

**CHILDREN, HAVE YOU EVER  
THOUGHT?**

**.2.**

**THE GLORY IN THE  
HEAVENS**

**(Allah) the Originator of the heavens and earth.**

**When He decides on something,  
He just says to it, "Be!" and it is.**

**(Surat al-Baqara: 117)**

**HARUN YAHYA**

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By Harun Yahya

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website: [www.harunyahya.com](http://www.harunyahya.com)  
e-mail: [info@harunyahya.com](mailto:info@harunyahya.com)

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## **To The Reader**

In all the books by the author, faith-related issues are explained in the light of the Qur'anic verses and people are invited to learn Allah's words and to live by them. All the subjects that concern Allah's verses are explained in such a way as to leave no room for doubt or question marks in the reader's mind. The sincere, plain and fluent style employed ensures that everyone of every age and from every social group can easily understand the books. This effective and lucid narrative makes it possible to read them in a single sitting. Even those who rigorously reject spirituality are influenced by the facts recounted in these books and cannot refute the truthfulness of their contents.

This book and all the other works of the author can be read individually or discussed in a group at a time of conversation. Those readers who are willing to profit from the books will find discussion very useful in the sense that they will be able to relate their own reflections and experiences to one another.

In addition, it will be a great service to the religion to contribute to the presentation and reading of these books, which are written solely for the good pleasure of Allah. All the books of the author are extremely convincing. For this reason, for those who want to communicate the religion to other people, one of the most effective methods is to encourage them to read these books.

It is hoped that the reader will take time to look through the review of other books on the final pages of the book, and appreciate the rich source of material on faith-related issues, which are very useful and a pleasure to read.

In these books, you will not find, as in some other books, the personal views of the author, explanations based on dubious sources, styles that are unobservant of the respect and reverence due to sacred subjects, nor hopeless, doubt-creating, and pessimistic accounts that create deviations in the heart.

## About The Author

Now writing under the pen-name of HARUN YAHYA, he was born in Ankara in 1956. Having completed his primary and secondary education in Ankara, he studied arts at Istanbul's Mimar Sinan University and philosophy at Istanbul University. Since the 1980s, he has published many books on political, scientific, and faith-related issues. Harun Yahya is well-known as the author of important works disclosing the imposture of evolutionists, their invalid claims, and the dark liaisons between Darwinism and such bloody ideologies as fascism and communism.

His pen-name is a composite of the names *Harun* (Aaron) and *Yahya* (John), in memory of the two esteemed Prophets who fought against their people's lack of faith. The Prophet's seal on the his books' covers is symbolic and is linked to the their contents. **ALLAH**It represents the Qur'an (the final scripture) and the Prophet Muhammad (peace be upon him), last of the prophets. Under the guidance of the Qur'an and the Sunnah (teachings of the Prophet), the author makes it his purpose to disprove each fundamental tenet of godless ideologies and to have the "last word," so as to completely silence the objections raised against religion. He uses the seal of the final Prophet, who attained ultimate wisdom and moral perfection, as a sign of his intention to offer the last word.

All of Harun Yahya's works share one single goal: to convey the Qur' an's message, encourage readers to consider basic faith-related **ALLAH**issues such as Allah's Existence and Unity and the hereafter; and to expose godless systems' feeble foundations and perverted ideologies.

Harun Yahya enjoys a wide readership in many countries, from India to America, England to Indonesia, Poland to Bosnia, and Spain to Brazil. Some of his books are available in English, French, German, Spanish, Italian, Portuguese, Urdu, Arabic, Albanian, Russian, Serbo-Croat (Bosnian), **ALLAH ALLAHALLAHALLAHALLAHALLAHALLAHg of Disbelief, Devoted to ALLAH of Believers, The Fear of ALLAHALLAH**Polish, Malay, Uygur Turkish, and Indonesian.

Greatly appreciated all around the world, these works have been instrumental in many people recovering faith in Allah and gaining deeper insights into their faith. His books' wisdom and sincerity, together with a distinct style that's easy to understand, directly affect anyone who reads them. Those who seriously consider these books, can no longer advocate atheism or any other perverted ideology or materialistic philosophy, since these books are characterized by rapid effectiveness, definite results, and irrefutability. Even if they continue to do so, it will be only a sentimental insistence, since these books refute such ideologies from their very foundations. All contemporary movements of denial are now ideologically defeated, thanks to the books written by Harun Yahya.

This is no doubt a result of the Qur'an's wisdom and lucidity. The author modestly intends to serve as a means in humanity's search for Allah's right path. No material gain is sought in the publication of these works.

Those who encourage others to read these books, to open their minds and hearts and guide them to become more devoted servants of Allah, render an invaluable service.

Meanwhile, it would only be a waste of time and energy to propagate other books that create confusion in people's minds, lead them into ideological chaos, and that clearly have no strong and precise effects in removing the doubts in people's hearts, as also verified from previous experience. It is impossible for books devised to

emphasize the author's literary power rather than the noble goal of saving people from loss of faith, to have such a great effect. Those who doubt this can readily see that the sole aim of Harun Yahya's books is to overcome disbelief and to disseminate the Qur'an's moral values. The success and impact of this service are manifested in the readers' conviction.

One point should be kept in mind: The main reason for the continuing cruelty, conflict, and other ordeals endured by the vast majority of people is the ideological prevalence of disbelief. This can be ended only with the ideological defeat of disbelief and by conveying the wonders of creation and Qur'anic morality so that people can live by it. Considering the state of the world today, leading into a downward spiral of violence, corruption and conflict, clearly this service must be provided speedily and effectively, or it may be too late.

In this effort, the books of Harun Yahya assume a leading role. By the will of Allah, these books will be a means through which people in the twentyfirst century will attain the peace, justice, and happiness promised in the Qur'an.

# INTRODUCTION

Have you ever thought about the vastness of the universe in which we live? Perhaps you have not given much thought to this subject until now. Even if you have, one can still hardly imagine the huge size of the universe. Let us try to explain how big it really is with an example. What is the biggest width you can think of? The distance from one side of the city you live in to the other may seem pretty big to you. Alternatively, it may well be that you have travelled all the way from the east to the west of your country and couldn't help but be amazed by how big it was. Some of you might have travelled to distant countries. Nevertheless, always keep in mind one important fact! Even if you travelled all around the whole world, that would still be too tiny to help you imagine the enormous size of the universe. That is because the size the Earth occupies in the entire universe barely compares to the size of a speck of dust.

This might surprise you, but it is the truth; the planet Earth is only a speck of dust in comparison to the whole universe.

Dear children! Now think about our Earth, a tiny speck in this enormous universe. Every day you wake up in your homes on this round ball. The roads that take you to school are also built on it.

Now consider this for a moment! If you put toy cars on top of a ball in your hand, would they be able to stay on it? Certainly not. And yet you spend all your day on this round planet, playing and enjoying yourself with your friends without falling off!

Now, think about the Sun. How could you warm yourselves, and where would your light come from without this yellow ball of fire? Would you be able to go swimming and have a dip? Would you be able to go on picnics with your family or classmates? Absolutely not! You wouldn't be able to do any of these things, because without the Sun, there would be no living things on Earth. Not only the plants, trees, birds, insects and the pets that you love so much, but also your mother, father, friends, brothers or sisters and even you yourself would not be around.

These two examples about the Earth and Sun reveal the importance of the heavenly bodies and their features for our lives. We are going to give you plenty of similar interesting examples in this book. It is very exciting to learn about the universe through these examples. You must also share what you learn with your mother, father, family and friends. They will also enjoy learning about these thought-provoking topics.

As you read this book, you will see that Allah our Creator created our universe and all the creatures in it. You will also see that Allah has created the Sun, Moon and Earth and everything in the universe, so that we could lead our lives most enjoyably and comfortably, and to test us and try us.

Now, let's start our wondrous journey through the universe.

# Chapter 1: CREATION OF THE UNIVERSE

Have you ever wondered how the endless universe we live in came into existence? How did the enormous Earth, Sun, Moon and stars come into being? Did you know that the universe is full of many interesting things as well as the Earth, Moon and the Sun? Did you know that a very delicate balance exists in the universe that provide exactly the right conditions for life?

Now let's start learning the answers to these questions, and how Allah created the universe.

## Once Upon a Time There Was No Universe!

In ancient times, man's knowledge of space was quite limited. The equipment needed to explore the sky was not as advanced as it is today. Therefore, people sometimes had strange ideas about how the universe originated. The idea that the universe had always existed was the funniest. That is to say, before man had telescopes and instruments to examine the heavens with, some ignorant people suggested that the universe did not have a beginning but had existed for ever and would continue to exist for ever.

