

# EINSTEIN IN OXFORD

A century ago, a little-known German physicist living in post-war Berlin, Albert Einstein, suddenly became famous in Britain, and soon after throughout the world. On 6 November 1919, in London, the Royal Society and the Royal Astronomical Society jointly announced that British astronomers had confirmed Einstein's general theory of relativity during a solar eclipse through observing the deflection of starlight by the gravity of the Sun. In 1921, the now-celebrated Einstein paid his first visit to Britain, including a few hours in Oxford on a private tour. A decade later, he returned to stay for almost a month at Christ Church, give lectures at Rhodes House and receive an honorary doctorate in the Sheldonian Theatre. Two Fellows of University College – one a chemist, the other a classicist – played small but significant roles in his Oxford reception.

Einstein's opening Rhodes lecture took place on 9 May in front of an overflowing audience of University staff plus some 500 selected students. Given in German without notes but with a blackboard, its English title was simply "The theory of relativity". The second lecture dealt with relativity and the expanding universe. It required "two blackboards, plentifully sprinkled beforehand in the international language of mathematical symbol", as *The Times* reported. The third lecture, delivered

immediately after the doctoral ceremony, tackled Einstein's constantly evolving unified field theory: "an account of his attempt to derive both the gravitational and electromagnetic fields by the introduction of a directional spatial structure", according to *Nature*.

*The Oxford Times* captured the atmosphere in two reports on the first and third lectures. The initial report, headlined "Women and relativity", remarked:

Women in large numbers flocked to hear Prof. Einstein speak on relativity... The front of the hall was filled with heads of houses and the back of the hall and the gallery with younger members of the University. It was unfortunate that no interpreter was provided, but Oxford seems to fight shy of interpreters. One wonders how many of those who were present thoroughly understood German, or if they could understand the language in which Prof. Einstein spoke, how many of them could follow the complexities of relativity.

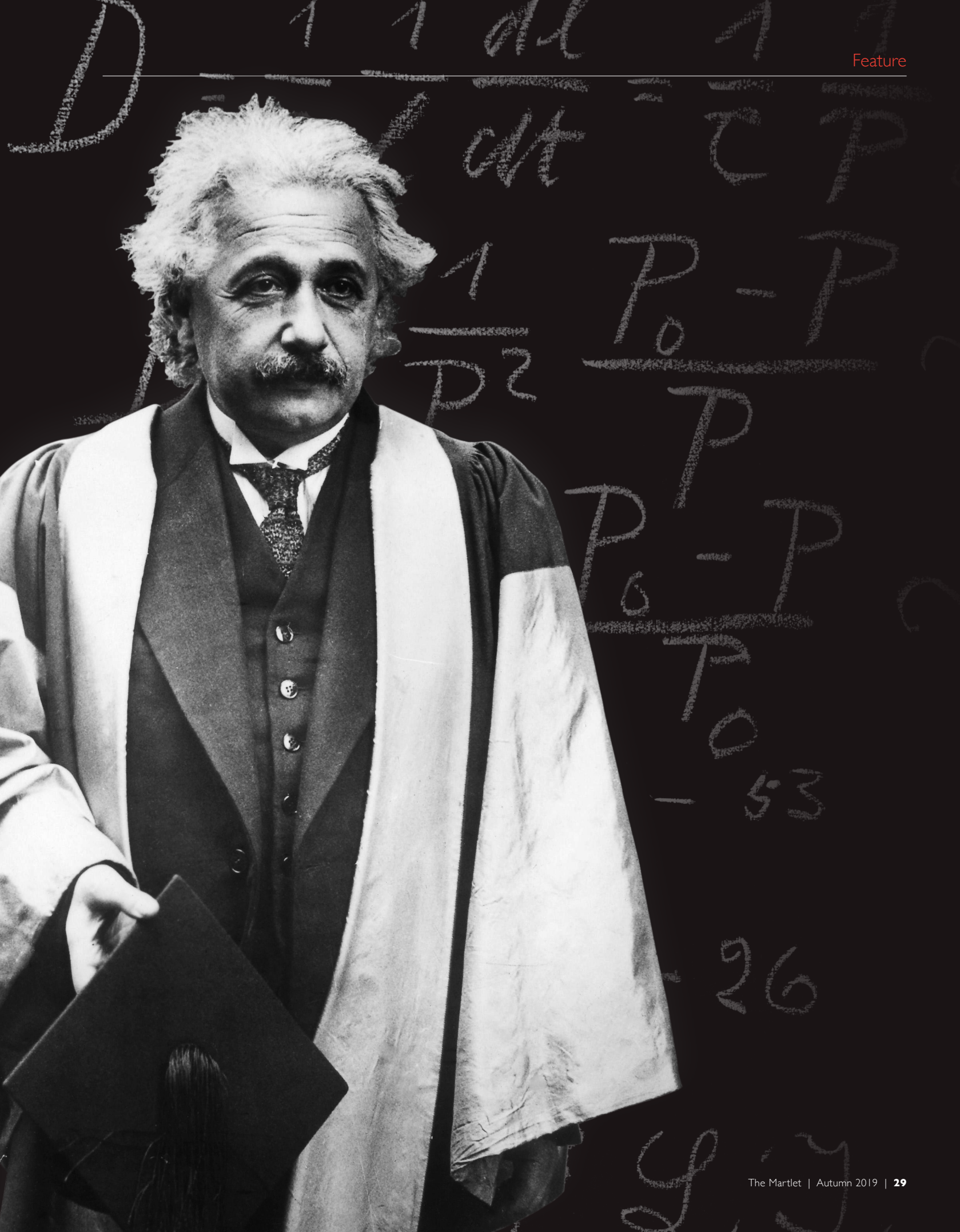
The second report observed:

