

COSMOS INTRODUCES ITSELF

Jos Werkhoven



I used Google translation to translate the three stories:

- Cosmos introduces itself
- Birth of cosmos
- The story of all building blocks

Google translate does that very well, but here and there something strange creeps in. That is no problem for the information, hopefully no problem for your language sense either.

INTRODUCTION

Kortenhoef, September 2018

Dear 'first users' of this book,

What to do when you, as a teacher, tell and/or read this story.

The best thing is if you tell the story yourself. The story, there will be many more sub-stories to follow, then really becomes something of yourself with the children. We do not only teach; we have a story to tell!!!

If you want to be even more inspired to tell these special stories, read: 'Once upon a time . . . a story to tell . . . !!!' You can download it here: <http://www.DeArend.nl/pdf/Er>

[was eens.pdf](#)

The title of this book is: "Cosmos Introduces Itself."

In other words, you tell and/or read as if you were 'Kosmos' speaking and addressing the children. Now, of course, Kosmos is not a person and cannot speak.

However, it is my personal choice to initially address the young child in this way to take them along in a big story. Very quickly it becomes clear to the children that the cosmos does indeed 'speak' to us, albeit not in words. That is why Cosmos calls on your help . Where you **encounter the blue color in the text**, you can use **your own name** .

You are also part of the cosmos, just like the children (and of course many more). It is good to get to know and understand each other, the cosmos as a whole and everything around us better.

In the text you will also encounter **green words** . These words are explained in the glossary at the back of the book .

You will also come across **red boxes** in the text with an **activity**. You choose when you do that activity.

You are among the 'first users' of this book. That means that it is definitely not 'finished' yet.

The first two stories were written by Jos Werkhoven as a 'finger test' in 2014 and now for the ENMS and the Montessori professional course have been laid out for the first time. It is a first layout, there is still a lot of work to be done. However, it is the reason why I forbid you to copy. You may use everything for your own practice (especially read carefully what I have described under **example and the teacher**). The underlying idea is to publish this and the following stories in book form (you can read more about that later under 'The lines of life').

After having made the first two or three stories into book form, I will concentrate on describing the teacher's ability to tell the story himself of Big Historical stories. I already wrote: "It is best if you tell the story yourself."

Example.

The primary aim of writing Jos Werkhoven's stories is: '*Reaching every conceivable child from the age of 6*', assuming that most children at school do not receive this offer.

Spicy, the language used is certainly not simple, but in the (yet to be written) introduction, I will give advice for parents, grandparents and..... the teacher who has purchased it for his class.



The Helix Nebula (NGC 7293) is a planetary nebula in the constellation Aquarius. This planetary nebula is located 650 light years from Earth and was discovered in 1824 by German astronomer Karl Ludwig Harding. The Helix Nebula gets its name from the fact that it looks like you are looking down on a screw thread. The nebula also looks a lot like an observing eye; the reason why I included it in the introduction: read carefully!

The teacher.

For the teacher I consider it as '**one**' **example** of very many possible stories with the same ingredients that following the development of the cosmos gives us. Mario Montessori also wrote more or less similar stories with the help of Maria Montessori's notes (and later processed by other Montessorians in a different way).

But...the best thing would be if every teacher tells his own story with the ingredients that the development of the cosmos offers us!!!

Now not every teacher is a born storyteller and then the stories could be read aloud. The expectation is that through the questions of the children this will still be an animated and meaningful activity. The children of the group can then independently read the story with the word lists regularly.

I wish you and your children a lot of fun telling the stories.

Jos Werkhoven

COSMOS INTRODUCES ITSELF

Hi Sandra, Emma, Lotte, Sanne, Nina, Anouk,,, And the boys too of course!

Hello Bram, Thomas, Tim, Daan, Jesse, Stijn,,,

Wait a minute. This will never work.

Of course I don't know your name! I'll start over.

Hello girl or boy....

No....., that doesn't sound nice.eeeehhh.....

Hello Dutch! Yes, that's it!!!

What are you saying?

You are not Dutch and yet you live in the Netherlands?

Well well, you guys are making it complicated.

There are almost 200 countries on Earth....

Earth???

Yes of course....earth.

Yay, now I know.

I'll start one more time.

Then it must be good.

Hello Earthling,

How nice to get to know myself.

No, no. Don't say anything.

I already know what you're thinking.

You think I'm saying it wrong.

You think I should say, "It's nice to meet you."

Wrong, completely wrong.

I said it right.

That's why I'll say it again.

How nice to get to know myself.

I understand why you don't get this.

I'll explain it.

Let me introduce myself to you: I am Kosmos.

People also sometimes call me Universe or Universe.

Some people even call me 'world' sometimes.

That name always confuses me.

