

What does the Bible say about the fabric of space?

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Three key words used in the Bible to describe space are examined. The Hebrew word *shachaq*, commonly translated as skies, describes things that were made firm or hardened through a casting type process. This helps to make sense of the word firmament which is related to the Hebrew word *raqa* (to beat, hammer out or spread out, e.g. metal). The heavens are like the finished goods of this manufacturing process. The language of Scripture not only hints at the heavens being like a fabric but suggests they are thin in a fourth spatial dimension, as observed by another author. Together, these words provide a biblical filter for evaluating theories and models of this medium.

In 1994 Russell Humphreys published a book which listed his now famous 17 verses on the stretching out or spreading out of the heavens. He also listed some key verses which strongly suggest the heavens are an actual material. Furthermore, some of these descriptions of the heavens suggest this material is thin in another spatial dimension.¹ Many of the current physics theories seem to make reference to some sort of medium or fabric of space but the concept is usually shrouded in more technical terms with a strong reluctance to use the politically incorrect word *ether*.² More recently, Humphreys has taken these concepts further with a new model for how gravity works based on a four-dimensional fabric of space that has tension in it. In his model this fabric is greatly accelerated uniformly in the fourth dimension.³

In 2011, John Hartnett reviewed the Bible's meaning of *natah* (to stretch or bend) in relation to the cosmos, concluding, "there is not a single verse in the Bible applied to the cosmos with the meaning of a rubber sheet, where space might have been stretched by some enormous factor [emphasis in the original]".⁴ Fifteen years earlier, Charles Taylor also pointed out that the stretching of *natah* does not imply expansion.⁵

This paper shares some insights from the Bible on how the Hebrew word *shachaq*, commonly translated as skies or clouds, seems to relate to the fabric of space, directly linking to the processes connected with the firmament. It also reviews what the Bible says about the firmament and the heavens, resulting in a collection of statements that a biblical model of the fabric of space should be consistent with.

The skies

The Hebrew word *shachaq* is used 21 times in Scripture:

- In one occurrence it means a speck of dust (Isaiah 40:15).

- In the remaining 20 occurrences it is translated as clouds, skies, or sky. It is normally found in the plural form in Hebrew except for the two occurrences in Psalm 89.
- The related Hebrew verb is used four times in the Old Testament and means to beat, pound, grind up, or erode.

While skies or clouds may be suitable translations into modern-day English most of the time, there are some descriptions of this word which don't seem to fit. They may be clues to the structure of the fabric of space.

Strong

There are three verses that talk about the strength of *shachaq*:

- Psalm 68:34—"Ascribe strength to God; His majesty is over Israel and His strength is in the skies [*shachaq*]" (NAS). God's strength is in the *shachaq*!
- Proverbs 8:28—"When He made firm the skies [*shachaq*] above, when the springs of the deep became fixed" (NAS). The verb used in relation to the skies means to strengthen, make firm or harden. This verse seems to be giving us a clue as to the changes that happened when God was creating the world.
- Job 37:18—"Can you, with Him, spread out [*raqa*] the skies [*shachaq*], strong as a molten mirror?" (NAS). The word for molten is often translated as cast. So again we see the Bible emphasizing the strength or hardness of *shachaq*. This verse also uses the word *raqa* (to beat, hammer out, or spread out, e.g. metal—see the next section on the firmament) to describe one of the activities God went through in making the *shachaq*.

Cast and hardened

Job 37:18 is not the only passage that mentions casting and hardening. In the very next chapter God questions Job in relation to creation, including a mention of *shachaq*:

"Who can count the clouds [*shachaq*] by wisdom,

Or tip the water jars of the heavens,
When the dust hardens into a mass,
And the clods stick together?” (Job 38:37–38, NAS).

The word translated as mass on the third line means a casting and is translated as such in its only other occurrence in Scripture (1 Kings 7:37). So the third line can be translated as “when the dust hardens in the casting”.

The firmament

In Genesis 1:6–8 on the second day, God made the firmament. (Some translations use the word expanse or vault rather than firmament.) Its purpose was to separate the waters into two parts.

