

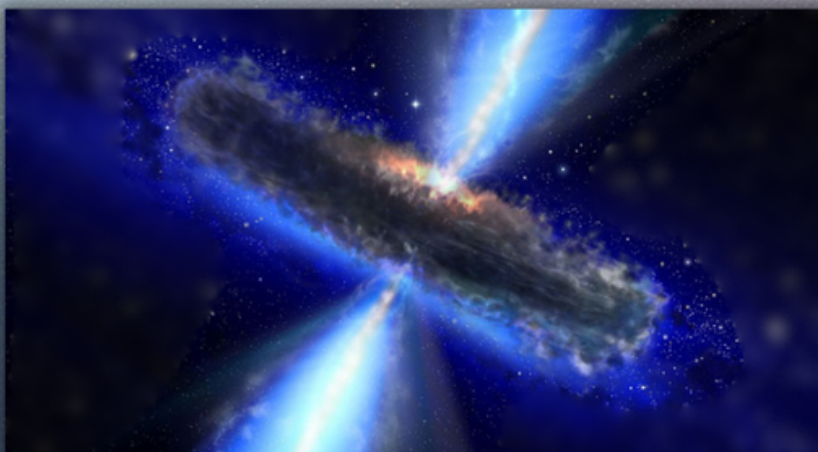
## Largest, Most Distant Reservoir of Water Found in Space

### 1. Where can we find water in space?

Astronomers found the largest and most distant reservoir of water ever detected in space!

This immense store of water is floating around a giant, bright quasar (basically the brightest object due to temperature) —a type of cosmic powerhouse powered by a supermassive black hole (ironic) that sits more than 12 billion light-years away from Earth.

- **Location:** The water reservoir surrounds the quasar APM 08279+5255, located over 12 billion light-years away.
- **Quantity:** It contains an estimated 140 trillion times the water in Earth's oceans.
- **Composition:** The reservoir is a massive cloud of water vapor.



## 2. Why is this discovery important?

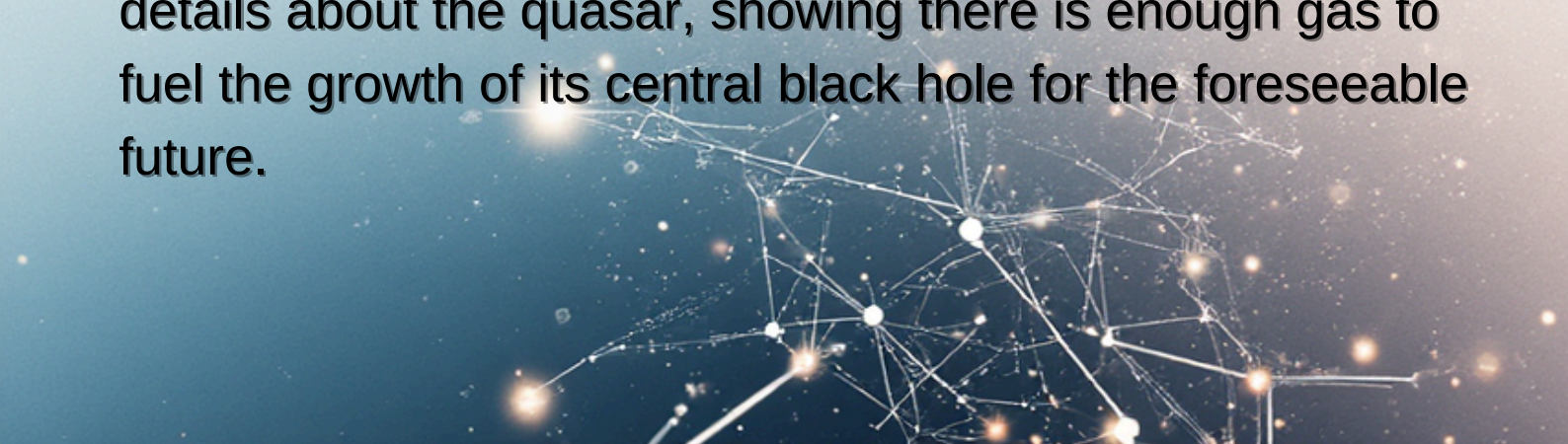
It's demonstration that water has been part of the universe for a long time. It began when the universe is 1.6 billion years old (our observed time due to speed of light and expansion of universe which is faster further away, not too important here), which means water has been existing for more than 12 billion years, water is pervasive throughout the universe, even at the very earliest times.