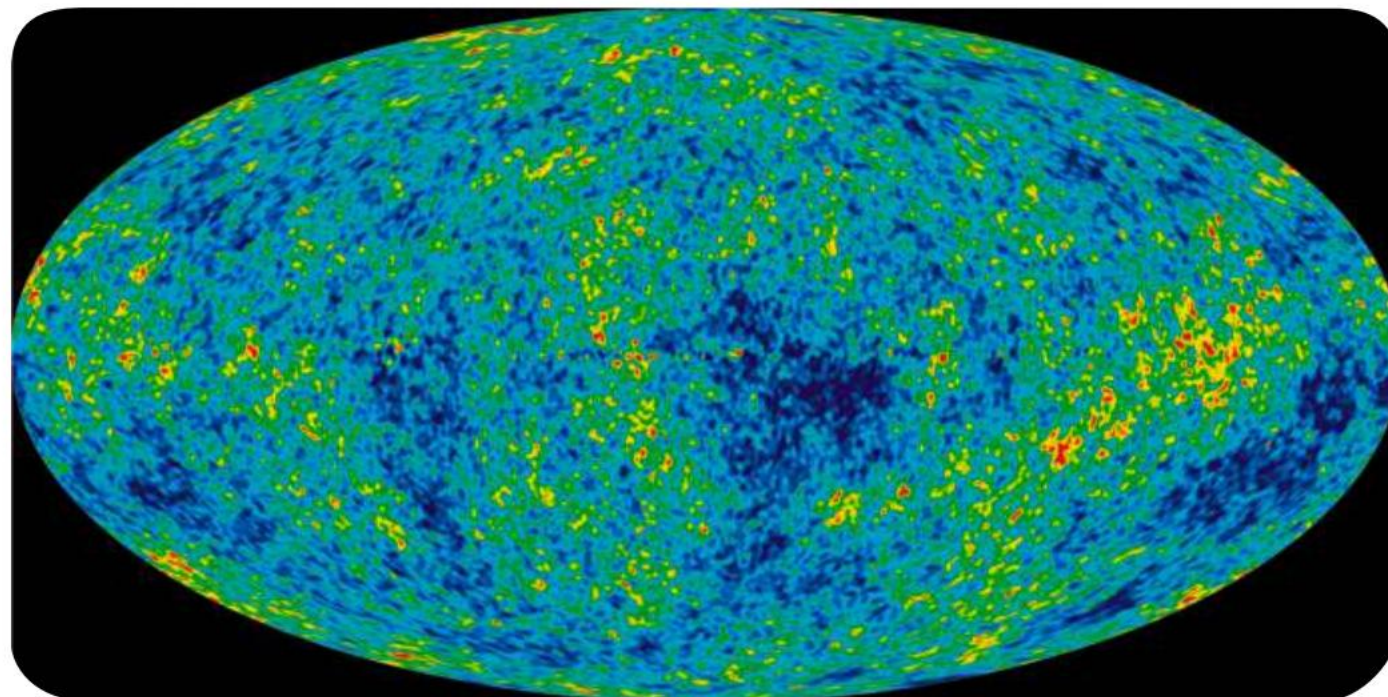
I think Cosmos is the most beautiful name.

I have placed a few pictures of myself on this page and the following pages. Then you know a little bit about what I look like. Later I will tell you much more about the pictures and myself. Now it is important that you know who I am.

I'll show you a childhood photo below first. In this photo you can see me completely! I was about **379,000** years old then. **(Explanation: large numbers)**

That's **13,799,621,000** years ago. Can you figure out how old I really am?

Unfortunately, it is the only photo of me where you can see me completely. There are no more.

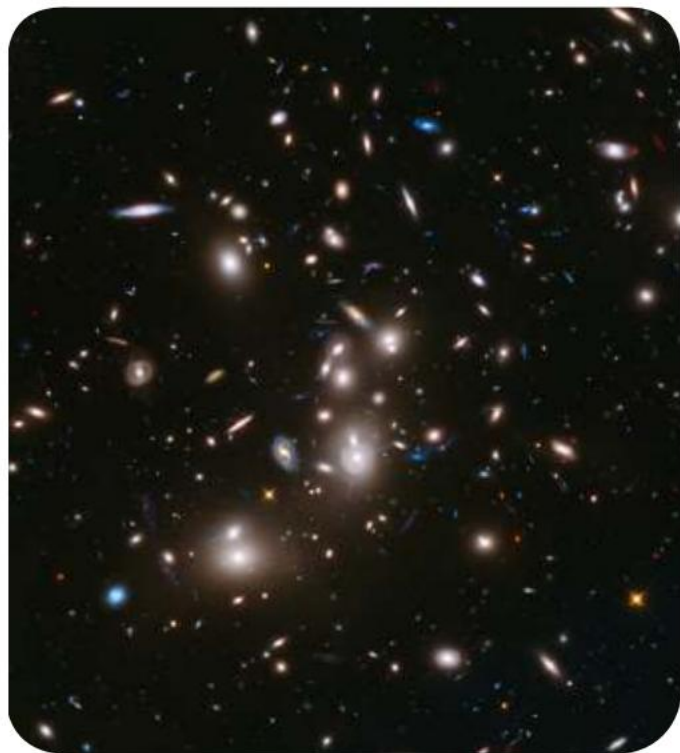


The other photos are all of a part of myself, on the left you see a funny part of myself. They also call this 'sombrero'. A sombrero is a Mexican hat. (See small photo below.)



It is one of my many **guises**. You can encounter me in many different forms.

Take a good look at the pictures on the following pages. They are all **galaxies**.



I also find this photo of a part of myself very nice and special. The photo looks very much like the place where you earthlings live.

