Quantum protocols for aligning directions in space

Dr. Giulio Chiribella
Center for Quantum Information
Institute of Interdisciplinary Information Sciences
Tsinghua University

Abstract:

Suppose that two parties, Alice and Bob, are on two satellite stations far apart from each other. Their Cartesian axes x, y, and z, point in different directions and they would like to find out what is their relative orientation in space. In this talk I will present protocols that achieve this goal via an exchange of messages between Alice and Bob, taking advantage of pre-existing correlations between their gyroscopes. When these correlations are quantum, I will show that Alice and Bob can discover the relative orientation with a precision that is impossible in the familiar world of classical physics.

About the Speaker:

Dr. Giulio Chiribella is an Associate Professor at the Center for Quantum Information, Institute for Interdisciplinary Information Sciences (IIIS), of Tsinghua University. In 2010 he was awarded the Hermann Weyl Prize for applications of group theory in quantum information. Currently, he is a Junior Fellow of the 1000 Talents Program of China, Member of Standing Committee of ICGTMP (International Colloquia on Group Theoretical Methods in Physics), Member of the Foundational Questions Institute (FQXI), and Visiting Fellow of Perimeter Institute. His research interests include quantum networks, quantum estimation theory, and the foundations of quantum information and computation.

All are welcome!
For enquiries, please call 2859 2180 or email enquiry@cs.hku.hk
Department of Computer Science
The University of Hong Kong