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# Creation Answers

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## Who writes this newsletter?

This newsletter is produced by Wayne Spencer on a Quarterly basis. Its purpose is to bring creation research within the reach of Christians and provide up-to-date reliable information on creation issues. Wayne Spencer is a creation author and former teacher who has presented papers at the International Conference on Creationism and has published in various creation publications, such as the Creation Research Society Quarterly, Creation magazine, the Journal of Creation, and Origins (from the Biblical Creation Society, UK).

This newsletter is meant to help people plug into creation resources and get informed about creation and evolution. It is provided free of charge on request. Using the free Adobe Acrobat Reader is necessary for viewing the newsletter. There are no restrictions in copying this newsletter or passing it on to others. Send questions about the newsletter to Wayne Spencer at [wspencer@creationanswers.net](mailto:wspencer@creationanswers.net).

More information on Wayne Spencer's education and publications can be found on the [creationanswers.net](http://creationanswers.net) web site. You'll also find many other resources.

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## A Personal Note from Wayne Spencer

Greetings,

I appreciate the interest of everyone in my newsletter. I have made a decision to discontinue this newsletter after 2015. I plan to finish this year sending out the newsletter but it will not continue in 2016. This means there will be just two more issues counting this one.

To complete the year, I am doing my main article in this issue on the formation of our solar system. This topic has been the focus of a lot of my research over the years and there are a number of new ideas to address. For my last issue in December, I am tentatively planning on something that will be a kind of history of my creation ministry.

Ending this newsletter does not mean ending creation ministry for me. With my job demanding more time and with other writing I do for publication, I've found it difficult to do the newsletter. So the reason to stop the newsletter is mainly to have time for other creation writing projects. I also act as a reviewer for creation publications on occasion.

I don't receive feedback on the newsletter often. But I have had good comments and I believe it has been something God has used to benefit people.

God bless ...

Wayne Spencer, M.S., Physics

## ***The Formation of Our Solar System***

Modern science is generally committed to the principle that only natural processes are applicable in science. When dealing with experimental science this is normally a valid assumption to make. But in dealing with matters of origins, Biblical creationists would say there could be some processes that were supernatural and unique in the beginning. Even without supernatural creation by God in the beginning, there could have been unique processes in the past that cannot be experimented on today. So this makes science inherently limited dealing with origins issues, compared to how experimental science works.

The young-age creation viewpoint takes the Bible at face value. This means the Bible is a narrative account of actual events, from the perspective of an observer on the Earth. There's very little in the Bible relevant to planetary science and the origin of our solar system. However, the Bible clearly gives a time framework. Exodus 20:11 (NIV) says, **“For in six days the Lord made the heavens and the earth, the sea, and all that is in them . . . .”** The creation account in Genesis chapter 1 describes the Sun and Moon as being created on the fourth day of the six day creation week. The creation account obviously makes Earth it's primary focus. Genesis establishes that the God of the Bible is God of all mankind and is in control of all he created. Some have suggested a longer time scale for the solar system than for Earth, or that the universe could be old while the Earth is only several thousand years in age. But I see no way to reconcile this with Exodus 20:11 and the creation account.

These Biblical considerations imply that a) some supernatural action by God was involved in the creation of our solar system, b) the solar system was created within the six days, c) details of the formation of objects are not spelled out by Scripture. One other

important general principle is found in Isaiah 45:18,

**“For this is what the Lord says— he is God; he who fashioned and made the earth, he founded it; he did not create it to be empty, but formed it to be inhabited . . . .”**

The above passage from Isaiah establishes that Earth is a special planet. It was designed to be a habitat for life, especially for humans. If Earth is designed by God for us, then it must have the material resources we need and the temperatures at Earth's surface must be in the right temperature range for what we need. Certainly these facts are true for Earth, but research on planets orbiting other stars and on the science of what makes a planet habitable have added new insights to this basic idea.