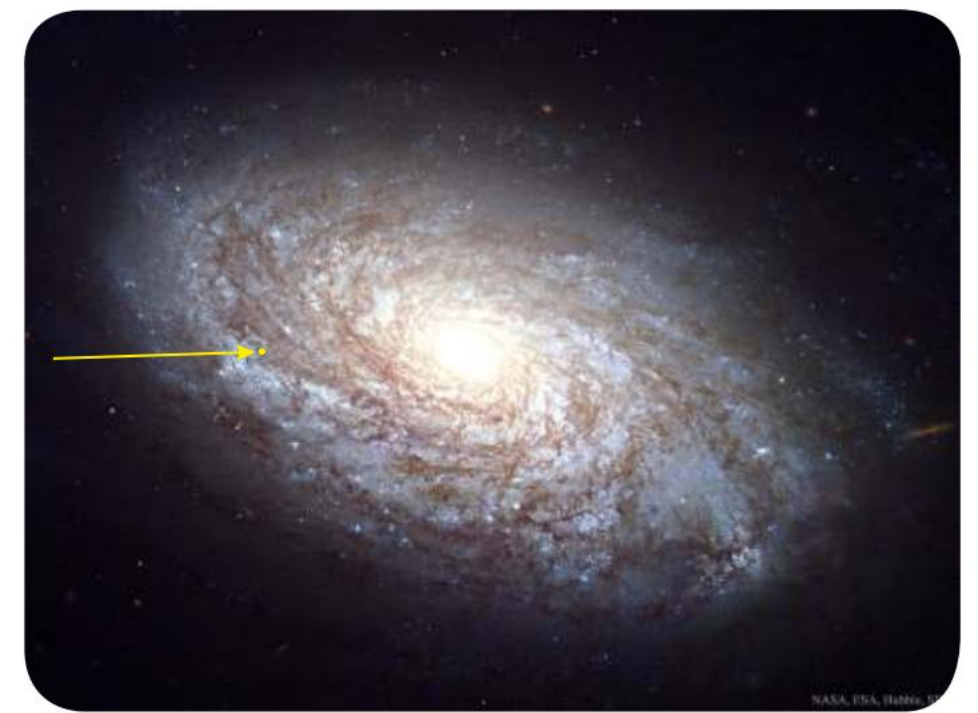
You see one galaxy in the photo.
I put a yellow dot where you would live. The dot is drawn much too big.

And yet it is difficult for you to see. That is why I have added a yellow arrow.

You see billions (!!!) of stars.
Your sun that is close to the earth is just one of them. So the sun is a **star**.

This galaxy is called NGC 4414.
You might be thinking, "What a strange name!"
For **scientists** (astronomers) it is impossible to come up with billions of names for all those billions of galaxies. Letters and numbers are still possible.

The galaxy where humans live is called the Milky Way.



This is another childhood photo.
In this photo you only see a **tiny part** of me.

You see all kinds of galaxies.
I was about 1,800,000 years old then. That's 12,000,000,000 years ago.

Activity at 'very small piece'.

This activity lets you experience how small or how big 'a very small piece' of the cosmos is.
This is best done on a dark evening and with a clear starry sky.
Unfortunately, we hardly know that in the Netherlands anymore because of the many lights everywhere.

Make sure you can see the sky. Put one finger in the air and look at your finger. You can't see the sky behind your finger.

Place one grain of sand on your finger.
You cannot see the sky behind the grain of sand.
What is hidden behind the grain of sand can be seen in the photo above.

No matter which direction you look, you will always see approximately the same as in the photo. No matter where you stand on the earth, you will always see approximately the same as in the photo.



And what do you think of this one? This is a very special one: new stars are born here.

?!?!?!?

I understand you are a little confused. Stars being born? Does that really happen?
Yes! In a next story about matter and stars I will tell you all about it (the explanation can be found at atom and matter).

But this is still a very small) part of myself.
People call this part the 'Eagle Nebula'.

*(This book was created by Jos Werkhoven, former owner of De Arend Publishing House in the De Arend house..
Jos thinks it's wonderful that such a beautiful piece of the cosmos has been given the name 'Eagle Nebula'.
The Eagle Nebula, a beautiful place where stars are born.*

The house De Arend, a place where)

I could show you billions more photos of myself like this.
You will understand that there is no room for that in any book.
That's why I've made a **collage** of nine more photos below. You'll see many different shapes of stars and galaxies.
That's enough for now.



Although?!? I'm not done yet. I'm much more. I'm not just billions of galaxies and billions of stars. I'm also: **planets!**

On the right you see the planets that revolve around your **sun** . I made a collage of it again. I also added the moon.

The sun and the planets that revolve around the sun are collectively called our **solar system**.

