



PLENARY LECTURE - 1

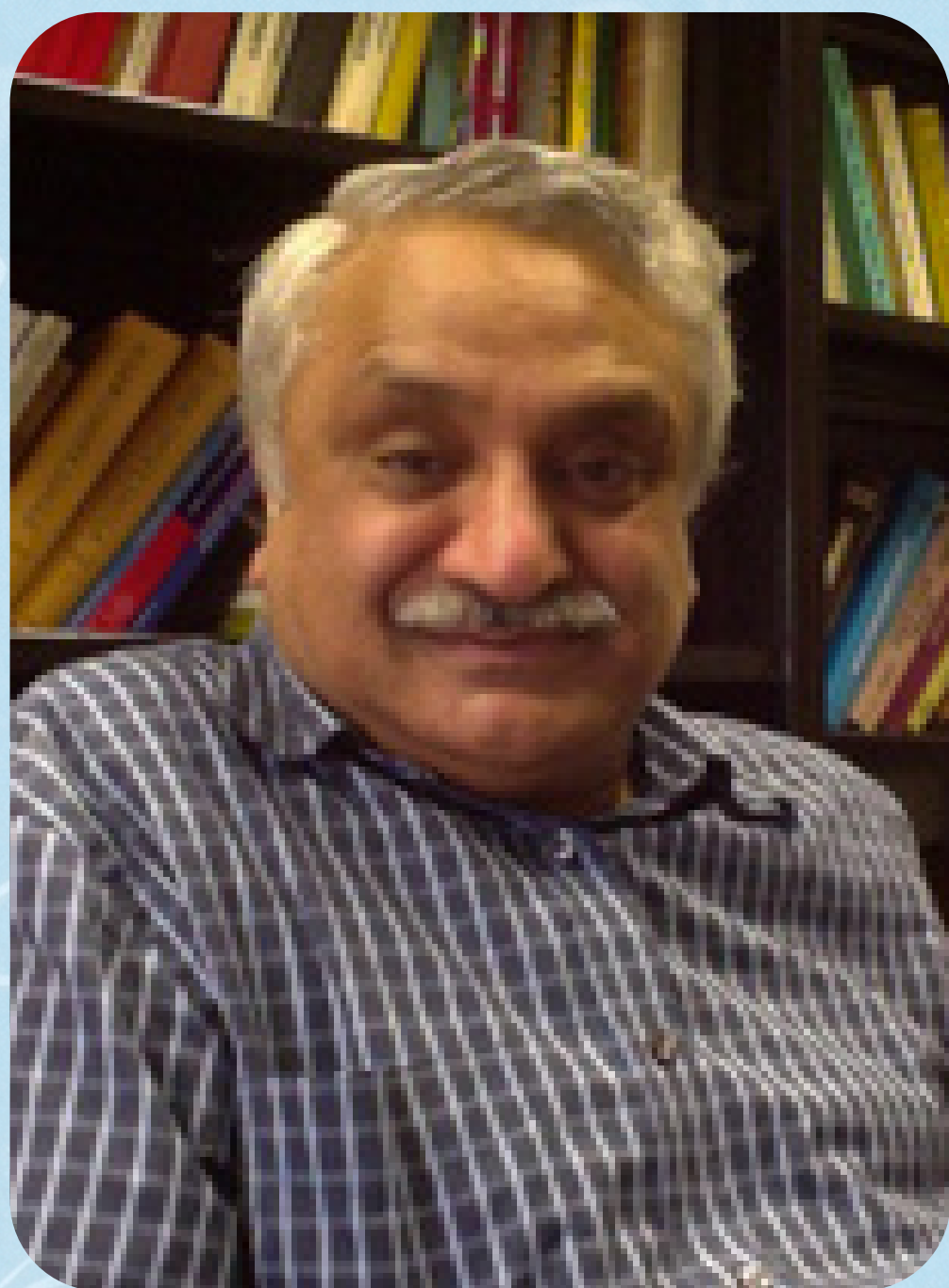
The classical limit of the spin- s Einstein-Podolsky-Rosen-Bohm experiment



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ABOUT THE SPEAKER:



Prof Anupam Garg is a Professor in the Department of Physics and Astronomy at Northwestern University, Illinois. He obtained his Master's degree from IIT Delhi in 1977 and his Ph.D. from Cornell University in 1983. He was elected Fellow of the American Physical Society in 2012 for his pioneering work on molecular magnetism and macroscopic quantum phenomena. He is best known as the co-formulator of the Leggett-Garg inequality, a key test of macrorealism in quantum mechanics. His research spans quantum tunneling of magnetization, spin path integrals, and coherent state methods in semiclassical quantum theory. He is also the author of Classical Electromagnetism in a Nutshell and Mathematics with a Scientific Sensibility.

ABSTRACT:

The incompatibility of the macrorealistic inequality with quantum theory has sharpened the need for understanding the classical limit of quantum mechanics. With this motivation, the strange correlations in the spin- s EPRB experiment are coarse grained via the inclusion of detector error. An error protocol is found which is remarkable in two ways. Firstly, it has the mathematical property that it can be viewed as an imperfection in the process either of detection or of state preparation. Secondly, it is minimal in both viewpoints in the sense that it is no more than is needed to wash out the excess quantum correlations. That such a remarkable dual interpretation should be possible suggests that this type of complementary coarse graining is an intrinsic aspect of how classicality is obtained in the large s limit, but this conclusion remains speculative.

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