Francis Halzen wins physics Nobel for IceCube

LEVEL C1


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I. WARM-UP

1. What space discoveries have interested you recently?
2. What extreme places are good for science? Why?
3. How do scientists detect things they cannot see directly?

II. KEY VOCABULARY

observatory
A place with instruments used to watch and measure natural events

neutrino
A tiny particle from space that passes through matter almost unnoticed

detector
A device that finds or measures something that is hard to see

embed
To fix something firmly inside another material

collision
When two things hit each other

astronomy
The study of space, stars and the universe

vibration
A small, fast movement that can shake or disturb equipment

proposal
A formal plan that asks for approval or support

III. READING

Prof Francis Halzen has won the 2026 Nobel prize in physics for turning deep, clear ice at the South Pole into a neutrino observatory. The Belgian particle physicist at the University of Wisconsin-Madison led IceCube, which made the first detection of high-energy neutrinos from space in 2013.

He receives 12m Swedish kronor. The Nobel committee said he made decisive contributions to IceCube and to finding high-energy neutrinos of astrophysical origin. To build IceCube, teams embedded thousands of basketball-sized light detectors into a cubic kilometre of Antarctic ice.

When a rare neutrino collision happens, the sensors catch a faint flash. Those events confirmed in 2013 opened a path to neutrino astronomy.

The site at the Amundsen-Scott South Pole Station is harsh for people but ideal for science: the ice is clear, and it is far from sources of interference and the risk of vibrations from earthquakes.

Using neutrinos adds a new window to earlier methods based on light, other electromagnetic waves, and gravitational waves. Halzen, who heard the news while travelling in Italy, said he is working on a new proposal and hopes the award will help it move forward.

Other major neutrino efforts include the Deep Underground Neutrino Experiment in the US and the Hyper-Kamiokande detector in Japan.

Reading text adapted from reporting by **The Guardian***: "Nobel prize in physics goes to Francis...". Original article linked at theenglishwire.com.*

IV. COMPREHENSION QUESTIONS

1. What prize did Francis Halzen win in 2026?
2. Where is the IceCube observatory located?
3. What did IceCube first detect in 2013?
4. How is IceCube built to observe neutrinos?
5. What does Halzen hope the prize will support next?

V. DISCUSSION

1. Why build an observatory at the South Pole? What are the pros and cons?
2. How might neutrino astronomy change our view of the universe?
3. Should huge science projects receive public funding? Why or why not?
4. Which fact in this story surprised you most, and why?

VI. GRAMMAR FOCUS

Adding emphasis - cleft sentences

Use clefts to highlight information. Forms: It + be + X + that/who + clause; and What + clause + be + X. Use who for people and that for things/places.

"**It was the South Pole that** *enabled the IceCube design.*"

"**What IceCube did was** *trace distant neutrinos.*"

VII. GRAMMAR EXERCISE

Circle the correct option in each sentence.

1. It was the clear ice (what / that) made detection possible. _____
2. It was Halzen (which / who) led the project. _____
3. It was the detectors (that / who) caught flashes. _____
4. What they needed (was / were) clear ice. _____
5. It was in 2013 (what / that) results were confirmed. _____

Teacher's Notes

TEACHERS ONLY

These notes are designed to help you get the most out of this lesson. Please do not share this page with students.


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I. LESSON GUIDE

- Timing: 8–10 minutes warm-up, 10 minutes vocabulary, 12–15 minutes reading and comprehension, 8–10 minutes grammar, 12–15 minutes discussion.
- Pre-teach or elicit neutrino, observatory, detector, and collision using quick sketches or simple analogies (for example, a camera flash in ice).
- For reading: set a gist task (Who, where, what, why it matters), then scan for dates, places and numbers. Pair-check answers before whole-class feedback.
- Differentiation: stronger students summarise IceCube's role in one sentence; others underline sentences explaining how the detector works.

II. DISCUSSION FACILITATION TIPS

1. List pros/cons on the board; push beyond weather to interference and logistics.
2. Elicit examples of new "windows" in science; prompt for methods beyond light.
3. Take a quick show of hands, then pair up opposites to exchange reasons and costs.
4. Have students quote one precise detail from the text to support their choice.

III. EXTENSION ACTIVITIES

Writing: In pairs, write a 120-word explainer for teens on how IceCube detects neutrinos.

Presentation: Prepare a 2-minute mini-talk comparing IceCube with DUNE or Hyper-Kamiokande.

IV. ANSWER KEY OVERVIEW

Comprehension questions: short factual answers from the text.

Grammar exercise: Adding emphasis - cleft sentences

Discussion: open-ended. Accept any reasonable ideas supported by examples and reasoning.

Answer Key

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IV. COMPREHENSION QUESTIONS

1. What prize did Francis Halzen win in 2026?
   The Nobel prize in physics.
2. Where is the IceCube observatory located?
   At the South Pole in Antarctica.
3. What did IceCube first detect in 2013?
   High-energy neutrinos from space.
4. How is IceCube built to observe neutrinos?
   Thousands of light detectors embedded in a cubic kilometre of ice.
5. What does Halzen hope the prize will support next?
   A new proposal he is working on.

V. DISCUSSION

Open answers. Accept any reasonable ideas supported by examples and reasoning.

VII. GRAMMAR EXERCISE

Circle the correct option in each sentence.

1. It was the clear ice (what / that) made detection possible. **that**
2. It was Halzen (which / who) led the project. **who**
3. It was the detectors (that / who) caught flashes. **that**
4. What they needed (was / were) clear ice. **was**
5. It was in 2013 (what / that) results were confirmed. **that**

VI. GRAMMAR FOCUS

Key point: Use clefts to highlight information. Forms: It + be + X + that/who + clause; and What + clause + be + X. Use who for people and that for things/places. (Examples constructed.)

> *"**It was the South Pole that** enabled the IceCube design."*
>
> *"**What IceCube did was** trace distant neutrinos."*