venture out onto the  
land. It must have felt like  
visiting another planet.

He studies the amphibian for a moment, then stands and walks  
down the shore.

NEIL

Forests, dinosaurs, birds, insects,  
they all evolved in the final week  
of December. The first flower  
bloomed on December 28th.

CLOSE ON NEIL'S HAND

as he reaches down to touch a single, primitive FLOWER  
BLOOMING in a time-lapse effect.

FLASH CUT: Face-on the Calendar, highlighting December 28th.

A68

EXT. PRIMEVAL FOREST / COSMIC CALENDAR - DAY (LIVE ACTION/  
VFX)

A68

Neil walks through a lush forest.

NEIL

As these ancient forests grew and  
died and sunk below the surface,  
their remains were transformed into  
coal. Three hundred million years  
later, we humans are burning most  
of that coal to power -- and  
imperil -- our civilization.

An asteroid flies over the treetops.

NEIL

Remember that asteroid back in the  
formation of the solar system --  
the one that got nudged a little to  
the left? Well, here it comes.  
It's 6:24 AM on December 30th on  
the Cosmic Calendar.

In the far distance, an ASTEROID the size of a city SLAMS  
into the EARTH. A blinding FLASH followed by a deafening  
BOOM. The ground trembles from the impact.

FLASH CUT: Face-on the Calendar, highlighting December 30th.

NEIL

For more than a hundred million  
years the dinosaurs were lords of  
the Earth, while our ancestors,  
small mammals, scurried fearfully  
underfoot. The asteroid changed  
all that. Suppose it hadn't been  
nudged at all. It would have  
missed the Earth entirely. For all  
we know, the dinosaurs might still  
be here but we wouldn't. This is a  
good example of the extreme  
contingency, the chance nature, of  
existence.

Neil comes to the edge of the forest, where the dense trees thin out to reveal the COSMIC CALENDAR stretching all the way back to JANUARY.

NEIL

The universe is already more than thirteen billion and a half years old, and still no sign of us.

Neil comes upon the ashes of a CAMPFIRE and picks a STONE TOOL from out of the dirt.

NEIL

In the vast ocean of time that this calendar represents, we humans only evolved within the last hour of the last day of the cosmic year.

He looks beyond the campfire to see a tiny, glowing, GOLDEN SQUARE in the lower right-hand corner of DECEMBER 31st.

NEIL

11:59:46. All of recorded history occupies only the last 14 seconds. Every person you've ever heard of lived somewhere --

(re: the Golden Square)

-- in there. All those kings and battles, migrations and inventions, wars and loves, everything in the history books happened *here*, in the last seconds of the cosmic calendar. But if we want to explore such a brief moment of cosmic time, we'll have to change scale...

The COSMIC CALENDAR enlarges until we're on the last few hours of DECEMBER 31st.

The TINY SQUARE in the corner sparkles like a diamond.

CUT TO BLACK.

**END OF ACT FIVE**



**ACT SIX**

FADE IN:

B68 EXT. PRIMEVAL SAVANNAH - NIGHT (LIVE ACTION)

B68

Establishing -- wide on the Savannah.

We find Neil studying PROTO-HUMAN FOOTPRINTS on the forest floor.

NEIL

We are newcomers to the cosmos. Our own story only begins on the last night of the cosmic year. It's 9:45 on New Year's Eve. Three and a half million years ago, our ancestors -- yours and mine -- left these traces. We stood up, and parted ways from them. Once we were standing on two feet, our eyes were no longer fixated on the ground. Now we were free to look up in wonder.

We can barely make out the silhouettes of two PROTO-HUMANS -- a mother and child -- through the vegetation.

NEIL

For the longest part of human existence, say the last 40,000 generations, we were wanderers, living in small bands of hunters and gatherers, making tools, controlling fire, naming things -- all within the last hour of the Cosmic Calendar.

Neil walks past the savannah's edge and we --

FLASH CUT: Face-on the Calendar, highlighting December 31st.

68 THE COSMIC CALENDAR (LIVE ACTION/VFX)

68

Neil walks up to an even smaller illuminated patch in the corner. It's now the size of a filing card. Neil looks up.

NEIL

To find out what happens next we'll again change scale to see the last minute of the last night of the cosmic year.

ANOTHER CHANGE in floor SCALE shows us the last MINUTE of the Calendar.

The holo-image of a Paleolithic CAVE PAINTING appears.

NEIL (V.O.)

11:59. We're so very young on the time scale of the universe that we didn't start painting our first pictures until the last sixty seconds of the Cosmic Year, a mere thirty thousand years ago.

We MOVE INSIDE the cave painting as it COMES TO LIFE --

69

IN THE CAVE PAINTING (ANIMATION)

69

An impressionistic sequence done in elegant prehistoric style:

-- ANIMALS on the run, with early human HUNTERS in hot pursuit.

-- HUNTERS with the rest of their clan around a campfire. An elder points to the Pleiades and begins to tell a story.

NEIL (V.O.)

This is when we invented astronomy. In fact, we're all descended from astronomers. Our survival depended on knowing how to read the stars in order to predict the coming of winter and the migration of the wild herds. And then around ten thousand years ago there began a revolution in the way we lived.

A primitive VILLAGE comes to life, with WOMEN pounding grain and HUNTERS returning with small game, accompanied by barking dogs.

NEIL

Our ancestors learned how to shape their environment, taming wild plants and animals, cultivating land, and settling down. This changed *everything*.

70

AS HISTORY UNFOLDS - MONTAGE (ANIMATION)

70

The style of animation EVOLVES from primitive to MODERN. At every stage the depictions reflect the illustrative style of the culture and period.

