News feature

Supplementary information to:

What does quantum mechanics say about reality?

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This Supplementary information comprises:

1. Survey methodology
2. Survey text (see separate PDF)
3. Raw data (see separate Excel file)

Nature quantum mechanics survey: methodology

The *Nature* survey was developed in consultation with Philip Ball, Sean Carroll, Elise Crull and Federico Levi.

It was e-mailed to 15,582 lead authors of relevant recent research papers, using the following search strategy to find manuscripts:

- Papers published in the journal *Quantum*, 2020–25
- Papers in 2020–25 that cited any of 8 key historic research breakthroughs in quantum foundations
- A Scopus search on papers published after 2020 with title, abstract or keywords mentioning 'quantum theory', 'quantum foundations', 'quantum mechanics', 'quantum information', 'quantum localization', 'entanglement', 'quantum computing', but including only the subject areas 'Physics and Astronomy', 'Mathematics', 'Computer science', 'Multidisciplinary', 'Social sciences', and 'Arts and Humanities'. Areas such as chemistry and engineering were excluded.

All 300 or so attendees of Helgoland 2025 were also invited to take the survey, with the kind permission of the conference organizers.

Results and data cleaning

After cleaning the responses to leave only those who answered at least the main two questions in the survey (their favoured interpretation and their confidence in it), this gave 1,101 respondents, implying a (usable) response rate of about 7%. This is close to the typical 5% response rate *Nature* journalists have experienced in surveys that involve one-shot 'cold e-mailing' authors on research papers.

In this case, we expect that there is unlikely to have been significant response bias making the results unrepresentative of our sample: those who responded are likely to be enriched in researchers who care about the issue.

Recoding

Respondents were always given opportunities to select the answer 'Other' and write in free-text answers to questions. Where they did so for the main question in the survey – about their favoured interpretations of quantum theory – we manually went through responses and sometimes recoded them into the original categories where appropriate. Three extra viewpoints, not in the categories provided, were identified through write-in answers: 'QBism', 'Shut up and calculate'/'No interpretation needed', and 'None of these/unknown'. The original data were recoded to include these viewpoints as

categories. Everything recoded is denoted by a '1' in an additional column; the original free-text answer is retained under the 'Other' column.

Anonymity

Respondents were advised that full anonymized survey data would be made available. *Nature* has redacted occasional comments in free-text answers where necessary to maintain anonymization.

Demographics

Demographic factors didn't seem to correlate with results, except – as noted in the article – that experimenters and theorists had different preferences, and those who studied quantum foundations directly were less likely to choose the Copenhagen interpretation.

Of the sample, 86% work (or worked) in academia, 10% in both academia and industry, and 3% in industry.
Career stage: 9% were retired, 37% advanced career, 24% mid-career, 20% early career and 9% PhD students.
Theorists and experimentalists: 68% were theorists, 13% both theorists and experimentalists, and 17% experimentalists.
Fields: We allowed respondents to select multiple fields of expertise. 35% selected quantum information/computing/communication/thermodynamics; 24% atomic/molecular/optics/condensed matter; 19% quantum foundations/philosophy; 8% Particle physics/field theory/string theory; 7% cosmology/gravity theory.
Geography: 43% of respondents had studied or worked in Europe; 33% North America; 15% Asia; 5% South America, 3% Oceania and 1% Africa. (Respondents could select multiple areas).
Gender: Only 8% of respondents were female; this is likely to have reflected the balance of authors e-mailed. It accords with a finding earlier this year that only 8% of senior authors in *Nature Physics* papers were women (A. M. Hallas *Nature Phys*. **21**, 491–493; 2025).
Religion: 62% of respondents declined to answer. Of the remainder, more than half were atheist/agonistic, with 30% Christian.