If the firmament is the medium for the propagation of light (i.e. electromagnetic waves), then it is important to note that light appeared before this on the first day. Light seems to travel like a wave in the medium and be detected as if it were a particle. Was there a different sort of medium for the light prior to the firmament? If there was no medium, did the light just sit there in one place, separated from the darkness?

Usage of *raqiya*

Raqiya, the Hebrew word for firmament, is used 17 times in the Old Testament. Nine of these occurrences are in Genesis 1 and a further five occurrences are in Ezekiel.

On the fourth day the phrase “in the firmament of the heavens” (NKJV) is used to describe where the sun, moon, and stars are placed. Even though God named the firmament heaven in verse 8, the expanded phrase is still used. Either the author wanted to be very clear as to which firmament was being referred to, or the firmament belongs to, or is a part of, the heavens in some way—or both. The word heaven on its own was not suitable to accurately and clearly describe where the sun, moon, and stars were placed.

On the fifth day a similar phrase is used to describe the place where the birds fly, “across the face of the firmament of the heavens” (NKJV). Humphreys discussed this verse at length in his 1994 book to reject the idea that the firmament refers only to the earth’s atmosphere.⁶

In Ezekiel 1, the prophet has a vision where he describes various things: four living beings, four wheels, the firmament, and a man on a throne. Verse 22 describes an object that has the *likeness* of a firmament. This firmament is above the heads of the living beings and the throne is above this firmament. This passage is not talking about the firmament of Genesis 1:6–8 but something that resembles it in some way. Interestingly, the firmament is described as stretching out or extending over their heads, i.e. in a horizontal direction rather than in a vertical or radial direction. This same word (Hebrew *natah*) is used to describe the stretching out of the heavens—see the next section on the heavens.

There is another reference to this same firmament and the throne in Ezekiel 10. The remaining three verses mentioning the firmament are:

- Psalm 19:1—it is the firmament that shows God’s handiwork (or causes it to be shown).
- Psalm 150:1—“praise him in the firmament of his power” or “mighty expanse”.
- Daniel 12:3—“shall shine as the brightness of the firmament”. The firmament is bright because God has placed lights in the firmament (Genesis 1:14–19), especially the greater light, the sun!

Usage of *raqa*

The Hebrew word for firmament is related in the Hebrew to the verb *raqa*. It is used 11 times in the Old Testament. Here is the range of meanings:

- To beat, hammer, or spread out metal (e.g. Exodus 39:3).
- To spread people out, to disperse (2 Samuel 22:43).
- To spread out the earth above the waters—a reference to the third day in Genesis 1 (e.g. Isaiah 44:24).
- To stamp one’s foot or feet (e.g. Ezekiel 25:6).
- To spread out the skies [*shachaq*] (Job 37:18). (This verse was examined in the section on the skies.)

This verb is applied to the skies [*shachaq*] but never to the heavens. In fact, Isaiah 42:5 and Isaiah 44:24 contain the word *raqa* and mention the stretching out of the heavens. However the earth is the direct object of *raqa* not the heavens. The heavens is the direct object of *natah*, instead. Isaiah, through divine inspiration, has selected one word to describe the spreading out of the earth above the waters and, within the same verse, another word to describe the stretching out of the heavens. The verb that the word for firmament is related to is *not* used to describe the stretching out of the heavens!

The heavens

Stretched out

Humphreys listed 17 verses on the stretching out of the heavens in his 1994 book.¹ These are summarized and grouped in table 1.

Although I don’t classify all 18 descriptions in these 17 verses as describing the spreading out of the heavens, nevertheless, the idea is clearly repeated, with the most common description using the Hebrew verb *natah*. As pointed out in some of the references mentioned earlier, *natah* suggests spreading out or extending rather than the expansion or large scale stretching of some sort of elastic material.^{4,5}

There are three similes we should quickly look at before moving on to the next point. The heavens are:

- Stretched out [*natah*] like a curtain that is used in the tabernacle (Psalm 104:2). The word used here for curtain

