Carlton M. Caves
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Biosketch: Carlton M. Caves is a theoretical physicist who has worked mainly on quantum metrology, the science of how to make the most sensitive measurements in the presence of the inherent uncertainties introduced by quantum mechanics. Caves was an undergraduate at Rice University, from which he received a BA in Physics and Mathematics in 1972. He received the PhD in Physics from the California Institute of Technology in 1979 and continued at Caltech as a Research Fellow and then Senior Research Fellow till 1987. From 1988 till 1992 he was Associate Professor of Electrical Engineering and Physics at the University of Southern California. He moved to the University of New Mexico as Professor of Physics and Astronomy in 1992, was recognized as a Distinguished Professor in 2006, and was Director of UNM's Center for Quantum Information and Control from its founding in 2009 till his retirement in 2018. Now Distinguished Professor Emeritus at UNM and Distinguished Visiting Research Chair at the Perimeter Institute for Theoretical Physics, Caves is a Fellow of the American Physical Society and the American Association for the Advancement of Science and a Member of the US National Academy of Sciences.

Research Interests: Carlton Caves began his research career as a relativity theorist, became a quantum optician to explore the noise in gravitational-wave detectors, and morphed to a quantum information scientist, interested in how to persuade quantum systems to do jobs we want, instead of doing what comes naturally. He is perhaps best known for having proposed to improve the sensitivity of interferometric gravitational-wave detectors by injecting squeezed-vacuum light into the normally unused (antisymmetric) input port of an interferometer, an early example, before anyone thought about it this way, of replacing what comes naturally, the vacuum entering the unused port, with the squeezed vacuum that improves sensitivity. Caves continues research today on projects drawn from quantum information theory, quantum optics, and quantum metrology. Focus on particular research projects, important, indeed crucial though they are, obscures the ultimate point. The overarching goal, too ambitious and therefore fatally attractive, is to explore what it is that makes the world quantum, to understand why the world turns out to be that way, and to formulate a coherent and consistent way to think about the quantum world.