

Sikhi and Science: The Eternal Entity (God) Conceptualized by Guru Nanak in a Logo, ੴ

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"After religious teachers accomplish the refining process indicated, they will surely recognize with joy that true religion has been ennobled and made more profound by scientific knowledge."

Albert Einstein (1879–1955)

<https://www.laphamsquarterly.org/religion/albert-einstein-solves-equation>

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ABSTRACT

This article after brief description of the main heading, Sikhi and Sikhism, discusses at length the Eternal Entity (God) conceptualized as a logo, ੴ, by Guru Nanak. The discussion indicates that One in ੴ is 'That' (ੴ with extended (ੴ) is Infinite' (amount of energy). Therefore, ੴ means 'One and Only That is Infinite' (amount of energy) in English and ਇਕੁ ਓ ਬੇਅੰਤ (Ek Oh Beant) in Punjabi. The One in ੴ is not a numeral but Singularity or Nothingness in science but called Ek (One), ਸੁੰਨ (Sunn) or ਨਿਰਗੁਨ (Nirgun) state of ੴ (the Eternal Entity - God) by Guru Nanak. When this One in ੴ exploded it gave rise to the ਸਰਗੁਨ (Sargun) state, the Nature/Universe.

Keywords:

Introduction

Under the main heading, SIKHI and SCIENCE, several articles will be written in a series about basics of Sikhi founded by Guru Nanak (1469–1539) during the 15th century and comparing it with science of today. The first article discusses *The Eternal Entity (God) Conceptualized by Guru Nanak in a Logo, ੴ*.

Before the beginning of science and during the Period of Renaissance some scholars were prophesying their philosophy based upon their keen observations of Nature and the Universal phenomena occurring in orderly form. Now their philosophy is called 'Natural Philosophy'.

Natural Philosophy is defined as follows:

The philosophical study of Nature and the physical Universe that was dominant before the development

of modern science. It is the precursor of natural science.
(Natural Philosophy, n.d)

Guru Nanak is one of those philosophers who promulgated his philosophy based on his keen observation of Nature: how the phenomena of Universe are occurring in orderly form, and the behaviour of humans without involving the God or any deity. Nanak is at the top of the list of Natural Philosophers of the world (Chahal, 2020).

Science

The Natural Philosophy became Science during the 19th century based on the Natural Philosophy of Copernicus (contemporary of Guru Nanak), Galileo, Newton, and of others.

Science is defined as: *a branch of knowledge or study dealing with a body of facts or truths systematically*

arranged and showing the operation of general laws. (Dictionary.com)

Sikhi

My study of the bani (words) of Guru Nanak, incorporated in the *Aad Guru Granth Sahib* (AGGS) (Sahib, 1983), clearly indicates that the philosophy embodied in his bani includes the characteristics of originality and uniqueness (Chahal, 2020) The irony is that very little work has been done by Sikh and non-Sikh scholars, Sikh scientists, and Sikh philosophers to portray the philosophy embodied in the bani of Guru Nanak in its real perspective. Instead, they remained busy interpreting *Sikhi* founded by Guru Nanak into an institutionalized religion, **Sikhism**. Nevertheless, Guru Nanak has defined 'Sikhi' in one phrase, which has been interpreted by Chahal, et al. (2015, 2019, 2020) as follows:

ਸਿਖੀ ਸਿਖਿਆ² ਗੁਰ³ ਵੀਚਾਰਿ⁴ ॥
Sikhī sikhīā gur vīchār.

*Sikhi*¹ is the teachings² which are based on the enlightening³ philosophy⁴.
AGGS, M 1, p 465.

Notes:

ਸਿਖੀ (**Sikhi**): This word is understood as a verb to "learn" by many theologians thus they go far away from the real theme of defining "Sikhi" as a noun.

ਸਿਖਿਆ (*Sikhia*/Teachings): something that is taught: philosophy.

ਵੀਚਾਰਿ (*Vichar*/Philosophy): the branch of knowledge or academic study devoted to the systematic examination of basic concepts such as truth, existence, reality, causality, and freedom; a particular system of thought or doctrine.

This type of **Sikhi** has not been disseminated by the followers of Guru Nanak.

It is evident from the above definition that in **SIKHI** the emphasis is on "enlightenment".

The word 'bani' (ਬਾਨੀ/ਬਾਣੀ) has been used as singular as well as plural in this article.

Enlightenment Defined

The Age of Enlightenment (also known as the **Age of Reason** or simply the **Enlightenment**) was an intellectual and philosophical movement that dominated the world of ideas in Europe during the 18th century, the

"**Century of Philosophy**". The Enlightenment emerged out of a European intellectual and scholarly movement known as **Renaissance humanism**. Some consider the publication of Isaac Newton's *Principia Mathematica* (1687) as the first major enlightenment work. Philosophers and scientists of this period widely circulated their ideas through meetings at scientific academies, Masonic lodges, literary salons, coffeehouses and in printed books, journals, and pamphlets. The ideas of the Enlightenment undermined the authority of the monarchy and the Church, and paved the way for the political revolutions of the 18th and 19th centuries (Age of Enlightenment, n.d.).

IS GURU NANAK A PIONEER OF THE AGE OF ENLIGHTENMENT?

YES.

During the time of discourse with the Siddhas, the most learned persons of that time, questioned to Nanak (Chahal, 2020):

Who is your Guru?

ਕਵਣ ਮੂਲੁ¹ ਕਵਣ ਮਤਿ² ਵੇਲਾ³ ॥
ਤੇਰਾ ਕਵਣ ਗੁਰੂ ਜਿਸ ਕਾ ਤੂ ਚੇਲਾ ॥

Kavaṇ mūl kavaṇ maṭ velā.

Ṭērā kavaṇ gurū jis kā tū chelā.

ਅਗਸਤ, ਮ: 1, ਪੰਨਾ 943.

What is the source of beginning¹ and which type of philosophy² is of this Age³?

Who is the 'guru' of whom you are his disciple?

AGGS, M 1, p 943. 8

Nanak replied that his 'guru' is 'Sabd:

ਪਵਨ¹ ਅਰੰਭੁ² ਸਤਿ³ ਗੁਰ⁴ ਮਤਿ⁵ ਵੇਲਾ⁶ ॥
ਸਬਦੁ⁷ ਗੁਰੂ⁸ ਸੁਰਤਿ⁹ ਧੁਨਿ¹⁰ ਚੇਲਾ¹¹ ॥

Pavan arambh satgur maṭ velā.

Sabaḍ gurū suraṭ ḍhun chelā.

The air¹ is the beginning² of every life and this is the Age⁶ of Enlightenment⁵ known through the True⁴ Guru³.

Who is the True Guru?

It is explained in the second sentence:

The sabd⁷ is the guru⁸ (enlightener) and my keen¹⁰ conscience⁹ is its disciple¹¹.

Note: who is a Guru?

According to Bhai Kahn Singh (Singh, 1996):

ਗੁਰੂ or ਗੁਰੂ or ਗੁਰ (Guru): ਸੰ. ਗੁਰੂ ਗੁਰੂ. (ਸੰਗਯਾ). ਇਹ ਸ਼ਬਦ ਗ੍ਰੀ (ਗੁ) ਧਾਤੁ ਤੋਂ ਬਣਿਆ ਹੈ, ਇਸ ਦੇ ਅਰਥ ਹਨ ਨਿਗਲਣਾ ਅਤੇ ਸਮਝਾਉਣਾ, ਜੋ ਅਗਿਆਨ ਨੂੰ ਖਾ ਜਾਂਦਾ ਹੈ ਅਤੇ ਸਿੱਖ ਨੂੰ ਤਤ੍ਵਗਿਆਨ ਸਮਝਾਉਂਦਾ ਹੈ, ਉਹ ਗੁਰੂ ਹੈ. ਗੁਰਬਾਣੀ ਵਿੱਚ ਗੁਰ, ਗੁਰੂ ਅਤੇ ਗੁਰੂ ਸ਼ਬਦ ਇੱਕ ਹੀ ਅਰਥ ਵਿੱਚ ਆਏ ਹਨ. (Guru comes from Sanskrit word, *Gri*, which means to engulf (to eliminate) darkness/ignorance, and which impart wisdom (enlightens) the humans.