However, that was illogical! Your house and school building were built on particular dates. Even the lines you are reading were written at a certain time. Similarly, you, your mother and father have birthdays. That means everything, whether living or non-living, comes into existence at a certain time. Saying, "The universe has no date of origin, because it has always existed" is ridiculous. No one believes that now.

Let us give you an example: on your morning journey to school, imagine that you took a different route and found a statue. What would you think? You would certainly think, "A sculptor made this statue and placed it here," wouldn't you? Well, what would you say if one of your friends said, "No, this statue has always been here; nobody carved it"? You would probably tell him, "Don't be ridiculous! Every work of art has a maker!" Wouldn't you?

Those who claim that the universe has always existed have a more ridiculous way of thinking than your friend who argues that the statue has always been there. A statue is only a piece of sculpted rock, but the universe consists of many heavenly bodies and systems much more delicate and intricate than a piece of rock.

Thanks to astronomical discoveries, the mistaken nature of this assertion that the universe has always existed became obvious. These studies revealed that, like everything else, the universe also had a beginning.

The first man who proved that the universe had a beginning was the astronomer Edwin Hubble. (Let us remind you that an astronomer is a person who studies space, the stars and galaxies.) Hubble worked with a giant telescope. One day in 1929, he realised that the stars were moving.

These are not ordinary random movements. Stars are continually moving away from us. Furthermore, they are also moving away from each another. A universe in which everything moves away from everything else means a universe that is constantly growing larger.

Not until a hundred years ago did people understand this. Today, all scientists agree that stars are moving away from each other as well as away from Earth.

This movement of the stars is a very important piece of information about the creation of the universe. The fact that the stars are steadily moving away from each other indicates that they were at one time closer together. Scientists computed that 15 billion years ago all the matter in the universe was gathered together in a single point as small as the tip of a needle. Our universe came into being when that tiny point exploded.

Now let us note down one by one what we have seen so far:

- Stars move continually;
- Stars are moving away from us;
- If time could be turned back, we would see stars coming closer together.

This would continue until the entire universe was gathered together at one point.

If we went a little further, this point would also disappear. This means that the universe came into existence from nothing; that is, Allah created it in an instant.

You might get a better idea of what "nothing" means by answering these three simple questions:

1. How old were you one year ago?

You might answer "A year younger."

2. If you counted your age back year by year, what age would be the last one you would get to?

Your answer would be "one". A year after your birth, you were one year old. At birth, however, you were not old enough to have an age. This could be expressed as "zero age".

3. Think about the year before your first birthday! How old were you then? Where were you?

You should have answered that by saying, "I wasn't around then."

You didn't exist at all before your mother became pregnant.

If we also turned time back for your body, you would see that your body would also disappear at the end of this operation. For every year we went back, your body would become smaller and smaller, until finally you would become a baby in your mother's womb. If this operation were carried still further, you would reach the time when your mother was not yet pregnant.

There was no universe before Allah created it. When we rewind time, the universe also becomes younger. It gets smaller until it becomes an insignificant point and finally disappears. All these indicate that the universe has been "created".

Meanwhile, let's remind ourselves that we use the word "creation" when we want to explain that something is brought into being from nothing. Only Allah can cause something to exist from nothing. In other words, only Allah can "create" something. People can also make things that did not exist before. For instance, they can paint pictures. They can build ships. However, the truth is that people can cause something to exist using the materials available in this world and by imitating things already existing in this world. Therefore, we cannot call this "creation". Creation is bringing something into being from nothing without prior examples. Allah has created everything in the universe, including Earth, from nothing.

Man imitates what Allah has already created, even if painting a picture. If we asked you to draw a picture of a landscape on a sheet of paper, what would you draw? Most possibly you would paint the Sun, a mountain, a few green trees, a rainbow and the sea. However, have you ever thought that it would be impossible for you to draw a tree if you had never seen one? Think of a person who is blind from birth. He can only know that the Sun is round and bright, if somebody describes it to him. He can only have an idea about something if he sees it.

Dear Children! As these examples show, only Allah has the power to create something without a prior example. The Qur'an, the Book Allah sent to all humanity as a guide, informs us:

**He is the Originator of the heavens and the earth....** (Surat al-An'am: 101)

Now, it is time to learn how Allah created the universe. You should be curious to hear how such a great event took place.

## **THE BIG BANG AND THE EXPANSION OF THE UNIVERSE**

You know that billions of years ago the universe was only a tiny speck. It is now time to learn how all of a sudden this tiny speck started expanding.

You probably watch cartoon films on TV. Generally, an enemy chases the hero in these films and the hero does anything he can to escape. One of the things he frequently does is to use dynamite. For example, Bugs Bunny's enemies place dynamite in his home, or Road Runner's enemies lay dynamite in his path. In each case, these heroes manage to escape the dynamite with great skill.

Now, try and visualise one of these explosions. For instance, the hunter chasing Bugs Bunny puts explosives in his underground home. What happens when they explode? The soil is scattered around and the pieces move away from one another, right? Before the explosion, the pieces of soil remain together. However, after the explosion, the tiny pieces of soil scatter around and move away from one another.

Billions of years ago, the universe came into being after an explosion. Many pieces came into existence with this explosion. These pieces moved away and scattered around, just like the bits of soil scattering around. Then they started to form the universe and the planets etc.

This explosion, which was the beginning of the creation of the universe by Allah, has come to be called the Big Bang. The moment this great explosion took place, the universe started constantly growing and expanding, and is still expanding today.

Before continuing with the next section, let's recap a few points we made earlier:

1. A long time ago, there was no universe;
2. The universe came into being with the explosion of one tiny speck;
3. After the explosion, incredible numbers of particles came into existence which came to make up our universe, and these particles started moving away from one another;
4. The universe expands as the objects in it move away from each other.

These are all evidence of Allah's infinite might. Even if all the people in the world came together, they could never make even a bad imitation of the universe. Even if all the materials available on earth were gathered together, man would still fail to imitate an explosion as big as the Big Bang. All power belongs to Allah, the One Who creates everything. Reading the next passage, you will better understand the infinite nature of Allah's power and wisdom.

## **ORDER EMERGES OUT OF AN EXPLOSION**

Dear children, as you can also imagine, no explosion brings about an orderly structure. On the contrary, an explosion destroys existing order. It damages everything around it. A high-explosive bomb can reduce huge buildings to nothing. The most powerful bomb in the world is the atom bomb. When dropped, this bomb devastates everything in its target, in some cases entire cities.

The Big Bang created a more powerful explosion than billions of atom bombs. The big bang, however, mysteriously produced the opposite effect and established a perfectly orderly world. The world we know, carefully designed to suit our needs, came into existence after this explosion.

How do you think the Big Bang produced such perfect order?

Allah created the universe from nothing by means of that big explosion. Obviously, our Lord also makes the perfect order in the universe.

Any answer other than the one above is wrong. For instance, saying that this order came into existence by chance after the explosion is irrational. Let's make an analogy to better explain why:

What would happen to the sand if a bomb were dropped on the beach? The sand particles would be scattered randomly this way and that, wouldn't they? What would you think if someone said that a castle came into existence because of an explosion on the beach? You would probably think him insane or think that he was telling a lie. Similarly, a person who claims that the order in the universe came into being by itself is mad. There are countless details, examples of balance and perfect order in this giant universe, which are incomparably more complex than a sandcastle.

In conclusion, the perfect order in the universe proves that the universe did not come into being by itself. Every order and balance existing in the universe is a sign of Allah's infinite wisdom.

## Chapter 2: THE UNIVERSE

In this chapter, we will dwell on the planets and other bodies in the universe. The Sun, Moon and Earth are among the ones we are most familiar with. There are, however, other celestial bodies in the universe you are not able to see.

Think about cartoon films or movies about space! The space above the clouds is full of stars, planets and meteorites that you have seen in these films. Each one of these is called a celestial body. Billions of these celestial bodies come together to form the giant collection of star systems we call galaxies. All celestial objects are enormous. For instance, our planet Earth is really quite small in comparison with the other celestial bodies. Despite this, it is big enough to hold human beings, animals, mountains, oceans and everything else you can think of.

Now let us proceed to the giant collection of star systems, the galaxies where billions of stars exist together.

### GALAXIES

Galaxies are composed of billions of stars. (Stars are big celestial bodies such as the Sun. Neither the Earth nor the Moon is a star.) There are about three trillion stars in the biggest galaxy. In a galaxy of an average size, there are about 200 to 300 billion stars, while there are about 100 billion stars in a small galaxy.

Now let's stop and think for a moment: What does the number one billion mean to you? For example, if you put two zeros next to the number one, it becomes 100. If you add one more zero to this number, it becomes 1,000. Add another zero and now you have the number 10,000 (ten thousand). Can you count up to 10,000? Maybe you can, but this will probably take a long time. Meanwhile, we still have not reached a billion. Then let us add two more zeros to 10,000. Now we have 1,000,000 (one million). We are still short of the number of stars in galaxies. However, if you put three more zeros next to 1,000,000, you reach the number 1,000,000,000 (one billion). Can you count up to 1,000,000,000? Let's answer this outright: Counting up to one billion would take a few decades, a decade being a period of ten years.