If a star in some other solar system in another part of our galaxy were not relatively stable it could easily threaten life for planets orbiting that star. If the star did not radiate light of the right colors plants might not be able to survive even if the temperature was about right. Without plants surviving on Earth, other living things that we depend on would not survive either. Some stars vary in their energy output a great deal or they may have large solar flares that could threaten life on a nearby planet. There are now close to 300 known extrasolar planets around other stars that are considered to be in the “habitable zone.” To be in the habitable zone means that liquid water can exist on the exoplanet without boiling away or freezing. In many other solar systems (in our galaxy) the planets are often similar to Jupiter but are very close to the star. A few rocky planets have been found orbiting other stars but they seem to be rare. In these extrasolar systems with planets, they don't have to support life. But our system does have to support life.

So in a Christian view of our solar system, our system has not come about only by natural processes. Also we are not just

“lucky” to be in a solar system with a habitable planet. There is purpose in our solar system being as it is. The purpose is primarily our safety. A second purpose I think is for us to learn from the variety that God created. God is not limited to the familiar environment we know of on Earth. He has created many worlds. The more different from Earth they are, the more we see how special our home planet really is.

### **The Naturalistic View**

Today the science on the formation of our solar system has changed. The principle of relying on only natural processes is still held to by the scientific community. But years of research on extrasolar planets, planets orbiting other stars, has given scientists creative new ideas. The science on extrasolar planets has been “brought home” as it were and applied in our own solar system. The research on extrasolar planets is now dominated by a search for an “earth-like” planet. The research in our solar system has also turned more toward how Earth itself formed. Scientists are very interested in how an earth-like planet formed. Is there a solution to this question by the operation of natural forces alone? I do not believe so but the following is summarizing today’s ideas on how the solar system and Earth formed. I will treat this in stages that seem logical to me.

#### Stage 0 - From Nebula to Disk

The first problem in a theory using only natural processes is to explain how a nebula in space could become a spinning flattened disk of dust and gas. Two principles are brought into this problem. First, nebulas are often very hot, that’s why they glow and make such beautiful pictures. So if they cool, gravity can make them contract. In the centers of these giant clouds there can be dense regions. New stars are believed to form in these dense regions. Note that according to the theory no one could ever see a star actually form because they must form in a thick cloud where they would not be visible. One book on the origin of the solar

system summarized the problems with Stage 0 by saying, “The clouds are too hot, too magnetic, and they rotate too rapidly.” This is saying that as a cloud in space contracts, the heat, the magnetic field, and the rotation all have a tendency to stop the contraction.

The second principle is that something has to give the cloud a kick. Gravity cannot compress the cloud enough for a star to form in it. But if there were a supernova explosion somewhere nearby, the shock wave from this blast would compress the cloud enough that a “protostar” could form in it. Recently a new theory has been added to this idea. It has been suggested that a supernova shock wave like this could also start parts of the cloud spinning. Try to imagine that the entire cloud (or nebula) is initially many many times bigger than our entire solar system. So when the supernova shock wave strikes it, the cloud fragments into multiple spinning eddies. Our solar system is believed to have come from one of these spinning eddies. Note that there is no known supernova close enough to do this for our solar system, as far as I know. But this is the theory. Scientists seem to have faith that such a supernova could have occurred and yet it leaves no evidence of its existence today.

#### Stage 1 - From Dust to Planetesimals

When science depends on natural processes alone for objects to form, they make an assumption that sizable rocky (or icy) objects can form from a disk of dust and gas. But here is where a naturalistic view has the biggest problem. Very small particles may be able to stick together by static electricity or other effects. But larger objects are more likely to break each other apart than stick together. When scientists do computer simulations of small objects forming into planets, asteroids, etc. they usually assume the smallest objects to be 1 kilometer in size. Why? Because no one has found an explanation of how objects could grow in size from something like a sand grain to something the size of a football stadium.