The *pauri* (stanza) # 38 of *JAP Bani* clearly indicates that the word ‘**sabd**’ means the ‘idea’ or ‘philosophy’ which enlightens a person to discover the right path of life. Therefore, ‘**sabd**’ is interpreted as ‘**enlightening idea/philosophy**’. The ‘**sabd**’ is constructed using self-control, patience, knowledge, and wisdom without involving any deity (Chahal, 2018) (Chapter 3).

THE ETERNAL ENTITY (GOD) CONCEPTUALIZED BY GURU NANAK AS A LOGO, “ੴ”

A logo or symbol is used by various companies, organizations, and religions to convey their main objectives or the products. For example, symbols of various religions are shown in Fig. 1.

In Christianity, the **Cross** is a symbol to represent crucifixion of Jesus, the Messiah and son of God, who dies at a cross to deliver the sins of all the people.

In Hinduism, the **AUM** or **OM** represents the Universe and the Ultimate Reality. The AUM represents the three aspects of God: The Brahma (A), the Vishnu (U) and the Shiva (M). It also represents the sound of the Universe.

In Islam, **Crescent and Star** is religious symbol. The Crescent, the early phase of the moon, represents

progress. The star represents the light of knowledge. The definition of Islam means submission to Allah and peace.

If we investigate symbols of various religions reported in different Websites, we do not find any symbol of Sikhism. However, the symbols shown in Fig. 1 from *Dreamtime.com* has included a *Khanda* (ੴ) as a symbol of Sikhism. This symbol has not been designed by any Guru including Guru Gobind Singh. Since every religion has their own logo or symbol, therefore, Guru Nanak has conceptualized the Eternal Entity (commonly called God) in a logo, ੴ, for ‘**Sikhi**’ founded by Guru Nanak for the welfare of humanity. The ‘**Sikhi**’ revolves around the Eternal Entity, ੴ.

How a logo is Designed

A ‘logo’ is a symbol made up of text, images and lines that identifies a business, institution, organization, religion, etc.



The logo of the Northwest Airlines was created by Landor Associates. The triangle within the circle serves both to point to compass direction northwest and to imply a W when combined with the shape of the N (Logo of Northwest Airlines, n.d.).

ZIP designer, Mike Erickson: The “I” has been replaced with a zipper to connect the Z & P to look like **ZIPPER** (Erickson, n.d.).



APPEARANCE OF LOGO, ੴ, IN THE AAD GURU GRANTH SAHIB

The logo, ੴ, appears at the top of the ਅਰੰਭਿਕ ਵਾਕ (*Arambic Vaak* - Commencing Verse commonly called *Mool Mantra*) clearly separated from its 9 attributes in the *Kartarpuri Bir* (Kartarpur Volume) scribed by Bhai Gurdas under the guidance of Guru Arjun in 1604 as in Fig 2.

Now the *Kartarpuri Bir* (Kartarpur Volume) is with the Sodhi family at Kartarpur near Jalandhar. It appears that

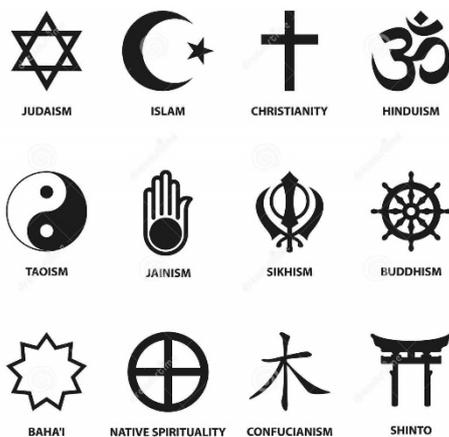


Figure 1: religious-sign-symbols-world-collection-isolated-white-background-vector-illustration-53229119 (Dreamtime.com)

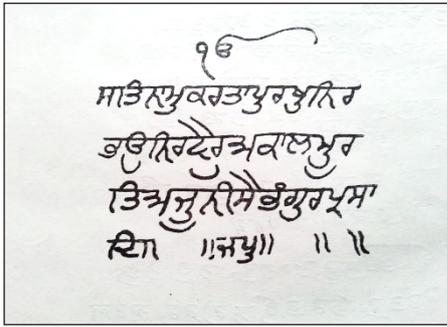


Figure 2: Commencing Verse in Kartarpuri Bir (Singh, 1968)

another copy of *Kartarpuri Bir* was prepared by Guru Arjun, and it was called '*Pothi*' (Book). In 1708 Guru Gobind Singh added the bani of Guru Teg Bahadur, the 9th Guru who succeeded to the 'House of Nanak', bestowed 'Guru-ship' upon this '*Pothi*' now called "Guru Granth". However, when the '*Pothi*' was printed in a press the logo, ੴ, was joined with its 9 attributes as shown on its first page. Fig.3. Therefore, the independent identity of the logo, ੴ, is lost. Now the Granth is addressed with various titles. The printed volume of the '*Pothi*', by the Shiromani Gurdwara Parbandhak Committee (SGPC), Amritsar carries a title: '*Aad Sri Guru Granth Sahib Ji*'. However, the Institute for Understand Sikhism (IUS) has dropped the 'Sri' being redundant after 'Aad' and 'Ji' after the 'Sahib' being redundant. Therefore, the appropriate title being used by the IUS is '*Aad Guru Granth Sahib*' (AGGS) (Chahal, 2002).

The logo, ੴ, appears 567 times in the AGGS (33 times before the beginning of the major section of the AGGS and 534 times in variously abridged forms before the beginning of sub-sections) so that the readers of the bani in the AGGS should keep in mind what ੴ means.

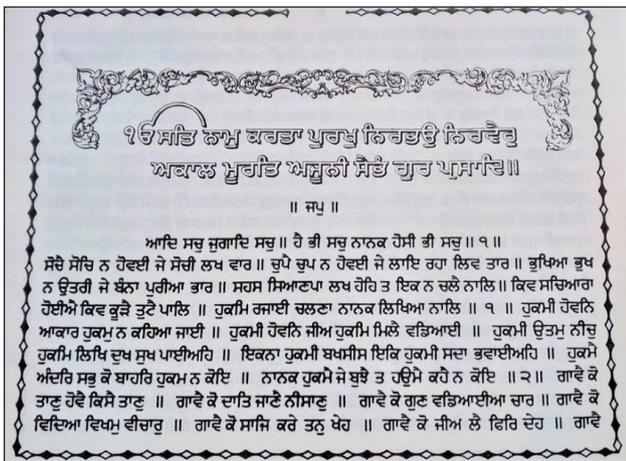


Figure 3: The First page of Aad Guru Granth Sahib (1983).

To understand logo, ੴ, the Eternal Entity, conceptualized by Guru Nanak, has been disassembled it as follows:

ੴ

ੴ + ੴ + ੴ

ੴ = (One). It is from Numerals but in science it is a Physical ONE like SINGULARITY of Albert Einstein. But for Guru Nanak Singularity or Nothingness is (ਸੁੰਨ - SUNN) and ਨਿਰਗੁਨ (NIRGUN) state of the Eternal Entity, ੴ. Therefore, this ੴ (One) is not numeral but 'PHYSICAL ONE' according to science of today.

ੴ = (open Oora). It is from Gurmukhi Alphabet but here it is an abbreviation of ਓਹ (Oh - That).