Now we have almost reached the number of stars in galaxies. If you put two more zeros next to the number 1,000,000,000, it becomes 100,000,000,000 (one hundred billion). This is the number of stars in the smallest galaxies.

Now do you have some idea of the size of the universe? If you spent all your life doing nothing but counting numbers, you would still fail to count all the stars in space. Allah, the Creator of the universe, has created this vast space that you are unable to imagine from nothing, and He encompasses every point of this immense universe every moment. Allah knows and sees every being in our giant universe, and everything that happens. The infinite power of our Lord is related in the Qur'an as follows:

**... He knows what is in the heavens and what is on earth. Allah has power over all things.** (Surah Al 'Imran: 29)

Now let's return to our topic and try to learn more about the galaxies.

In galaxies of average or large size, there exists a galactic centre. Around the galactic centre are arms rotating at immense speed. These arms are made up of stars, gas and dust clouds.

With their arms and centres, galaxies are the biggest celestial bodies in space. These giant celestial bodies also form clusters of celestial bodies. There are thousands of galaxies in some galactic clusters. Moreover, these galactic clusters form other clusters of celestial bodies. This regular clustering goes on and on, getting bigger and bigger.

Now let's go over what we have seen so far:

- Galaxies are composed of billions, even trillions of stars.
- The big and average galaxies have galactic centres.
- The galaxy has arms made up of stars, gas and dust clouds. These arms spin around the galactic centre at great speed.
- The galaxies come together to form galactic clusters. Sometimes, there may be thousands of galaxies inside a galactic cluster. The galactic clusters also come together in clusters of clusters.

Keep in mind that a galaxy composed of 100 billion stars is a small galaxy, not to mention that every star is at least as big as the Sun. In addition, there are both large and small planets such as our Earth that spin around many of these stars.

Now, consider the following: Could billions of stars gather together by chance in an orderly manner? Could the stars spontaneously establish an order in which they can move without colliding with other celestial bodies (for instance our Earth and other planets)?

These are all unlikely. This means that the stars' spinning and moving at great speed without colliding with other celestial bodies since the first day of their existence is a sign of the existence of a Creator, a Planner and an Organiser, Allah, the Ruler of the universe. Allah has created countless paths for the planets, stars and comets in space. All these celestial bodies follow their own paths without colliding with one another.

Now let's continue our journey with our galaxy.

## **The Milky Way**

The Milky Way is the name of the galaxy in which our Earth is located. The Milky Way galaxy is enormous. As is the case with all big galaxies, the Milky Way also has a galactic centre. You will probably remember what a galactic centre is since we discussed it in the previous section. The stars inside these centres are older stars; they are red or yellow in colour. The stars in the arms of the galaxies are mostly young and hot stars of blue colour. These aside, gas and dust clouds exist in these arms.

The Milky Way has the shape of a spiral; in fact, the shape of the galaxy is identical to a "pinwheel". That is, it has arms at the centre extending towards the outer parts. There are four arms. One of these is the "Hunter Arm". The group of planets called the "Solar System" is located in this arm, and our Earth is one of the planets within this group.

Our Solar System is located a little more than one half of the way out from the centre of this spiral-shaped galaxy. The Sun (and our solar system) is revolving around the centre of the galaxy, and makes a complete revolution every 220 million years or so.

The giant Milky Way has maintained this form and movement for billions of years. Although the stars in it revolve at great speed, they preserve their own paths.

However, it is not possible for stars to form such patterns on their own. It is also impossible for them to reach agreement; that is to line up in the most appropriate way and to move in an organised manner. Nor is it possible for the laws that govern these stars to have formed by themselves. Think about the stones in your garden! Could these stones take a decision and say, "Let some of us form the centre and the rest take up positions on the arms, and then perpetually spin in the garden"? Would you believe someone who says he had heard the stones talking to each other in this way? No doubt, you would not. By the same token, saying that the Milky Way came into existence by coincidence and the stars started to move of their own accord would be as funny as the example of stones in the garden. Keep in mind that celestial bodies are non-living, unconscious beings just like the stones in the garden.

No power other than Allah is capable of creating billions of giant stars in an orderly universe. Allah created them and the laws to which they are subject. They all testify to His power and control over the entire universe. For that reason, each piece of information we learn about the universe reminds us of Allah's existence and His creation of it. This way, Allah also shows us His infinite wisdom and knowledge.

Now, let us proceed to the stars.

## **STARS**

Stars and planets come into existence through the compression of the masses of gases and dust in space called "nebulae". For this reason, nebulae, the sources of celestial bodies, have a major role in the universe. Nebulae do not have any light of their own as is in the case of stars. Therefore, it is hard to see them. They become visible only when their inner gas gives off light or if they reflect the light coming from stars. We can also see them when they pass by a source of light.

Stars give off heat, light and energy. Apart from tiny stars, there are also very large stars. Surprisingly the Sun is not a major star as we believe to be; There are many stars much bigger than it.

Well, did you know that stars also have life spans? Stars are not living beings, but just like them, they are born, lead a life and die.

As we have shown, stars come into existence in the nebulae. A huge star's life often ends in an immense explosion, the material that makes it up being scattered in every direction. From these scattered pieces, there emerge the elements that contribute to the construction of relatively smaller stars and planets. The Sun and planets within the Solar System and our Earth have come into being following the explosion of a huge star in the past.

Now, let's take a tour in our Solar System and see how it looks!

# **THE SOLAR SYSTEM**

In our Solar System, there are nine major planets with 61 satellites and countless asteroids, all revolving around a single star called the "Sun". The Sun is located at the heart of the Solar System.

These nine planets, which are a part of our Solar System, revolve around themselves as well as the Sun in an orderly pattern. Let us review the names of the planets starting from the one closest to the Sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. As you can see, our Earth is the third planet from the Sun.

Every planet within the Solar System has different features. The temperatures on some of these planets are high enough to cause lead to melt. Others, on the other hand, are totally covered with ice. Some of the planets are entirely composed of gases. Moreover, some planets are as tiny as the Moon.

There is a very harmonious relationship between the satellites and their primaries. (In astronomy, a primary is something that another body revolves about. Earth's primary is the Sun; the Moon's primary is Earth.) Planets attract their satellites. However, satellites balance this attraction. Without such a balance, satellites would become stuck to the planets or break loose into space.

For instance, if the Moon rotated slower, it would plunge into Earth at an immense speed. This would mean the end of Earth. If it rotated faster, it would gradually move away from Earth and would no longer be our satellite.

Now let's look at the Sun, the heart of our Solar System.

## **The Sun**

The Sun is the greatest celestial body in the Solar System. It consists of very hot, glowing gases. Every second, explosions occur all over its surface, for the Sun itself is an enormous nuclear bomb. These surface explosions are equivalent to the energy given off by millions of atom bombs. They shoot off flares 40-50 times larger than our Earth.

The Sun looks like a ball of fire and gives off enormous heat and light from its surface. If the Sun did not exist, it would always be night for us, and our whole world would be covered with ice. Most importantly, there would be no life on Earth.

Space (you will also remember the films about the space) is a very dark, huge, empty place. Our Earth is a celestial body in this dark expanse, and no other celestial body is near enough to illuminate and heat our Earth.

The light from the Sun is very bright. You have probably tried looking at the Sun on a clear day. After looking for a few seconds, your eyes were dazzled, weren't they? Because its light is very bright, looking straight at the Sun is very dangerous for our eyes. As well as that, being exposed to sunlight for a long time in summer is dangerous. Severe sun-burns may occur on our skin, and they only heal up after medical treatment. Especially in summer, the heat radiating from the Sun is very high. However, the Sun is millions of kilometres away from Earth, and only one part in two-thousand of the heat it radiates reaches Earth.

If the temperature of Earth is so high despite the distance between Earth and the Sun, can you imagine how hot the Sun is?

Scientists provide approximate values for this. However, we cannot have any idea of this temperature by trying to compare it with the temperature of anything we are familiar with in this world. Consider that on the surface of the Sun, the temperature is 6,000°C (11,000°F). Inside, it rises as high as 12,000,000°C (21,600,000°F). There is nothing as hot on Earth with which you could compare this temperature! Your hands can hardly touch water around 50°C (120°F). Even on hot summer days, the temperature remains at about 40–50°C (105-120°F). This example shows that Allah tuned the distance between Earth and the Sun most delicately. If the Sun were a little closer to us, everything on the world would be withered and dried by the heat and turn into ashes. However, if it were a little more distant, everything would freeze. Of course, life would not be possible in either case.

