spontaneously and events do not follow a cause and effect relationship.

This can be regarded as a good explanation of where the quantum singularity came from, and therefore leave no space for God in the creation of the universe. However, some argue that the very fact that there is chaos at the subatomic level yet order at the observed level is enough to show that there must be a God.

Others say that this aspect of science is not yet fully understood and that in time, clearer patterns will become apparent as the bigger picture is understood.

The Sikh Perspective

Sikh dharma is one of very few religions that go hand in hand with science. Carl Sagan said, *"A religion that stressed the magnificence of the universe as revealed by modern science, might be able to draw forth reserves of reverence and awe hardly tapped by traditional faiths. Sooner or later, such a religion will emerge."* This rings true for Sikh dharma and is highlighted by the Shri Guru Granth Sahib Ji, the Sikh Holy Scripture which says, *"Millions of sciences all sing His Praises" (p. 1163)*. Science helps to explain the beautiful workings of our universe and is not in conflict with spirituality or religion.

The widely accepted Big Bang theory seems to be a great explanation for the origins of the universe, however, it does not remove the need for God. In fact, it seems to fit in well with Sikh philosophy as it allows the existence of God previous to the singularity.

Continuous creation and the expansion of the universe are also supported by the Shri Guru Granth Sahib Ji which says, *"Having created the creation, He watches over it. By His Glance of Grace, He bestows happiness. There are planets, solar systems and galaxies. If one speaks of them, there is no limit, no end. There are worlds upon worlds of His Creation. As He commands, so they exist. He watches over all, and contemplating the creation, He rejoices. O Nanak, to describe this is as hard as steel!" (p. 8)*. The Shri Guru Granth Sahib Ji also provides an insight into the expansion of the universe, *"In so many ways, He has unfolded Himself. So many times, He has expanded His expansion. Forever and ever, He is the One, the One Universal Creator" (p. 276)*.

In terms of Darwin's theory of evolution, Sikh dharma has no direct conflicts. Theistic evolution helps to show the Sikh perspective.

Quantum physics is an intriguing aspect of physics and other theories such as String Theory offer some interesting discussions. Although it would be a loose link, Sikh philosophy says that everything within the creation contains vibrations and the frequencies of the vibrating strings could be argued to be similar to this. However, this may be seen be Concordism so it is perhaps better say that Sikh dharma has no conflicts with quantum physics or the recent String Theory.

Conclusion

Sikh dharma provides a unique balance of spirituality and science. Both complement each other and together give a better understanding of how the world around us works, as well as how to use the world around us to achieve the meaning of life. Anon provides a great insight by saying, *"There can never be a conflict between true science and true religion, because they both describe reality"* .

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Religion and Science

Sikh Dharma

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Introduction

Science and religion have traditionally been considered to conflict with each other. One major reason could be that science requires empirical evidence whereas religion does not. However, does the lack of this evidence make something any less meaningful or truthful? Whether that is the case or not, Sikh dharma is a prime example of how modern science can go hand in hand with religion.

Origins of the Universe

One major change in the understanding of how the universe came to be was when the Big Bang theory was announced.

Big Bang Theory

In short, this theory argued that approximately fourteen billion years ago, a quantum singularity that contained all matter expanded, it contained the four forces of: strong and weak nuclear forces, electromagnetism and gravity. Then subatomic particles were created followed by hydrogen and helium atoms. With the influence of gravity, stars were formed which had carbon particles. Following this, oxygen and planets formed in the case of Earth.

In 1925, Edwin Hubble discovered further than the Milky Way and proved that objects like galaxies were much further away than previously thought. Thus providing strong evidence for the Big Bang theory. Other evidence includes:

- Universe still expanding - we know this because of the red shift
- Universe cooling - which suggests expansion and thus a singular starting point
- BMR (Background Microwave Radiation) - which is consistent with a large explosion like the singularity
- Helium (25%) makes up the universe - this is again consistent with the theory

Oscillating and Continuous Creation

One further point of discussion based around the Big Bang theory is what will happen to the universe as it expands?

There are three possible scenarios:

- A Big Crunch - where the universe reduces in size and causes another Big Bang. This cycle then continues forever. This theory has been disputed by many scientists because they argue there is not enough matter in the universe to cause an oscillating effect.
- Continuous Creation - where the universe continues to expand forever at an ever reducing speed. This theory is thought to be the most likely.
- Equilibrium - where the universe stops expanding and reaches an equilibrium state where it remains.

Steady State Theory

This was created by Fred Hoyle in 1948. He was an atheist who was actively against religion and suggested that the universe has no beginning or end and therefore God cannot exist. He suggested that the cosmic matter density remained constant. Known as continuous creation, new matter is created at a very slow rate as other matter ceases to exist. However, this theory is not held very highly by scientists due to BMR, and that the universe does not look the same. The majority of scientists regard the Big Bang theory to be a satisfactory explanation to the origins of the universe. However, the main alternative is the Steady State theory.

Creationism

An alternative theory presented by 'creation scientists' is that everything has been created by God directly, for example in six days. This is based on Genesis in the Bible. This is a controversial movement as it is arguably not based on actual scientific evidence. Creationism also refutes the idea of Evolution.

Evolution

The idea of evolution is very old but the modern concept involving natural selection was first set out by Alfred Wallace and Charles Darwin in the 1930s.

This theory argues that all living things on earth started from a single starting point and over the years, this has led to the development of organisms as we see them today. With evidence from DNA and fossils pointing to similarities in the fundamental building blocks of all things, this theory is widely accepted by most scientists worldwide.

The main arguments against this theory are those presented by creation scientists with theories such as intelligent design. This is based on the idea that certain things are not explained by random events but instead by intelligent causes.

Theistic evolution is one attempt to link the theory of evolution with traditional religious thoughts of direct creation by God. This theory argues that natural selection does not necessarily mean that God could not have created the universe. It sees Darwin's theory to simply be the process in which life, including humans, developed as a result of the initial creation.

Quantum Physics

Quantum physics was started by Max Planck in 1900, and examined the world at a subatomic level. The idea that waves could be understood as particles helped to answer many questions that previous theories could not, and later became a pillar of modern physics.

The exact workings of particles at a subatomic level are not fully understood, and to some extent seem to be random. In the quantum world, particles can come into existence