As the lecture proceeded, not only equations but a singular diagram appeared on the blackboard, and Professor Einstein gesticulated helpfully in curves with the chalk to explain it. At this point he turned repeatedly from his audience to the board and back. Later, the diagrams

were rubbed off in favour of more formulae, and the better informed members of the audience were kept busy taking them down.

By now, at least one audience member had fallen asleep, however. The Dean of Christ Church, Henry Julian White, a biblical scholar in his seventies, slept soundly in the front row. Einstein was amused to see this, and perhaps also learnt a lesson. For after one of the lectures he reportedly remarked that the next time he had to lecture in Oxford, "the discourse should be in English delivered." When he gave his most important lecture in Oxford, in June 1933, he read it from a fluent English translation made by three Oxford colleagues: a philosopher, a classicist and a physicist.

The blackboards proved a source of friction between Einstein and the University. On 16 May, he wrote in his diary (in German): "The lecture was indeed well-attended and nice. [But] the blackboards were picked up. (Personality cult, with adverse effect on others. One could easily see the jealousy of distinguished English scholars. So I protested; but this was perceived as false modesty.) On arrival [at Christ Church] I felt shattered. Not even a carthorse could endure so much!"



Today, an Einstein blackboard is the most famous object of the 18,000 or so objects in Oxford's History of Science Museum: "a relic of a secular saint", as the museum's website ironically describes it, adding: "Some visitors today treat it almost as an object of veneration, anxiously requesting its location on arrival and eager to experience some connection with this near-mythical figure of science."

The idea of permanent preservation came from certain dons at the lectures. One was Robert Gunther, a historian of science who founded the museum in 1926-30 (with some financial help from Univ). Another was Edmund Bowen, a tutor in chemistry at Univ, whose laboratory work in photochemistry had confirmed some of Einstein's theoretical work. They and others asked the Rhodes trustees for the two blackboards from the second lecture. Although one board was later accidentally wiped in the Museum's storeroom, the other survived. It neatly summarises Einstein's April 1931 cosmology paper, based on Alexander Friedmann's relativistic model of an expanding cosmos and using Edwin Hubble's measurements of the expanding universe to estimate three quantities, including the age of the universe,  $t$  (chalked as ten billion years). However, it also preserves a mistake in Einstein's calculations. This was possibly another reason why he did not favour preservation. He certainly resisted any publication of his 1931 Rhodes lectures by an eager Oxford University Press, on the grounds that – as he frankly told the Warden of Rhodes House in 1933 – "he had since discovered that everything he had put forward in the lectures was untrue!"

By contrast, Einstein's Sheldonian ceremony went without incident, though not without comedy. The Public Orator, who presented the academically attired Einstein in Latin, had the most challenging role. He was a classical scholar at Univ, Arthur Blackburne Poynton, a former tutor of C. S. Lewis, who was then Bursar of the College (Master in 1935-37). His speech opened sweetly with a reference to the crucial solar eclipse of May 1919 – in which "Mercurius" (the planet Mercury) had been observed in the position predicted by Dr Einstein: "*Atque utinam Mercurius hodie adesset, ut, cuius est eloquentiae, vatem suum laudaret!*" ("If Mercury were present today, he would of course praise his poet with his own eloquence!") Then Poynton grappled with relativity – without attempting to translate the definitive word into Latin, and without mentioning either gravity or Isaac Newton.