Polar regions, where heat from the Sun is received less, are always covered with ice. The equator, on the other hand, the region where many more solar rays are received, is always hot. Allah has created these regions as examples for us. Other regions are more suitable to support life for human beings. This shows the mercy Allah pours down on us. That is because, if Allah had not tuned the distance between the Sun and Earth so delicately, life on Earth would be much harder for us. There might even be no life at all.

As we have explained earlier, Allah created the Sun and the Moon exactly the way it has to be for human life to exist on our planet. In the Qur'an, Allah informs us that the Sun and the Moon move by the command of Allah:

**Allah is He Who raised up the heavens without any support—you can see that—and then established Himself firmly on the Throne. He made the sun and moon subservient, each running for a specified term. He directs the whole affair. He makes the Signs clear so that hopefully you will be certain about the meeting with your Lord.** (Surat ar-Ra'd: 2)

## **The Gravitational Attraction of the Sun**

Countless celestial bodies move in an orderly manner without colliding with one another because Allah placed them in finely-adjusted orbits. An orbit is the path a planet or comet follows as it revolves around the Sun. No planet stops following its orbit to fly off into the depths of outer space. That is because planets remain under the gravitational attraction of the Sun. As you read these lines, our Earth is moving at the enormous speed of 108,000 kilometres (70,000 miles) per hour in its orbit around the Sun. An analogy may help you to grasp the enormity of this speed: the maximum speed a car can travel is around 200 kilometres (125 miles) per hour. This means the speed of Earth's rotation around the Sun is 540 times the speed of a car. Another example is the following: a bullet moves at a speed of 1,800 kilometres (1,100 miles) per hour. The speed of Earth's rotation around the Sun is 60 times the speed of a bullet.

Because of this high speed the Earth moves at, the gravitational pull of the Sun is very important. If the Sun started to exert less gravitational force, we would fly off into space together with the Earth. This would certainly be the end of Earth...

On the other hand, if the Sun started to exert an even greater gravitational force, then our Earth would plunge into the Sun and melt. In this case, we would also vanish. Furthermore, the gravitational pull of the Sun

also prevents the planets in their respective orbits from colliding with each other. However, have you ever thought how the Sun attracts these planets?

The answer is obvious. It is our Creator Allah, Exalted in Power, Who creates and continually preserves these balances.

Besides, not only the Sun has a gravitational pull. The planets within the Solar System also have their own gravitational forces. For instance, the gravitational force of Earth attracts the Moon towards it. Because of this gravitation, the Moon is almost suspended at a certain distance. In this way, Earth does not collide with the Moon. Without doubt, the infinite might of Allah prevents the Moon from falling onto Earth.

There is another gravitational pull similar to that of the sun, which is specially designed for mankind to live. That is the gravitational pull of the earth that gives us our weight. The gravitational force, which we experience as weight, holds us on Earth and provides us with the ability to walk and run with ease without floating off into space.

Assume that there is a ball in your hand. What happens when you withdraw your hand? The ball drops, doesn't it? That is because gravity attracts it to the ground. However, if you left this ball far out in remote outer space, the ball would not fall down since there is less gravitation there. Therefore, the existence of the higher force of gravity on Earth is essential for us.

There is another very important detail about gravitation: Gravitation should be neither more nor less than its current force. If it were less, you would be walking up in the air and not be able to touch the floor with your feet. You would not be able to move as you wish; you would constantly drift from one place to another, bounce when you take a step and hit the ceiling. Similarly, if the gravitational force of Earth were greater, you would not be able to walk because you would be drawn down towards the ground. You would only be able to crawl along the ground, if that.

Yet, none of these happen to us; Allah has created exactly the right strength of gravitation for us.

You can attain a better understanding of this by help of an example: The Moon, like Earth, also has a gravitational force. However, this gravitational pull is less than the one on Earth. Therefore, it is not possible for you to survive on the Moon. On television, you have probably seen how astronauts walk on the Moon. Could we spend our entire life this way? Definitely not.

Now let us continue our journey by visiting the planets within the gravitational pull of the sun.

## **PLANETS**

We mentioned earlier that planets are the celestial bodies that rotate around the stars. In this section, we are going to examine the planets in the solar system our Earth is located in. If we assume the Solar System to be a circle, the Sun is right at the centre of it.

Pluto is the planet on the outermost circle. Pluto is the smallest and farthest planet from the sun. Observation of this planet is hard, and even the Hubble telescope can only show some rough details of its surface. This planet is quite a cold place. The temperature is around  $-238^{\circ}\text{C}$  ( $-396^{\circ}\text{F}$ ). In winter, when the temperature on Earth dips below  $-2$  or  $-3^{\circ}\text{C}$  ( $28$  or  $26^{\circ}\text{F}$ ), it becomes freezing.  $-238^{\circ}\text{C}$  ( $-396^{\circ}\text{F}$ ) is a temperature

100 times colder than a temperature we on Earth can hardly resist in wintertime. This kind of cold would end our lives. From the outside, Pluto looks like a ball covered in ice.

Advancing closer towards the sun, we meet Neptune. This planet is also quite "cold"; its surface temperature is about  $-218^{\circ}\text{C}$  ( $-360^{\circ}\text{F}$ ). Its atmosphere consists of gases poisonous to human beings. This aside, dreadful storms reaching up to 2,000 kilometres (1,250 miles) per hour blow over its surface.

Moving a little further towards the sun, in the middle of the circle, we meet Uranus. Uranus is the third largest planet in the Solar System. The temperature of its atmosphere is about  $-214^{\circ}\text{C}$  ( $-353^{\circ}\text{F}$ ), which means this planet is cold enough to freeze us in only a second. Its atmosphere consists of poisonous gases that definitely would not support life.

If we continue our journey towards the sun, we next encounter Saturn. This, the second largest planet of the Solar System, is particularly notable for the system of rings around it. These rings are made up of gases, rocks and ice. The temperature on this planet is again unsuitable for human life:  $-178^{\circ}\text{C}$  ( $-288^{\circ}\text{F}$ ).

When we come even closer to the sun, we encounter Jupiter, the largest planet of the Solar System. Jupiter is a planet 11 times bigger than Earth. Conditions on this planet are again not suitable for life, and it is a very cold place.

After Jupiter comes Mars. Mars is a dead planet that does not even compare to Earth. Mars has no life on it. There are reasons for this: First, the atmosphere of Mars is a poisonous mixture containing concentrated carbon dioxide. Second, there is no water on the planet. Third, the temperature on Mars is about  $-53^{\circ}\text{C}$  ( $-63^{\circ}\text{F}$ ). Finally, there are very strong winds and sandstorms on Mars that last for months.

The blue planet that appears before us after Mars is our Earth. We will focus our attention on our planet Earth in the last chapter. Meanwhile, let's remind you of one point: Our Earth is the only planet that allows organisms to live.

Heading towards the sun, our search brings us to a planet called Venus. Venus is the brightest celestial body after the Sun and Moon. Therefore, people have known it since ancient times. Although all the planets as far out as Saturn have also been quite familiar to people throughout the ages, Venus is incomparably bright and clear in both the morning and evening skies. In contrast to the other planets, Venus is very hot. The temperature on the surface is  $450^{\circ}\text{C}$  ( $840^{\circ}\text{F}$ ), which is enough to cause even lead to melt. Another feature of Venus is its heavy atmosphere composed of a concentrated layer of carbon dioxide. Besides that, the atmosphere of Venus contains layers of acid several kilometres deep. No organism could survive in such a place for a second.

Speeding away from Venus, we reach Mercury, the planet closest to the sun. Its rotation has been so slowed down by its proximity to the Sun that the planet makes only three full turns in the time it takes to revolve twice around the sun. That is why one side of Mercury is extremely hot while the other is extremely cold. The difference between the day and night sides of Mercury is as much as  $1,000^{\circ}\text{C}$  ( $1,800^{\circ}\text{F}$ ). Of course such an environment cannot support life.

Our search so far reveals that except for Earth, none of the planets in the Solar System offers anything that might serve as a haven for life. Each of them is a lifeless and silent body. Our world, however, is a planet that provides everything necessary for life. With its green forests and blue oceans, it looks beautiful from space. The first astronauts on the Moon were astonished by the colourful and bright view they had of Earth.

## OTHER CELESTIAL BODIES

Some other celestial bodies in the Solar System are comets, asteroids and meteorites. These are the celestial bodies remaining from the nebula in which the Solar System originated four to six billion years ago.

- **Comets** are made up of condensed gases and dust. Sometimes, their orbits bring them closer to the sun. As the comet approaches the sun, its surface starts evaporating because of the heat. This evaporation causes a bright light. A huge ball of gas and dust appears around the nucleus. This ball of gas and dust is called a "coma". Also, there is a tail of gas and dust related to this coma.