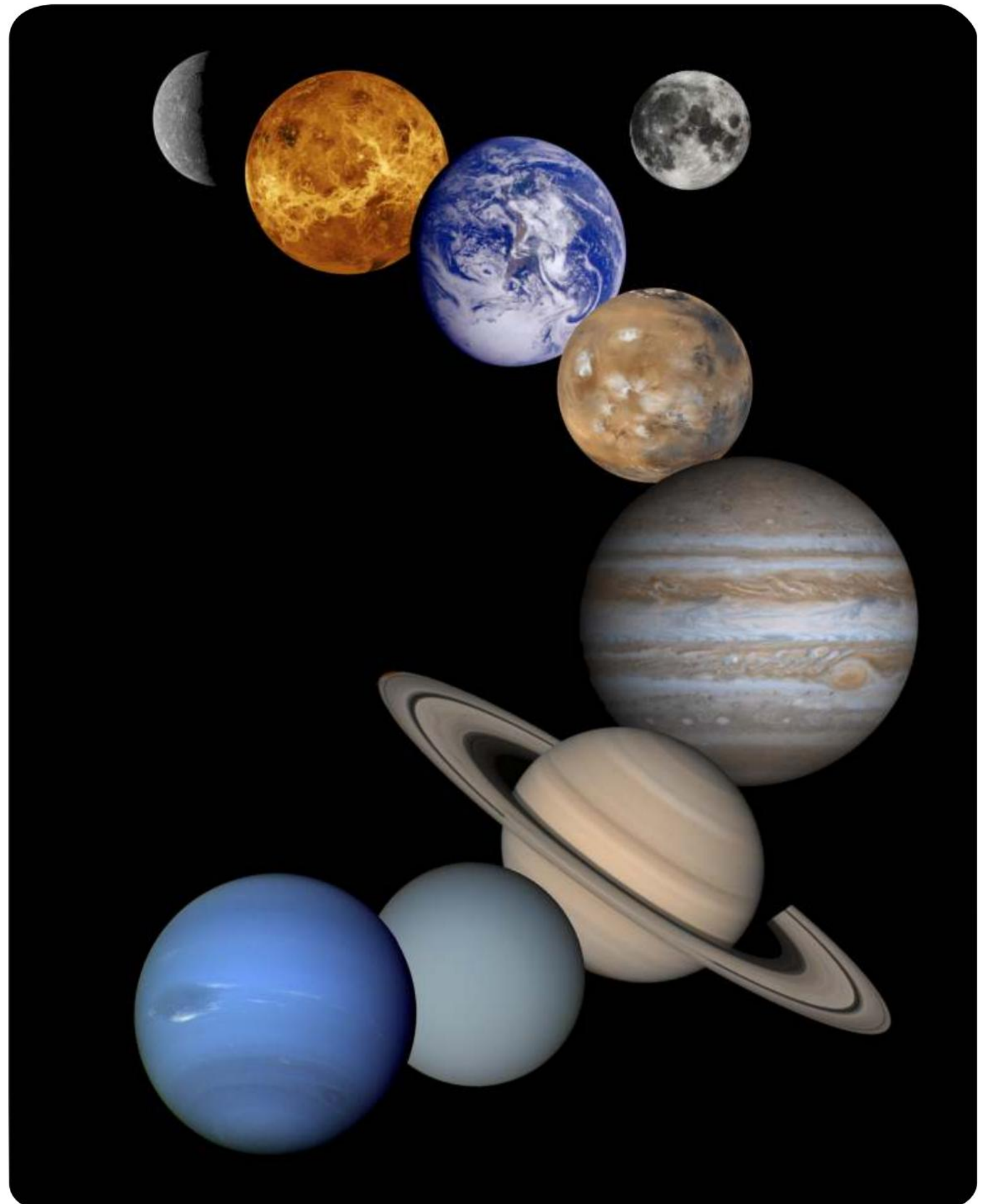
Can you point out your own planet, Earth?

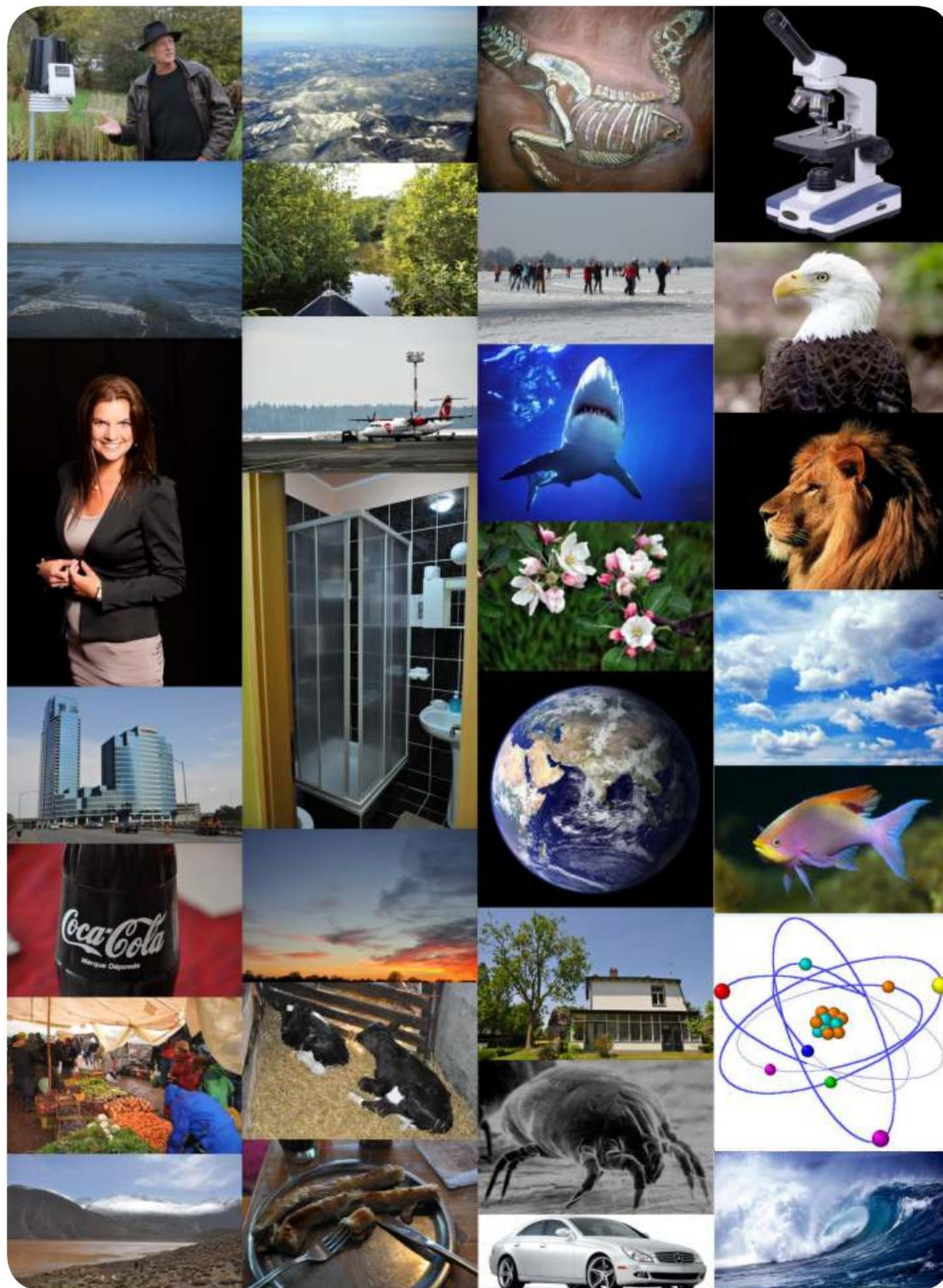
Now it seems like they are all the same size. That is absolutely not the case. I will tell you much more about that later. Now I am still busy introducing myself to you.

