Colloquia at the Ramanujan Auditorium

3rd January 2013, 9:30 am
Holography and quantum gravity
Ashoke Sen
Harischandra Research Institute, Allahabad, India

3rd January 2013, 10:50 am
Concept of Moduli
S Ramanan
Chennai Mathematical Institute, Chennai, India

3rd January 2013, 11:50 am
Solving cubic equations
Benedict Gross
Harvard University, Cambridge, USA

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years of
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Colloquia at the Ramanujan Auditorium

4th January 2013, 9:30 am
Limiting Laws for Spectral Statistics of Large Random Matrices
Leonid Pastur
Institute of Low Temperature Physics, Kharkov, Ukraine

We consider certain functions of eigenvalues and eigenvectors (spectral statistics) of real symmetric and hermitian random matrices of large size. We first explain that an analog of the Law of Large Numbers is valid for these functions as the size of matrices tends to infinity. We then discuss the scale and the form for limiting fluctuation laws of the statistics and show that the laws can the standard Gaussian (i.e., analogous to usual Central Limit Theorem for appropriately normalized sums of independent or weakly dependent random variables) in non-standard asymptotic settings, certain non Gaussian in seemingly standard asymptotic settings, and other non Gaussian in non-standard asymptotic settings.

4th January 2013, 10:50 am
Particles and Fields at the LHC
George Sterman
Yang Institute for Theoretical Physics, Stony Brook, USA

This talk will review how high energy experiments reveal quantum fields, using as a prime example the theory of the strong interactions, quantum chromodynamics. We'll review the classical concept of gauge theories and the quantum consequence of asymptotic freedom, with the goal of illustrating how the complex outcomes of particle collisions have been used to confirm simple underlying laws.

4th January 2013, 11:50 am
Beyond Nash Equilibrium: Solution Concepts for the 21st Century
Joseph Halpern
Cornell University, USA

Nash equilibrium is the most commonly-used notion of equilibrium in game theory. However, it suffers from numerous problems. Some are well known in the game theory community; for example, the Nash equilibrium of repeated prisoner's dilemma is neither normatively nor descriptively reasonable. However, new problems arise when considering Nash equilibrium from a computer science perspective: for example, Nash equilibrium is not robust (it does not tolerate "faulty" or "unexpected" behavior), it does not deal with coalitions, it does not take computation cost into account, and it does not deal with cases where players are not aware of all aspects of the game. In this talk, I discuss solution concepts that try to address these shortcomings of Nash equilibrium. This talk represents joint work with various collaborators, including Ittai Abraham, Danny Dolev, Rica Gonen, Rafael Pass, and Leandro Rego. No background in game theory will be presumed.