- **Meteors** are rocky objects in space. Usually, they are observed in between the orbits of Mars and Jupiter. In some cases, the diameter of meteors may be as much as 1,000 kilometres (620 miles).

- **Meteorites** are solid bodies which fall to Earth from outer space. Pieces of rock, or mixtures of rock and iron detach themselves from meteors and comets. Sometimes when Earth passes through the dust cloud remaining from a comet, for example, the objects within this dust cloud burn in the atmosphere. They heat up when they enter Earth's atmosphere and leave a fine line of light in the sky. This is called a meteor. Sometimes, when they do not burn completely, meteors strike the Earth. These meteors that reach Earth are called aerolites or meteorites.

Consider one important point here: Meteors that reach the atmosphere occasionally fall on the Earth. When they fall, the destruction they cause varies according to their size. Our Earth is vulnerable to such a threat at every moment, but our Lord has created these celestial bodies in such a way that they are usually burned and destroyed in the atmosphere and thus are no danger to us. This shows Allah's mercy and compassion for us as well as the protection He provides us.

You must now have grasped that Allah has control over all celestial bodies, whether huge or small, and governs them all at every moment in a planned and orderly manner.

## **Chapter 3: THE EARTH**

In this chapter, you will come to know the planet Earth better. You will understand the importance for our lives of Earth's shape and of the blue sky. You will also have a chance to recognise that the perfect systems you observe are created by Allah only to make our lives liveable.

### **THE FINELY-TUNED BALANCES OF OUR EARTH**

Until the sixteenth century, that is 500 years ago, although some of the Greeks did have an idea about it, people did not generally know that Earth was a planet. Observations made at that time helped people to recognise this. In the 20th century, mankind was sure about the location of Earth in the Solar System. Earth is the third farthest planet from the Sun and the fifth biggest planet.

Scientists believe that Earth has an iron core which has a temperature of 7,500°C (13,500°F). This is even hotter than the surface of the sun. However, because you never feel a bit of this terrible warmth, you can sit in your classroom listening to your teacher or sleep soundly in your bed. Earth's crust insulates us from this heat. Allah is very merciful to us because He has created the Earth's crust on which we live thick enough to prevent the heat getting through it. Moreover, Allah has created a human-friendly atmosphere for us. He has also given plants some features so that they can maintain the oxygen-carbon dioxide balance.

This structure of Earth and other fine balances reveal that Earth is specially designed for mankind to live on.

From its atmosphere to its geography, from its distance from the Sun to all forms of balances, Earth is a special planet created to support life. For example, we may compare our Earth to an aquarium. An aquarium provides the most appropriate conditions for fish. A thermostat maintains the proper temperature of the water, there is a motor for ventilation and sand placed on the bottom. There are special pills to be placed in the water, there is the protective cover of the aquarium, a filter system continually filtering the water, and a continuous food supply... All these support the life of the fish in the aquarium.

However, the fish within the aquarium are unaware of this artificial environment. They assume they live in a "natural" setting or an environment that came into existence spontaneously. They are unaware that someone has supplied the thermostat and adjusted the levels of the water or the functioning of the ventilating motor. They also do not know who provides the food that suddenly appears on the surface of the water. Nevertheless, the source is obvious; the owners of the aquarium provide everything the fish need.

Obviously, life on Earth requires more delicate systems than life in an aquarium.

A person of wisdom does not spend his life in ignorance like fish in an aquarium. He understands that Earth is "ready-made" for him and it has a Creator and a Governor. Without doubt, Allah established these delicate balances and this order that make life possible on Earth. An intelligent person wants to know the Lord Who gives all these blessings to him and to learn what He expects from him. In the Book He has sent us, Allah lets us know Him and informs us about His expectations of us.

No doubt, Allah set up the fine balances and the order making life on Earth possible. Allah tells us about this in the Qur'an:

**We placed firmly embedded mountains on the earth, so it would not move under them, and We put broad valleys as roadways in it, so that perhaps they might be guided. We made the sky a preserved and protected roof ...** (Surat al-Anbiya': 31-32)

Allah designed, balanced, and harmonised every detail on Earth to make it a liveable place for us. Anyone who realises this fact should believe in Allah, see His infinite power and be grateful for everything He has given him.

Now, let's examine some of the balances Allah, our Creator, has created on our planet and witness His infinite Might.

## **Location of Earth in the Universe**

What would happen if our Earth were a little closer to the sun? The answer is obvious because everybody knows that the heat of the Sun is scorching. Indeed, because of this enormous heat, we would neither have the current atmosphere nor the oceans and the seas... The temperature would be so high that the majority of the water on Earth would evaporate. In that case, no water would remain on Earth. Earth would be as dry as a desert.

For example, in an earlier chapter we mentioned that the planet Venus is closer to the Sun than our planet. Therefore, the temperature of Venus is higher than that of Earth. At times, this temperature may rise up to 475°C (885°F). In order to visualise how high this temperature is, just think that when you put some water on the hot-plate, it starts boiling at 100°C (212°F).

Now, let's think of the opposite. What if Earth were farther from the sun? In this case, our Earth would receive less heat. You can imagine that if this were the case, a great part of Earth would freeze and turn to ice. Earth's surface would resemble the dry, icy surface of Mars, which is the planet a little bit farther from the sun than the earth. We can draw a conclusion from these cases: Our Earth is located just at the right place! How do you think this has happened? Could it be a coincidence that our Earth is in exactly the right place? Surely, that cannot be. The Earth is a non-living and unconscious planet. It is unlikely that it could work out the most appropriate place on its own, or settle itself there by coincidence. The fact that Earth is in the most suitable location is a sign of Allah's perfect creation.

The latest astronomical findings have shown the importance of the other planets' existence for Earth. For example, Jupiter's size and position turn out to be critical. As the biggest planet in the system, Jupiter makes the Earth's orbit more stable.

If a planet of such size did not exist where Jupiter is, Earth would be the target of meteors and comets wandering about in space. In short, Jupiter is like a shield protecting Earth. If Jupiter were in some other orbit, our earth, and therefore we would not be around.

A wise person who knows all these things, understands that nothing in this universe is created without purpose. This understanding is described in the Qur'an as follows:

**In the creation of the heavens and the earth, and the alternation of night and day, there are Signs for people with intelligence.** (Surah Al 'Imran: 190)

As the verse suggests, we should think over the creation of the heavens and the earth. What you have learned from this book illustrates Allah's creation of the universe. When you reflect on this knowledge, you will have a better comprehension of Allah's power.

### **OUR EARTH'S SHAPE IN THE OUR'AN**

**Dear Children**, you know that our Earth is round. Thanks to technological breakthroughs, this fact is also observed in the photographs of Earth taken from space. The Qur'an that Allah sent us 1,400 years ago makes certain statements that led Muslim scientists to understand that the Earth is round.

**He created the heavens and the earth with truth. He wraps the night around the day and wraps the day around the night...** (Surat az-Zumar: 5)

"Takwir," the word used for "wrapping around" in Arabic, means "to fold something round about as cover". The information provided in the verse about night's wrapping around day and vice versa, (takwir) also stimulates one to think of the world as a globe.

During that period, however, it was extensively believed that the Earth was not round but flat. All scientific computations and explanations were based on this flawed approach. At the period, people were so ignorant about space that some people held the weird belief that the Earth was placed between the horns of an ox.

Dear Children, you have recognized that the information scientists could only attain centuries after the revelation of the Qur'an were hinted at by Allah in the Qur'an a long time ago. This is one of the obvious proofs that the Qur'an is the Word of Allah, the One Who has created the entire universe and Who has knowledge of all things.

## **The Temperature of Earth**

Dear Children, do you know what the average temperature in space is?  $-270^{\circ}\text{C}$  ( $-455^{\circ}\text{F}$ )! Such a low temperature makes life impossible. The average temperature of our Earth is between  $15^{\circ}\text{C}$  and  $20^{\circ}\text{C}$  ( $60-70^{\circ}\text{F}$ ). This temperature varies considerably as one rises to the upper layers of the atmosphere.

For instance, the African continent is a hot region. What would you say if we asked you, "Can you make a snowman in Africa?" We already know your answer. Probably most of you will answer: "In order to make a snowman you need some snow. Since it is unlikely to find snow in such a warm region, there is no chance of making a snowman." However, you are wrong, because you can make a snowman in the African continent at any time you like, even though it is known to be extremely warm. To do so, you must climb mount Kilimanjaro, whose peak is the highest point on the continent from the ground, the temperature decreases. The temperature falls

to nearly  $-50^{\circ}\text{C}$  ( $-58^{\circ}\text{F}$ ) in the atmospheric layer called the "Stratosphere". Rising further, the weather warms up again. Owing to the protection Allah provides for us, no huge temperature differences exist on Earth.