I'm almost done.

I'll show you one more photo collage of pieces of myself.

I think you know who (or what???) I am exactly.





So? Do you know who (or what) I am now?

At first you saw all of me.

That was in the childhood photo when I was about 30,000 years old.

Then you saw galaxies and stars and planets.

And in the last photo collage next to it you saw:

the earth, people, animals, plants, flowers, things, cars, houses, buildings, mountains, air, water, and finally a drawing of an **atom**.

Yes!!!

I am all of it! I am the cosmos. People sometimes call me the universe or universe. Some even call me 'world'. That name always confuses me. I think cosmos is the most beautiful name.

So I am all there is. So I am also you!

Better said: you are a part of me.

Do you understand now why I wrote in the first pages: "How nice to get to know myself."

You are made of the same building blocks that are found throughout me. I am almost 14 billion years old.

And you? How old are you? Six? Nine? Maybe twelve?

Ha ha! I think you're almost 14 billion years old too!

But that's a long story. It's a big story! It's an incredibly exciting story!!!

It is also a true story.

At least... that's what the scholars, the scientists, say.

There are more stories about how it all started, but not much has been written about them.

Scientists do that.

Scientists have written thousands, tens of thousands, even hundreds of thousands of books.

Scientists are constantly investigating how something came into being, how something is put together or how something works.

When they find an answer, they write it down in a book or magazine.

They then have other scientists check whether what they have found is correct.

This is how the big story came about.

So this story was actually written by the most brilliant scientists walking the earth.

(I'm going to tell you that big story in pieces.

Well, not just me.

I let most of the work be done by a part of me: **Jos Werkhoven**.

I found out that he was also very interested in how I was born and grew up.

He wrote on his website: "Every

person on earth has the right to hear the big story.

Every person may know what our scholars also know.

Every child should know what our scholars know.

We need to tell this great story to children in our schools.

We should not tease children with isolated bits of geography, history, physics or biology.

At home they also like to put down the **WHOLE** puzzle. If a piece is missing, that sucks. You can never enjoy one loose piece.

The **WHOLE** puzzle, now that's beautiful!

Only then will you see and understand how everything fits together!"

I agree with **Jos**. My story is such a fantastic story! The best storyteller could not have imagined it.

And I like it when you learn a lot about me, Kosmos. I think you will understand everything much better. You will understand more about geography, history, physics or biology.

I'll even throw in astronomy, chemistry, archaeology, mathematics and language!

The Dutch language even has a proverb for it: "All the puzzle pieces fall into place!"

You have already received the first puzzle pieces from me.

I can well imagine that you cannot yet make a complete puzzle out of that.

I'm going to put **Jos** to work now. He's going to tell you about my birth first:

The story of 'Cosmos, the birth of the universe'.

On the timeline next to this, it starts at **1.**

But of course it doesn't stop there.

We're going to finish the puzzle completely.

Then follows:

The story of all the building blocks. (On the timeline that starts at **2.**)

The story of the shining stars. (On the timeline it starts at **3.**)

The story of our sun and our earth (On the timeline it starts at **4.**)

The story of life on earth. (On the timeline it starts at **5.**)

The story of man on earth. (On the timeline, this starts between **6a and 6b.**)

• The story of agriculture and animal husbandry. (On the timeline, this starts at **7.**)

• The story of civilizations and cultures. (On the timeline, this starts at **8.**)

• The story of mathematics (arithmetic, geometry, algebra).

(On the timeline that starts at **9.**)

• The story of language (on the timeline it starts at **?a and ?b.**) and writing (**at 10.**)

(We can only guess about the beginning of language, the beginning of writing is known.)

