



---

July 2016 Degree Congregation

# **Honorary Degree Oration**

---

21 July 2016

Professor Tim Palmer, CBE, FRS

---

# Professor Tim Palmer, CBE, FRS

---

Doctor of Science

Orator: Professor Sir Michael Berry

Madam Pro Vice-Chancellor

Timothy Noel Palmer – ‘Tim’ – is the Royal Society Professor of Climate Physics at Oxford University. He is also ‘one of ours’, having started his university life in Bristol, where he left in 1974 with first-class honours in our joint mathematics/physics degree.

While in Bristol he studied Einstein’s theory of gravity – general relativity – then emerging into physics centre-stage from decades of obscurity – and decided that he wanted to be a theoretical physicist. Oxford was a leading centre of relativity research, and he was accepted for a D.Phil– thereby completing an intellectual loop, because his supervisor Dennis Sciama had himself studied for a doctorate under our Nobel-Prize-winning Bristol graduate Paul Dirac.

An outstanding problem was how to define gravitational energy in the curved spacetime of Einstein’s theory. Tim solved that, got his D.Phil, was accepted for postdoctoral research in Cambridge in the group of Stephen Hawking, and seemed set for a career in theoretical physics as a relativist. But he began to doubt his prospect of solving the central problem: unifying gravity with the equally fundamental quantum physics; and he also worried that what he was doing was unlikely to be useful for society.

A chance meeting made him aware of recent developments in climate science, and he applied for a job at the Meteorological Office, even though, as he has written, he was ignorant even of which way the air goes round in a cyclone. To his surprise, he was accepted, turned down the position in Cambridge, and launched into his second scientific life. How spectacularly successful it has been!

Time prevents even a listing of his achievements. Here is probably his most successful one. We can’t always predict tomorrow’s weather reliably, even though the physics of air indicates that if we knew today’s we could, because the prediction would require knowing today’s weather with accuracy far greater than we can measure and computers vastly more powerful than we have. The underlying mathematics is an example of chaos theory: the future may be determined by the present, but it cannot be predicted because it is unstable: a slightly different present can soon lead to a very different future. Weather is even more subtle: often unpredictable, but not always. So how do we know when a forecast will be reliable and when not? The information we have is today’s weather, measured on a grid of points across the world but of course not at every point.

Tim’s solution, based on our limited data, is to run a number of forecasts (fifty, say) for tomorrow, based on slightly different versions of today’s weather, within the accuracy of measurement, and see how differently they develop over time. If they develop similarly, the forecast will be reliable; if their outcomes are very different, the forecast will be less reliable. With today’s computers this is possible. Tim’s ‘ensemble weather forecasting’ is widely used worldwide, to give an accurate indication of how reliable weather prediction is likely to be over the coming days. The same idea, applied on longer timescales, is being used to gauge the accuracy of climate models.

Tim’s intellectual reach is much greater than this. Away from his day job, he has used the mathematics of chaos theory to try to understand some of the counter-intuitive features of quantum mechanics in a revolutionary (and unashamedly controversial) way, reviving his long-abandoned dream of connecting this with gravity.

His work has been abundantly recognised. Among his numerous prizes are: the Dirac Medal of the UK Institute of Physics, the Silver Medal of the European Meteorological Society, the Carl-Gustav Rossby Medal of the American Meteorological Society (“For fundamental contributions to understanding the role of nonlinear processes in the predictability of weather and climate, and for developing tools to estimate such predictability.”), the Royal Society’s Esso Gold Medal (“For reducing aviation fuel costs through improved numerical forecasts of upper tropospheric jet streams”) – and a share of the 2007 Nobel Peace Prize, awarded to the International Panel for Climate Change, of which he is a member. He was elected to the Royal Society and numerous other academies, and in the 2005 Queen’s Honours list he became a CBE. He is much in demand as a speaker at scientific meetings worldwide, to deliver prestigious standalone lectures, and to address the nonscientific public.

---

---

Outside science, he plays guitar in a rock and roll band – and has done so since his student days here. A musician in a bar in the Amazon apparently said “This Englishman is really good” – a compliment that Tim said means as much to him as all his academic distinctions. He declares “We would be happy to play at any University of Bristol occasions where such a band might be needed! Very reasonable rates.” According to his wife Gill, his fellow band members think he is desperately trying to save the planet – while living on another one. They call him Edna as in ‘head in the clouds’. He plays golf; he’s a keen cyclist. He rarely cooks, but he can: for Gill’s 40th birthday, he prepared a fabulous Italian meal for sixteen people, menu cards and all, after which he declared “I don’t know why you make a fuss about dinner parties”. Not bricklaying, though; when they were first married, Gill sent him on a course, and all he said afterwards was “I will have to earn some money so I don’t have to do that again”.

Tim has written “Bristol gave me a wonderful start to my career and I will always be very grateful for that.” We are enormously proud of him.

Madam Pro Vice-Chancellor, I present to you Professor Timothy Noel Palmer as eminently worthy of the degree of Doctor of Science *honoris causa*.

---