

# First International Conference on Quantum Error Correction

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Quantum error correction of decoherence and faulty control operations forms the backbone of all of quantum information processing. In spite of remarkable progress on this front ever since the discovery of quantum error correcting codes a decade ago, there remain important open problems in both theory and applications to real physical systems.

In short, a theory of quantum error correction that is at the same time comprehensive and realistically applicable has not yet been discovered. Therefore the subject remains a very active area of research with a continuing stream of progress and breakthroughs.

The First International Conference on Quantum Error Correction, hosted by the USC Center for Quantum Information Science & Technology (CQIST), will bring together a wide group of experts to discuss all aspects of decoherence control and fault tolerance. The subject is at this point in time of a mostly theoretical nature, but the conference will include talks surveying the latest experimental progress, and will seek to promote an interaction between theoreticians and experimentalists.

Topics of interest include, in random order: fault tolerance and thresholds, pulse control methods (dynamical decoupling), hybrid methods, applications to cryptography, decoherence-free subspaces and noiseless subsystems, operator quantum error correction, advanced codes (convolutional codes, catalytic, entanglement assisted, ...), topological codes, fault tolerance in the cluster model, fault tolerance in linear optics QC, fault tolerance in condensed matter systems, unification of error

correction paradigms, self-correcting systems, error correction/avoidance via energy gaps, error correction in adiabatic QC, composite pulses, continuous-time QEC, error correction for specific errors (e.g., spontaneous emission), etc.

The conference will take place Dec. 17-21 at the University of Southern California in Los Angeles.

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