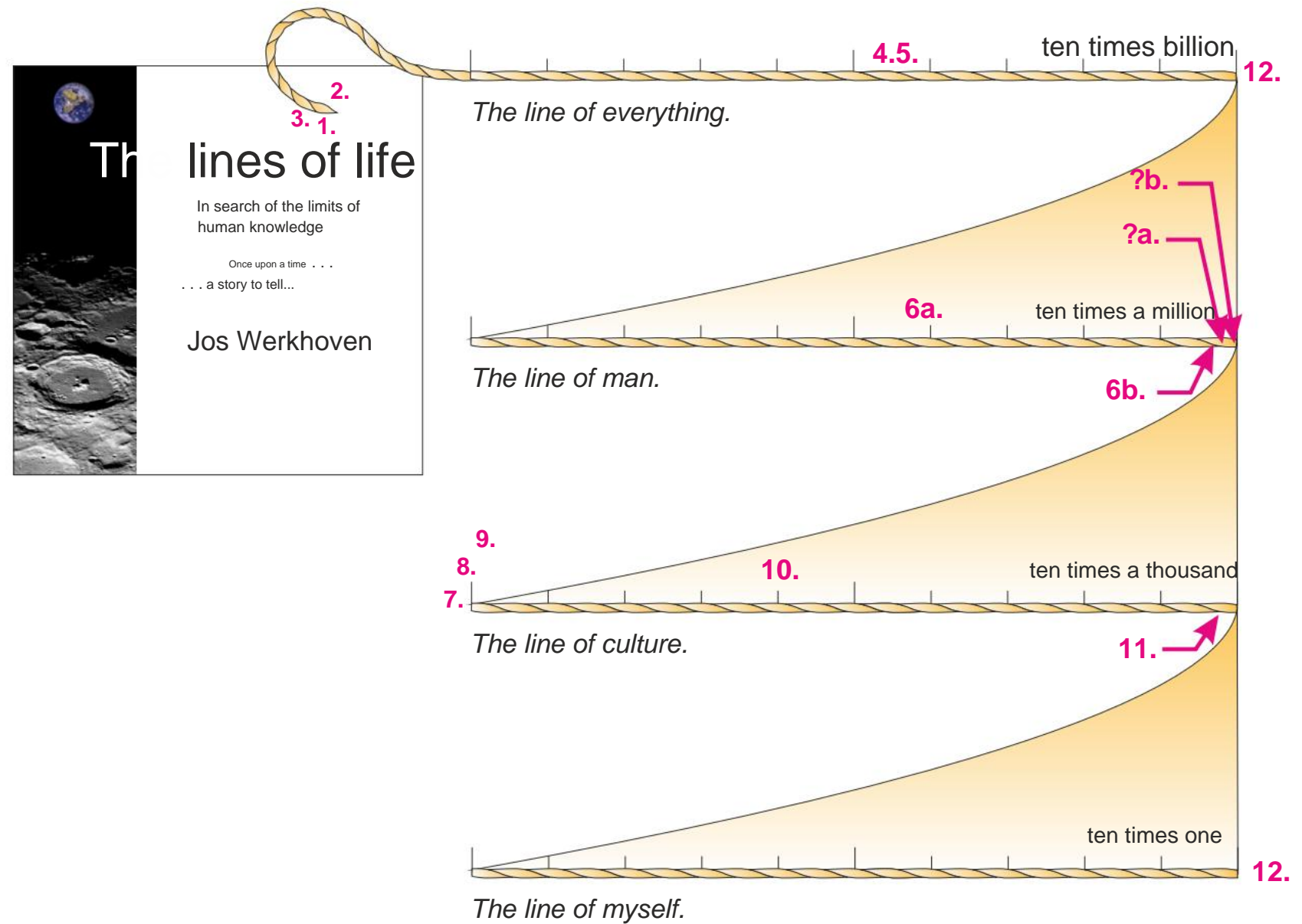
• The story of the modern revolution. (On the timeline, that starts at **11.**)

• The story of the future. (On the timeline, that starts at **12.**)

OK!

Let's get started.

Jos! Get to work!!!



Very important note regarding the numbers in the timelines.

The numbers indicate a point in time at which the stories are approximately set. You read that right: **APPROXIMATELY!!!**

For many things, the exact beginning cannot be determined: we simply do not know (yet?!). It is more important to know that the
 But . . . developments have taken place than to know exactly when they took place.

The order of developments over time is also important to know.

More about this is told in the stories.

GLOSSARY

The words are in the order they appear in the story.

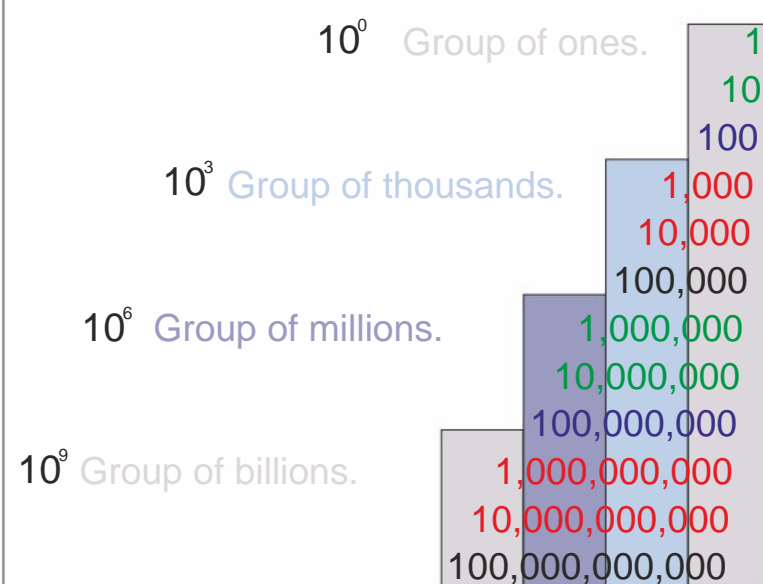
Big numbers

Numbers with three digits are called the **group of 'ones'**.

