1067-Z1-1635 **David Clark*** (dcclark@mtu.edu), Department of Mathematics, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931. *Using Steiner designs to construct entanglement-assisted quantum error-correcting codes.*

Entanglement-assisted quantum error-correcting codes (EAQECCs) are a newly discovered category of quantum codes. Among other benefits, EAQECCs can be created from *any* classical binary code, which is a significant advantage over the more common stabilizer quantum codes. We show how EAQECCs and block designs are fundamentally connected, and present a general method for constructing EAQECCs which is based on Steiner designs. This method creates infinite classes of EAQECCs with many desirable properties, including efficient decoding algorithms and very low error rates. (Received September 21, 2010)