ੴ = The extended end of ੴ (open Oora) is from geometry representing INFINITE (amount of Energy).

ੴ = (open Oora) and its extended end (ੴ) are qualifiers words for ੴ (One) in ੴ indicating That One is Infinite (amount of energy as in Singularity)

Therefore, ੴ can be pronounced as ਇਕੁ ਓ ਬੇਅੰਤ (*Ek Oh Beant*) in Punjabi and as 'That the One and Only is Infinite' in English.

Note: Geometry is the branch of mathematics that deals measurement, and relationships of points, lines, angles, and figures. During Guru Nanak's time there was no sign of 'infinity'. The infinity sign (∞) was developed by John Wallis in 1655 about more than 100 years after Guru Nanak (1469-1539). Therefore, Guru Nanak has only choice to use extended end of open Oora (ੴ) to represent 'Infinity'.

Further explanation of all parts of ੴ in Aad Guru Granth Sahib:

ੴ (One)

The 'One' in this logo means 'One and Only' according to Guru Nanak:

ਸਾਹਿਬੁ ਮੇਰਾ ਏਕੈ ਹੈ ॥

Sāhib merā eko hai.

ਏਕੈ ਹੈ ਭਾਈ ਏਕੈ ਹੈ ॥੧॥ ਰਹਾਉ ॥

Ēko hai bhāī eko hai. ||1|| rahāo.

ਅਗਰਾਸ, ਮ: , ਪੰਨਾ 350.

My Eternal Entity (God)¹ is One and Only^{2,3,4}, Hey Brother!

AGGS, M 1, p 350.

ਏਕੈ ਮਹਿ ਸਰਬ ਸਰਬ ਮਹਿ ਏਕੈ ਏਹ ਸਤਿ ਗੁਰਿ ਦੇਖਿ ਦਿਖਾਈ ॥੫॥

Ēk meh sarab sarab meh ekā eh satgur dekḥ dikhāī. ||5||

ਅਗਰਾਸ, ਮ: 1, ਪੰਨਾ 907.

Guru Nanak says:

The True⁴ enlightenment⁵ has shown⁷ (me) the vision⁶ that the One¹ is in everything² and everything² is the One³.

AGGS, M 1, p 907.

About 20 centuries before Guru Nanak Anaxagoras (born ca. 500–480), a Greek philosopher, propounded a physical theory of “**everything-in-everything**”. It is somewhat close to that of the above observation of Guru Nanak. Anaxagoras also claimed that nous (intellect or mind) was the motive cause of the cosmos (meaning denied the divinity of all other gods but his principle, the mind) (Chahal, 2020).

Guru Arjun has also explained this attribute as follows:

ਏਕੈ ਰੇ ਹਰਿ ਏਕੈ ਜਾਨੈ ॥

Ēkai re har ekai jān.

ਏਕੈ ਰੇ ਗੁਰਮੁਖਿ ਜਾਨੈ ॥੧॥ ਰਹਾਉ ॥

Ēkai re gurmukhī jān. ||1|| rahāo

ਅਗਗਸ, ਮ: 5, ਪੰਨਾ 535.

Hey enlightened person!⁵ Comprehend^{3,6} the Eternal Entity (God) as One and Only^{1,2,4}.

AGGS, M 5, p 535.

ਨਾਨਕ ਵਰਤੈ ਇਕੁ ਇਕੋ ਇਕੁ ਤੂੰ ॥੨੨॥੧॥੨॥ ਸੁਧੁ ॥

Nānak varṭai ik iko ik tūṅ. ||22||1||2|| sudh.

ਅਗਗਸ, ਮ: 5, ਪੰਨਾ 966.

"Nanak Says:

You⁵, the One and Only^{2,3,4}, pervade¹ everywhere.

AGGS, M 5, p 966.

I may add here that some scholars, without understanding properly the following phrase of Guru Nanak, they justify that he himself says that God is also ‘One’ in Vedas:

ਬੇਦਾ ਵਖਾਣਿ ਕਹਹਿ ਇਕੁ ਕਹੀਐ ॥

Beḍ vakḥāṅ kahēh ik kahīai.

ਓਹੁ ਬੇਅੰਤੁ ਅੰਤੁ ਕਿਨਿ ਲਹੀਐ ॥

Oh be=antṭ antṭ kin lahīai.

ਅਗਗਸ, ਮ: 1, ਪੰਨਾ 1188.

However, critical study of the above phrase shows that here ਬੇਦ/ਵੇਦ (*bed/ved*) means intellect/wisdom according to Bhai Kahn Singh (1981) although ਬੇਦ/ਵੇਦ (*bed/ved*) also means, sacred books in Hinduism. Therefore, the above phrase has been interpreted as follows:

Intellectual¹ deliberation² reveals⁴ that the Eternal Entity (God) is ‘One’³.

The Oh (That)⁵ is Infinite⁶ and nobody⁸ has found⁹ its limit⁷.

AGGS, M 1, p 1188.

Another example ਬੇਦ/ਵੇਦ (*bed/ved*) means knowledge/wisdom to justify the above interpretation is found in JAP bani:

ਅਹਰਣਿ ਮਤਿ ਵੇਦੁ ਹਥੀਆਰੁ ॥

Ahraṅ maṭ veḍ hathīār.

ਅਗਗਸ, ਜਪੁ 38, ਪੰਨਾ 8.

Wisdom² should be anvil¹ and knowledge³ be the tools⁴.

AGGS, Jap 38, p 8.

Therefore, it is wrong to say that Guru Nanak was following Vedic philosophy to address the Eternal Entity (God) as ‘One’. The following verses of Guru Nanak further confirm that the Eternal Entity (God) to be ‘One and Only’:

ਵੰਞੈ ਨਦਰਿ ਕਰੇ ਜਾ ਦੇਖਾ ਦੂਜਾ ਕੋਈ ਨਾਹੀ ॥

Ṃṅṅai naḍar kare jā ḍekhā ḍūjā koī nāhī.

ਏਕੋ ਰਵਿ ਰਹਿਆ ਸਭਾ ਥਾਈ ਏਕੁ ਵਸਿਆ ਮਨ ਮਾਹੀ ॥੧੩॥

Ēko rav rahiā sabḥ thāī ek vasiā man māhī. ||13||

ਅਗਗਸ, ਮ:1, ਪੰਨਾ 433.

When visioned², I saw³ that there is no⁵ second⁴ (other).

The One⁶ pervades⁷ everywhere^{8,9} and the One¹⁰ also pervades¹¹ in my mind¹².

AGGS, M 1, p 433.

Note: ਵੰਞੈ is a letter of Gurmukhi script used just to start the phrase, a style of writing poetry.

This phrase also confirms that this One is not numeral 1 since there is no number 2 after it

ਓ (ਓਹੁ – Oh) (meaning ‘That’). It is qualifier noun for ੧ (One) in ਓ, Eternal Entity (God)

ਨਾ ਓਹੁ ਮਰੈ ਨ ਹੋਵੈ ਸੋਗੁ ॥

Nā oh marai na hovai sog

ਅਗਗਸ, ਮ: 1, ਪੰਨਾ 9.

Oh (That) does not die; thus, there is no reason to mourn.

AGGS, M 1, p 9.

ਓਹੁ ਬਿਧਾਤਾ ਮਨੁ ਤਨੁ ਦੇਇ ॥

Oh biḍhātā man ṭan ḍeīe.

ਅਗਗਸ, ਮ:1, ਪੰਨਾ 931.

Oh¹, (That – Eternal Entity)² blesses⁵ the mind³ and body⁴.

AGGS, M 1, p 931.

