

## Stephen Hawking explained multiverses in final paper

21st March, 2018



The world-famous physicist and cosmologist Stephen Hawking published an important paper before he died last week. Professor Hawking died on March 14, aged 76. Two weeks before his death, he published his final theory in a paper called "A Smooth Exit from Eternal Inflation".

He explained two very important ideas. The first was how humans might be able to detect multiverses. These are parallel universes that were created at the same time as our universe after the Big Bang. The second theory is about how our universe will eventually end, when the stars finally run out of energy. Scientists say his paper could be his most important work ever, and that he could have won a Nobel Prize for it.

Stephen Hawking's new paper started by explaining an older theory of his called inflation. This is when our universe suddenly expanded from a tiny point in space into the billions of stars and solar systems we have today. Hawking suggested there were an infinite number of big bangs and each of them created its own separate universe. He called this collection of universes a multiverse. Hawking wrote that he believed scientists could find the multiverse by using sensors on space ships. Carlos Frenk, a professor of cosmology, said: "These ideas offer the breathtaking prospect of finding evidence for the existence of other universes." Hawking is also famous for his best-selling book "A Brief History of Time".

Sources: [telegraph.co.uk](http://telegraph.co.uk) / [independent.co.uk](http://independent.co.uk) / [metro.co.uk](http://metro.co.uk)

### Writing

It would be great if there were more universes. Discuss.

### Chat

Talk about these words from the article.

famous / cosmologist / published / death / humans / parallel / universe / Nobel Prize / theory / inflation / space / billions of stars / infinite / sensors / breathtaking / book

### True / False

- a) Stephen Hawking is a cosmologist and physician. T / F
- b) Professor Hawking explained two important ideas in his theory. T / F
- c) The second theory is about making the universe last forever. T / F
- d) Stephen Hawking won a Nobel Prize for his theory. T / F
- e) Hawking said our universe started from a tiny point in space. T / F
- f) Professor Hawking said there were countless big bangs. T / F
- g) A professor said sensors on drones could be used to find a multiverse. T / F
- h) Stephen Hawking's book is called "A Brief History of Time". T / F

### Synonym Match

(The words in **bold** are from the news article.)

- |                         |                 |
|-------------------------|-----------------|
| 1. <b>died</b>          | a. co-existing  |
| 2. <b>theory</b>        | b. spectacular  |
| 3. <b>detect</b>        | c. unexpectedly |
| 4. <b>parallel</b>      | d. passed away  |
| 5. <b>run out of</b>    | e. set          |
| 6. <b>suddenly</b>      | f. unconnected  |
| 7. <b>tiny</b>          | g. ideas        |
| 8. <b>separate</b>      | h. minute       |
| 9. <b>collection</b>    | i. find         |
| 10. <b>breathtaking</b> | j. use up       |

### Discussion – Student A

- a) What do you think about what you read?
- b) What do you know about our universe?
- c) What would you like to know about our universe?
- d) Is there life on other planets?
- e) What would be most exciting about space travel?
- f) What is the future of Earth?
- g) What will we know about space in 1,000 years from now?
- h) What questions would you like to ask a cosmologist?

# BreakingNewsEnglish - The Mini Lesson

## Phrase Match

1. The world-famous physicist
  2. parallel
  3. about how our universe will
  4. when the stars finally run
  5. could have won
  6. our universe suddenly expanded from a
  7. billions
  8. an infinite
  9. find the multiverse
  10. Hawking is also famous for his best-
- a. tiny point in space
  - b. out of energy
  - c. by using sensors
  - d. selling book
  - e. and cosmologist
  - f. number of big bangs
  - g. universes
  - h. a Nobel Prize
  - i. of stars
  - j. eventually end

## Discussion – Student B

- a) What do you know about Stephen Hawking?
- b) Would you like to be a physicist?
- c) What does a cosmologist do every day?
- d) What is a multiverse?
- e) How would our world change if we found a multiverse?
- f) What would you do if our universe was about to end?
- g) What do you know about the Big Bang?
- h) How interested are you in space?

## Spelling

1. The world-mfosau physicist
2. Hawking pesldihbu an important paper
3. Two weeks before his tdhea
4. his final rhtoey
5. how our universe will enttueylva end
6. the stars niylfla run out of energy
7. expanded from a nity point in space
8. iilslbno of stars
9. its own teaspear universe
10. using srnsose on space ships
11. a ssfrepopor of cosmology
12. finding enivcdee

### Answers – Synonym Match

1. d	2. g	3. i	4. a	5. j
6. c	7. h	8. f	9. e	10. b

## Role Play

### Role A – Mars

You think Mars is the most interesting part of the universe. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least interesting of these (and why): comets, Earth or the Milky Way.

### Role B – Comets

You think comets are the most interesting part of the universe. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least interesting of these (and why): Mars, Earth or the Milky Way.

### Role C – Earth

You think Earth is the most interesting part of the universe. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least interesting of these (and why): comets, Mars or the Milky Way.

### Role D – The Milky Way

You think the Milky Way is the most interesting part of the universe. Tell the others three reasons why. Tell them what is wrong with their things. Also, tell the others which is the least interesting of these (and why): comets, Earth or Mars.

## Speaking – Universe

Rank these with your partner. Put the most interesting parts of the universe at the top. Change partners often and share your rankings.

- our moon
- Mars
- comets
- International Space Station
- the Sun
- the Milky Way
- Earth
- asteroids

### Answers – True False

a	F	b	T	c	F	d	F	e	T	f	T	g	F	h	T
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Answers to Phrase Match and Spelling are in the text.