Table 1. The 17 verses on the stretching of the heavens identified by Humphreys

Hebrew Verb	Object	Meaning	Verses
<i>natah</i>	The heavens	To bow or bend the heavens (so that God can come down)	2 Samuel 2:10; Psalm 18:9 (parallel passage to 2 Sam 2:10); Psalm 144:5
		To spread out or extend (like a curtain)	Job 9:8; Psalm 102:4; Isaiah 40:22a; Isaiah 42:5; Isaiah 44:24; Isaiah 45:12; Isaiah 51:13; Jeremiah 10:12; Jeremiah 51:15; Zechariah 12:1
	The north	To spread out or extend	Job 26:7
	The likeness of the firmament—not the firmament of Genesis 1	To spread out or extend (like hills or rivers in a landscape)	Ezekiel 1:22
<i>mathach</i>	The heavens	To spread out (like a tent or possibly a folded up sack before putting grain in it)	Isaiah 40:22b
<i>raqa</i>	The skies [<i>shachaq</i>]	To beat, hammer out or spread out (like metal)	Job 37:18
<i>taphach</i>	The heavens	Most probably to span, as in putting up the palms of your hands as a measure	Isaiah 48:13

occurs 54 times in the Old Testament, 44 of these are in Exodus 26 and 36 for the tabernacle curtain. The Gershonites of the tribe of Levi were responsible for carrying these curtains from place to place (Numbers 4:21–28). At each new place the tabernacle, including the curtains, needed to be set up.

- Stretched out [*natah*] like a *fine, thin* curtain (Isaiah 40:22). This word for curtain [*doq*] is different to the one above and occurs only once in the Bible. It is some sort of fine, thin cloth. This noun is related to the verb to crush, pulverize or make into dust but it isn't the same verb that *shachaq* is related to.
- Spread out [Hebrew *mathach*] like a tent (Isaiah 40:22). This word for spreading out occurs only once in the Bible. However, a word for sack is related to this verb and occurs only in Genesis 42–44—the sacks that Joseph's brothers used to carry grain. The tent mentioned in this verse refers to a nomadic tent made out of strips of black goats' hair cloth, sewn together into one large piece.⁷

While the focus of these passages is on how the heavens are being stretched out, spread out, or unfolded, it is curious that in each case the material involved in the analogy seems to be woven. We also see this in the next subsection about the heavens wearing out like a garment. Is this more than coincidental? (It should be noted that the concepts of casting and weaving are not necessarily in conflict as the woven material may be cast originally, as in Exodus 39:3.)

Other descriptions of the heavens

There are several other descriptions of the heavens in the Bible, all of which reinforce the concept that the heavens are something real and tangible.^{1–3} The heavens:

- Can be torn, like tearing your garments to show grief or remorse (Isaiah 64:1).
- Will wear out like a garment (Psalm 102:26; Hebrews 1:11).
- Will be rolled up like a scroll or robe (Isaiah 34:4; Revelation 6:14; Hebrews 1:12). At the same time as this, all the host of heaven will rot away and wither (Isaiah 34:4). Furthermore, Revelation 6:14 uses the Greek word *apochorizo* (*apo* from and *chorizo* to separate or divide) to describe the heavens separating from something.
- Will be shaken (Hebrews 12:26; Haggai 2:6; Isaiah 13:13) and the “powers of the heavens will be shaken” (Matthew 24:29; Mark 13:25; Luke 21:26).
- Will be changed, like changing clothes, swapping the current version with a new version that can't be shaken (Psalm 102:26; Hebrews 1:12; 12:27).

All but the first point refer to future events in the end times.

A fourth spatial dimension

The rolling up of the heavens (Isaiah 34:4; Hebrews 1:12; Revelation 6:14) strongly suggests that there is some dimension in which the heavens are thin and which, presumably, is the same direction that they will be rolled up into.^{1,3}

Assuming that there is a fourth spatial dimension, then the description of the spreading out of the heavens like a curtain or tent (i.e. material that is thin in one of its dimensions) may also be a description of some sort of unfolding in four spatial dimensions rather than just three. Figure 1 shows that a fabric unfolding in a fourth spatial dimension can appear as if normal three-dimensional space is expanding, the scale of which depends on the amount of folding in this fourth