Extended End () of Open Oora’ (ਓ) is also qualifier sign for ੧ (One) in ਓ to represent its Infinity:

ਗੁਰਮੁਖਿ ਬੇਅੰਤੁ ਧਿਆਈਐ ਅੰਤੁ ਨ ਪਾਰਾਵਾਰੁ ॥੪੬॥

Gurmukh be=antṭ ḍhiāīai antṭ na pāravār. ||46||

ਅਗਗਸ, ਮ: 1, ਪੰਨਾ 936.

The enlightened person¹ contemplates³ the Infinite², who has no limit⁴ or end⁵.

AGGS, M 1, p 936.

ਤਾਂ ਕੇ ਅੰਤ ਨ ਪਾਏ ਜਾਹਿ ॥

Fā ke ant̄ na pā^e jāhi.

ਏਹੁ ਅੰਤੁ ਨ ਜਾਣੈ ਕੋਇ ॥

Ēhu ant̄ na jāṇai ko^e.

ਅਗਗਸ, ਜਪੁ 24, ਪੰਨਾ 5.

The infiniteness² of That¹ cannot be comprehended³.

(In fact) Nobody⁶ knows⁵ its infiniteness⁴.

AGGS, Jap 24, p 5.

Now let us consider if this **ੴ (One)** used in **ੴ** is 'Nothingness' or 'Singularity' as understood by scientists? (Big Bang Theory - The Premise, n.d.)

WHAT IS NOTHINGNESS OR SINGULARITY?

To comprehend ੴ (One) in ੴ, it is necessary to understand 'Nothingness' or 'Singularity'. Their understanding would further strengthen our thesis that ੴ is an original and unique logo conceptualized by Guru Nanak to represent the **Eternal Entity** (God).

Singularity

According to standard theory (Big Bang Theory – The Premise, n.d.) our Universe sprang into existence from "Singularity" around 13.7 billion years ago. Singularities are zones which defy our current understanding of physics. They are thought to exist at the core of "black holes." Black holes are areas of intense gravitational pressure. The pressure is thought to be so intense that finite matter is squished into infinite density (a mathematical concept which truly boggles the mind). These zones of infinite density are called "Singularities." Our Universe is thought to have begun as an infinitesimally small, infinitely hot, infinitely dense, something – a Singularity.

Nothingness

Nothingness has been defined by Kaup (n.d.) as follows:

"Nothingness Theory defines nonexistence as being the absence of existence, the absence of nothingness, and the absence of absence. It is, what is not being referred-to under any circumstances. Nonexistence is that which cannot be referred-to, named, or defined. So, referring to it in any way violates its strict definition. Nevertheless, this fundamental paradox is at the basis of Nothingness Theory and must be referred-to anyway. Despite it is not being absolute nonexistence exerts a detectable force. We have proven through simple logic that **the Universe**

has and always will exist. Therefore, the Universe must have existed before the "Big Bang" and will exist forever. This also means that the state of Nothingness from which the Universe burst into existence must have existed relative to absolute nonexistence given that absolute nonexistence is not achievable. So, **energy-matter and space-time can attain relative nonexistence by collapsing into infinite density, which is a uniform state of static equilibrium.** Examples of this state of relative nonexistence can be seen throughout the Universe in the form of **black holes**. A 'black hole' is the pinnacle of perfectly symmetrical uniformity of energy, matter, space, and time.

Therefore, 'Nothingness' does not mean 'without anything'. However, it is in such a small volume that it appears to be 'Nothingness'. According to the 'Big Bang Theory', the energy was in such a small volume that has been termed as 'Nothingness' by some scientists and as 'Singularity' by others. This 'Nothingness' is termed as **ਸੁੰਨ (SUNN)** and **ਨਿਰਗੁਨ (Nirgun)** state by Guru Nanak. It is also termed as '**Jyot**' (highly condensed energy) by Guru Nanak.

Is 'ੴ (Ek – One) in ੴ 'Singularity' in Gurbani?

Yes.

This 'One' of Guru Nanak in ੴ is the same as the 'Singularity' of scientists in which energy-matter and space-time have attained relative nonexistence by collapsing into infinite density, which is a uniform state of static equilibrium?

Therefore, the Big Bang Theory can be considered equivalent to Guru Nanak's view that the Universe exploded and started to expand from 'ੴ (One) placed before ੴ:

ਕੀਤਾ ਪਸਾਉ¹ ਏਕੇ² ਕਵਾਉ³ ॥

Kītā pasā^o eko kavā^o.

ਤਿਸ ਤੇ ਹੋਏ ਲਖ⁴ ਦਰੀਆਉ⁵ ॥

Tis tē ho^e lakh dārī^o.

ਅਗਗਸ, ਜਪੁ 16, ਪੰਨਾ 3.

It is literally translated by most of the writers as follows (Thind, n.d.):

You created the vast expanse of the Universe with One Word.

Hundreds of thousands of rivers began to flow.

AGGS, Jap 16, p 3.

Using present day science and the methodology of Guru Nanak, remembering that he would express his philosophy allegorically, metaphorically, and symbolically,

therefore, my interpretation will be quite different from that of all other writers:

The Universe exploded from one² source of energy (Singularity)³ and started to expand^d, thereafter, appeared many⁴ things⁵.

The above phrase of Guru Nanak indicates the One (Singularity, Nothingness- ਸੁੰਨ-Sunn, the ਨਿਰਗੁਨ -Nirgun state) has given rise to everything means ਸਰਗੁਨ (Sargun) state, the Nature/Universe.

Note:

ਪਸਾਉ¹ (pasao) means to expand.

ਕਵਾਉ² (kavao) does not mean sound, word or note. In fact, it means 'energy' as explained by Guru Arjun as follows:

The word, ਦਰੀਆਉ³ (dariao), in the above phrase of Guru Nanak has been explained with a new word, ਸਭਿ (sabh – everything), and ਕਵਾਉ (kavao) with another word, ਕਵਾਵੈ (kavavai – energy) by Guru Arjun:

ਏਕ¹ ਕਵਾਵੈ² ਤੇ ਸਭਿ³ ਹੋਆ⁴ ॥੧॥

Ēk kavāvai ṭe sabh̄ hoā. ||1||

From one¹ source of energy² (Singularity) everything³ was created⁴.

AGGS, M 5, p 1003.

Note: 'ਏਕ¹ ਕਵਾਵੈ² (ek kavavai) in the above phrase is the same as ਏਕੋ ਕਵਾਉ² (eko kavao) used by Guru Nanak in his previous phrase.

ਕਵਾਵੈ² (kavavai) is from ਕਵਾ (kava) which means 'energy' according to Mahan Kosh (Singh, 1981).

ਦਰੀਆਉ³ (daryao) has been literally interpreted as rivers by many scholars. Keeping in view the methodology used by Guru Nanak, 'ਦਰੀਆਉ³ (daryao) has been used as a metaphor for the word, things. What are those things?

