

# **“The Demon and the Quantum: From Thermodynamics to Quantum Mechanics and Beyond”**

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We often hear phrases like quantum weirdness and the strange world of the quantum. A fact that is not so widely appreciated is that quantum mechanics can (and does) shed light on problems such as the Maxwell Demon Paradox of thermodynamics, the seemingly spiritual nature of information, and even, perhaps, new insights into the existence of Mind! The common denominator of all this is the fact that information is a real physical quantity. Information is more than something just in our mind, it is the essence of, and in many ways more general than the concept of entropy. By focusing on entropy, information, and observation, the authors bring a unique perspective to this subject, and offer insight into the strange ways of the quantum.

## **Marlan Orvil Scully**

Marlan Orvil Scully is a physicist best known for his work in theoretical quantum optics. He is currently a professor at both Texas A&M and Princeton Universities. He has authored over 700 scientific articles, as well as standard textbooks.

At Texas A&M University, Marlan is the Burgess Distinguished Professor of Physics, holds the TEES Distinguished research chair, and is Director of the Center for Theoretical Physics and the Institute for Quantum Studies. At Princeton University, Marlan holds the rank of Professor in the Mechanical and Aerospace Engineering Department and the Princeton Institute for the Science and Technology of Materials.

He is known for the Scully-Lamb quantum theory of the laser, which was the first theoretical treatment which yielded the laser photon statistics, the laser linewidth, and all higher order photon correlations, and also for the "quantum eraser" effect with Druehl which dramatically underscores the difference between our classical conceptions of time and how quantum processes can unfold in time.

Marlan is a member of the National Academy of Sciences, the American Academy of Arts & Sciences, the Academia Europaea, and the Max Planck Society. He has also received numerous awards including the Charles H. Townes Award of the OSA, the Quantum Electronics Award of IEEE, the Elliott Cresson Medal of the Franklin Institute, the Adolph E. Lomb Medal of the OSA, a Guggenheim Fellowship, the Alexander von Humboldt Distinguished Faculty Prize, the APS Arthur L. Schawlow Prize, and has been appointed to a Harvard Loeb Lectureship.

In 2007, Marlan and his son, Rob, co-authored a book entitled "The Demon and the Quantum: From the Pythagorean Mystics to Maxwell's Demon and Quantum Mystery" which was published by Wiley-VCH. The book is directed toward the layperson as well as the professional physicist and examines the connection between Maxwell's Demon and the role of the observer and quantum eraser.