Gravity will not work for this. Small particles may stick together but the same thing does not work on a bigger scale. So if you have two objects in space the size of a football stadium, their gravity is going to cause them to come together in space with enough speed that they are likely to break each other apart, not get larger. There can be occasional exceptions to this rule. We know that some asteroids have collided and essentially “welded” each other together. But it would be rare for the objects to have just the right relative speed, direction, and the right materials to allow them to do this. So the fact remains that big objects tend to break each other apart when they collide. But it is believed that by some process solid objects will grow to be 1 kilometer and larger in size. They collide with each other at random in the spinning disk surrounding the star. If an object in the disk becomes larger than other objects around it, it may then have more objects colliding with it, thus it can grow more. This is how scientists believe an object can grow to become a large asteroid or even a planet. This process is known as accretion. Objects that could grow like this into asteroids or planets are called planetesimals, in the early solar system.

In an important paper called “Emergence of a Habitable Planet” (K. Zahnle, et. al., 2007) the problem of accretion is summarized in the following extended quote.

“In the simplest terms accretion of terrestrial planets is envisaged as taking place in four stages:

1. Settling of circumstellar dust to the mid-plane of the disk.
2. Growth of planetesimals up to ~ 1 km in size.
3. Runaway growth of planetary embryos up to ~ 1000 km in size.
4. Oligarchic growth of larger objects through late-stage collisions.

Stage 1 takes place over time scales of

thousands of years and provides a relatively dense plane of material from which the planets can grow. The second stage is the most poorly understood at present but is necessary in order to build objects that are of sufficient mass for gravity to play a major role. Planetesimals would need to be about a kilometer in size in order for the gravitationally driven stage 3 to start.

We do not know how stage 2 happens, although clearly it must. Scientists have succeeded in making fluffy aggregates from dust, but these are all less than a cm in size. How does one make something that is the size of a house or a stadium? One obvious suggestion is that some kind of glue was involved.”

Thus accretion theory fails at a crucial step in the process. Scientists are aware of this problem but they merely skip over it in computer simulations. This problem calls into question theories on the formation of all sorts of objects in space. But to consider the rest of the process, we will move on. The planetesimals are believed to form and in some cases break up and reform over a few million years.

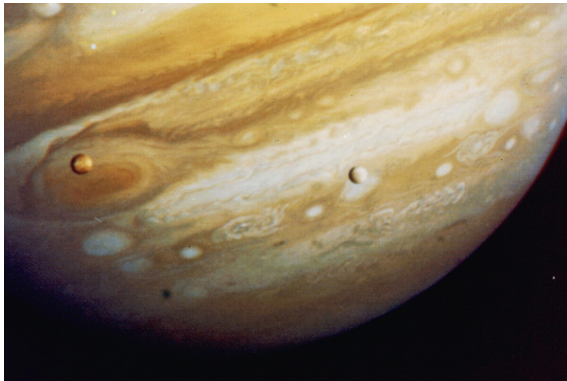
#### Stage 2 - Planet Core Accretion

This stage in solar system formation would be envisioned as perhaps 40 - 50 million years long. At the beginning of this stage, some gas has cleared out or dissipated away and the disk consists mostly of planetesimals of varied sizes. The planetesimals can include ice and some may be mostly ice in the colder regions. In this stage planets begin forming. Planet formation depends on a “core” of a certain size forming so that it’s gravity will be strong enough to attract gases and other objects to it. The largest planets form quickest because they have stronger gravity. Smaller planets take longer to accumulate material on them. By the end of this stage a number of important things have happened.

- The outer planets, Jupiter, Saturn, Uranus, and Neptune have formed

but are not in their present positions.

- The luminosity of the Sun has decreased. Ice can exist just outside Earth's orbit.
- There are many rocky planetesimals in the solar system, especially from about 15 to 30 A.U. distance from the Sun. But there are also loosely held together icy objects like comets.
- The Oort cloud has not yet formed.
- Earth is about 60% of its present mass. It possesses an atmosphere very different than today. Earth's surface is partly molten.



One of the main problems with this stage is that what happens to planets depends a great deal on the disk. In the old ideas on planet formation there was always a problem that the disk tended to dissipate before the outer planets could get as large as we see them today. Also, the material in the disk has a tendency to move inward toward the Sun. If the disk is too massive near the Sun, it can pull planets into the Sun before they can get very large. On the other hand, planets, especially large ones, can clear out zones around them, making the disk of planetesimals look more like concentric rings.