Water vapor is an important trace gas that reveals the nature of the quasar, distributed around the black hole in a gaseous region spanning hundreds of light-years in size.

Measurements of the water vapor and of other molecules, such as carbon monoxide, suggest there is enough gas to feed the black hole until it grows to about six times its size (if no new object feeds it)

## 3. Conclusion

This discovery confirms that water was abundant in the early universe, proving it is a long-standing and pervasive cosmic element. The water vapor also reveals crucial details about the quasar, showing there is enough gas to fuel the growth of its central black hole for the foreseeable future.



## Fun Fact:

Water in space is found in various forms:

- Water molecules in nebulae
- Around quasars
- Ice on comets and even liquid water on other planets and moons.

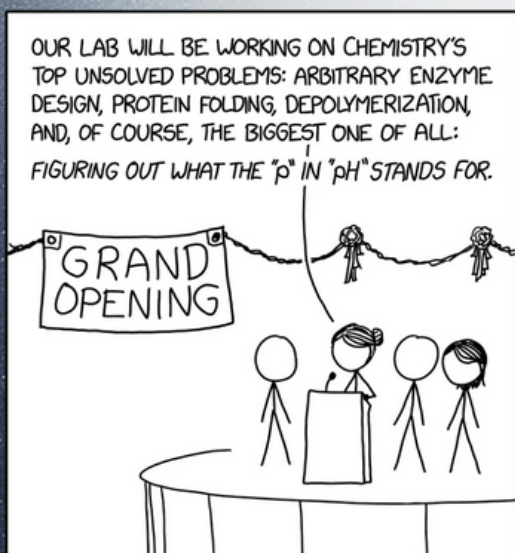
## Monthly Quiz

If you can answer all the questions correctly, you will receive a small gift!

Deadline: 19/11/2025



## Relaxing Zone



2		4		5			
3				9		1	2
	7		8	1			
1	3				5	9	4
6							3
4		5	9				6
				4	1		5
8		2		3			7
				2		6	9

5	4	1	7	2	8	6	3	9
8	6	2	5	3	9	4	1	7
7	9	3	6	4	1	2	5	8
4	2	5	9	8	3	7	6	1
6	8	9	1	7	4	5	2	3
1	3	7	2	6	5	9	8	4
9	7	6	8	1	2	3	4	5
3	5	8	4	9	6	1	7	2
2	1	4	3	5	7	8	9	6

Answer!

# October Quiz Answer

1. What is the primary cause of ocean acidification?

**B. Absorption of large amounts of carbon dioxide by the ocean**

2. Which of the following ions is released when carbon dioxide reacts with seawater?

**B. Hydrogen ions (H<sup>+</sup>)**

3. How does ocean acidification affect shellfish such as oysters and clams?

**B. It makes it harder for them to form shells**

4. Which industrial method is mentioned to reduce sulphur dioxide emissions?

**B. Adding powdered limestone to hot gases**

5. What is one biological solution proposed to combat ocean acidification?

**B. Cultivating photosynthetic sea algae**

**Winners:** 1B So Lap Kwan ,2A Yu Ho Ying, 2C Li Tsz To, 2D Deng Yongshan, 2D Hung Chi Ho, 4B Li Man Ni

**Small gift will be awarded**

## Post Competition Quiz Answers

1. D	2. B	3. C	4. C	5. B
6. D	7. C	8. C	9. A	10. B

**Winners:** 4B Cheng Ho Yin

3C Yeung Man Lok

**Gift: \$50 book coupon, prize will be presented on 27/11**

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