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Quantum cryptography: a pedestrian introduction

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Abstract:

We review the concept of non-classical correlations (entanglement) in multipartite quantum systems. These quantum correlations are the necessary resource for quantum teleportation and quantum cryptography. Starting from the famous EPR (Einstein-Podolski-Rosen) paradox and its simpler GHZ (Greenberger-Horne-Zeilinger) version, we discuss the physical consequences of entanglement. Putting emphasis on experimental realizations with photon pairs, simple protocols are presented for quantum key distribution and quantum teleportation.

Bio: Dr. Wimberger received a binational PhD degree in physics in 2004 from the University dell'Insubria (Como) and the LMU Munich. Early 2004 he was a post-doc at the Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, before taking a Fedor-Lynen Fellowship from the Alexander von Humboldt Foundation at Pisa University (2004-2006); in 2006-2007 he was a Research scientist at Politecnico di Torino, Italy; in 2007-2013 he was a Research group leader at Heidelberg University, Germany. Since 2014 he is a senior researcher at Parma University, Italy.

Organizer

Prof. Alberto Bononi