The maintenance of this temperature range is both related to the amount of heat that the Sun radiates as well as the distance between Earth and the Sun. In the previous chapters, we touched on this topic. We will tackle this issue in detail here. According to calculations, a reduction of just 10 percent in the energy given off by the Sun would result in the Earth's surface being covered by layers of ice many metres thick. Yet if the Sun's energy were to increase a little, all living things would be scorched and die.

The speed the Earth spins at also helps keep the temperature distribution in balance. The Earth makes a complete rotation once every 24 hours. For this reason, the alternating periods of daylight and darkness are short. Because they are short, the temperature differences between night and day are quite small.

The importance of this can be seen in the extreme example of Mercury, where a day lasts longer than a year and where the difference between day-time and night-time temperatures is almost  $1,000^{\circ}\text{C}$  ( $1,800^{\circ}\text{F}$ ).

Geography also helps distribute heat equally over the Earth. There is a difference of about  $100^{\circ}\text{C}$  ( $212^{\circ}\text{F}$ ) between polar and equatorial regions of Earth. If such a temperature difference were to exist over a completely level area, the result would be wild winds sweeping away everything in their path.

Instead, Earth is full of geographical barriers that block the huge movements of air that such temperature differences would otherwise cause. Those barriers are chains of mountains like the one that stretches from east to west, beginning with the Himalayas in China and continuing with the Taurus mountains in Anatolia and the Alps in Europe.

We have learned how our Earth maintains its temperate, although the temperature in outer space is around  $-270^{\circ}\text{C}$  ( $-455^{\circ}\text{F}$ ). If the temperature of Earth were too cold or too hot, to the extent of becoming a threat to human life, we would simply not be able to survive. Therefore, the moderate temperate level on Earth is Allah's blessing. In return for this blessing, we ought to show gratitude to Allah, Who provides the most beautiful conditions of life for us. This is one of the most important things we need to keep in mind.

How big is Earth and how does Allah protect our Earth against other bodies in space?

In the next section, we will answer these questions...

## **The Size of Earth And Its Protection from Other Celestial Bodies**

As you will remember in earlier sections, we mentioned the varying sizes of planets.

Now let's compare our Earth with other planets with respect to their sizes. Let's start by making the following comparison: Let's imagine that our Earth is a pea. In this case, Mercury could be considered a sesame seed, Venus a pea like our Earth, Mars a watermelon seed, Jupiter an orange, Saturn a tangerine, Uranus and Neptune cherries, and Pluto a sesame seed. These apart, the Sun would be a huge ball bigger than a basketball in comparison to our pea.

Is the size of Earth as compared to other planets "coincidental"? Or, on the other hand, is it deliberate?

When we examine the size of Earth, we can easily see that our planet was designed to be exactly as large as it is.

If Earth were a little smaller, gravitation would weaken and prove too feeble to hold the atmosphere around it. Without the atmosphere, our world would be vulnerable to meteors and harmful radiation from space. In addition, loss of oxygen would mean the end of life. If the Earth were larger, the gravitational pull would increase tremendously, turning the atmosphere into a deadly mixture since it would preserve some poisonous gases.

In addition to its mass, the interior of Earth is also specially designed. The layers of the core move around each other, and this movement is what creates Earth's magnetic field. This magnetic field has a vital role in the preservation of life. Extending far beyond the surface, this field protects Earth from the effects of harmful radiation from outer space.

Other scientific findings show us that the universe has not been left abandoned. Certainly, Allah; the Lord of the universe, the Creator, holds control over the entire universe, and creates and sustains the galaxies, stars and planets under His power.

The blue planet on which we live is a special creation of Allah. In the Qur'an, Allah describes this amazing creation in the 2nd verse of Surat al-Furqan with the words "**He created everything and determined it most exactly.**" It may be that this statement makes it plain, as do many other verses of the Qur'an, that on this planet, Allah provides everything man needs.

Dear Children, from now on we will start exploring Earth. First, let's examine the reason why our Lord created blue oceans and seas and learn the blessings they offer us.

## **Oceans – Seas**

71 percent of Earth's surface is covered with water. Earth is the only planet where water is in its liquid form. Water gathering in giant holes forms the oceans, which are essential for life to exist.

For example, they prevent sudden variations in atmospheric temperature and thus help living things to exist within a stable range of temperatures. They also soften the climates. In addition, oceans shape seashores through erosion and corrosion. On no other planet does there exist such a system.

Moreover, oceans offer a variety of fish and seafood to us. Eating this delicious seafood, swimming in the sea and travelling by boat are all blessings that Allah has given us.

Dear Children, Allah has created everything we need perfectly. Of course, apart from these beautiful things, there are also dangerous things such as the volcanoes that sometimes erupt, although they usually remain silent. Now, we will turn our attention to these volcanoes.

## **Mountains That Spray Magma**

Because the magma, or melted rock, under Earth's crust is in liquid form, it occasionally finds a way out through the cracks on Earth's crust and violently erupts. This scary event is called a volcanic eruption.

Often with a great explosion, the volcano erupts spewing tons of dust and ash into the atmosphere. This eruption forms a giant, dark cloud in the sky. Then magma starts moving over Earth's surface, wiping out the forests and cities it encounters.

The magma flowing from the volcano over the Earth is called "lava". In time, lava cools on the Earth's surface and solidifies, forming rocks. Throughout history, many cities were destroyed because of such disasters. For instance, in the first century CE, sudden volcanic eruptions obliterated the town of Pompeii, then a very prosperous Roman town, from the face of the earth. It was so sudden that people in the town died before they had a chance to escape. The lava rapidly reached the town of Pompeii and covered the whole town, leaving all its residents for dead.

No soul remained alive; the people of Pompeii, who were known for their disobedience to Allah's commands and their immorality, died at once. The inevitable end awaiting these and similar people is described in the Qur'an as follows:

**...Against some We sent a sudden squall of stones; some of them were seized by the Great Blast; some We caused the earth to swallow up; and some We drowned...** (Surat al-'Ankabut: 40)

Dear Children, these verses indicate that Allah has power over all things and He can destroy everything on Earth whenever He wills. Nobody is safe from His punishment. However, Allah is also very compassionate and merciful to His servants. Throughout this book, we have seen much evidence of Allah's endless compassion. That these volcanic eruptions only occasionally take place is another blessing of Allah if we would only reflect upon it.

## **ATMOSPHERE**

Dear Children, do you ever wonder what is happening in the sky when you look up? We believe you are all curious about it. Let us now turn our minds towards the skies!

The layer of air around Earth is called the "**atmosphere**". The atmosphere is made up of seven layers. Each layer is composed of different gases, all in perfect harmony with one another.

In the Qur'an, Allah mentions that He arranged the heaven into seven heavens:

**In two days He determined them as seven heavens...** (Surah Fussilat: 12)

The word "heaven" used in many verses in the Qur'an also means "sky". It is also thought to refer to the different depths of space as well as the Earth's sky. If this second meaning of the word is considered, it is stated in the verse that Earth's sky, that is, the atmosphere is made up of 7 layers. Of course, there can be other meanings of the verse, but it is very interesting that when we study the sky, we find that it is composed of seven layers:

- **Troposphere:** This is the part closest to Earth's surface. The thickness of this layer varies according to the climates. The temperature drops as the altitude increases, and the temperature at the highest altitude is between  $-51^{\circ}\text{C}$  ( $-60^{\circ}\text{F}$ ) and  $-79^{\circ}\text{C}$  ( $-110^{\circ}\text{F}$ ).

- **Stratosphere:** The layer above the troposphere. The temperature rises as one moves upwards.

- **Mesosphere:** The layer above the stratosphere. Here, the temperature drops to  $-73^{\circ}\text{C}$  ( $-100^{\circ}\text{F}$ ).

- **Thermosphere:** This is the layer above the Mesosphere. The temperature rises at a slower rate. The temperature difference between night and day is more than  $100^{\circ}\text{C}$  ( $212^{\circ}\text{F}$ ).

- **Exosphere:** The layer that begins at an altitude of 500 kilometres (310 miles) above Earth's surface.

- **Ionosphere:** Gases in this region are found in ionic form. These ionised gases are what give the layer its name.

- **Magnetosphere:** Due to the Earth's magnetic field lying in this layer, it is called the Magnetosphere. This layer, which functions like a protective shield, is located between 3,000 and 30,000 kilometres (1,850 and 18,500 miles) above the surface. As we explained before, this region, which protects the Earth against harmful radiation coming from space, is called the Van Allen belt.

To have a better grasp of how important the atmosphere is for us, let's also look at the other planets. For example, let's assume we are on the planet Mercury. There is no atmosphere on this planet. However, an atmosphere is essential for life. So far, we have mentioned the importance of the gases in the atmosphere, such as oxygen, or the protective features of the atmosphere. There is, however, also the weight of the atmosphere, which is fundamental to human life.

