

The Carpet of Light*

A short scientific story

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The night fell over Assalam city, and everyone went to sleep early to get ready for another day. A mother in one of the houses was striding before going to bed, when she saw the light in her daughter's room, Nora, was still on!

Nora was walking in her room, back and forth, while talking loudly to herself, "When I walk in this room, I can move in two dimensions; forwards and backwards, right and left, whereas a circus athlete walking on the line moves only in one dimension; forwards and backwards."

Nora saw her mother entering the room and greeting her, so she greeted her back and said, "I'm revising what we have learned today in school. Mom, you see; we move in three dimensions in this universe; right and left, forwards and backwards, upwards and downwards." Then she jumped on her bed, "Look mom! Now I moved upwards!" Her mother smiled, "That's very good Nora, but now it's late, and you should get enough sleep."

"I know, mom", Nora said. "But there's a question concerns me a lot. The teacher told us about a fourth dimension which is not related to the three space dimensions that we know, so I'm wondering what it would be?!"

The mother paused for a while then said: "Nora, do you remember Al-Zuhoor city?"

"Yes mom," Nora nodded, "I still remember, although we left it before I went to school."

"Good," said her mother, "And what about Al-Worood city? Do you remember it as well?"

"Of course!" Nora answered, "We went there last week to visit my aunt, and we've been there many times!"

"That's very good," said her mother, "Now, which one of the two cities is farther from you?"

"Al-Zuhoor city!" Nora answered right away.

"You feel that because we haven't been there for a long time, but it's only 100 km away," said her mother, "while Al-Worood city is 150 km away."

Nora thought of it for a second, "What do you mean mom?"

"I mean you referred to Al-Zuhoor city as farther "in time" from us, though it is closer "in distance", without you noticed that!" said her mother.

"So, are you saying that time is the fourth dimension?!" asked Nora with extreme surprise.

"Indeed, sweetheart!" Her mother said with a smile on her face, "That's just a little example. Now, recite your sleep prayers and go to bed. We'll talk more about this topic tomorrow, Insha'Allah."

The moment Nora was laying down on her bed, she heard a knock on the window. She was afraid at first, but when the knocking continued, she got up and carefully went to the window. She saw a little bird knocking with his beak. She felt relieved and opened the window but was surprised

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** The author of the novel "Madrasset Alfurussiah".

because the bird started talking! “Forgive me my friend, don’t let my speech surprise you, as what I want you for is much more important.”

Nora asked the bird, “What do you want me for?!”

“I found something very strange next to the tree where I built my nest, and I want you to come and have a look!” said the bird with excitement.

Nora stared at the bird, “What is wrong with you, my friend? Now it’s too late and I can’t get out without asking my parents!”

“Please Nora!” The bird insisted, “It’s very serious, and we can’t wait for tomorrow!”

Nora ignored the little voice inside her, telling her not to go, and jumped out of the window and followed the bird.

When Nora got there, she saw a very beautiful carpet, with bright colors that shone all around.

“What do you think, Nora?” asked the bird, “Haven’t I told you that it is very serious, and can’t wait for tomorrow?”

“It is, indeed!” Nora nodded, “How did it get here? Yesterday I passed by this tree, and I didn’t see anything!”

“I don’t know, Nora,” answered the bird, “I was sleeping in my nest, then the carpet shone and woke me up!”

Nora took the carpet in her hands, “It reminds me of Sindibad’s magic carpet.” Suddenly she noticed a folded paper on the top of the carpet. She opened it quickly, while the bird flew over her head and said, “Please Nora, read it loud. I want to know what’s written.”

“This is “The Carpet of Light”. If you place its front end towards the north, 3 meters above the ground, it will take you to a speed near the speed of light by a fraction of 0.999999999.”

“Wow!” Nora cheered, “Near the speed of light?! That’s too much!”

“Is it faster than an eagle swooping down on its prey?” exclaimed the bird.

“Of course, it is, my little bird!” laughed Nora, “It is much faster than that! The speed of light is about 300,000 km/s!”

The bird did not seem to understand that, so Nora added, “If we had the chance to travel from here to the sun at this speed, we’d get there in about 8 minutes!”

“Oh God, that’s amazing!” gasped the bird, “Come on Nora, let’s give it a try!”

Nora thought for a moment, “Ummm, well, the carpet is so fast that we can go around the world before morning,” Nora continued, “I guess that’s fine for me. Let’s follow the instructions.”

The bird looked around and said, “Hey! What about pulling the carpet to that fig tree over there? It’s about the height we need, and its branches are tangled, so we’ll just place the carpet there.”

“Well done, my friend,” said Nora with a smile, “Now let’s get to work.”

Nora grasped the carpet to pull it towards the tree, “Oh it’s too heavy!” she said, “I didn’t expect that!”

She looked at the bird and saw him trying to pull the carpet upwards.

“Do you really think that this would help me in moving the carpet?” asked Nora.

“You know I’m trying my best,” answered the bird, while trying to catch his breath.