Sheaves of grain are piling up.

NEIL

For the first time in our history,  
we had more... *stuff* than we could  
carry. We needed a way to keep  
track of it.

A Sumerian SCRIBE sits down by larger piles of grain, takes out a clay tablet and stylus, and begins to tally them. A ziggurat rises behind him.

NEIL (V.O.)

At 14 seconds to midnight, or about  
six thousand years ago, we invented  
writing. And it wasn't long before  
we started recording more than  
bushels of grain.

-- The scribe looks up from his tablet to see KING HAMMURABI on a throne. TWO GUARDS drag a PRISONER before the King. As Hammurabi speaks, the scribe records his words.

NEIL (V.O.)

Writing allowed us to save our  
thoughts and send them much further  
in space and time. Tiny markings  
on a clay tablet became a means for  
us to vanquish mortality. It shook  
the world.

-- A pair of stone tablets appears, etched with the *Ten Commandments* in Hebrew.

NEIL (V.O.)

Moses was born 7 seconds ago...

-- A BODHI TREE springs into fullness. A FIGURE, with his back to us, sits cross-legged in its shade.

NEIL (V.O.)

Buddha, 6 seconds ago ...

-- A comet graces the night sky above a NATIVITY SCENE.

NEIL (V.O.)

Jesus, 5 seconds ago...

-- A MINARET rises against the skyline of ancient Mecca.

NEIL (V.O.)

Mohammed, 3 seconds ago.

-- We move up to the crescent MOON hanging over the minaret.

-- And down again to find a CARAVEL bobbing on a moonlit sea with a PALM-LINED SHORE in the distance.

NEIL (V.O.)

It was not even 2 seconds ago that, for better or worse, the two halves of the Earth discovered each other.

-- BACK on the same crescent MOON.

And pull out to reveal that it is an image seen through the first telescope. GALILEO squints at the eyepiece. He pulls away and adds another detail to the drawing in his notebook. We push into his drawing to find --

NEIL (V.O.)

And it was only in the very last second of the Cosmic Calendar that we began to use science to reveal nature's secrets and her laws. The scientific method is so powerful that in a mere four centuries, it has taken us from Galileo's first look through a telescope at another world...

-- Apollo image of a human FOOTPRINT in the lunar dust. We rapidly PULL BACK from this image until the frame is filled with black, and then we --

NEIL (V.O.)

... to leaving our footprints on the moon. It allowed us to look out across space and time to discover *where* and *when* we are in the cosmos.

FADE IN:

71	OMITTED	71
72	EXT. MONTEREY CLIFFS - DAY (LIVE ACTION)	72

CARL SAGAN (V.O.)

(from 1980 COSMOS series)

*We are a way for the cosmos to know itself.*

Find Neil.

NEIL

Carl Sagan guided the maiden voyage of COSMOS a generation ago. He was the most successful science communicator of the 20th century, but he was first and foremost a scientist.

INSERT: footage of Carl that spans his diverse and decades-long career. His first television appearance; his testimony before congress; his work with the Voyager programs; Johnny Carson listening to him, fascinated, on The Tonight Show; etc... All over:

NEIL (V.O.)

Carl contributed enormously to our knowledge of the planets. He correctly predicted the existence of methane lakes on Saturn's giant moon Titan. He showed that the atmosphere of the early Earth must have contained powerful greenhouse gases. He was the first to understand that seasonal changes on Mars were due to windblown dust. Carl was a pioneer in the search for extra-terrestrial life and intelligence. He played a leading role in every major spacecraft mission to explore the solar system during the first 40 years of the Space Age.

BACK ON NEIL. He shows us what appears to be a book.

NEIL

But that's not all he did... This is Carl Sagan's *own* calendar from 1975.

Neil opens it to December. There's only one entry for the whole day of the 20th -- a Saturday -- the handwritten name "Neil Tyson".

NEIL

Who was I back then? Just a seventeen-year-old kid from the Bronx with dreams of becoming a scientist. And somehow the world's most famous astronomer found time to invite me to Ithaca, in upstate New York, to spend a Saturday with him. I remember that snowy day like it was yesterday. He met me at the bus stop and showed me his laboratory at Cornell University. Carl reached behind his desk and inscribed this book for me...

A73 OMITTED

A73

B73 EXT. MONTEREY CLIFFS - CONTINUOUS (LIVE ACTION)

B73

Neil takes out the well-worn book, shows us the inscription:

NEIL

"For Neil, a future astronomer -- Carl." At the end of the day, he drove me back to the bus station. The snow was falling harder. He wrote his phone number -- *his home phone number* -- on a scrap of paper. And he said if the bus can't get through: call me, and spend the night at my home with my family. I already knew I wanted to become a scientist, but that afternoon I learned from Carl the kind of *person* I wanted to become. He reached out to me, and to countless others, inspiring so many of us to study, teach, and do science. Science is a cooperative enterprise, spanning the generations.

73	OMITTED	73
74	EXT. MONTEREY CLIFFS - CONTINUOUS (LIVE ACTION/VFX)	74

The Ship of the Imagination rises behind Neil.

NEIL

It's the passing of a torch from teacher to student to teacher -- a community of minds reaching back to antiquity -- and forward to the stars. *Now, come with me. Our journey is just beginning.*

We follow the Ship as it ascends up to --

75	OMITTED	75
76	EXT. EARTH ATMOSPHERE/SPACE (VFX)	76

POV sailing upward through dense clouds, until the atmosphere clears to reveal a SEA OF STARS. We are soaring as Bruno did, bound for a universe of infinite possibilities...

**END OF EPISODE**