The atmosphere is made of light air.

This does not mean that the atmosphere has no weight. Actually, these layers of air kilometres-thick rising above us are very heavy.

According to research, the atmosphere applies tons of weight in pressure on every one of us. This is called "**air pressure**". Now you may raise the question, "So, why aren't we crushed?" We aren't crushed because our bodies are created with the strength to withstand the weight of the atmosphere. We would no longer function or even exist in an environment with a lower air pressure. That is because, without this pressure, the blood circulating rapidly in our body would exert tremendous pressure on our veins. Unless balanced by atmospheric pressure, our veins would burst due to the high pressure.

Therefore, it is not possible for human beings to live in an environment, such as Mercury's, lacking an atmosphere.

There is an atmosphere on the planet Venus. Because the pressure on Venus is ninety times greater than the pressure of Earth's atmosphere, it does not provide suitable conditions for human life. From this information, we understand that no life can exist on the planet Venus since under its great pressure all living things would be crushed.

Let us go over the points we made earlier: The atmosphere is one of the essentials for life on Earth. The atmosphere has many functions, some of which have been briefly explained above. As you will remember, one of these is the importance of the gases that make up the atmosphere for human life. If the atmosphere did not exist, living things could not breathe, and thus there would be no life on Earth.

Another function of the atmosphere is to protect our Earth against threats from outer space, such as meteors. The atmosphere prevents meteors from falling on Earth and causing harm.

The atmosphere also blocks harmful radiation coming from space. Thanks to the atmosphere, only 7 percent of this harmful radiation reaches Earth. Here is another topic to think over: The radiation that is capable of supporting life on Earth is just the kind of radiation that Earth receives. As you will remember too, the distance of our Earth from the Sun is just right, neither too far away nor too close.

Dear Children, could the atmosphere, which is so critical for our lives, have originated by itself, by chance?

A good analogy showing that this is certainly not a possibility is the following: Think about delicious sweet cakes. What gives these cakes their delicious taste? No doubt, they are so delicious because your mother adds just the right amount of ingredients to the flour, kneads the dough properly and finally bakes it at the right temperature. Would you believe someone who says, "You actually don't need your mother for these delicious cakes; they can cook themselves spontaneously"? Of course, you would find these words nonsense. In this case, could the atmosphere surrounding our Earth have come into existence spontaneously? We already know that this is improbable.

Someone who knows all this would probably say the following when he looks at the sky, "If Allah had not created the atmosphere, it would be impossible to live on Earth." Or, he would think to himself, "Allah is Exalted in power. If our Lord did not protect our Earth, giant meteors would strike Earth and destroy it completely." You can reflect on all the information you learn in a similar way. This is also a way to show your gratitude to Allah.

## **The Atmosphere's Suitability for Life**

Earth's atmosphere is equipped with all kinds of features essential for life. Now, let's describe the special structure of our atmosphere.

Earth's atmosphere consists of 77 percent nitrogen, 21 percent oxygen and 1 percent carbon dioxide, argon and other gases. Let us first examine oxygen.

Oxygen is essential for life, since the energy needed for living beings is obtained through chemical processes most of which take place through oxygen. That is why we always need oxygen, and breathe to meet our need for oxygen.

The level of oxygen in the atmosphere is just right for life. If this ratio were 22 percent instead of 21 percent, just one flash of lightning would be enough to burn a whole forest. If this ratio were 25 percent, huge fires would burn the Earth, since oxygen is a flammable gas.

The following question might occur to you: What would happen if all oxygen in the atmosphere were used up? Despite the heavy air pollution of the last century, this hasn't yet become a threat, since more than 80 percent of the oxygen produced on our Earth is generated by microscopic organisms in the oceans. That is, even if all the forests disappeared, there would still be oxygen in the atmosphere.

A perfect system maintains the oxygen content in the atmosphere. This is called the recycling system. Animals and human beings use up oxygen and produce carbon dioxide. Plants, on the other hand, consume carbon dioxide and produce oxygen. They maintain the continuity of life by turning carbon dioxide into oxygen. Every day, billions of tons of oxygen are produced by plants and released into the atmosphere.

One point deserves special mention here. Why do only plants produce oxygen? Would not life be easier if all living beings produced oxygen?

No, absolutely not! Life would not be easier. On the contrary, if animals and human beings also produced oxygen, the oxygen ratio in the atmosphere would increase so much that the atmosphere would become "flammable" in a short while. Consequently, a tiny spark would cause enormous fires.

On the other hand, if all living beings, including plants, produced carbon dioxide, then the oxygen in the atmosphere would be quickly consumed and living things would start dying of "suffocation" in great numbers, since there would no longer be any oxygen to breathe.

Dear Children, as you see, apart from protecting us, the atmosphere preserves the oxygen we need to breathe. Allah has created many interrelated systems to keep the oxygen level stable. That is, Allah has created many delicate balances. This is very easy for Allah.

Always keep in mind that every breath you take without difficulty is a reason to be grateful to Allah. That is because, if Allah did not so will it, there would be neither atmosphere nor oxygen.

## **CLOUDS THAT DRIFT**

When we look at the sky, we see white or grey clouds that look like lumps of cotton-wool. Sometimes we think they resemble some other objects, don't we? Have you ever thought how clouds come into existence? Now, let's see how.

Every day, the Sun's heat causes water on the Earth's surface to evaporate. This form of water existing in the air is called "water vapour". Air coming closer to the ground grows warm. Warm air rises, and on its way it carries the water vapour to higher altitudes. At high altitudes, the water vapour inside the warm air encounters cool air and thus turns into tiny water droplets and forms clouds.

Water evaporating from oceans rich in salt and lakes with a high mineral content carries these salt particles upward to higher altitudes. These particles of salt are so tiny that they are invisible to the naked eye. Winds that carry these droplets collect 27 million tons of salt in a day in the atmosphere. These salts form the centres of the raindrops-to-be.

Clouds look like cotton-wool from Earth. You may therefore assume that they do not weigh very much. However, when these water crystals turn into rain, you see tons of water falling to the ground. An average rain cloud consists of 300,000 tons of water. (One ton is equal to 1,000 kilograms (2,200 pounds). 300,000 tons is 300 million kilograms (660 million pounds). If you consider that the weight of an average adult is about 60-70 kilograms (130-150 pounds), you can see how enormous this figure is.) 300,000 tons hangs in the air.

Allah brings down the rain from these giant clouds to revive the Earth. In this way, every corner of Earth receives enough water. In the Qur'an, our Lord informs us how clouds cause rain:

**Do you not see that Allah propels the clouds then makes them coalesce then heaps them up, and then you see the rain come pouring out of the middle of them...** (Surat an-Nur: 43)

Besides that, Allah draws our attention to the purity of the water He sends down from the sky:

**... And We send down from heaven pure water.** (Surat al-Furqan: 48)

As the verse above suggests, rain falls on the ground pure and clean. It includes a very small amount of salt and minerals. This is surely a blessing of Allah, since soil receives the salt and minerals it needs from rainwater. If the water evaporating from the oceans contained a high ratio of salt, when it fell on land in the form of rain this would be very harmful to life on our planet. If rainwater were very salty, it would wither the soil and plants away, which would result in the death of all living things. In brief, life on Earth would soon come to an end. However, this never happens, because Allah has great compassion for people. This we are informed in the Qur'an:

**Have you thought about the water that you drink? Is it you who sent it down from the clouds or are We the Sender? If We wished We could have made it salty, so will you not give thanks?** (Surat al-Waqi'a: 68-70)

The explanation in the verse above makes it clear that Allah specially created everything on Earth suitable for human life.

Dear Children, as you have seen, we have no power over anything we need for our lives. Unless Allah willed it, we could not live on Earth. For this reason, at every moment we should remember that Allah is the Creator of everything and we should always thank Him.

We have learned how water on Earth evaporates, how clouds form and turn into rain. Now, how about learning how rain falls on Earth in due measure?

## **MEASURE OF THE RAIN**

Rain falls down to Earth in a certain measure. This measure has only been worked out by contemporary research. Computations reveal that 16 million tons of water evaporate every second. In a year, this amounts to 505 trillion tons. Again, each year, 505 trillion tons of rain fall on Earth's surface. As it turns out, this amount is the same from one year to another. This fact, which has recently been discovered by scientists, is reflected in the Qur'an, which was revealed 1,400 years ago:

**It is He Who sends down water in due measure from the sky ...** (Surat az-Zukhruf: 11)

Dear Children! It is very fascinating that Allah refers to an exact measure, or amount, in which He sends down water from the sky, as is the discovery that the amount falling every year is constant. Here, the parallel is very striking.

The evaporation and condensation of equal amounts of water mentioned above, that is the "water cycle," maintains the continuity of life on Earth. Maintaining this measure artificially would be impossible, even if all contemporary technological means were put to use.