Numbers with four to six digits get an additional group: **the group of 'thousands'**. ($1,000 \times 1 = 1,000 = \text{one thousand}$)

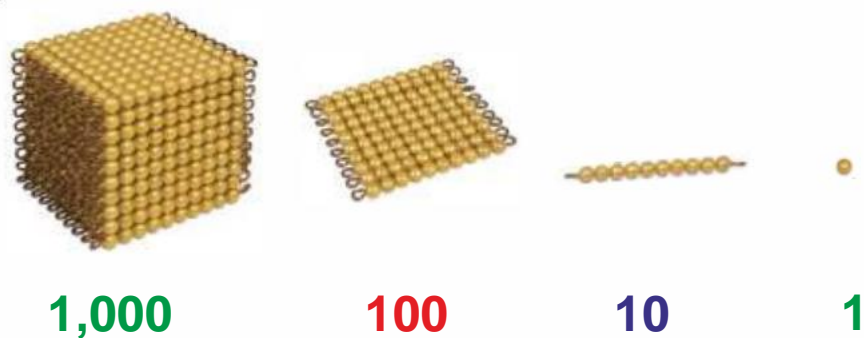
Numbers with seven to nine digits get another group: **the group of 'millions'**. ($1,000 \times 1,000 = 1,000,000 = \text{one million}$)

Numbers with ten to twelve digits get another group: **the group of 'billions'**. ($1,000 \times 1,000,000 = 1,000,000,000 = \text{one billion}$)



At a Montessori school they use a beautiful material that clearly shows what 1, 10, 100 or a thousand is.

There is even a necklace with 1,000 beads.



If you have €1000.00 in your savings account, you probably know what you can buy with it.

One million is a thousand thousands.

That already makes you a little dizzy. That is a lot.

Approximately 17 million people (17,000,000) currently live in the Netherlands.

One billion is a thousand millions. That's so much! It's almost unimaginable.

There are currently over 7 billion people (7,000,000,000) living on Earth.

So there are billions of stars and billions of galaxies. There are so many that we can't even count them anymore.

There are more stars in the cosmos than grains of sand on Earth.

Shapes

The singular is shape (one shape).

The plural is shapes (two or more shapes).

A shape is a form that you can see. You have the shape of a human.

The shape of a human being is: head, neck, torso, two arms, two legs.

You cannot take on another form. You can dress up as a horse, for example.

You have then taken on the form of a horse.

Some insects can actually change shape.

Just think of the caterpillar that can change into a butterfly. The caterpillar has then changed shape.

Galaxies can also come in many shapes and sizes.

Next to this you see a number of different shapes.

Galaxies

A galaxy is a group of billions of stars together.

There are billions of galaxies.

Star

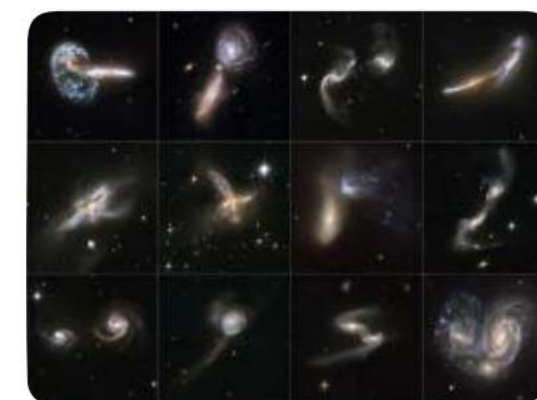
A star is a celestial body. A celestial body that gives off light by itself.

A star gives off so much light that you can still see the star when it is very, very far away. If you look at the sky in the evening when it is dark, you can see thousands of stars. In the Netherlands you can't see the stars that well. It is even more difficult if you live in a big city. That is because people light up the streets and roads so well. There is so much light then that you see the light of the stars less well.

To see the stars properly, you actually have to stand in the middle of the desert in Africa.

The photo here is taken in Chile (South America). It is also very dark there.

The way you see the starry sky there is impossible in the Netherlands.



Scientists.

Scientists is the plural. Scientist is the singular.
Scientist comes from the word science.

You are in primary school. Then you go to secondary school.

After high school there is another school. We don't call it school anymore, but university.

If you graduated from university, you are a scientist.

We also call a scientist a researcher or scholar.

You recognize the word 'knowledge' in the word scientist. Everything we know as humans we call science. In the following story (The Birth of Cosmos) I will tell you much more about this under 'fact and opinion'.

Mist

Another word for fog can also be mist. When there is fog, there are a lot of small water droplets in the air. You can then hardly see through the air.

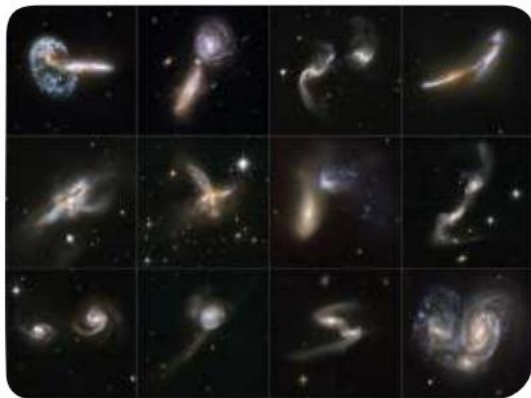
There can also be very small dust particles floating in the air. Even then you cannot see through the air very well. This is the case with smoke.

