# Integrality properties of the Weil Representation of a finite quadratic module

## Luca Candelori

The Weil representation of a finite quadratic module is an essential tool in studying the transformation laws of theta functions. This complex, finite-dimensional representation factors through a finite quotient of the metaplectic cover of the modular group and it has a canonical basis of delta functions. With respect to this basis, the matrix entries of the Weil representation lie in a cyclotomic field extension. In this talk we prove that after a suitable change of basis the matrix entries can be taken to lie in the ring of integers of the cyclotomic extension. For cyclic quadratic modules of even prime-power order, we exhibit a canonical choice for such an integral basis. The original motivation behind this question was the development of Integral Topological Quantum Field Theory by Gilmer and Massbaum. We discuss the connections with this integral theory, as well as with integral TQFTs afforded by more general modular tensor categories. This is joint work with Richard Ng and Yilong Wang at LSU, and with Yilong Wang and Shaul Zemel at Hebrew University.