A minor change in the water cycle would cause great instability in nature in a very short time, which would ultimately mean the end of life. However, that never happens; Earth's surface always receives the same amount of rainfall. Allah "sends down water in due measure..."

You must by now have understood that Allah holds the measure of rainfall under His control. Otherwise, how could it be possible that the same amount of rain falls on Earth each year? This is improbable. Allah is the Lord of the entire universe, and everything happens by His will.

Now we will turn our attention to a very interesting topic, the rainbow.

## **THE COLOURFUL RAINBOW**

You must have seen a rainbow at least once in your life. If not, you have probably seen a picture of one in a book or on television. The sight of a rainbow is quite astonishing, since its colours and shape are enchanting. Have you ever wondered how this colourful arc comes into existence? If you haven't, let us tell you.

A rainbow sometimes appears when the Sun comes out after rain. It is an arc of seven colours lined up one after another. The rainbow looks like a crown and has a very impressive appearance.

A rainbow is actually a trick of the light. It consists of the basic colours of sunlight. Indeed, the white rays of the Sun are actually multi-coloured. These colours coming from the Sun are called the spectrum. The basic colours of the spectrum are red, orange, yellow, green, blue, indigo and violet. The white of sunlight is formed when these colours are combined. Once sunlight passes through a drop of rain, the colours that make it up appear. That is because water refracts, or separates the colours of, light. These separate colours pass through the raindrop and refract out at different angles.

Does this seem complicated? If you think it is, find a crystal glass and flash a strong light through it. Here, the glass assumes the role of the raindrop. You will see that when the glass is exposed to a strong light, a small rainbow appears on the wall.

While talking about rainbows, we always see them as semicircular. However, this is not true, since the rainbow is actually a circle. However, it is not possible to observe all of this circle from the ground. Therefore, we always see the rainbow as semicircular. Only from an aeroplane could we see the rainbow as a circle.

The centre of the rainbow's circle is always a point exactly opposite the Sun. When the Sun rises higher, the rainbow also moves higher to remain at the level of the Sun.

Our Lord creates this colourful and enchanting sight of a rainbow especially so that we can take pleasure from the beauties of Earth, and reflect on His power and attributes. Allah has the power to create an infinite number of beautiful things. Therefore, this does not surprise us but makes us appreciate Allah better and be more grateful to Him.

Now we will focus our attention on another astonishing splendour. This time, we will examine a small celestial object, the moon that astonishes us with its beauty at night.

## **THE MOON THAT ILLUMINATES OUR NIGHTS**

The moon resembles an enormous stone ball that spins around our Earth. At night, in a cloudless sky, the moon shines brilliantly in the pitch-black. However, the Moon is not a real source of light. Just like a mirror, it reflects the light of the Sun. This feature of the moon is referred to in the Qur'an:

**Blessed be He who placed constellations in the sky and put a blazing lamp and shining moon among them.** (Surat al-Furqan: 61)

We always see the same side of the Moon since it rotates both around itself and around the Earth every twenty-nine days. Since the period of rotation in both cases is the same, we always see the same face of the Moon.

When we look at the sky at night, the moon sometimes appears as a circle and sometimes as a semicircle. As the Moon rotates around Earth, its illuminated face takes different shapes.

Earth and the Moon attract one another, but the gravitational force of Earth is six times greater than that of the Moon. Despite this, the gravitation of the Moon influences Earth and causes "lunar tides" in the oceans and seas. A regular variation occurs in the surface level of the oceans. If the gravitational attraction of the Moon were stronger, the tides would cause water levels to rise and fall considerably. Under such circumstances, regions near the oceans and seas would be flooded regularly.

However, during tides, water usually rises to a moderate level because our Lord has "fine-tuned" the gravitational forces of the Moon and Earth so as to protect us from disaster.

## **NIGHT-DAY AND THE SEASONS**

During its rotation on its axis, our Earth is slightly inclined from its orbit. This is what causes the formation of the four seasons: spring, summer, autumn and winter.

If Allah willed, however, our Earth would stand straight upright to its orbit. Then there would be no seasons. The temperature would be the same all over Earth. From the food we eat to the air we breathe, our lifestyles and environment would be completely different.

Dear Children, have you ever wondered how night and day come into existence? Space is completely dark. However, on our Earth, which is also in space, there is an alteration between night and day. In the morning, we wake up to sunshine but when night falls, it becomes dark. Well, how do you think our Earth becomes bright in the morning?

As our Earth moves along its orbit, it also turns around itself like a spinning top. As Earth revolves around itself, the side facing the Sun becomes light.

Unlike our planet, Uranus rotates on its side, as if the planet has fallen over. This causes the planet to roll around the Sun in its orbit like a barrel. The equator of Uranus is tilted at 98° with respect to its orbit, so that each pole is almost facing the Sun during part of each orbit. It takes Uranus 84 earth years to orbit the sun! Therefore, for years at a time, each of the poles receives either continuous sunlight or is continuously in shadow.

What would happen if it were always daytime on one side of Earth and night on the other? If this were the case, people would not have specific times for sleep. Everyone would sleep or be awake at different times. There would be much confusion in relationships between people.

Let's first imagine that we only had daytime: Would we be able to sleep soundly? Besides, we would never be able to see the moon and stars that are visible only in the darkness of the night.

Alternatively, what if we were always in darkness? First, we would never be able to see the Sun, blue skies or other beauties we can only see during the day. No one knows how our sleeping hours or schedule at school would be. We would go to school in the darkness of the night and have our breaks in darkness.

What is more important is that plants that need both night and day to live would quickly disappear. Eventually this would mean the end of life.

However, Our Lord has created night and day to make our lives easy. By creating night and day, He has put our lives into order. The reasons for the creation of night and day are stated in the Qur'an as follows:

**It is He who made the night a cloak for you and sleep a rest, and He made the day a time for rising.**  
(Surat al-Furqan: 47)

Consider that every day new discoveries and inventions are being made. However, none of these are unprecedented; that is, they are all inspired by things and beings already existing in nature. Which one of these inventions could make Earth rotate around itself and thus cause night and day? None of them, right? Only Our Lord, the Creator of the heavens, the earth and everything in between could accomplish this.

Always keep in mind that just as Allah has created the night and day, He could well remove them. Then our lives would be in turmoil. Furthermore, we would not be around to read these lines. In the Qur'an, Allah informs us that if He wills He could well lengthen the night or day:

**... If Allah made it permanent night for you till the Day of Rising, what god is there other than Allah to bring you light? ...** (Surat al-Qasas: 71)

**... If Allah made it permanent day for you till the Day of Rising, what god is there other than Allah to bring you night to rest in?** (Surat al-Qasas: 72)

These verses make it clear that neither night nor day could have come into existence without Allah's will. This universe and everything in it belongs to Allah, the Creator.

Dear Children; never forget that Allah the All-Mighty has perfectly created you and everything you know and can imagine.

# CONCLUSION

Dear Children, this is the end of our journey in space. During this journey, you witnessed the wonderful creation of the universe and saw that, with its precisely-tuned equilibrium, Earth is a planet specially created for us in the universe. Now let's briefly go over what has been discussed throughout the book. Our Earth is located in still, cold, lifeless space. If we compare space to a vast, desolate dry desert, then it would be no exaggeration to compare our planet to a castle in this desert. This castle protects us from desert storms and extreme heat, and provides us with everything we need. Just like this castle in the desert, Earth is our castle in space. Like a spacecraft travelling through space, it protects us against the dangers of space. Here, there is plenty of everything: water, air and everything we need. A castle could not come into existence in the desert spontaneously. This also holds true for our planet. It is obvious that Earth is a sign of a superior creation.

Moreover, millions of delicate balances, other than the ones you have learned about in this book, exist in the universe. What we have seen here alone definitely proves that neither the universe nor Earth could have come into existence by a series of gradual coincidences.

All these, again, illustrate an obvious fact. Allah, the Possessor of Infinite Power and Omnipotence, has created the universe, stars, planets, mountains and seas in perfection, and given life to people and all living things. This perfect creation of Allah is described in the Qur'an thus:

**Are you stronger in structure or is heaven? He (Allah) built it. He raised its vault high and made it level. He darkened its night and brought forth its morning light. After that He smoothed out the earth and brought forth from it its water and its pastureland and made the mountains firm, for you and for your livestock to enjoy.** (Surat an-Nazi'at: 27-33)

Dear Children! Always keep in mind that Allah created you and everything you possess. Everything is a blessing from Allah. You should always be aware of this truth, think about the blessings you have and be thankful to Allah for them.

**They said, "Glory be to You! We have no knowledge  
except what You have taught us.  
You are the All-Knowing, the All-Wise."  
(Surat al-Baqara: 32)**