A new theory called the Nice Model is becoming well accepted by planetary scientists. (Nice is pronounced like "niece", from the city in France.) It says that inside the orbit of Mars the disk became rather thin and out at a distance (15 - 30 A.U. from the Sun) the disk was very thick. This assumes there were many objects similar to Pluto in the outer solar system. Jupiter, Saturn, Uranus, and Neptune formed closer to the Sun than their present positions (and closer together) and then Jupiter and Saturn moved. Jupiter did not move much but Saturn came into a special resonance motion with Jupiter. There was one orbit of Jupiter for every two orbits of Saturn. The effect of this was to clear material away in a large zone near Jupiter and Saturn, and cause Uranus and Neptune to migrate outward. The Nice model allows the gas giant planets to form closer to the Sun where there could have initially been more material in the disk. But then they migrate outward (except Jupiter) to their present positions. They migrate outward due to the planetesimals out at the edge of the solar system and because of them being affected by Saturn as it migrates outward.

The Nice Model is an attempt to deal with the problems older theories had with planet formation. One of the biggest potential problems with the Nice model is that the assumptions it makes about the disk are probably unrealistic. It requires a much more massive disk than older theories and this could cause the inner planets, or even Jupiter, to fall into the Sun. It also assumes some rather lucky timing in a number of ways in order for the planets to eventually end up in their current orbits. But it does work in some computer simulations. Jupiter and Saturn form much as they were thought to form before the Nice Model. So some of the old problems could still apply to Jupiter and Saturn. For instance, Jupiter spins very rapidly and the rapid rotation of planets in our solar system has been a problem in planet formation. Note that a computer simulation does not constitute evidence that it really happened like the simulation. A computer

simulation is only a theoretical study. Simulations, as they are run over and over, tend to only give the desired results some of the time.

### Stage 3 - Planet Migration and Scattering

After the outer planets, Jupiter, Saturn, Uranus, and Neptune initially form in circular orbits, their orbits change according to the Nice Model. Initially the Nice Model even has Neptune inside the orbit of Uranus and so Uranus and Neptune swap positions as they migrate. Scientists like the migrating planets scenario of the Nice Model because of what it does to change the planet orbits as well as the orbits of many small objects. The planet orbits are not perfect circles and scientists think the migration process is the reason for this. Both planets (the large objects) and planetesimals (the small objects) get scattered by each other. The small objects get scattered in a more dramatic manner than the planets because they are much smaller. So the scattering of small objects causes a period of chaotic changes and many collisions and impacts throughout the solar system. This is known as the Late Heavy Bombardment.

Stage 3 is a longer period of roughly 700 million years. It is believed to be in this period that many impacts take place across the solar system. There are two regions where there are significant numbers of small objects in our solar system. The first is the asteroid belt, which lies between Mars and Jupiter. The second is the Kuiper belt which is farther out, beyond Neptune's current orbit. Though the outer planets and Jupiter tend to keep small objects from the Kuiper belt out of the inner solar system, objects from the asteroid belt have a tendency to get scattered inward some of the time. Thus in the Late Heavy Bombardment the inner planets are struck by objects predominantly from the asteroid belt. (There are also some comets that come through the inner solar system but they are much fewer in number.) Stage 3 has more frequent orbit changes for asteroids than today and so inner planets are also

bombarded.

Important things happen at Earth in the early part of stage 3. The accepted theory today for the origin of the Moon is that Earth was struck by an object approximately the size of Mars and the Moon formed from the material ejected from this impact. This is believed to have happened sometime between 55 and 100 million years after solar system formation began (counting from stage 1). The object that struck Earth is known as Theia. This has come to be known as the Giant Impact Theory for the formation of the Moon. The primary arguments for it are related to the composition of the Moon being similar to Earth in certain respects. The Theia impact allows some of Earth's mantle to mix in with the Moon. But scientists have found it challenging to get the mechanics of it to work. It can be simulated on computers. But one criticism has been that it may require that the impacting object (Theia) be moving implausibly slow. The speed and mass of Theia are critical because it can easily cause Earth to spin too fast. Still, most scientists have generally accepted the theory.