The word, 'ਲਖ ਦਰੀਆਉ' (lakh dariao), has been used to mean 'many things', because of the limited vocabulary available at that time. However, one must understand that no water was formed immediately after the Big Bang. It took billions of years to form water on the Earth. Therefore, 'ਲਖ ਦਰੀਆਉ' (lakh dariao), is a metaphoric expression of many things (that means starting from elementary particles to protons, electrons, neutrons, and neutrinos which formed various elements. The first element formed was

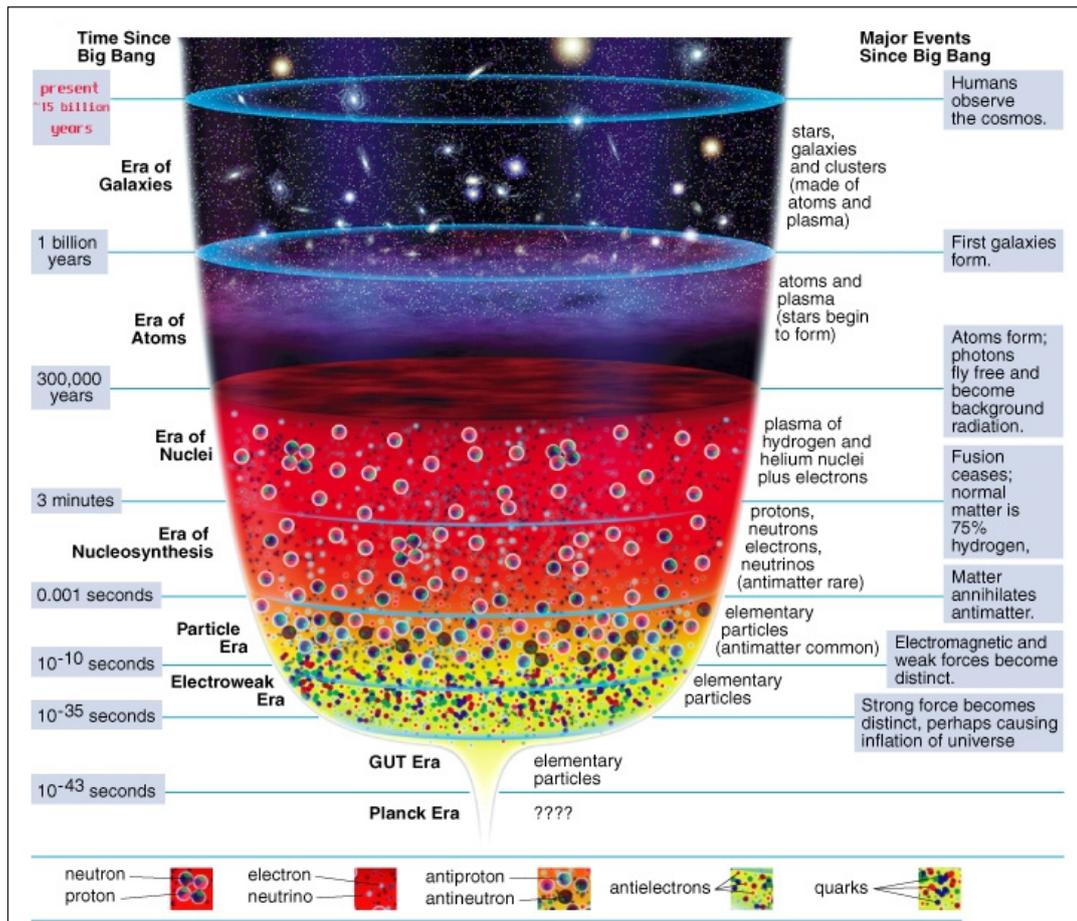


Figure 4: Origin of Universe from Singularity (Nothingness or ਸੁੰਨ -Sunn) according to the Big Bang Theory based on the above description (Wesley, n.d.). Picture Credit: Wesley, Addison

Hydrogen with one proton encircled with one electron. Then Helium was formed joining two protons and two neutrons in nucleus encircled by two electrons. Thereafter, many more elements appeared to give rise to many galaxies containing many stars and planets as explained in the following Fig. 4.

Wesley (n.d.) has explained the evolution of Universe from Singularity (Nothingness or ਸੁੰਨ (Sunn) after Big Bang as follows (Fig. 4):

- after about 10^{-43} seconds: Planck Era???
- after about 10^{-35} seconds: Elementary particles appeared.
- after about 0.001 second to 3 minutes: Electrons, neutrons, neutrinos, and neutrons appeared.
- after about 3 minutes to 300,000 years: The plasma of Hydrogen, Helium nuclei plus electrons gave rise to more elements.
- after about 1 billion years: Galaxies, stars (suns) and planets started to form.
- today the Universe is 13.7 billion years old.
- our Solar System including our Earth was formed 4.6 billion years ago.

Nature – God

ਨਾਨਕ ਸਚ ਦਾਤਾਰੁ ਸਿਨਾਖਤੁ ਕੁਦਰਤੀ ॥੮॥
Nānak sach dātār sinākhat̄ kudratī. ||8||

Nanak says¹:

The Ever-existing² Bountious³ (Eternal Entity) is recognized⁴ as Nature⁵ (the Universe).
AGGS, M 1, p 141.

Here Guru Nanak is equating God with Nature (Universe). That means “God is Nature”.

Note: Nature: 1. Physical World - all natural phenomena and living things.
2. The forces and processes collectively that control the phenomena of the physical world independently of human volition or intervention.

According to German philosopher Karl Jaspers, when Baruch Spinoza (1632–1677) wrote “*Deus sive Natura*” (“**God or Nature**”) Spinoza meant God was *Natura naturans* not *Natura naturata*, that is, “a dynamic nature in action, growing and changing, not a passive or static thing” (Spinozium, n.d.). In 1929 Rabbi Herbert Goldstein sent a telegram to Albert Einstein (Livio, 2018) asking, “Do you believe in God?”. In response Einstein wrote that he admired the Dutch Jewish philosopher Baruch Spinoza, and stated: “**I believe in Spinoza’s god, who**

reveals Himself in the lawful harmony of the world, not in a god who concerns himself with the fate and the doings of mankind.”

Is it not strange that the Natural Philosophy of Guru Nanak, GOD IS NATURE has been accepted by Spinoza and Einstein after about 140 and 390 years, respectively, after the demise of Guru Nanak?

It is evident from the above discussion that the Eternal Entity (God), conceptualized by Guru Nanak as a logo, ੴ, is Nature/Universe.

Therefore, according to Guru Nanak’s philosophical doctrine his God (ੴ) is Pantheistic.

Nevertheless, in the whole AGGS there is Pantheistic as well as panentheistic God.

Note:

Pantheism is defined as follows:

- The doctrine that God is the transcendent reality of which the material Universe and human beings are only manifestations: it involves a denial of God’s personality and expresses a tendency to identify God and nature.
- Any religious belief or philosophical doctrine that identifies God with the Universe.
(Dictionary.com)

Panentheism is defined as follows (Panentheism, n.d.):

Panentheism is meant to be different from pantheism, which ontologically equates the Universe with God. Thus, the panentheistic God is both an immanent force within all creation, and the transcendent power over the Universe.

In pantheism the God is impersonal while in panentheism the God is considered personal in almost all religions.

IS ਸੁੰਨ (SUNN) ‘Nothingness’ in Gurbani?

Yes.

The ‘ੴ’ (Ek – One) in ੴ is very much comparable to ‘Singularity’ in science as explained previously. This ‘ੴ’ (Ek – One) in ੴ is also called ਸੁੰਨ (Sunn) or ਨਿਰਗੁਣ (Nirgun) state by Guru Nanak, but called ‘Nothingness’ in science, is explained as follows:

The first three phrases are in the form of questions about ਸੁੰਨ (Sunn):

ਸੁੰਨੈ ਸੁੰਨ ਕਹੈ ਸਭੁ ਕੋਈ ॥

Sunno sunn kahai sabh koī.

ਅਨਹਤਾ ਸੁੰਨ ਕਹਾ ਤੇ ਹੋਈ ॥

Anhaṭ sunn kahā tē hoī.

ਅਨਹਤਾ ਸੁੰਨਿ ਰਤੇ ਸੇ ਕੈਸੇ ॥

Anhaṭ sunn ratē se kaise.

Everyone speaks about the sunn¹.

How did Infinite² sunn³ originate⁴?

How⁸ can one understand⁷ the Infinite⁵ sunn⁶?

Then Guru Nanak answers it as follows:

ਜਿਸ ਤੇ ਉਪਜੇ ਤਿਸ ਹੀ ਜੈਸੇ ॥

Jis tē upje tis hī jaise.

That (Nothingness)⁹ originated¹⁰ from the Universe¹¹, therefore, it is the same since it has everything of that Universe¹², and it (ਸੁੰਨ - Sunn) will become same as the Universe again.

