SEMINAR

Quantum Reality - New Perspectives

March 26, 2011 (Saturday)

Nehru Science Center Auditorium

On Dr. E. Moses Road between Mahalaxmi Rly. Stn. and Worli Naka

9 A.M. Registration

OPEN TO ALL

ADMISSION FREE

PRE-REGISTRATION *REQUIRED*

To Pre-Register,
SMS your name to
93222-11128
98696-86366
99696-14308
or email it to
seminarQM@isist.info

"There is no doubt that the stage that quantum physics has reached is beyond the grasp of even its creators."
~Max Planck

"Quantum theory, that strange thing we all know how to use, but understand very little."
~Murray Gell Mann, 1979

What is the nature of the physical reality underlying quantum theory? Although developed over 80 years ago, quantum mechanics still defies a clear answer to this question.

In this seminar, three quantum physicists will discuss the foundational issues involved in a simple-to-understand manner and describe some new approaches. No familiarity with the subject matter will be presupposed.

You are cordially invited to attend this exciting half-day seminar.

9:30 A.M. Chairman's Introductory Remarks
Prof. C. R. MUTHUKRISHNAN (*formerly*) Deputy Director, I.I.T. Madras

9:40 A.M. Prof. GARY BOWMAN Dept. of Physics and Astronomy, Northern Arizona Univ., U.S.A.

What is Quantum Mechanics? A Very Brief Guide for the Perplexed

The non-physicist seeking quantum enlightenment faces a daunting task. Technical discussions are inaccessible, while popular treatments often focus on "quantum weirdness," neglecting key principles that are essential for understanding quantum mechanics. I aim to present these key principles – superposition, representation, the uncertainty relations, and measurement – in a non-technical yet conceptually accurate manner. I then discuss what sorts of questions quantum mechanics can, and cannot, address.

10:40 A.M. Prof. C.S. UNNIKRISHNAN Tata Institute of Fundamental Research, Mumbai

Is There Spooky Action-at-a-Distance in Microscopic Physics?

Superluminal action-at-a-distance or 'nonlocality' is a widely held belief amongst today's physicists faced with the bizarre nature of reality in quantum physics. After describing the historical milestones including the famous EPR query and Bell's inequalities concerning entanglement in quantum physics that has led to this belief, I will go on to debunk the notion of nonlocality in quantum physics with plenty of good arguments and new results.

11:40 A.M. Prof. RAVI GOMATAM
Director, Inst. for Semantic Information Sciences & Tech., Mumbai; Adjunct Professor, BITS, Pilani

Objective Semantic Information - A New Framework for Understanding Quantum Reality

Our senses constantly receive information about worldly objects in two forms: physical (location, shape, size etc.), and semantic (sensations-color, smell, taste etc., as well as objects' meaning to us). Classical physics succeeded by objectivizing and dealing solely with physical information (via precise concepts such as mass, position, velocity and energy). These concepts have been retained in quantum mechanics so far, although the theory is acknowledged to be radically non-classical. Indeed, despite its practical success, the theory features deep conceptual problems that remain unsolved. I will propose that the semantic information referred to above, long neglected in physics, can also be objectivized and used (instead of objective physical information) to understand quantum theory and its underlying notion of reality in an intuitive, problem-free manner. This approach also opens possibilities for new, practical applications for quantum theory.

12:45 P.M. Chairman's Remarks by Prof. C. R. MUTHUKRISHNAN
1:00 P.M. *Seminar ends*

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