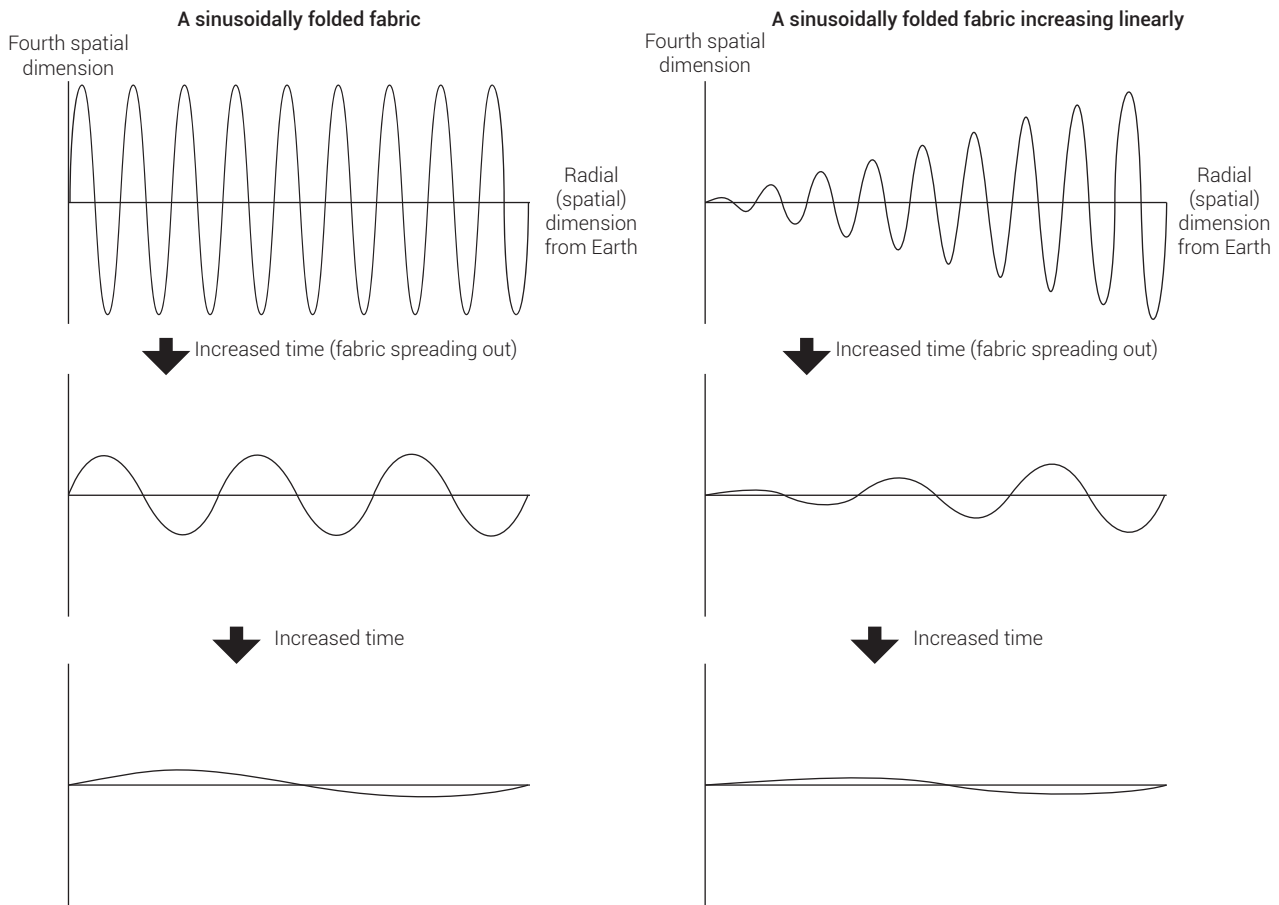


Figure 1. Two examples of how a fabric unfolding in a fourth spatial dimension can appear as if normal three-dimensional space is expanding

dimension relative to our normal three spatial dimensions. The following points need to be stressed about figure 1:

- I have used the idea of a curtain spreading out (Psalm 104:2; Isaiah 40:22). Spreading out a tent (Isaiah 40:22) may look different to this! In reality, we are in the realm of speculative models to try and fit with the hints that we find in Scripture.
- I agree with Humphreys in his recent paper on gravity that it would seem most likely that the majority of this spreading out of the heavens would have been done by the end of the second day of creation.³ If so, this would not help models requiring an expansion of space after the creation of stars on the fourth day in order to resolve the distant starlight problem. But the idea may lead to other concepts like the cooling down of the hardened, cast medium affecting the tension or giving rise to the cosmic microwave background radiation.