AGGS, M 1, p 943.

Guru Nanak also supports origin of ਸੁੰਨ (Sunn) as follows:

ਅਵਿਗਤੇ ਨਿਰਮਾਇਲੁ ਉਪਜੇ ਨਿਰਗੁਣ ਤੇ ਸਰਗੁਣੁ ਬੀਆ ॥

Avigaṭo nirmā'il upje nirgun tē sargun thī'ā.

ਅਗਗ, ਮ:1, ਪੰਨਾ 940.

The Nirgun⁴ state of the Eternal Entity originated³ purely² from Nothingness¹ and this Nirgun state became⁶ Sargun⁵ state (Nature/Universe).

AGGS, M 1, p 940.

This is comparable to today's theory that the Universe will go into a "big crunch" (Villanueva, 2009) ending up as one point called Singularity, Nothingness or ਸੁੰਨ (Sunn).

Now in the following phrase Guru Nanak is indicating that this Nothingness (ਸੁੰਨ - Sunn) and ਨਿਰਗੁਣ (Nirgun) state is Eternal Entity that does not take birth or dies since it is always present in one form or other (Singularity, Nothingness, and ਸੁੰਨ - Sunn) or Nature/Universe:

ਜਨਮਿ ਨ ਮਰਹਿ ਨ ਆਵਹਿ ਜਾਹਿ ॥

O'e janam na marēh na āvahi jāhi.

ਨਾਨਕ ਗੁਰਮੁਖਿ ਮਨੁ ਸਮਝਾਹਿ ॥੫੨॥

Nānak gurmukh man samjhāhi. ||52||

ਅਗਗਸ, ਮ: 1, ਪੰਨਾ 943.

This state of ਸੁੰਨ (Sunn) to Universe and back to ਸੁੰਨ (Sunn) is a continuous cycle. Therefore, neither it is born nor dies.

Oh, Enlightened person! Orientate your mind so that you can understand the above fact. 52.

AGGS, M 1, p 943.

Guru Nanak is explaining that when Nothingness (ਸੁੰਨ - Sunn) or Singularity became the Nature/Universe after the Big Bang then it will go back to Nothingness (ਸੁੰਨ - Sunn) or Singularity again.

Guru Arjun has explained the above philosophy of Guru Nanak in his own words as follows:

ਕਈ ਬਾਰ ਪਸਰਿਓ ਪਾਸਾਰ ॥

Kaī bār pasri'o pāsār.

ਸਦਾ ਸਦਾ ਇਕੁ ਏਕੰਕਾਰ ॥

Sadā sadā ik ekankār.

ਅਗਗਸ, ਮ: 5, ਪੰਨਾ 276.

The Universe⁴ came into existence³ many¹ times².

Nevertheless, the One⁶ (ਸੁੰਨ - Sunn, Nothingness or Singularity) remains One and Only⁷ (Ekankār - Singularity) all the time⁵.

AGGS, M 5, p 276.

The above stanzas of Guru Nanak and Guru Arjun, respectively, had expressed the same theory about 550 years ago as formulated by Bergman now. Bergman (2003) says if there is enough matter in the Universe, eventually gravitational forces will stop its expansion. When this happens, gravity will cause the Universe to reverse its direction and begin to collapse under its own weight. This phase of the Universe's life is known as the 'Big Crunch' (Bergman, 2003; Villanueva, 2009). He says that some theorize that the Universe could collapse into the same state that it began as and then blow up in another Big Bang. In this way, the Universe would last forever but would continually go through these phases of expansion and contraction - Big Bang and Big Crunch, and so on.

Guru Nanak says that *panj tatt* (five elements) originated from the ਸੁੰਨ (Sunn) (Nothingness or Singularity), which is comparable to the evolution of Universe from Singularity:

ਪੰਚ ਤਤੁ ਸੁੰਨਹੁ ਪਰਗਾਸਾ ॥

Panch taṭ sunnahu pargāsā... 14

ਅਗਗਸ, ਮ: 1, ਪੰਨਾ 1038.

The five¹ elements² have originated⁴ from Nothingness³ (Sunn)...14.

AGGS, M 1, p 1038.

Guru Nanak further says that ਸੁੰਨ (Sunn) (Nothingness or Singularity) gave rise to stars and planets:

ਸੁੰਨਹੁ ਚੰਦੁ ਸੂਰਜੁ ਗੈਣਾਰੇ ॥

Sunnahu chand sūraj gaināre.

ਤਿਸ ਕੀ ਜੋਤਿ ਤਿਭਵਣ ਸਾਰੇ ॥

Tis kī jot̄ tibhvaṇ sāre.

ਸੁੰਨੇ ਅਲਖ ਅਪਾਰ ਨਿਰਾਲਮੁ ਸੁੰਨੇ ਤਾੜੀ ਲਾਇਦਾ ॥੫॥

Sunne alakh apār nirālam sunne tārī lā'idā. ||5||

ਅਗਗਸ, ਮ: 1, ਪੰਨਾ 1037.

Moons¹¹ and Suns¹² (planets and stars) have originated¹³ from Nothingness¹⁰ (ਸੁੰਨ - Sunn).

The Energy¹⁵ of That¹⁴ (ਸੁੰਨ -Sunn) pervades in the whole Universe¹⁶ (mythical three worlds).

(Guru Nanak is talking about the Eternal Entity (God) in the state of Nothingness (ਸੁੰਨ -Sunn) and Universe.)

The Ineffable¹⁸, Infinite¹⁹, without any flaw²⁰ (the Universe) originated from Nothingness (ਸੁੰਨ -Sunn)¹⁷ and will go back/imbibed²² in the same Nothingness (ਸੁੰਨ -Sunn)²¹. 5.

AGGS, M 1, p 1037.

This explanation by Guru Nanak is comparable to 'Big Crunch'.

Guru Nanak continued to describe that human body was formed by the *Pant Tatt* (five elements + many elements) which originated from ਸੁੰਨ (*Sunn*):

ਪੰਚ ਤਤੁ ਮਿਲਿ ਕਾਇਆ ਕੀਨੀ ॥

Panch taṭ mil kāiā kīnī.

The human body was made by five elements

AGGS, M 1, p 1030.

And he repeats the same as follows:

ਪੰਚ ਤਤੁ ਮਿਲਿ ਇਹੁ ਤਨੁ ਕੀਆ ॥

Panch taṭ mil ih taṇ kīā.

The human body is made of five elements.

AGGS, M 1, p 1039.

Bhagat Kabir also says that the human body was made by mixing five elements:

ਪੰਚ ਤਤੁ ਮਿਲਿ ਕਾਇਆ ਕੀਨ੍ਹੀ ਤਤੁ ਕਹਾ ਤੇ ਕੀਨੁ ਰੇ ॥

Panch taṭ mil kāiā kīnī taṭ kahā te kīn re.

The human body was made by God by mixing five elements, but he questions wherefrom these five elements came.

AGGS, Kabir, p 870.

Bhagat Kabir (1398–1448 or 1440–1518) appeared before Guru Nanak (1469–1539) but does not talk about the origin of five elements. He is mentioning five elements (air, earth, fire, water, and sky) as accepted in Hinduism but does not know where the five elements came from. However, Guru Nanak did explain that five elements came from ਸੁੰਨ (*sunn* - Nothingness / Singularity).

Guru Ramdas also follows ancient philosophy that the Eternal Entity (God) created the Universe with the *panj tatt* (five elements) and nobody can create the sixth element:

ਪੰਚ ਤਤੁ ਕਰਿ ਤੁਧੁ ਸਿਸਟਿ ਸਭ ਸਾਜੀ ਕੋਈ ਛੇਵਾ ਕਰਿਉ ਜੇ ਕਿਛੁ ਕੀਤਾ ਹੋਵੈ ॥

Panch taṭ kar tuḍh sarisat sabh sājī koī chhēvā kariō je kichh kītā hovai.

