

Introduction to the second issue

Following the theme initiated in the first issue of QIC, in this second issue, we include invited review papers on the current status of achieving entanglement in experiments. Here we include a paper on photon entanglement and its applications by Wolfgang Tittel and Gregor Weihs and a paper on entanglement of atomic ions by Cass Sackett. A subsequent issue will include papers on entanglement in the context of NMR by Raymond Laflamme and in the context of cavity-QED by Jeff Kimble and Mike Chapman. In this second issue, we also include a regular paper on quantum key distribution by Hoi-Kwong Lo and a review by David DiVincenzo of the book "Quantum Computation and Quantum Information" written by Michael Nielsen and Ike Chuang.

We hope the reviews will acquaint both theorists and experimentalists with the achievements (and problems) in areas outside their area of expertise. We also hope the reviews will help bridge the gap between pure theoretical developments and what is possible experimentally, given the technical limitations of the various possible physical implementations of quantum information processing. This may lead to optimized algorithms for various tasks in the different physical systems.

David Wineland, Ignacio Cirac, and Richard Jozsa