

中央大學物理學系

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Colloquium

Completing the Quantum Revolution in the True Spirit of Heisenberg and Dirac

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Venue: S4-625

Time: 14:00-16:00

Abstract :

99 years ago, Heisenberg took the bold move to create the new quantum theory. Dirac immediately presented a full formulation of that. The key idea is that physical quantities are q-number, instead of c-(real) number, ones. However, Schrödinger's formulation in terms of wavefunctions has been misinterpreted, leading all the way to Born's probability. The revolution has been compromised, giving a theory 'nobody understands'. Identifying the missing noncommutative (q-)numbers, we give a realistic picture of the theory in the original true spirit of Heisenberg and Dirac, and take it all the way to confront gravity. A noncommutative number represents a piece of quantum information. Its introduction, conceptually first by Dirac, should be a natural step in the history of mathematics and physics. Quantum gravity should be the general relativity of the noncommutative/quantum spacetime. The Relativity Principle is well-reconciled with the quantum theory for the first time.