ਅਗਰਾਸ, ਮ: 4, ਪੰਨਾ 736.

The Eternal Entity (God) has created the Universe with five elements; if anyone can create sixth one then let him show us.

AGGS, M 4, p 736.

Strangely, the above statement is the reverse what happened according to scientific information that the five elements (air, earth, fire, water, and sky (space)) made the Universe. However, according to scientific information these so-called five elements were formed after the evolution of the Universe.

During ancient times in classical thought, the four elements **air, earth, fire, and water**, and as proposed by Empedocles (490 – 430 BCE) frequently occur. Aristotle (384–322 BCE) added a fifth element, **aether**; it has been called **akasha (sky)** in India and quintessence in Europe (Panj Tatt Ancient, n.d.). Ancient cultures in Egypt, Babylonia, Japan, Tibet, and India had similar lists. The origin of *Pani Tatt* from ਸੁੰਨ (*Sunn*) and the formation of celestial bodies (stars/suns, planets, galaxies) and human bodies by them as mentioned during the discussion of ਸੁੰਨ (*Sunn*), the *Panj Tatt* of Guru Nanak, the Natural Philosopher, could be considered comparable to modern five elements - Carbon, Hydrogen, Oxygen, Nitrogen and Phosphorus – the basic plus more. Therefore, the *Panj Tatt* when mentioned by Guru Nanak are different than the ancient and complex elements (air, earth, fire, water, and sky). Antoine Lavoisier (1743-1794), together with Louis-Bernard Guyton de Morveau, Claude-Louis Berthollet and Antoine Francois de Fourcroy, developed *Méthode de nomenclature chimique* (Method of Chemical Nomenclature), in 1787. The ancient concept of five elements of air, earth, fire, and water to which the fifth, aether or sky, was added, was discarded instead some 55 substances which could not be decomposed into simpler substances by any known chemical means, were provisionally listed as elements (Antoine Lavoisier, n.d.). Now there are 118 elements in the periodic table (Panj Tatt Modern, n.d.).

OTHER OPINIONS ABOUT ੴ

This is another independent subject to be discussed later somewhere. However, the survey of the available literature indicates that Bhai Gurdas was the first Sikh scholar trained at Banaras school, who has pronounced ੴ as ਏਕੰਕਾਰ ਓਅੰਕਾਰੁ (*Akangkar Oankar*) as is evident from his *Pauri 15 of Vaar 3* (Singh, 1984). Thereafter, pronunciation

of ੴ as ਏਕੁ ਓਅੰਕਾਰੁ (*Ek Oankaar*) became popular in the Sikh world. While some Sikh and non-Sikh scholars accept ੴ as ਏਕੁ ਉਮਕਾਰ (*Ek Omkar*), however, both ਓਅੰਕਾਰੁ (*Oankaar*) and ਉਮਕਾਰ (*Omkar*) represent OM which stands for Trinity of God: Brahma, Vishnu, and Shiva. Guru Nanak does not accept the Eternal Entity (ੴ) in Trinity.

On the other hand, some scholars have refused to accept the above both pronunciations. Nirmal Singh Kalsi (1996) may be the first who refused to accept ੴ as *Ek Oankaar* instead he pronounced it as "Ekoooooooo...". He is ignoring to pronounce open *Oora* with its extended end (ੴ with extended, ੴ). Thereafter, Gulbarg Singh Basi (2020, n.d.) and Dr Iqbal Singh Dhillon (2019) followed him and pronounce ੴ as "Ekko". However, both Basi and Dhillon involve open *Oora* (ੴ) with One of ੴ to pronounce *Ekko* and are ignoring its extended end (ੴ) as a calligraphy. While Col Manmohan Singh Scout is of opinion that ੴ should be pronounced as ਏਕੰਕਾਰ (*akankar*) (Personal communication). However, Bhai Gurdas has already pronounced One in ੴ as ਏਕੰਕਾਰ (*akankar*) meaning *Eko Ek* (One and Only). He does not involve open *Oora* (ੴ) to make it *Eko Ek*. All of them are ignoring to pronounce open *Oora* and its extended end (ੴ with extended, ੴ) which are most important qualifier word and sign referencing to One of ੴ.

Conclusions

Guru Nanak is a great Natural Philosopher who founded 'Sikhi' based upon his observations that every action and reaction in this Universe and living being is going on under the Natural Laws. 'Sikhi' has been defined as the 'enlightening philosophy' based on Guru Nanak's experience in Natural Philosophy. Natural Philosophy became to be known as 'Science' based on the Natural Philosophy of Copernicus, Galileo, Newton, and others during the 19th century.

After briefly description of the main heading, Sikhi and Sikhism, this article discusses at length the Eternal Entity (God) conceptualized by Guru Nanak as a logo, ੴ. It indicates that 'One' in ੴ is 'That' (ੴ with extended, ੴ) which is Infinite' (amount of energy). Therefore, ੴ means 'One and Only That is Infinite' (amount of energy) in English and ਇਕੁ ਓ ਬੇਅੰਤ (*Ek Oh Beant*) in Punjabi.

According to Guru Nanak the 'One' in ੴ is not a numeral but a physical one which is supported by qualifier letter ਓ (open *Oora*) with its extended end (ੴ) indicating That One is Infinite (amount of energy). The 'One' in ੴ is called ਸੁੰਨ (*Sunn*) or ਨਿਰਗੁਨ (*Nirgun*) state of the Eternal Entity (God) by Guru Nanak which is comparable to physical 'One' called Singularity or Nothingness in science of today.

When this 'One' in ੴ exploded it gives rise to the ਸਰਗੁਨ (*Sargun*) state, the Nature/Universe. According to Big bang Theory after the explosion of Singularity/ Nothingness Elementary Particles, Electron, Neutrons, Neutrinos, Protons appeared. The first element, Hydrogen, was formed with one Electron encircling one Proton. Thereafter, second element, Helium, was formed by two Electrons encircling two Protons along with two neutrons. Thereafter, more elements were formed to give rise to the formation of suns (stars), planets, and galaxies.

Guru Nanak has declared, 'God is Nature'. Spinoza also wrote "*Deus sive Natura*" ("**God or Nature**") and Einstein said he believes in Spinoza's God about 140 and 390 years, respectively, after the demise of Guru Nanak. Therefore, the God of Guru Nanak is 'Pantheistic' although in the AGGS the God is accepted both 'Pantheistic' as well as 'Panentheistic'.

The origin of *Pani Tatt* from ਸੁੰਨ (*Sunn*) and the formation of celestial bodies (stars/suns, planets, galaxies) and human bodies by them during the discussion of ਸੁੰਨ (*Sunn*), the *Panj Tatt* of Guru Nanak, the Natural Philosopher, could be considered comparable to modern five elements - Carbon, Hydrogen, Oxygen, Nitrogen and Phosphorus – the basic plus more. Therefore, the *Panj tatt* when mentioned by Guru Nanak are different from the ancient *Panj Tatt* (air, earth, fire, water, and sky) which were discarded by Antoine Lavoisier and his associates and reported about 55 real elements. Now there are 118 elements in the periodic table.