Here is his explanation:

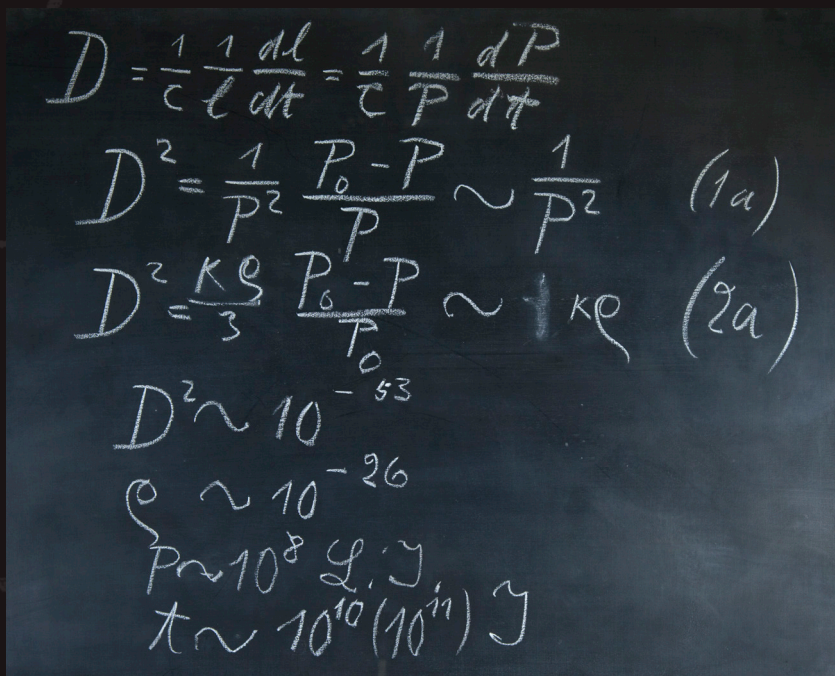
The doctrine which Einstein interprets to us is, by its name and subject, interpreter of a relation between heaven and earth. It bids us view, under the aspect of our own velocity, all things that go on in space; to right and left, upward and downward, backward and forward. This doctrine does not in any way supersede the laws of physicists.



Blackboard photo: Inv. 44725, © History of Science Museum, University of Oxford

Opposite: Einstein near the Sheldonian Theatre, Oxford, during his doctoral ceremony, May 1931. The man in the middle (half-hidden behind the Bedel) is the Public Orator, Arthur Blackburne Poynton. Below: Arthur Blackburne Poynton as Master of Univ in a College photograph, 1935. Bottom: The world-famous blackboard used by Einstein at Rhodes House, Oxford, in 1931, now kept at the History of Science Museum.

At the end, Poynton attempted to relate relativity to classical philosophy, alluding to Euclid, Heraclitus and Plato. No wonder Einstein noted in his diary that the speech was “serious, but not wholly accurate”. He must have based this remark on a translation, since he did not understand Latin. Yet, even when the Public Orator was speaking, Einstein had recognised the mention of Mercurius. “I had noticed his face lit up when ‘Mercury’ was named”, remarked a friend, the musicologist Margaret Deneke.



Nonetheless, Einstein “threw himself into all the activities of Oxford science, attended the colloquiums and meetings for discussions and proved so stimulating and thought provoking that I am sure his visit will leave a permanent mark on the progress of our subject”, according to his Church Church host, the physicist Frederick Lindemann (later scientific adviser to Winston Churchill).

Yet, perhaps the most evocative memory of Einstein in Oxford in 1931 concerned his charisma. It was recalled by William Golding, the future author of *Lord of the Flies* and Nobel laureate, who started as an undergraduate in science before switching to literature. Golding happened to be standing on a small bridge in Magdalen Deer Park looking at the river when a “tiny moustached and hatted figure” joined him. “Professor Einstein knew no English at that time, and I knew only two words of German. I beamed at him, trying wordlessly to convey by my bearing all the affection and respect that the English felt for him.” For about five minutes the two of them stood side by side. At last, said Golding, “With true greatness, Professor Einstein realised that any contact was better than none.” He pointed to a trout wavering in midstream. “Fisch,” he said. “Desperately I sought for some sign by which I might convey that I, too, revered pure reason. I nodded vehemently. In a brilliant flash I used up half my German vocabulary: ‘Fisch. Ja. Ja.’ I would have given my Greek and Latin and French and a good slice of my English for enough German to communicate. But we were divided; he was as inscrutable as my headmaster.” For another five minutes, the unknown undergraduate Englishman and the world-renowned German scientist stood together, “then Professor Einstein, his whole figure still conveying goodwill and amiability, drifted away out of sight.”

Andrew Robinson, a chemistry undergraduate at Univ from 1975-79, is the author of 25 books, including *Einstein: A Hundred Years of Relativity*, published by Princeton University Press in 2015, and *Einstein on the Run: How Britain Saved the World's Greatest Scientist*, published by Yale University Press in 2019. He is also a former literary editor of the *Times Higher Education Supplement*. He will deliver a talk at the History of Science Museum, Oxford on 12 December 2019, titled: “Einstein on the Run: Oxford, Britain and Nazi Germany”.