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STATEMENTS FROM SCIENTISTS ON

BERNARD d'ESPAGNAT WINS 2009 TEMPLETON PRIZE

Alain Aspect, Ph.D. – Professor and CNRS Senior Scientist, Ecole Polytechnique and Institut d'Optique, Palaiseau, France

In 1974, at a time when it was not fashionable to work on the foundations of quantum mechanics, I learned from Bernard d'Espagnat many subtleties about the Einstein-Podolsky-Rosen problem, Bell's inequalities, and quantum non-locality. This played a crucial role in my decision to embark on an experimental program to test Bell's inequalities. More generally, his books addressed to physicists as well as to the general public have greatly contributed to focusing attention on quantum weirdness, and have emphasized its importance both for epistemology and for science. Without visionary thinkers like Bernard d'Espagnat, the field of quantum information would certainly not have emerged as it did. I am happy to congratulate him and to have this opportunity to tell how much I owe him.

Nicolas Gisin, Ph.D. – Director of the Group of Applied Physics, University of Geneva, Switzerland

I have great pleasure in congratulating Bernard d'Espagnat for his well deserved 2009 Templeton prize. His early recognition of the groundbreaking role of "non-local entanglement" for our world view and his contribution to the studies of the foundations of quantum physics have had a profound impact on the entire field. It is fair to say that his leading role triggered the experimental work on Bell's inequality that took place in Europe in the 1980s and 1990s, especially in France, Austria and Switzerland. Today's experimental and conceptual worldwide research efforts in exploring quantum nonlocality owe a great deal to d'Espagnat's early contributions.

Brian Greene, Ph.D. – Professor, Mathematics and Physics, Columbia University

Quantum mechanics is the most accurate theory of nature ever devised. There's never been a single experimental result that's contradicted its predictions; indeed, some of these predictions regarding subatomic particles have been confirmed to better than ten decimal places. Such phenomenal success stands in stark contrast to the many mysteries regarding what quantum mechanics tells us about the true nature of the cosmos. Bernard d'Espagnat is among a small coterie of courageous thinkers who over the course of many decades has worked tirelessly to meld scientific and philosophical insights to reveal the full wonder of quantum reality.

Sir Anthony Leggett, D. Phil. – John D. and Catherine T. MacArthur Professor of Physics, University of Illinois; 2003 Nobel Prize in Physics

I would like to congratulate Bernard d'Espagnat on his receipt of the 2009 Templeton Prize. In an era when, as John Bell put it, "the typical physicist feels that (the questions of quantum measurement) have long been answered, and that he will fully understand just how if he can ever spare twenty minutes to think about it," d'Espagnat was one of the small group of physicists to appreciate how flawed were all the standard arguments for that conclusion, and to emphasize the profound philosophical implications of the predictive success of quantum mechanics. He realized from early on the crucial importance of Bell's work, and has for decades labored tirelessly to get its message across both to the physics community, as in his beautiful book *Conceptual Foundations of Quantum Mechanics* and his 1979 *Scientific American* article, and to the general public in a series of other books. When we look back on the early days of what are now recognized as the eminently respectable disciplines of quantum foundations and quantum information, we see how far ahead of his time d'Espagnat has been.

William D. Phillips, Ph.D. – Laser Cooling and Trapping Group, Atomic Physics Division, National Institute of Standards and Technology, U.S.A.; 1997 Nobel Prize in Physics

Entanglement is one of the key features of quantum mechanics, one that most sets it apart from classical physics—our pre-twentieth century description of how the universe works. Bernard d'Espagnat was a key figure in providing a mature understanding of both the scientific and philosophical implications of entanglement, a phenomenon so counterintuitive that it continues to intrigue 21st century physicists. D'Espagnat appreciated that entanglement not only changed our view of how physics works, but also our concept of the very nature of reality. At a time when entanglement is increasingly being put to use in the science and technology of quantum information, it is a pleasure to congratulate Bernard d'Espagnat on the occasion of his receiving the Templeton Prize, recognizing his contributions to both physics and philosophy in advancing understanding of this astounding phenomenon.

Anton Zeilinger, Ph.D. – Scientific Director, Institute of Quantum Optics and Quantum Information, Austrian Academy of Sciences, and Full Professor of Experimental Physics, University of Vienna, Austria

In April 1976 I had the privilege to meet for the first time Bernard d'Espagnat at a small meeting, "Thinkshop in Physics" organized by him together with John Bell in Erice, Italy. This meeting brought together theorists, experimentalists and even philosophers interested in the newly emerging field of testing the foundations of quantum physics. D'Espagnat is one of the exceptional kind of physicists who are able to very early realize the significance of emerging fundamental concepts and ideas, in that case of Bell's theorem and entanglement. Subsequently his book, *In Search of Reality*, became an eye opener for me and was crucial for my interest in entanglement. Little did we know at that time that this work did also lay the foundations of quantum information science.

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