“What you’re doing won’t help us at all, my poor friend!” Nora said.

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The bird was frustrated, “How’s that Nora?”

“You see,” Nora explained, “We’re trying to move the carpet towards the tree. On the other hand, you are moving it upwards; that is perpendicular to the direction we want the carpet to move in! Because of that, all the force you’re applying to try and move the carpet won’t produce any work, thus the carpet is not moving a bit towards the tree!” The bird thought of all of that; finally, he said, “I don’t quite understand what you’re saying Nora. All I know that what I’m doing is not helping in moving the carpet, so what should I do now?”

“You should apply your force in the same direction we want to move the carpet, this will generate the work needed to move the carpet; which is equal to the applied force multiplied by the displacement you’re moving; that is from here to the tree, otherwise all your effort will do nothing.” Nora explained.

Nora and the bird finally got the carpet to the big fig tree, where she said, “Lifting the carpet upwards is the hardest part.” Nora smiled and continued, “Now my dear friend, you can grab the carpet and drag it up with you; because the force you apply now will be in the same direction we want the carpet to move and that will produce work!”

The bird smiled in return, “I think I started to understand the relationship between work, force, and displacement. Thank you, Nora!”

The carpet is finally resting on the high branches of the fig tree. Nora sat on the carpet with the bird next to her.

“Now I can finally fly without flapping my wings!” the bird exclaimed joyfully.

They sat there, but the carpet did not move. Nora remembered the instructions and said, “We forgot to face the north!”

The bird sighed, “How will we figure out where the north is?”

Nora looked up at the cloudy sky, “The north polar star can’t be of any help right now! Wait a second! From where does the sun set?” she asked.

“From there,” the bird pointed out with his wing, “behind that house.”

“That’s good enough to determine the direction of the north,” Nora said happily, “Now look, the opposite direction will be the east, so if I stretched my arms like this, with my right arm towards the east and the left arm towards the west, that makes my face towards the north!”

The bird clapped his wings with joy, “Amazing Nora! What a brilliant girl you are!”

Once Nora turned the carpet to face the north, a glass shield rose from the rear end of the carpet until it sealed the space around them as if they were trapped inside a cage.

“It seems like we’re trapped inside a closed glass box,” said the bird.

“You can also say that we’re inside a spaceship with a magical glowing carpet!” Nora added.

Moments later, the carpet flew them into the outer space, and this filled Nora up with joy. The bird then asked her in surprise, “Is this the great speed you told me about, Nora?”

“You don’t really feel it, I guess that’s what this glass shield is for. Look around you, my friend; we flew out the atmosphere of the earth without feeling it! Oh, look we’re heading towards Saturn!” cheered Nora, “I can’t wait to see its wonderful rings!”

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“But we’re going to be late!” said the bird.

“Don’t worry at all, my little friend,” said Nora, “We’re travelling at a very high speed; it won’t take us to Saturn that much.” Saturn emerged in front of them, before Nora finished her sentence.

“Oh God! We got there within an eye blink!” Nora glanced at her watch, “We arrived at a time much less than I’ve expected! We still have at least 7 hours before sunrise.”

The bird jumped and cheered aloud, “That’s wonderful! We have plenty of time to have fun, without anyone noticing that we were away!”

Nora and her little friend spent their time in outer space praising the Lord for the things he has created.

“Okay, time for us to go home,” Nora said at last.

The bird realized something very important, “But how will we get back to where we started our journey as we can’t locate our location right now?”

Nora hesitated as she did not see that coming.

“We got very excited over a journey we don’t know how to get back from,” she said nervously.

At that point it seemed that Nora had lost hope of finding their way back to the garden. “I want to get back to my nest! I want to get back home!” the little bird started crying.

Nora tried to calm him down, “Don’t worry, my friend, and let’s find our way out of here. You know, this is a punishment we deserve because I didn’t tell my parents and listened to you. Let’s pray to God; he might help us.”

A glowing red button with the words “Back to launch point” caught Nora’s eyes.

“Thank God!” Nora cheered, “we’re going to make it back home!”

Once she pressed the button, they entered the atmosphere of the earth again, and then found themselves on top of the fig tree, where a big surprise awaited.

The glass shield opened, Nora and the bird got up, and she felt a bit strange. The bird was looking all around him then he asked her, “Are we back to the right place Nora? I remember the trees were covered with leaves, not as if we’re in autumn!”

Nora was nervously checking the place around them.

“What’s more, look at the garden; there are these plants that I’ve never seen before.” Nora shouted, “Our house! When have we got it painted like that?”

The bird was trembling, “I don’t think we’re back Nora.”

“That’s very odd,” she said, “if this isn’t where we first started, then it looks so much like it with a little difference!”

“How did we miss this?” Nora exclaimed after she checked her watch, “the sky clearly suggests that it’s nearly sunset, yet it is before dawn according to my watch!”

“Well, maybe your watch is not working properly?” the little bird suggested.