Competing Interests Statement

The author declares that he has no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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References

- Aad Guru Granth Sahib. (1983). Amritsar, Punjab, India: Shiromani Gurdwara Parbandhak Committee). (M = Mahla, i.e., succession number of the Sikh Gurus to the House of Nanak, M is replaced with the name of Bhagat/ Bhatt for their Bani, p = Page of the AGGS.
- Age of Enlightenment. (n.d.). In *Wikipedia*. Retrieved from https://en.wikipedia.org/wiki/Age_of_Enlightenment
- Antoine Lavoisier. (n.d.). Retrieved from https://en.wikipedia.org/wiki/Antoine_Lavoisier
- Basi, G. S. (2020). ੴ IKKO as Its Proper Pronunciation. *Sikh Bulletin*, 22(2), 9–14. Retrieved from <http://www.sikhbulletin.com>
- Basi, G. S. (n.d.). The Eternal Precepts of Sikhi. *Sikh Bulletin*, 23(1), 19–23.
- Bergman, J. (2003). The Big Crunch, Windows to the Universe (2003). Retrieved from https://www.windows2universe.org/?page=the_universe/Crunch.html
- Big Bang Theory - The Premise. (n.d.). Retrieved from <http://www.big-bang-theory.com/>
- Chahal, D. S. (2002). HOW TO ADDRESS THE HOLY GRANTH OF THE SIKHS? . *Understanding Sikhism Res, J*, 4(2), 23–31. Retrieved from <http://iuscanada.com/journal/archives/2002/j0402p23.pdf>
- Chahal, D. S. (2018). JAP: The Essence of Nanakian Philosophy (a scientific and Logical Interpretation). Retrieved from <http://iuscanada.com/books/2018/JAP-2018-Final-filtered.html>
- Chahal, D. S. (2019). PHILOSOPHY OF GURU NANAK IN THE EYES OF A SCIENTIST. *Understanding Sikhism Res, J*, 21(1), 29–43. Retrieved from <http://iuscanada.com/journal/archives/2019/j2101p29.pdf>
- Chahal, D. S. (2020). ORIGINALITY AND UNIQUENESS OF BANI OF GURU NANAK. *Understanding Sikhism Res, J*, 22(1), 5–7. Retrieved from <http://iuscanada.com/journal/archives/2020/j2201p05.pdf>
- Chahal, D. S. (2020). SIKH AND SIKHISM - Their Relationship with the Age of Enlightenment - Basic Principles of Sikhi. *Understanding Sikhism Res, J*, 22(1), 9–19. Retrieved from <http://iuscanada.com/journal/archives/2020/j2201p09.pdf>
- Chahal, D. S. C. (2020). NATURAL PHILOSOPHERS Nanak is at the Top of the List. *Understanding Sikhism Res. J.*, 22(1), 29–40. Retrieved from <http://iuscanada.com/journal/archives/2020/j2201p29.pdf>
- Chahal Thind, K. S, Dhailwal, A. .S. and Schell, J, D. S. (2015). Nanak: The Guru - The Founder of Sikhism . Laval, Quebec, Canada: Institute fro Understanding Sikhism. Retrieved from http://www.iuscanada.com/books/2015/ebook_Nanak_The_Guru_The_Founder_of_Sikhism.pdf
- Dhillon, I. S. (2019). ੴ da ucharan ate bhaveth arth. *Journal Parkh, Punjab Universty, Chandigarh*, 1 & 2, 206–222.
- Kalsi, N. S. (1996). *Beej Mantar Darshan (Punjabi)*. Surrey, BC, Canada: Kalsi Technologies, # 15, 7711 - 128th Street.
- Kaup, C. (n.d.). Nothingness Theory: The connection between the evolution of the universe and human thought. Kaup Communication. Retrieved from <http://overunity.com/7793/everything-in-the-universe-is-moving-towards-equilibrium-setting-off-free-energy/#.WcLSBmIGPn0>
- Livio, M. (2018). Einstein’s Famous “God Letter” Is Up for Auction. Retrieved from <https://blogs.scientificamerican.com/observations/einsteins-famous-god-letter-is-up-for-auction/>
- Logo of Northwest Airlines. (n.d.). Retrieved from https://www.google.ca/search?q=logo+of+Northwest+airlines&ei=pWU_YcnBGYWMggeJroRw&oq=logo+of+Northwest+airlines&gs_lcp=Cgdnd3Mtd2l6EAMyBggAEbYQHjoHCAAQRxCwAZoHCAAQsAMQQzoQCC4QsQMqQxwEQOQMqQxCTAjoHCAAQsQMqQzoECAAQzoKCAAQsQMqQwEQQzoFCAAQKl6BQgAEIAESgQIQRgA
- Mike Erickson. (n.d.). Zip. Retrieved from <https://dribbble.com/shots/2517664-Zip%0A>
- Natural Philosophy. (n.d.). In *Wikipedia*. Retrieved from [https://en.wikipedia.org/wiki/Natural_philosophy#:~:text=Natural philosophy or philosophy of, the precursor of natural science.](https://en.wikipedia.org/wiki/Natural_philosophy#:~:text=Natural%20philosophy%20or%20philosophy%20of%20the%20precursor%20of%20natural%20science)
- Panentheism. (n.d.). In *New World Encyclopedia*. Retrieved from <https://www.newworldencyclopedia.org/entry/Panentheism>
- Panj Tatt Ancient. (n.d.). Retrieved from https://www.google.ca/search?source=hp&q=ancient+five+elements&oq=ancient+five+elements&gs_l=psy-ab..1.0.0i22i30k1l5.1931.7385.0.12141.22.21.0.0.0.0.433.3336.0j17j2j0j1.20.0.dummy_maps_web_fallback...0...1.1.64.psy-ab..2.20.3326.0..0j35i39k1j0i131k1.0.3lz9
- Panj Tatt Modern. (n.d.). Retrieved from https://en.wikipedia.org/wiki/Classical_element
- Singh, J. (1968). *Kartarpuri Bir dai Darshan*. Patiala, Punjab: Punjabi University.
- Singh, K. (1981). *Mahan Kosh*. Patiala, India: Bhasha Vibagha Punjab.
- Singh, K. (1996). *Gurmat Martand (Punjabi)*. Patiala: Language Department Punjab.
- Singh, V. (1984). *Vaaran Bhai Gurdas Steek (Punjabi)*. Hall Bazar, Amritsar: Khalsa Samachar.
- Spinozium. (n.d.). Retrieved from <https://en.wikipedia.org/wiki/Spinozism%0A%0A>
- Thind, K. S. (n.d.). Sri Granth. Retrieved from <http://www.sri-granth.org/servlet/gurbani.gurbani?S=y>
- Villanueva, J. C. T. B. C. T. E. of O. U. (2009). The Big Crunch: The End of Our Universe? Retrieved from [https://www.universetoday.com/37018/big-crunch/ %0A](https://www.universetoday.com/37018/big-crunch/)
- Wesley, A. (n.d.). Big Bang Picture. Retrieved from http://www.physicsoftheuniverse.com/photo.html?images/big-bang_timeline.jpg&Timeline and major events since the Big Bang

Biographical Statement of the Author

Professor Dr. Devinder Singh Chahal was Professor and Head of Department of Microbiology at Punjab Agricultural University, Ludhiana, India, Fulbright Fellowship in 1974 at the Department of Food Science and Chemical Engineering, at Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA and then visiting scientist in the Department of Chemical Engineering at the University of Waterloo, Ontario, Canada.



In 1982 he moved to the Institut Armand-Frappier, Université du Québec, Laval, Québec, and retired as Professor of Industrial Microbiology in 1996. His work is on the utilization of waste cellulosic materials into food, feed, and fuel. He is the inventor of “solid state formation” for production of cellulases, which has been quoted by many scientists (312 + 84) throughout the world.

Since 1999, he has been the Founder and the President of the Institute for Understanding Sikhism and the

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He has been one of the 100 Top Most Influential Sikhs of the World from 2012 to 2016 as a writer. He was honored by Shiromani Gurdwara Parbandhak Committee (SGPC - “Supreme Gurdwara Management Committee”), Amritsar, India in 2004, and by the Delhi Sikh Gurdwara Management Committee (DSGMC, New Delhi on Khalsa Fateh Divas on March 8-9, 2014. DSGMC is an autonomous organisation which manages Gurdwaras in the state of Delhi, India.

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