This is also the case with the 'Eagle Nebula'. You can still see a lot, but also a lot you can't.

In the photo on the right you see a piece of the 'Eagle Nebula'. You do see a lot of 'clouds'. Those clouds are clouds of dust.
About that substance and what to do with it happens, I'll tell you a lot more later.
Out of those clouds of dust new stars are born.



Collage



When you combine several photos into one photo, it is called a collage.
The twelve galaxies you see here are in one photo, but it is a **collage** of twelve photos.

In the French language, '**coller**' means to paste or join together.
Merge can also mean paste.

Planet

A planet is a celestial body. But... there is a huge difference with a star. A star gives light of itself, a planet does not.

I can hear you thinking: "What about the moon?" You're right. The moon also gives light! But...the moon doesn't do that itself.

The light you see is the light of the sun shining on the moon.

But beware...the moon is not a planet. The moon is a 'moon'. That's what you call a celestial body that orbits a planet.

I'll tell you much more about planets and moons later

You can also sometimes see the planets Venus and Jupiter. Because they are much further away than our moon, they look like stars.

But that too is the light of the sun shining on the planets.

Eight planets revolve around our sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

Jupiter has 63 moons! Saturn has 62, Uranus 27 and Neptune 14.

Sun

The sun is a star. Just like the stars you see in the sky at night. They seem smaller, but that's because they are very far away.

The star closest to Earth after the Sun is called Proxima Centauri.

Yet Proxima Centauri is so far away from Earth that we could travel there in one lifetime the fastest rocket cannot travel there.

That would take, don't be alarmed, 310 billion years (310,000,000,000).

And I (Kosmos) am not even that old. I am almost 14 billion years old. To be exact: 13,800,000,000 years.



Solar system

Is the collective name for our sun and the planets that revolve around the sun.

In the photo on the left you can see the sun partially on the left.

The planets are shown in the correct order from the sun.

The names are in English: Mercury = Mercury, Earth = Earth, Saturn = Saturnus, Neptune = Neptune.

In reality, the planets and the sun are much, much further apart.
I talk about this in the story of our sun and our earth.

A beautiful animation showing how the sun moves through space with the planets can be seen here: https://www.youtube.com/watch?v=0jHsq36_NTU

Atom and matter

An atom is the smallest building block.

Atom comes from the Greek language and literally means 'indivisible'; so you can't make it any smaller or divide it into smaller pieces.

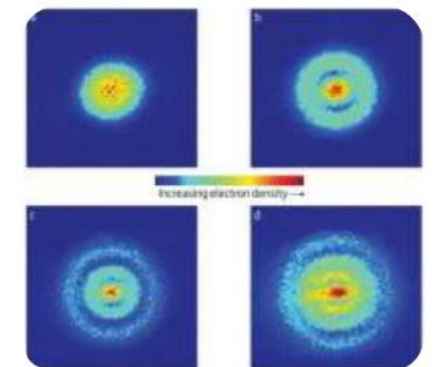
For a long time, man thought that nothing even smaller existed.

It is so small that you cannot see it under the strongest microscope.

Here you will find four photos of one atom at different times. The electrons around the nucleus are always in motion. These are the very first photos ever made of atoms. They were made in 2014.

We now know that an atom consists of several other particles.

I will tell you about this in the story of all the building blocks.



COLOPHON

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Jos Werkhoven

This is a first experimental release.
Your comments and suggestions are greatly appreciated.

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ONCE UPON A TIME

A STORY

TO TELL

ORIGIN PHOTOS ,

Photo source if not from Jos Werkhoven

Childhood photo of background
radiation: NASA / WMAP
Science Team http://map.gsfc.nasa.gov/media/121238/ilc_9yr_moll4096.png

Childhood photo deep space: NASA,
ESA, <https://www.nasa.gov/image-article/nasas-webb-delivers-deepest-infrared-image-of-universe-yet/>

Hubble Extreme deep field 13.2 billion years:
<https://science.nasa.gov/image-detail/hubble-xdf/>

Helix Nebula:
<https://svs.gsfc.nasa.gov/vis/a030000/a030700/a030792/helix-hst-3240x3240.png>

Sombrero Nebula: <https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubble-messier-catalog/messier-104/>

NGC+4414; similar to Milky Way: http://upload.wikimedia.org/wikipedia/commons/c/c3/NGC_4414_%28NASA-med%29.jpg

Eagle Nebula, birthplace of stars: <https://www.demorgen.be/news/hubble-looks-back-in-time-b4177380/?referrer=https://www.google.com/>

Collage galaxies
<https://hubblesite.org/>

Collage planets
<http://photojournal.jpl.nasa.gov/jpeg/PIA03153.jpg>

Starry sky glossary:
<http://apod.nasa.gov/apod/ap140127.html>

Photo atom
<https://phys.org/news/2014-06-snapshots-atoms-physics-textbooks.html>

Mendeleev's Table
<http://www.ptable.com/?lang=nl>

Photo solar system
<https://nl.wikipedia.org/wiki/Solarsystem>

Mexican coneflower
<https://www.vegao.nl/>

Photo sun
<https://www.quantamagazine.org/what-is-the-sun-made-of-and-when-will-it-die-20180705/>