“I don’t think so!” Nora said, without finding any explanation for this and this made it even worse. She has not got anything else to do, but to head for her room window, which she didn’t even recognize!

The bird was not less frightened than her; he was looking for his nest.

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Suddenly, the bird yelled, “Where did all these birds come from! And they have nests as well! Oh, look there are even little chicks! It’s impossible that all of this happened in just few hours!”

Nora felt completely horrified; her legs could not even hold her anymore, so she sat near the tree and started to cry. The little bird felt guilty for all of what has happened, so he tried to comfort her, “Don’t lose hope Nora, let us pray and praise God, he might help us now, didn’t you tell me that earlier? Come on, Nora.”

Nora wiped her tears away, “You’re right, God will help us out of this problem.”
Meanwhile, a middle-aged man entered the garden, as if it was his own house! Once he saw Nora, he went straight towards her, “Hello! What are you doing here, little girl? Do you want something?”
Nora looked up at him with her eyes full of tears; what should she say?! She spoke at last and told the man the whole story, every bit of it.

The man listened to Nora with great amazement, and then, he asked her, “Where is that carpet?”
Luckily, the carpet was still hanging on the fig tree. Nora handed the man the paper she found on the carpet.

“We found this on the carpet right over here.” Nora said.

As soon as he read the paper, he was shocked, “I never thought that anything like this would ever happen!” he paused then turned towards Nora, “I haven’t introduced myself. My name is Sami and I happen to be a physics teacher. When you move with very high speed approaching the speed of light, time slows down.”

Nora did not understand a word.

Sami continued, “When you travelled with a speed close to the speed of light, time just went slower and slower, to you only a few hours have passed, and that was what your watch told you. Here on earth, a lot of time has passed, to be more into this, let’s do some calculations.”

Sami took a piece of paper and a pencil from his pocket, and talked out loud while writing, “The time that passed on earth is equal to the time that passed when you were in space, divided by the square root of ‘ $1 - (\text{speed of carpet}/\text{speed of light})^2$ ’. How long did you travel on that carpet?” he asked.

“Maybe six or seven hours.” Nora answered.

“Okay,” continued Sami, “let’s say that they were seven hours, since the ratio between the speed of the carpet and the speed of light was 0.999999999, according to the paper, then by putting all the numbers together we find that it’s been 17.87 years here on earth!” Sami said using his calculator.
Nora didn’t quite well understand the mathematical operation directly, so she asked him, “What does this mean, sir? How long has it been on earth while I was away?”

“More than 17 years! This explains it all; you got back to the place you started from but not the same time.” Sami answered.

Nora gazed at him, “And what am I supposed to do now, sir? I want to get back?”

“Where do you want to go my child?” Sami said softly.

“I want to get back to my mom and dad, my home, my school and friends; I want to get back from where I first started off!” Nora was weeping.

Sami patted her on the shoulder and said, “Listen to me carefully, you might get back to the same place you started from, which you did, but you will never get back to the same time. Time is the

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dimension we move through in one direction only and you just can't go back, God says in his holy book, in 'Surah AL-MU'MINUN (THE BELIEVERS)':

[For such is the state of the disbelievers], until, when death comes to one of them, he says, "My Lord, send me back. That I might do righteousness in that which I left behind." No! It is only a word he is saying; and behind them is a barrier until the Day they are resurrected. ⁽¹⁾

Sami took a deep breath and continued, "I live in this house with my family for many years now. Although I know nothing about your family, but I will help you as much as I can until you reunite with them once again, maybe they're still out there; 17 years isn't a long time for us to lose hope in finding them. Now, you must think of your new life, and learn from the mistakes you've made in the past, you just might meet your parents again, then you'll not waste any moment without trying to please them and beg for their forgiveness for all that you've done."

Nora imagined all the pain she has caused for her parents while playing and having fun in outer space, she felt really guilty. She told herself that if she ever meets them again, she will do her best to make it up for them. Then she started her prayer, regretting for what had happened.

Nora felt a soft pat on her head, "Nora, wake up, sweetheart! The sun is about to rise, and you haven't prayed Fajr yet."

Nora could not believe her eyes! Her mother was right there! She jumped out of bed and hugged her, "Thanks God! I'm finally back! I promise you mom, I'll never leave the house without telling you no matter what! I will never ever make you angry again! I promise!"

Her mother smiled and realized that her daughter had one of those dreams again.

"Where were you this time, sweetheart?" she asked her.

"I travelled far away through the fourth dimension!" Nora answered with excitement, but she stopped when she remembered that it was just another long dream!

"Isn't it right mommy that time slows down when your speed approaches the speed of light?" Nora asked.

"You've had a dream of that as well!" exclaimed her mother, "That's a small bit of the theory of special relativity by Albert Einstein, and this phenomenon is known as time dilation. Well, it looks like you got a long story to tell this time, why don't you pray Fajr and tell me all about it?"

The End

Reference:

(1) <https://quran.com/23>

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