What about life on Earth in the formation of the solar system? Planetary scientists suspect that life may have actually evolved multiple times but was wiped out by heat or impacts. So planetary scientists would say that the Theia impact was one of the last large impacts on Earth. Only after this was life able to survive and evolve, by evolutionary thinking.

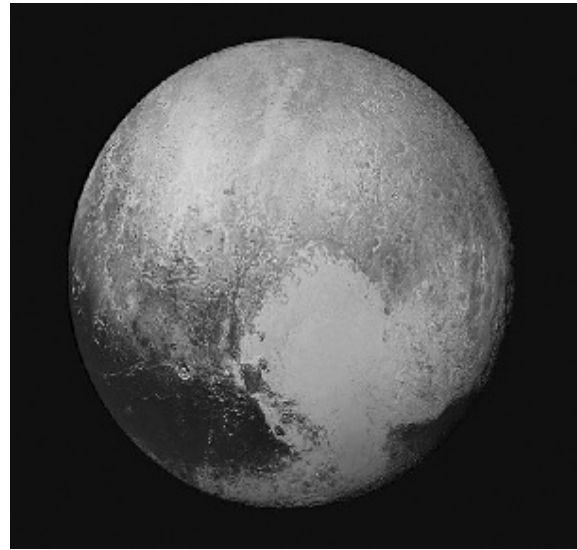
### **Conclusions**

There are many complex issues with the solar system forming by natural processes from a disk. There are many issues about the composition of particular planets or moons and magnetic fields for example. I would say God created our solar system with order and purpose, but changes could have happened since the beginning. There are also indications of the system being young, not billions of years old. [CLICK HERE](#) to see an article from creation.com on this. (See also the June 2015 Creation

Answers newsletter on “Warm Icy Moons.”) Modern science is fixated on an old age view that says our planet and our solar system are billions of years old. But this is not the only way to look at the facts. An old age view sometimes makes it more difficult to explain the facts. I choose to believe the Bible. This is not irrational but reasonable. The God of the Bible created all we see and provided the physical resources that we have.

### ***The “Patterns of Evidence” Video***

Recently an important video has come available relating archeology to the Bible about the Exodus. It is called “Patterns of Evidence” and it is about historical evidence related to the exodus of the Israelites from ancient Egypt. I have watched this issue for years and I’m glad to see a really well-done film showing the whole story on this. This is something Christians should be aware of. Scholars in the fields of history and archeology often say there is no evidence for the exodus at all because they look for it at the wrong time in history. But there is actually very good evidence for the Israelites in Egypt and the exodus, and for the conquest of Canaan. I was surprised by some of it. I watched the video via Netflix. The video is produced by a filmmaker named Timothy Mahoney. It can be purchased on Amazon or from [biblearchaeology.org](http://biblearchaeology.org). The video is almost two hours long and very well worth it.



### ***Surprising Pluto***

This summer something happened in exploration of the solar system that is an important milestone. The New Horizons spacecraft did a successful flyby of Pluto. Scientists have been very surprised by the fascinating variety of formations on Pluto’s surface. It has been a real treat to me to see the photos of Pluto. Pluto was redefined as a “dwarf planet” several years ago. [CLICK HERE](#) to see an article on the redefinition of planet and Pluto.

Pluto’s surface is made up of zones that appear very different from each other. There is one region with a dark surface and it has more craters. But much of the surface is covered by multiple types of ice, and has few craters. There are ice mountains and odd structures that scientists are still puzzled by. Though some photos are available, it requires many months for the New Horizons spacecraft to send all its data back to Earth. Pluto may be similar to some of the icy moons in the outer solar system, but we’ll have to wait for more information. God still has surprises for scientists to discover.