Summary of Bible statements

The key aspects of the fabric of space mentioned in this paper are summarized in table 2.

In terms of understanding the differences between the three words, here is a suggestion:

- The name for skies [*shachaq*] reflects a focus on the *substance*.
- The name for firmament [*raqiya*] reflects a focus on the *process*.
- The name for heavens [Hebrew *shamayim*, from “to be lofty”] reflects a focus on the *placement*.

The heavens occur over 400 times in the Old Testament, so it is by far the most commonly used term out of the three. The heavens are like the finished goods or final product of this manufacturing process.

A scientific theory or model is probably not going to explain all of the statements in table 2, especially as many of them relate to one-off events in the past or in the future. But this summary can give us insight into the structure of the fabric of space and can enable us to put forward theories and models that are *consistent* with the Bible, i.e. models which don’t disagree with the Bible.

The role of a medium in physics has far-reaching effects.² It may even result in a new theory built up from the subquantum level which gives rise to general relativity type

Table 2. Observations from the Bible on the fabric of space

Object	Observation
The skies (Hebrew: <i>shachaq</i>)	The Hebrew word <i>shachaq</i> describes an object or objects which are in the heavens region.
	The <i>shachaq</i> were made firm or hardened by God as part of His creative process (Proverbs 8:28).
	God's strength is in the <i>shachaq</i> (Psalm 68:34).
	The processes of casting and hardening are directly linked to the <i>shachaq</i> (Job 38:37–38; 37:18).
The firmament	There was light on Day 1 before God made the firmament on Day 2.
	The sun, moon, and stars were placed in the "firmament of the heavens" (Genesis 1:14–18). Similarly, the birds fly "across the face of the firmament of the heavens" (Genesis 1:20).
	The Hebrew word <i>raqa</i> (meaning to beat, hammer out, or spread out) is not used to describe the stretching out of the heavens (Isaiah 42:5; 44:24) but the spreading out of the <i>shachaq</i> (Job 37:18). (The Hebrew word for the firmament, <i>raqiya</i> , is related to the verb <i>raqa</i> .)
The heavens	The heavens are stretched out like a curtain and spread out like a tent (Psalm 104:2; Isaiah 40:22).
	The heavens can potentially be torn by God, like tearing a garment (Isaiah 64:1).
	The heavens will wear out like a garment (Psalm 102:26; Hebrews 1:11).
	The heavens will be rolled up like a scroll or robe (Isaiah 34:4; Revelation 6:14; Hebrews 1:12).
	The heavens will be shaken (Hebrews 12:26; Haggai 2:6; Isaiah 13:13) and the "powers of the heavens will be shaken" (Matthew 24:29; Mark 13:25; Luke 21:26).
	The heavens will be changed, like changing clothes, swapping the current version with a new version that can't be shaken (Psalm 102:26; Hebrews 1:12; 12:27).

phenomena, electromagnetism, and the statistical results of quantum mechanics.

Conclusion

The Hebrew word *shachaq* seems to provide a big clue as to the structure of the fabric of space. Unlike the word heavens, it is used with the Hebrew verb *raqa* (to beat, hammer out, or spread out, e.g. metal), which is related to the Hebrew word for the firmament, *raqiya*.

The future rolling up of the heavens strongly suggests there is some dimension in which the heavens are thin. A fabric unfolding in a fourth spatial dimension can appear as if normal three-dimensional space is expanding—see figure 1.

Table 2 summarizes the observations from the Bible mentioned in this paper on the skies, firmament, and the heavens. This list can give us insight into the structure of the fabric of space and provides a biblical filter for evaluating related theories and models.

God's strength is in the *shachaq* (Psalm 68:34)!

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